

Forest Farm, Chippenham
Environmental Statement

Chapter 8
Natural heritage



8 Natural heritage

Introduction

- 8.1 EAD Ecology was appointed to undertake the assessment of the potential for effects on natural heritage, including as a result of habitat loss and creation, disturbance of protected and priority species, and effects on designated nature conservation sites. The findings of the assessment are summarised in this chapter and the full report is included as technical appendix F. The references and data sources used in the assessment are shown in table 8.1.

Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F., 2014, Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (<i>Triturus cristatus</i>) environmental DNA
Bright, P., Morris, P. and Mitchell-Jones, T., 2006, The Dormouse Conservation Handbook 2 nd edition
British Standards Institution, 2013, BS 42020:2013 Biodiversity – Code of practice for planning and development
British Standards Institution, 2012, BS 5387:2012 Trees in relation to design, demolition and construction: Recommendations
Chanin, P. and Woods, M., 2003, Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project. English Nature Research Report No. 5
Chartered Institute of Ecology and Environmental Management, 2018, Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine Version 1.3
Collins, J., 2016, Bat Surveys for Professional Ecologists: Good Practice Guidelines (3 rd edition)
Collins, J., 2023, Bat Surveys for Professional Ecologists: Good Practice Guidelines (4 th edition)
Dean, M., Strachan, R., Gow, D. and Andrews, R., 2016, The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin
Defra, 2007, Hedgerow Survey Handbook – a standard procedure for local surveys in the UK
Defra, 2024, The Statutory Biodiversity Metric – Technical Annex 1: Condition Assessment Sheets and Methodology
Defra and the Environment Agency, 2026, Pollution prevention for businesses
Elmeros, M., Møller, J., Dekker, J., Garin, I., Christensen, M. and Baagøe, H., 2016, Bat mitigation measures on roads – a guideline
Froglife, 1999, Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation – Froglife Advice Sheet 10
Gilbert, G., Gibbons, D.W. and Evans, J., 1998, Bird Monitoring Methods
Harris, S., Cresswell, P. and Jeffries, D., 1989, Surveying Badgers
Institution of Lighting Professionals (ILP), 2023, Guidance Note GN08/23: Bats and Artificial Lighting At Night
LUC, 2023, Wiltshire Local Plan Review Habitats Regulations Assessment – Appropriate Assessment
Miller, B., 2001, A method for determining relative activity of free flying bats using a new activity index for acoustic monitoring. <i>Acta Chiropterologica</i> 3 (1), 93-105
Natural England, 2009, Protection of Badgers Act 1992 (as amended). Interpretation of 'Disturbance' in relation to badgers occupying a sett
Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M., 2000, Evaluating the suitability of habitat for the Great Crested Newt (<i>Triturus cristatus</i>). <i>Herpetological Journal</i> 10(4), 143-155
Reason, P.F. and Wray, S., 2023, UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1
Robb, G.N., McDonald, R.A., Chamberlain, D.E., Reynolds, S.J., Harrison, T.J. and Bearhop, S., 2008, Winter feeding of birds increases productivity in the subsequent breeding season. <i>Biology Letters</i> 2008 Apr 23;4(2):220-3
Rowse, E.G., Lewanzik, D., Stone, E.L., Harris, S. and Jones, G., 2016, Dark matters: the effects of artificial lighting on bats. In <i>Bats in the Anthropocene: Conservation of bats in a changing world</i> (pp. 187-213)
Shawyer, C.R., 2011, Barn Owl <i>Tyto alba</i> Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting
Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. and Win, I., 2021, The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. <i>Brit. Birds</i> 114: 723-747
Stone, E.L., Jones, G. and Harris, S., 2009, Street lighting disturbs commuting bats. <i>Current Biology</i> 19: 1-5

Stone, E.L., 2013, Bats and lighting: Overview of current evidence and mitigation. Bats and Lighting Research Project, University of Bristol, www.batsandlighting.co.uk
Stone, E., Harris, S. and Jones, G., 2015, Impacts of artificial lighting on bats: A review of challenges and solutions. Journal of Mammalogy, Volume 80, Issue 3: 213-219
Wiltshire Council, 2015, Bat Special Areas of Conservation (SAC) Planning Guidance for Wiltshire
Websites: https://magic.defra.gov.uk/MagicMap.aspx http://jncc.defra.gov.uk https://www.gov.uk/government/organisations/natural-england
Table 8.1: References and data sources

Legislation and policy

Legislation

- 8.2 The Conservation of Habitats and Species Regulations 2017 (as amended) make it an offence to deliberately capture, kill, disturb or injure any European protected species. It is also an offence to take or destroy the eggs of a European protected species, or damage or destroy a breeding or resting place of such an animal. The term 'disturbance' includes any disturbance that is likely to impair an animal's ability to survive, breed or reproduce, or to rear and nurture their young, hibernate or migrate; or to significantly affect the local distribution or abundance of the species concerned.
- 8.3 The Wildlife and Countryside Act 1981 (as amended) sets out the legal protection afforded to all wild animals and plants. All wild birds, their eggs and nests are protected, along with specified mammals, plants, fish, reptiles and amphibians. It is an offence to kill, injure, sell or take protected species; or intentionally, or recklessly, damage, destroy or obstruct their places of shelter. Birds listed on Schedule 1 of the Act are afforded an additional level of protection above that provided to all wild birds.
- 8.4 Section 28 of the Wildlife and Countryside Act requires Natural England to notify land of special interest for plants, animals and geological or physiographical features. The notification of a site of special scientific interest (SSSI) gives a legal mechanism to protect these areas. The Countryside and Rights of Way Act 2000 strengthens protection for SSSIs and provides a further basis for the conservation of biological diversity.
- 8.5 The Natural Environment and Rural Communities Act 2006 requires the publication of a list of species and habitats of principal importance for the conservation of biodiversity in England. In total, 56 habitats and 943 species are included in the Section 41 lists. The inclusion of species and habitats on these lists is used by local authorities in implementing their duties under this Act to have regard for the conservation of biodiversity when carrying out their normal functions.
- 8.6 The Protection of Badgers Act 1992 sets out the legal protection for badgers, making it an offence to wilfully kill, injure or take a badger, or to attempt to do so, unless permitted under the Act. The legislation also extends the protection to badger setts, defined as "*any structure or place which displays signs indicating current use by a badger.*" It is an offence to intentionally, or recklessly, interfere with a badger sett by damaging or destroying it, obstructing access or disturbing a badger occupying a sett. The Act was introduced primarily for animal welfare reasons, rather than for species conservation.

- 8.7 The Hedgerow Regulations 1997 set out criteria for identifying important hedgerows. These relate to the value of hedgerows from an archaeological, historical, wildlife and landscape perspective. The regulations include provisions for the protection of hedgerows and make it an offence to remove important hedgerows without consent from the local planning authority. Where planning permission is granted for a development proposal, the removal of important hedgerows is deemed to be permitted.
- 8.8 Further details of relevant legislation are provided in technical appendix F.

National policy

- 8.9 The National Planning Policy Framework (NPPF; 2024) sets out the government's planning policy for England. Paragraph 187 requires that the planning system should contribute to and enhance the natural and local environment by:

“minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures and incorporating features which support priority or threatened species such as swifts, bats and hedgehogs.”

- 8.10 Paragraph 193 sets out a series of principles that local planning authorities should use when determining planning applications to conserve and enhance biodiversity.

Local policy

- 8.11 Local planning policy in relation to natural heritage is provided by the adopted *Wiltshire Core Strategy* (2015). Core Policy 50: Biodiversity and geodiversity requires development proposals to demonstrate how they protect features of nature conservation value as part of the design rationale and that they should retain, buffer and manage such features favourably. Damage is only acceptable where impacts have been mitigated as far as possible and appropriate compensatory measures can be secured. The policy also requires development proposals to incorporate appropriate measures to avoid and reduce disturbance of sensitive wildlife species and habitats and to seek opportunities to enhance biodiversity.
- 8.12 Core Policy 57: Ensuring high quality design and place shaping requires the retention and enhancement of existing important landscaping and natural features, such as trees, hedges, banks and watercourses, to take opportunities to enhance biodiversity, create wildlife corridors and mitigate any losses that may occur through the development.
- 8.13 The *Chippenham Neighbourhood Plan 2023-2038 Made Version* (2024) also sets out relevant policies in relation to natural heritage. Policy G11 – Protecting and Enhancing Biodiversity requires the retention and enhancement of features of significant biodiversity value, including trees, hedgerows, blue infrastructure, and native plants and wildflower areas. Policy G15 – Trees, Woodlands and Hedgerows states that proposals should seek to protect existing trees, woodland and hedgerows and should incorporate new and replacement tree planting.

- 8.14 A more detailed review of local and national planning policy is provided in technical appendix F.

Methodology

Baseline

- 8.15 Baseline ecological data were collected through a desk study and a range of field surveys. The desk study collated data from published sources and databases, including the Wiltshire and Swindon Biological Records Centre (WSBRC). Information was obtained on internationally important nature conservation sites within 10 km of the site, nationally designated nature conservation sites within 5 km of the site, and locally designated nature conservation sites and protected and notable species within 2 km of the site (extended to 4 km for bats).
- 8.16 The following ecological surveys were carried out on the site and a wider survey area that included the central farm complex of Forest Farm, which is outside the application boundary:
- Extended Phase 1 habitat survey – February 2012, June 2014, October 2021, April 2024 and July 2025
 - Habitat Condition Assessment of all habitats on site following Statutory Metric guidance (Defra, 2024) – May 2024 and July 2025
 - Invasive plants survey to identify the presence of any legally controlled invasive plants – May 2022 and May 2024
 - Hedgerow survey in accordance with survey guidelines (Defra, 2007) – May 2022
 - Great crested newt environmental DNA (eDNA) surveys, sampled in accordance with Biggs et al (2014) and habitat suitability index (HSI) surveys (Oldham et al, 2000) – May 2022 and May 2024
 - Reptile surveys in accordance with the standard methodology (Froglife, 1999) – April to June 2022
 - Breeding bird surveys in accordance with a modified Common Bird Census methodology (Gilbert et al, 1998) – April to June 2022
 - Hazel dormouse surveys following the standard methodology (Bright et al, 2006) – April to October 2022
 - Preliminary bat roost assessment of all trees and buildings (within the adjacent farm complex) in accordance with Bat Conservation Trust guidelines (Collins, 2016 and 2023), dusk / dawn emergence / re-entry surveys of impacted (directly or indirectly) trees in accordance with Bat Conservation Trust guidelines, and additional aerial tree climbing surveys – July to September 2014 (buildings and trees), July to September 2022 (buildings and trees) and April to August 2024 (trees only)
 - Bat activity surveys in accordance with Bat Conservation Trust guidelines (Collins, 2016) – April to October 2022
 - Badger surveys in accordance with survey guidelines (Harris et al, 1989) – April 2022 and April 2024
 - Otter surveys in accordance with survey guidelines (Chanin, 2003) – April to October 2022 and April to June 2024
 - Water vole surveys in accordance with survey guidelines (Dean et al, 2016) – April to October 2022 and April to June 2024

8.17 Full details of the survey methodologies are set out in technical appendix F.

Impact assessment

8.18 The importance of the identified ecological features was evaluated using criteria for habitats and species based on the Chartered Institute of Ecology and Environmental Management's (CIEEM; 2018) guidelines. Ecological importance was classified using an eight-level geographic scale from sub-parish to international (table 8.2). To provide consistency with the approach used in the other chapters of this ES, table 8.2 explains how these levels relate to the general tor&co approach to assessment described in chapter 3 of this ES.

Importance	Definition	tor&co approach
International	Internationally designated sites, or sites meeting criteria for international designation. Sites supporting populations of internationally important species	High
UK	Sites with UK importance	High
National	Nationally designated sites (e.g. SSSIs) or sites meeting SSSI selection criteria. Sites containing viable areas of threatened priority habitat or supporting a viable population of Red Data Book species or supplying critical elements of their habitat requirements	High
Regional	Sites exceeding county-level designations but not meeting SSSI criteria. Sites containing viable areas of threatened habitats on the regional Biodiversity Action Plan (BAP), supporting viable populations of species that are nationally scarce or included in the regional BAP due to rarity	Medium
County	Sites meeting criteria for county or Metropolitan designations. Sites containing a viable area of a threatened habitat identified on the county BAP or supporting viable populations of county or Metropolitan rarities, e.g. county BAP or county Red Data Book species	Medium
District	Undesignated sites or features that are considered to appreciably enrich the habitat resource in the context of the borough or district	Medium
Parish	Areas of habitat considered to appreciably enrich the habitat resource within the context of a parish or neighbourhood	Low
Sub-parish	Ecological resource not meeting any of the above criteria	Low
Table 8.2: Criteria for assessing receptor importance and comparison with the tor&co approach		

8.19 Features were identified that were considered 'important', in accordance with the CIEEM guidelines, and therefore subject to further detailed assessment. Features that were unlikely to be affected by the project, or were sufficiently widespread, unthreatened or resilient to potential project impacts, were not considered important in the context of the proposed development and were therefore not subject to further assessment.

8.20 The proposed development was informed by the ecological baseline, including the presence of habitats and protected species. Therefore, the initial impact assessment was of a partially mitigated scheme incorporating primary (embedded) mitigation. Additional (secondary) avoidance, mitigation, compensation and enhancement measures were subsequently identified and an assessment of the residual effects remaining after this mitigation was undertaken in accordance with the CIEEM guidelines. Effects were described at a geographical scale, with effects identified at sub-parish level and below not considered significant. Effects identified at parish level and above were considered significant.

- 8.21 To facilitate a consistent approach to the assessment of residual effects within the ES, the degree of the residual effects following mitigation was assessed by combining the importance of the receptors (table 8.2) with the magnitude of change (figure 8.1), using a matrix (figure 8.2). Effects that are moderate or above are considered to be significant in EIA terms.

Limitations and uncertainties

- 8.22 The extended phase 1 habitat survey was updated in April 2024 and did not identify any significant habitat changes to the previous survey undertaken in October 2021; however, it was considered appropriate to update a number of the surveys listed above to inform the emerging development proposals. As the on-site habitats had not changed significantly, the results of the hedgerow, reptile, breeding bird, hazel dormouse and bat activity surveys undertaken in 2022 were still considered valid; age of survey data is not considered to be a limitation and accords with BS 42020:2013.
- 8.23 Access for building inspections and emergence surveys was not possible in 2024, so the surveys could not be updated. However, the on-site habitats had not changed significantly and the buildings did not appear to have changed significantly externally so it was considered appropriate to include the results of the 2014 and 2022 surveys to inform the emerging development proposals.
- 8.24 The part of the site comprising the A4 London Road and adjacent hedgerows and verges was not included in the ecological survey area for the phase 2 surveys because works in this area will largely be within the current highway footprint, although it was included within the Habitat Condition Assessment surveys to inform the biodiversity net gain assessment. This is not considered to compromise the adequacy of this assessment.
- 8.25 The survey boundary for the July 2025 habitat survey and Habitat Condition Assessment was extended to include the two pedestrian / cycle access routes in the north west of the site. The survey area for the phase 2 surveys did not include these access routes, which were incorporated into the site after the surveys had been completed. Based on the habitats present along these routes, the information obtained on the presence / distribution of protected and notable species from the phase 2 surveys of the adjacent land, and the nature of the works proposed in these areas, this is not considered to be a significant limitation to the assessment.

Baseline

Designated sites

Internationally and nationally designated sites

- 8.26 There is one internationally designated site within 10 km of the site: the Bath and Bradford on Avon Bats Special Area of Conservation (SAC), which is approximately 9.4 km to the south west of the site at its nearest point. The SAC is designated primarily for its greater horseshoe bat and Bechstein's bat hibernation roosts. It consists of four component SSSIs, the nearest of which to the site is the Box Mine SSSI. The landscape around the SAC roosts is considered to be important in maintaining the favourable conservation status of the qualifying species and Wiltshire Council's (2015) *Bat SAC Planning*

Guidance for Wiltshire identifies bat consultation zones that comprise 'core roosts' and 'core areas' for the bat species associated with the SAC.

- 8.27 The site is not located within a bat consultation zone for the SAC. LUC's (2023) *Wiltshire Local Plan Review: Habitats Regulations Assessment* includes the site as part of the former policy 7 allocation. It screens out any likely significant effect as a result of physical loss of 'functionally linked habitat' arising from policy 7, so no impact mechanisms or pathways are identified to affect the SAC. It is therefore not considered further.
- 8.28 There are three statutory designated sites of nature conservation importance within 5 km of the site. The nearest is Mortimore's Wood Local Nature Reserve (LNR), which is 1.5 km to the west and is designated for its ancient semi-natural broadleaved woodland and river bank habitats. No impact mechanisms or pathways are identified that are likely to affect this site, so it is not considered further.
- 8.29 Bencroft Hill Meadows SSSI is approximately 2.2 km to the north east of the site and is designated for its unimproved pasture of very high botanical quality. Spye Park SSSI is approximately 3.1 km to the south of the site and is designated for its large expanses of alder woods, oak woods, parkland and dry acidic grassland. The site does not lie within a SSSI 'impact risk zone' for residential development for these SSSIs and they are therefore not considered further.

Locally designated sites

- 8.30 There are 15 non-statutory designated local wildlife sites (LWS) within 2 km of the site (table 8.3).

Site name	Distance from site	Reason for designation
Stanley Abbey Farm Meadows LWS	820 m east	Neutral grassland
Middle Lodge Wood LWS	920 m south west	A small semi-natural oak wood in a shallow valley basin
Derry Woods LWS	930 m east	Two areas of ancient semi-natural broadleaved woodland on a greensand and clay ridge
Nocketts Hill Copse LWS	940 m south east	A small fragment of ancient wet alder woodland
Bristol Avon River LWS	1.1 km south	Large wildlife corridor with river and riparian habitats
Baydons Meadow LWS	1.1 km north east	Area of neutral grassland
Tacklemore Wood, Wheeler's Wood and Hazel Copse LWS	1.2 km south	Ancient and semi-natural woodland
Horse Copse and Pigsty Copse LWS	1.2 km south east	Ancient woodland
Derry Hill Farm Meadows LWS	1.2 km south east	Seven fields comprising unimproved neutral grassland and wet flushes, with woodland
Close Wood LWS	1.3 km east	Ancient semi-natural broadleaved woodland with substantial wet areas
Lackham Wood LWS	1.3 km south east	Ancient woodland
Raspberry Copse and Badgers Brow LWS	1.5 km south east	Species-rich woodland with a variety of stand types
Mortimore's Wood LWS	1.5 km west	Ancient, semi-natural broadleaved woodland
Bencroft Hill Meadows LWS	1.6 km north east	Two hay meadows with herb-rich neutral grassland
Ash Grove LWS	1.9 km south	A small greensand site with hay meadow, pond-sedge swamp, open water and woodland

Table 8.3: Locally designated sites within 2 km of the site

- 8.31 The proximity of the Stanley Abbey Farm Meadows LWS to the site means that there is the potential for it to be affected by the proposed development, while the site lies within the catchment of (and is hydrologically linked to) the River Avon and therefore the Bristol Avon River LWS, so these sites are scoped in for further assessment. No impact mechanisms or pathways are identified that could affect the other LWSs due to their distance from the site and / or the lack of public access, so they are not considered further. Stanley Abbey Farm Meadows LWS and Bristol River Avon LWS are receptors of parish to county (low to medium) importance.

Habitats and vegetation on the site

Improved grassland

- 8.32 The habitats on site are shown on figure 8.3. The site is dominated by fields containing improved grassland that are managed for cattle pasture and silage cropping. The sward is generally short (<15 cm), except in occasional locations adjacent to the field margins. The grassland is species-poor and dominated by perennial ryegrass. This is a common and widespread habitat of low ecological importance, although 'farmland habitat' is a Wiltshire BAP habitat. It is considered to be a receptor of sub-parish to parish (low) importance.

Poor semi-improved grassland

- 8.33 Narrow strips of poor semi-improved grassland are present along the verges of the A4 London Road in the north of the site. This is a common and widespread habitat of limited ecological value. It is a receptor of sub-parish to parish (low) importance.

Amenity grassland

- 8.34 Amenity grassland is the main habitat along the two proposed pedestrian / cycle link routes. As a common and widespread habitat of limited biodiversity value it has not been considered further in the assessment.

Hedgerows

- 8.35 Hedgerows are present around field boundaries throughout the site (figure 8.3). The majority are species-rich and comprise blackthorn, field maple, hawthorn, grey willow, elm, elder, ash, hazel, dogwood, dog rose and spindle. Many hedgerows contain mature oak trees and three veteran trees were recorded within hedgerows. Occasional species-poor hedgerows are also present, containing hawthorn, blackthorn, elder, oak, ash, field maple and elm.
- 8.36 Two of the 30 hedgerows within the site, both in the west, were assessed as 'important' under the ecological criteria of the Hedgerow Regulations 1997. All hedgerows are UK priority habitats, while ancient and / or species-rich hedgerows are a Wiltshire BAP habitat. Hedgerows also act as ecological corridors. They are receptors of parish (low) importance.

Scattered trees

- 8.37 Mature oaks are present throughout the site. They are mostly associated with hedgerows, but a line of mature trees is present along part of the eastern

boundary. Mature trees provide habitat for a range of species, including invertebrates and nesting birds. They are a receptor of sub-parish to parish (low) importance.

Semi-natural broadleaved woodland

- 8.38 The northern proposed pedestrian / cycle link route passes through two narrow bands of semi-natural broadleaved woodland to the south of Pewsham Way, and cuts through the edge of another narrow band of woodland to the north of Pewsham Way. These woodlands include ash, oak, hazel, hawthorn and field maple. Lowland mixed deciduous woodland is a UK priority habitat and woodland is a Wiltshire BAP habitat. Semi-natural broadleaved woodland is a receptor of parish (low) importance.

Scrub

- 8.39 Scattered bramble scrub was recorded occasionally within the site, generally associated with field boundaries and fence lines. This is a common and widespread habitat that is suitable for nesting birds. It is a receptor of sub-parish (low) importance.

Ditches

- 8.40 Several wet and dry ditches are present on the site, all of which are associated with hedgerows. The water levels within the ditches vary, with many dry for the majority of the year. The dry ditches contain very little aquatic vegetation, with only occasional fool's water-cress recorded. The wet ditches contain water up to 20 cm during the winter months only and were recorded to be regularly dry during the summer months. Aquatic vegetation within the wet ditches includes willowherb species, fool's water-cress and reed canary-grass. Ditches are a common and widespread habitat of low ecological importance and are receptors of sub-parish (low) importance.

Running water

- 8.41 A small, slow-flowing stream, approximately 1 m wide and 20 cm deep, bisects the site. It flows from north east to south west and follows the line of the adjacent hedgerows. After leaving the site, the stream joins the River Avon approximately 2 km downstream. Aquatic plant species present include occasional fool's water-cress, willowherb species and reed canary-grass. Rivers and streams are a UK priority habitat and 'rivers, streams and associated habitats' are a Wiltshire BAP habitat. The watercourse is likely to support a range of species, including otter, and will act as a wildlife corridor. It is a receptor of parish to district (low to medium) importance.

Hardstanding

- 8.42 Hardstanding is present where the two proposed pedestrian / cycle link routes cross Pewsham Way and along the existing footpath link between Pewsham Way and Monks Way. As an artificial habitat of low ecological importance it has not been considered further in the assessment.

Habitats and vegetation in the wider survey area

Buildings

- 8.43 There are several buildings within the farm complex at the centre of the survey area. The more modern barns comprise steel structures with corrugated panelling, while the older buildings comprise block or rendered walls with tiled roofs. One single-storey residential property is also present to the north east of the farm complex. 'Built environment' is a Wiltshire BAP habitat. The buildings will not be impacted by the proposed development and are therefore not considered further.

Hardstanding

- 8.44 Hardstanding is present around the farm buildings at the centre of the survey area and also connects these buildings to the A4 London Road via a farm access track that runs north from the central farm complex. This is an artificial habitat of limited biodiversity value and is not considered further.

Orchard

- 8.45 A small orchard was recorded within the farm complex at the centre of the survey area. This contains fruit trees above a lawn of regularly mown amenity grassland. Traditional orchards are a UK priority habitat and a Wiltshire BAP habitat. The orchard is a receptor of parish (low) importance.

Amenity grassland

- 8.46 Two regularly mown lawns were recorded adjoining residential properties within the farm complex. These were species-poor with a short sward. This is a common and widespread habitat of limited biodiversity value and is not considered further.

Tall ruderal

- 8.47 Small nettle-dominated stands of tall ruderal vegetation were recorded around the farm complex. This is a common and widespread habitat of limited biodiversity value and is not considered further.

Standing water

- 8.48 An area of standing water with very poor water quality that is used as a slurry pit / farm water storage is present within the farm complex. It was not considered to meet the UK priority habitat criteria for ponds or the Wiltshire BAP habitat criteria for 'standing open water' due to its artificial nature, use, water quality and lack of aquatic vegetation. It is therefore not considered further.

Other off-site habitats

- 8.49 The site is bordered to the north west by residential properties and to the west by the A4 Pewsham Way, beyond which is an extensive residential area. To the north, east and south of the site is agricultural land that comprises predominantly modified grassland bounded by hedgerows. The A4 London Road borders the site's northern boundary and a defunct section of the Wilts

& Berks Canal, lined with broadleaved woodland and scattered trees, runs adjacent to part of the eastern site boundary. Semi-natural broadleaved woodland partly borders the site to the north, south west and south.

- 8.50 The urban areas (residential and roads) are artificial habitats of low ecological importance that are unlikely to be impacted by the proposed development. They are therefore not considered further. The grassland, hedgerows, woodland and watercourses form part of the wider ecological network and include several priority habitats. They are receptors of parish (low) importance.

Fauna

Bats

- 8.51 At least ten species of bat were recorded during the static detector surveys. Common pipistrelle accounted for the highest number of registrations (60.11%), followed by soprano pipistrelle (16.69%), *Myotis* bat (15.70%), 'noctule, serotine or Leisler's bat' (1.99%) and noctule (1.82%). Other species recorded at less than 1% of registrations included barbastelle, greater horseshoe, lesser horseshoe, long-eared bat, serotine, *Nyctalus* bat, unidentified pipistrelle species and Nathusius' pipistrelle. The two static detector locations in the west of the site recorded the highest levels of bat activity, followed by the two in the south. Activity at these locations was dominated by common pipistrelle, soprano pipistrelle and *Myotis* bat, which together comprised over 90% of activity recorded at these locations.
- 8.52 Light-averse bat species recorded on site included *Myotis*, long-eared, lesser horseshoe, greater horseshoe and barbastelle bats. Fewer light-averse species were recorded in the north of the site, which is likely to be as a result of light spill from streetlights and the sports complex to the north of the A4 London Road. Barbastelle bats were recorded at all the static detector locations, with the highest activity in the east of the site. Analysis of the barbastelle bat activity suggests that the site provides suitable foraging habitat, but is not a core commuting / foraging location for this species.
- 8.53 Greater horseshoe bats were recorded at five of the static detector locations, in the north west, south and east of the site. Greater horseshoe foraging activity, as defined by Miller (2001), was not recorded on site, indicating that the site is not a core foraging location for this species. Lesser horseshoe bats were recorded at all static detector locations, with the exception of the one in the north of the site. The highest levels of activity were recorded on the southern and north western boundaries. Analysis of the lesser horseshoe activity suggests the site is not a core commuting / foraging location for this species, with the recorded activity sporadic in nature rather than consistent or regular over consecutive nights.
- 8.54 At least seven species of bats were identified during the transect surveys. Common pipistrelle accounted for the highest proportion of the registrations (62.57%), followed by soprano pipistrelle (18.36%), noctule (6.85%), *Nyctalus* bat (4.49%), *Myotis* bat (3.84%) and undetermined pipistrelle bat (2.54%). Other bat species that accounted for less than 1% of the registrations included 'noctule, serotine or Leisler's bat', long-eared bat, barbastelle and serotine. Observations made during the transect surveys and analysis of the relative densities of bat registrations identified that the areas of higher bat activity

generally correlated with the central section of the site, adjacent to the farm complex, and an area of hedgerow to the east of these buildings.

- 8.55 Light-averse bat species were recorded across the site during the transect surveys, although in relatively low numbers. The highest levels of these species were generally observed in the south and west of the site. *Myotis* bats were recorded in all areas of the site, with higher activity recorded in the west and south east. Long-eared bats were only recorded in the south east. Two barbastelle registrations were recorded in the south of the site, with a single registration in the west. No greater horseshoe bats were recorded during the transect surveys.
- 8.56 Although greater horseshoe bats and *Myotis* bat species with the potential to be Bechstein's bats were recorded in low numbers on site, the recorded activity levels were only indicative of occasional commuting. This indicates that the site is not of importance for greater horseshoe or Bechstein's bats associated with the Bath and Bradford on Avon Bats SAC.
- 8.57 During the 2014 surveys of the off-site farm buildings, two buildings were found to support transitional roosts for low numbers of soprano pipistrelles (maximum count of three). The surveys undertaken in 2024 did not record any evidence of roosting soprano pipistrelles, but recorded a day roost for low numbers of common pipistrelles (maximum count of two) in one building. Two trees in the west and south of the site were also found to support day roosts for low numbers of common pipistrelles (maximum count of two). Bats are receptors of parish (low) importance.

Badger

- 8.58 The badger survey recorded two active outlier badger setts within the site and a further disused single-entrance outlier sett on the site boundary. A further three active main badger setts and one annex sett were recorded immediately adjacent to the site. The grassland and hedgerows on site provide suitable foraging habitat for badgers and badger tracks, hairs, prints and latrines were recorded throughout the site. Badgers are receptors of sub-parish (low) importance.

Amphibians

- 8.59 There are numerous records of great crested newt within 2 km of the site, including several from within 100 m of the site boundary. Great crested newt is a fully protected priority species and Wiltshire BAP species. Common toad, which is also a priority species and Wiltshire BAP species, has also been recorded within the study area.
- 8.60 Eight ponds / waterbodies were identified within 250 m of the site with the potential to provide suitable breeding habitat for great crested newt. The slurry pit within the farm complex was excluded because of its poor water quality. The ditches on site were also considered to be unsuitable for amphibians because they are dry for the majority of the breeding season, with only shallow water present during the winter.
- 8.61 The eDNA sampling surveys of the eight ponds in 2022 were all negative. Seven were also negative in 2024, but one pond returned a positive result, indicating the presence of great crested newt. This is approximately 155 m to

the north of the site. The grassland margins and hedgerows on site provide suitable habitat for great crested newt and common amphibians such as the common toad. Amphibians are receptors of parish (low) importance.

Reptiles

- 8.62 The desk study identified records of grass snake, adder and slow-worm from the study area. All reptiles are legally protected priority species. The reptile surveys recorded a low population of grass snake on site, with a maximum count of two individuals. Suitable reptile habitat is restricted to the field margins, with the majority of the grassland providing sub-optimal habitat due to its short sward resulting from frequent mowing / grazing. The hedgerows may also provide hibernation habitat and movement corridors for reptiles. Reptiles are receptors of parish (low) importance.

Breeding birds

- 8.63 The breeding bird surveys recorded a total of 49 bird species within the site, of which 40 were either confirmed, probably or possibly breeding on site. These included the red-listed priority species house sparrow (confirmed as breeding), skylark and yellowhammer (probably breeding) and starling (possibly breeding), the red-listed greenfinch (probably breeding), the amber-listed priority species bullfinch (confirmed as breeding), dunnoek and song thrush (probably breeding) and the amber-listed rook (confirmed as breeding), woodpigeon and wren (probably breeding), kestrel, moorhen, sparrowhawk, whitethroat and stock dove (possibly breeding).
- 8.64 Red kite was considered to have probably bred within the off-site woodland immediately adjacent to the south western site boundary. This species is protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and the habitats on site may form part of a red kite territory.
- 8.65 No barn owls were recorded during the breeding bird surveys. However, two barn owls were recorded emerging from a tree in the west of the site during bat surveys in July and September 2024. The presence of a barn owl nest and / or roost site within this tree is therefore assumed. The habitats on site include improved grassland, managed for cattle grazing and silage cropping, with a short homogenous sward, which falls within the 'Type 2 barn owl habitat category' (Shawyer, 2011). Type 2 habitats are described as offering "*sub-optimal habitat for field voles and are of intermediate and often transient value to barn owls.*" Barn owl is protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and is a Wiltshire BAP species.
- 8.66 Overall, the site provides suitable foraging and nesting habitat for a range of bird species, including declining species of conservation concern and priority species, although the extent of this habitat is limited. Birds are considered to be a receptor of parish (low) importance.

Hazel dormouse

- 8.67 There were no records of hazel dormouse from the desk study. No evidence of hazel dormouse was recorded during the surveys and this species is assumed to be absent from the site.

Otter

- 8.68 Otter, which is a legally protected priority species and a Wiltshire BAP species, has previously been recorded within 2 km of the site. The closest records are from London Road, within 100 m of the site boundary. No evidence of otter or otter resting places was recorded along the watercourse on site. However, periodic use of the stream is assumed for foraging / commuting. The hedgerow habitats adjacent to the stream are considered to be sub-optimal for use by resting otter. The ditches on site are considered unlikely to be used by this species due to the absence of standing water for the majority of the year and low water levels during the wetter months. Otter is a receptor of parish (low) importance.

Water vole

- 8.69 Records of water vole from the River Avon, approximately 1.5 km to the west, were returned from the desk study. The ditches on site are considered to provide sub-optimal habitat for water vole due to the absence of standing water for the majority of the year and low water levels during the wetter months. The watercourse provides potentially suitable habitat, but no evidence of water vole activity was recorded during the surveys. The species is therefore considered to be absent from the site.

Beaver

- 8.70 Three records of beaver were returned from the desk study, the nearest of which was approximately 1.5 km to the west from the River Avon. No evidence of beaver was recorded along the watercourse on site and the ditches on site are considered to be unsuitable for beaver due to the absence of standing water for most of the year. The species is therefore considered to be absent from the site.

Other mammals

- 8.71 Brown hare, hedgehog and harvest mouse have all previously been recorded within 2 km of the site. These are all priority species and brown hare is also a Wiltshire BAP species. Brown hare was recorded incidentally on site during surveys in 2022. There is suitable habitat for hedgehog on site and the presence of this species is assumed. Extensive alternative habitat for these species is available in the immediate vicinity and the site is considered unlikely to be of particular importance for these species. The habitats are sub-optimal for harvest mouse and this species is considered unlikely to be present. Other mammals are receptors of sub-parish (low) importance.

Invertebrates

- 8.72 A range of notable invertebrate species were recorded from the desk study, including 45 priority species of butterfly and moth, the legally protected Jersey tiger moth, two nationally notable true fly species and the nationally notable bulrush veneer, Gromwell ermine and spindle knot-horn (moths) and red-tailed cuckoo bee, and three nationally scarce true fly species.
- 8.73 The trees, hedgerows, ditches and modified grassland on site provide potential habitat for a range of common invertebrate species. The presence of significant populations of protected and / or notable invertebrates is

considered unlikely. Invertebrates are receptors of sub-parish (low) importance.

Future baseline

- 8.74 In the absence of the proposed development, the site is likely to remain in its current use and the agricultural practices would continue.

Primary mitigation and habitat creation

- 8.75 During the design evolution of the proposed development, the findings of the ecological surveys were carefully considered and the mitigation hierarchy was applied to avoid and / or minimise impacts. The master plan has therefore been designed to minimise the loss of important habitats and features and to incorporate and enhance these through the provision of new habitats and networks of green infrastructure. The main primary mitigation that has been incorporated within the proposed development is as follows:
- New habitat creation, including an extensive area of public open space in the east and south of the site comprising wildflower grassland with scattered broadleaved trees, native woodland, scrub and hedgerow planting and permanently wet 'wildlife ponds' with native marginal planting. Further habitat creation will be provided throughout the developed area and 'habitat corridors', to include native scrub, hedgerow and tree planting, wildflower grasslands, sustainable drainage systems (SuDS) features and swales
 - Hedgerow loss has been minimised and retained hedgerows will be buffered from new development through the creation of landscape buffers at least 5 m wide either side of the hedgerows, and enhanced where possible through infill planting, maintaining functional 'habitat corridors' around the site
 - Planting of species-rich native hedgerows with trees along currently undefined sections of the northern site boundary and adjacent to larger roads throughout the site to strengthen the existing habitat network
 - Provision of a landscape buffer of at least 10 m in width either side of the watercourse (with the exception of the two culverted road crossings), including enhancement of the riparian corridor through wildflower grassland and scattered native tree and scrub planting
 - Provision of a landscape buffer of at least 10 m in width between the broadleaved woodland adjacent to the south western site boundary and the development footprint, including native scrub enhancement planting along the woodland edge
 - Retention of a bat habitat corridor linking the off-site buildings at Forest Farm to the new habitats within the eastern and southern public open space area and wider off-site habitats to the east and south

Effects during construction

Designated sites

- 8.76 Without appropriate mitigation, there is a risk that the Bristol Avon River LWS could be affected by pollutants leaving the site in runoff entering the on-site watercourse, which is hydrologically connected to the River Avon and feeds into the LWS approximately 2 km downstream. This could occur, for example, as a result of surface water runoff contaminated with silt, hydrocarbons or

other construction materials, or from an accidental fuel or concrete spill. While the risk of such an impact is considered to be low, if it did occur it would be a medium term, adverse effect that would be significant at the parish level.

- 8.77 The distance of the Stanley Abbey Farm Meadows LWS means that there are unlikely to be any effects from the construction of the proposed development.

Habitats on the site

- 8.78 Site clearance is predicted to lead to the removal of the following areas of habitat:

- Approximately 39.03 ha of improved grassland
- Approximately 0.19 ha of poor semi-improved grassland
- Approximately 0.04 ha of scrub
- Approximately 0.10 ha of broadleaved woodland
- Approximately 360 linear metres of hedgerow
- Approximately 40 linear metres of ditch associated with hedgerows
- Eight mature trees (all veteran trees will be retained)

- 8.79 The loss of these habitats will be a medium term, adverse effect at the sub-parish level that will not be significant. It will be mitigated in the medium to long term by the implementation of the proposed landscape strategy.

- 8.80 Construction works could also result in impacts to the retained trees, watercourse, ditches and hedgerows on site, for example through vehicular damage to tree root protection areas and storage of materials / compounds damaging habitats. Such activities could also lead to the generation of dust, which could have an adverse effect on plants through interference with photosynthesis, respiration and transpiration, and sediment and pollutants in surface water runoff, which could have an adverse effect on the quality of the watercourse and ditches. Without mitigation, this will be a long term, adverse effect that will be significant at the parish level.

Habitats adjacent to the site

- 8.81 Construction works could also result in impacts on the broadleaved woodland immediately adjacent to the site boundary, for example through vehicular damage to tree root protection areas and storage of materials / compounds. Dust and pollutants produced by construction activities could also potentially affect adjacent trees, woodland, hedgerows and watercourses. Without mitigation, this will be a short term, adverse effect that will be significant at the parish level.

Fauna

Bats

- 8.82 There will be no direct loss of bat roosts as a result of the proposed development. The off-site buildings at Forest Farm, which were found to support common and soprano pipistrelle bat roosts, lie outside the application boundary and will remain in agricultural use. The two trees identified as supporting roosting pipistrelle bats will be retained within habitat corridors. As a more 'light-tolerant' species, the pipistrelle bats associated with these roosts are unlikely to be significantly disturbed by construction lighting. In addition,

construction lighting is only likely to be in use at times close to dusk / dawn during the winter, when bats would not be expected to be using the transitional / day roosts within these trees. Impacts to roosting bats are assessed as neutral.

- 8.83 The majority of the linear habitats that provide flight-lines and foraging habitat for bats will be retained and buffered from the proposed development within habitat corridors. These include the majority of the hedgerows, the stream corridor, the off-site woodland and the tree lines along the site boundaries. However, site clearance will result in the loss of approximately 360 linear metres of hedgerows across the site, and two road crossings of the stream corridor, which will reduce the overall habitat connectivity through the site and could affect commuting bats through the loss or fragmentation of these linear habitat features.
- 8.84 Loss of habitat, including hedgerows and grassland, will also decrease habitat for night-flying invertebrates, thereby reducing the overall value of the site for foraging bats. Bat activity was concentrated around the centre of the site, adjacent to the retained off-site agricultural buildings. The effects of habitat removal on foraging bats will be a long term, adverse effect that will be significant at the parish level.
- 8.85 Bat commuting and foraging across the site could also be adversely affected by construction lighting. This would have the greatest impact on the more light-sensitive species, such as greater and lesser horseshoe, barbastelle, long-eared and *Myotis* bat species (Stone et al, 2015; Rowse et al, 2016). However, construction activities will largely be undertaken during the day, when bats are not active, and lighting requirements are likely to occur largely during the winter when bats would be expected to be hibernating for most of the time and therefore either absent or present in very low numbers. Such effects are therefore considered to be minimal and unlikely to affect the local bat population. Short term, adverse effects are predicted at the sub-parish level that will not be significant.

Badger

- 8.86 The four identified off-site main / annex badger setts are located outside the site boundary and will be a minimum distance of 30 m from the development footprint. They will therefore not be directly impacted by the development proposals.
- 8.87 The three on-site outlier badger setts lie within hedgerows, which will be retained within habitat corridors, but will be within 20 m of the proposed development footprint. There is therefore the potential for disturbance or damage to these outlier setts as a result of construction and / or landscaping works, inappropriate tracking of vehicles, or storage of plant and materials during construction. There is also the risk that any badgers present within setts could be killed or injured during these works. Open excavations within the construction area could lead to entrapment of badgers. Without mitigation, badgers may also be harmed by construction materials and chemicals. This will be an acute, adverse effect at the sub-parish level that will not be significant.
- 8.88 Site clearance will result in the loss of approximately 39 ha of grassland habitat, which provides suitable foraging habitat for badgers. Whilst foraging

habitat is available in the wider area, this habitat loss may cause badgers to seek to extend foraging activities beyond current territory boundaries, leading to conflict with adjacent badger groups. This will be a long term, adverse effect at the sub-parish level that will not be significant.

Amphibians

- 8.89 There will be no loss of breeding habitat for amphibians and the off-site pond found to support great crested newts, which is approximately 155 m from the site, will not be directly affected by the proposed development. Construction works will result in the loss of grassland, scrub and hedgerow, which represent suitable terrestrial habitat for amphibians including great crested newts. There is the potential for individual amphibians to be killed or injured during site clearance. In the absence of mitigation, this will be a short term, adverse effect that will be significant at the parish level. The retention and protection of habitat corridors through the site will ensure that amphibians can continue to move around the site to reach other suitable habitats (including ponds) in the vicinity.

Reptiles

- 8.90 The removal of grassland margins and hedgerow sections will lead to a reduction in foraging and breeding habitat for grass snake. This will be an adverse long term effect at the sub-parish level that will not be significant. The site clearance could also result in direct effects, such as death or injury to reptiles. This will be an acute, adverse effect at the sub-parish level that will not be significant.

Breeding birds

- 8.91 Depending on the timing of site clearance, there could be a direct effect on nesting birds, their eggs and young. This would be an acute, adverse effect at the sub-parish level that would not be significant. Habitat clearance, particularly hedgerow and tree removal, will result in the loss of nesting and foraging habitat used by a range of common / widespread species. This is considered to be a short term, adverse effect at the sub-parish level that will not be significant.
- 8.92 The retention and protection of mature trees on site, including the tree identified as a barn owl nest and / or roost site, will minimise potential effects to nesting / roosting barn owl. The protection and buffering of the off-site woodland will also minimise potential impacts on red kite, which are known to nest adjacent to urban areas.
- 8.93 Construction activity has the potential to cause localised noise and visual disturbance, which may cause displacement of nesting birds in the immediate vicinity. Some species will be tolerant of disturbance or will become habituated. Given the temporary nature of the construction works, it is likely that any impact of disturbance on individual breeding pairs will not affect the local populations of affected species. This is considered to be a short term, adverse effect at the sub-parish level that will not be significant.

Otter

- 8.94 Any pollution event during construction could have an adverse effect on water quality in the ditches / watercourse, which could affect prey availability for otter. Any otters using the watercourse on and adjacent to the site could be disturbed by construction noise and lighting. However, as otters are predominantly nocturnal, the effects of disturbance would be largely avoided, as works will be undertaken during the day. Overall, short term, adverse effects are predicted at the sub-parish level that will not be significant.

Other mammals

- 8.95 Habitat clearance within the site could reduce the area of foraging and resting habitat for brown hare and hedgehog. However, there is abundant alternative suitable habitat present in the wider area. There is also the potential for direct effects, such as death or injury, on these species during site clearance. Short term, adverse effects are predicted at the sub-parish level that will not be significant.

Invertebrates

- 8.96 No impacts are predicted on notable invertebrate species. Site clearance works will result in the loss of habitat for common and widespread species, although alternative habitat occurs in the vicinity. This will be a long term, adverse effect at the sub-parish level that will not be significant.

Effects post-construction

Designated sites

- 8.97 The proposed development could impact the Bristol Avon River LWS through changes to the quality or quantity of surface water or groundwater received by the hydrologically connected watercourse. However, the proposed drainage strategy, including SuDS, will ensure that there will be no significant increase in the quantity or decrease in the quality of the water leaving the site. No significant effects are therefore predicted on the LWS.
- 8.98 The proximity of the Stanley Abbey Farm Meadows LWS to the site and the presence of a network of connecting public rights of way could mean that the LWS receives increased recreational pressure as a result of the proposed development. However, public access to the LWS, which is privately owned, is limited to a single public footpath located along the south eastern LWS boundary. The provision of a significant area of on-site public open space is also expected to minimise the numbers of new residents accessing the LWS via the footpath network. No significant adverse effects are therefore predicted on the LWS.

Habitats on the site

- 8.99 The proposed approach to the landscape and ecological design for the proposed development is summarised in paragraph 8.75. A range of habitats will be created, while habitat loss will primarily comprise improved grassland, which is a habitat of low ecological importance. Hedgerow and tree loss, of higher ecological importance, will be minimised and mitigated through

extensive new hedgerow and tree planting. The new habitat creation will be a long term, beneficial effect at the sub-parish level that will not be significant.

- 8.100 The proposals have been designed so that the majority of the retained hedgerows will lie within habitat corridors and not directly adjacent to development parcels. Only the northern development parcel will be located directly adjacent to an existing hedgerow, although this hedgerow already forms the curtilage of an off-site residential garden. However, this retained hedgerow could be subject to further interference / removal by new homeowners whose gardens also abut it, affecting its structure and functionality. In the absence of mitigation, this will be a long term, adverse effect at the sub-parish level that will not be significant.

Habitats adjacent to the site

- 8.101 No significant effects are predicted on habitats adjacent to the site.

Fauna

Bats

- 8.102 The trees supporting bat roosts will be retained within landscape buffers and the buildings at Forest Farm are located off site at a distance from the development boundary. As a more 'light-tolerant' species, the pipistrelle bats associated with the tree roosts and the off-site buildings are therefore unlikely to be significantly disturbed by street lighting and residential lighting from properties within the development. However, the detailed design of public realm lighting will seek to minimise light spill to the roost features further (see 'mitigation' section below).
- 8.103 Research indicates no negative impacts to soprano and common pipistrelle bats as a result of artificial lighting within flight corridors or foraging areas (ILP, 2023). Further, the retention of a landscape-buffered habitat corridor along the northern portion of the on-site watercourse will maintain a functional flight route between the off-site buildings at Forest Farm and adjacent tree roosts to the new foraging habitats within the eastern and southern public open space area, as well as wider off-site habitats to the east and south of the site. Where this habitat corridor is crossed by a cycle path, lighting will be kept to the minimum standard required for safety. Overall, the effects on roosting bats are assessed as neutral. Should the safeguarded link road connection come forward at a later date, mitigation would need to be considered as part of that scheme to ensure landscape connectivity to these roosts is retained.
- 8.104 Street lighting and residential lighting from properties could have an adverse effect on foraging and commuting bats, particularly more light-sensitive species. The impact of public realm lighting on foraging and commuting bats is variable and depends on the species concerned and the nature of their activity, as well as on the type and intensity of the lighting. Certain bat species are known to be relatively tolerant of artificial lighting, e.g. common pipistrelle and noctule (Stone et al, 2009; Stone, 2013).
- 8.105 The green infrastructure proposals include the creation of vegetated landscape buffers at least 5 m wide either side of retained hedgerows, at least 10 m wide either side of the watercourse (with the exception of the two culverted road crossing locations) and at least 10 m wide from the edge of the

off-site woodland. These landscape buffers will continue to provide suitable foraging habitat and flight routes for more light-tolerant bat species. Several of these species are also likely to continue to forage over the urban areas of the site and are unlikely to be significantly affected by public realm lighting. The retention of a habitat corridor along the on-site watercourse will maintain a functional flight route for the pipistrelle bat species that roost in the off-site buildings at Forest Farm and will prevent the isolation of this roost.

- 8.106 Lighting directed to features used by light-sensitive species, such as lesser horseshoe bat, greater horseshoe bat, long-eared bat, barbastelle and *Myotis* species, could potentially inhibit use of flightpaths. Such species are likely to avoid illuminated areas (Stone, 2013). Given the low recorded levels and patterns of occurrence of these species during the surveys, it is considered unlikely that the proposed development will compromise the local conservation status of any bat species. New habitat creation within the public open space in the east and south of the site will provide an extensive area of suitable foraging habitat for bats. Overall, the effects on foraging and commuting bats are assessed as long term and adverse at the sub-parish level, which will not be significant.

Badger

- 8.107 The proposed built form and hardstanding within the proposed development will be over 30 m from the main and annex badger setts adjacent to the site boundary. Whilst development could potentially subject any badgers to increased levels of disturbance through traffic, lighting and noise, Natural England considers badgers to be relatively tolerant to moderate levels of noise and activity (Natural England, 2009) and so any disturbance caused by the proposed development is unlikely to be significant.
- 8.108 The introduction of roads and vehicles on site could result in increased badger mortality from collisions with vehicles. The new habitats within the site will be suitable for foraging badgers and will reduce the effect of habitat loss during construction. In addition, movement corridors for badgers will be retained within the site. However, the overall effects on badgers will be long term and adverse at the sub-parish level, which will not be significant.

Amphibians

- 8.109 New habitat creation, including wildflower meadow, permanently wet 'wildlife ponds' and wetland habitats, will provide terrestrial and aquatic habitats for amphibians, potentially including great crested newt. The proposed habitat corridors will also provide suitable movement corridors for amphibians and link habitat within the site to habitat in the wider landscape, including the off-site ponds to the north and south east of the site. Overall, the effects on amphibians are assessed as neutral in the medium term onwards.

Reptiles

- 8.110 The habitat creation measures, including wildflower meadow, ponds and wetland habitats, will also provide suitable foraging and commuting habitat for common reptiles such as grass snake. Overall, the effects on reptiles are assessed as neutral in the medium term onwards.

Breeding birds

- 8.111 Habitat creation proposals and the provision of bird boxes will provide foraging and nesting habitat for birds, including notable species such as barn owl, swift, house sparrow and dunnock.
- 8.112 Red kite is known to be relatively tolerant to anthropogenic disturbance and will nest adjacent to urban areas. Therefore, any disturbance caused by the proposed development is unlikely to be significant to this species. The provision of a landscape buffer that will be at least 10 m wide between the development footprint and the off-site broadleaved woodland in which red kite were expected to be breeding, including woodland edge scrub planting, will further reduce any risk of potential disturbance.
- 8.113 It is expected that a proportion of households within the new development will own cats and, therefore, local bird populations may be adversely affected by increased predation. However, it is also expected that a proportion of households will provide supplementary feeding for birds, which is likely to help winter survival rates within the local population of some species and has been shown to improve breeding success in the following spring (Robb et al, 2008).
- 8.114 Overall, the post-construction effects on birds are assessed as neutral in the medium term onwards, as new habitats develop and the installed bird boxes are utilised.

Otter

- 8.115 The proposed development could potentially subject any otters using the watercourse on site to increased levels of disturbance through lighting and noise. Traffic using the new road network within the site could also result in increased road traffic collisions, leading to death or injury of otters. However, given the assumed sporadic usage of the watercourse by otters and the presence of existing high volumes of traffic on roads bordering the site, this is unlikely to be a significant increase. The watercourse will largely be buffered from built development by a minimum 10 m wide landscape buffer. However, road crossings of the stream are proposed, which could restrict otter movement. The post-construction effects on otters will be long term and adverse at the sub-parish level, which will not be significant.

Other mammals

- 8.116 Hedgehogs are likely to use gardens and newly created habitats within the site for foraging and shelter. However, without mitigation, close-board fences (e.g. for residential gardens) are likely to impede the movement of hedgehogs. Traffic using the new road network within the site could also result in increased road traffic collisions, leading to death or injury of hedgehogs, although this is unlikely to be significant given the presence of existing high volumes of traffic on roads bordering the site. The effects on hedgehogs are considered to be neutral in the long term.
- 8.117 It is unlikely that brown hare (if present) would use the site following development. A long term, adverse effect is predicted at the sub-parish level, which will not be significant.

Invertebrates

- 8.118 The proposed on site habitats, including wildflower grassland, ponds, woodland, scrub and hedgerows, will provide suitable habitat for a range of invertebrates, including notable species. This will be a long term, beneficial effect at the sub-parish level that will not be significant.

Mitigation and monitoring

Construction mitigation

General mitigation measures

- 8.119 A construction ecological management plan (CEcoMP) will be produced to detail measures to ensure habitat and species protection during construction, which will be agreed with Wiltshire Council prior to works commencing. An Ecological Clerk of Works (ECW), as required by the CEcoMP, will be appointed to provide advice and undertake ecological supervision, as required.

Designated sites

- 8.120 The pollution prevention measures outlined in paragraph 8.122 below will ensure that there is no potential for construction effects on the Bristol Avon River LWS. No mitigation measures are required for any other designated nature conservation sites.

Habitats on and adjacent to the site

- 8.121 Construction works will be undertaken in accordance with BS 5837:2012 *Trees in relation to design, demolition and construction*. The retained hedgerows and trees and off-site woodland will be protected from potential damage during construction through the use of temporary barriers, such as Heras fencing. All contractors' compounds will be located away from retained hedgerows and trees and the off-site woodland to minimise potential lighting and disturbance effects. Lighting will be avoided between March and October where possible, and no lighting will be left on during the night. Any security lighting will be low-level and motion activated on short timers.
- 8.122 Best practice measures will be implemented to protect the watercourse, including adherence to national pollution prevention guidance (Defra and the Environment Agency, 2026). Measures to control pollution, runoff and dust will be specified in a construction environmental management plan (CEMP). All habitat protection measures will be detailed in the CEcoMP, which will be appended to the CEMP.
- 8.123 The implementation of this mitigation will reduce the effects on retained terrestrial habitats to neutral and not significant. The effects on the watercourse will be reduced to a medium term adverse effect at the sub-parish level that is not significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant. The loss of habitats on site will remain a medium term adverse effect that is not significant at the sub-parish level. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Bats

- 8.124 The two trees with confirmed bat roosts are proposed for retention and no further trees identified as having the potential to support bat roosts are proposed to be removed. However, should any of these trees require felling or pruning for safety or other reasons, further surveys would be undertaken as necessary to establish roost status. If it was found that potential impacts to a roost could not be avoided, a Natural England bat mitigation licence would be obtained and implemented.
- 8.125 During construction, all contractors' compounds will be located a minimum of 10 m away from the watercourse, retained trees and hedgerows and the off-site woodland, to minimise potential lighting and disturbance impacts on commuting / foraging bats. Construction lighting will also be designed to ensure lighting is directed away from the landscape buffer zones around retained habitats and from the off-site buildings at Forest Farm. Between April and October inclusive, any construction lighting within the site will be turned off prior to sunset; any security lighting will be positioned at a low height and motion-activated on short timers only. A strategy for mitigating the effects of construction lighting is set out in the lighting impact assessment submitted in support of the planning application and will be specified within the CEMP.
- 8.126 1FR Schwegler bat tubes (or similar approved) will be incorporated into new buildings, at a minimum ratio of one per two dwellings, to provide new roosting habitat for bats. Boxes will be integrated into the walls of new buildings at a minimum height of 4 m, ideally under the eaves or a gable end. The locations of integral boxes will be detailed in the CEcoMP and relevant construction drawings.
- 8.127 A further 30 Schwegler 2F-DFP boxes (or similar approved) will be installed on retained trees within the open space in the south and east of the site. The approximate locations of the tree-mounted bat boxes will be detailed in the CEcoMP and the precise locations will be determined on site by the ECW.
- 8.128 With these measures in place, the effects on bats will be reduced to long term adverse effects at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Badger

- 8.129 Update badger surveys will be undertaken prior to construction to confirm the status of setts within the site. Where retention of setts is not feasible, given the consideration of the relevant technical constraints, a Natural England badger development licence will be obtained prior to commencement of the works for any active setts likely to be damaged or disturbed during site clearance / construction. All works will be undertaken in accordance with the method statement for the licence. The requirements for a mitigation licence will be specified in the CEcoMP.
- 8.130 Exclusion zones marked by post and rail fencing (or similar) will be set out at a 20 m radius around all retained active badger setts prior to construction to avoid any accidental damage of these setts. The off-site main and annex setts will not be directly affected by construction activities and minimum 20 m

buffer zones will also be established around the site boundaries adjacent to these setts.

- 8.131 General construction management measures to minimise impacts on badgers will be adhered to during construction to protect badger welfare. Excavations and piping (>100 mm in diameter) will be fenced / capped overnight to deter badgers from entering. Excavations that cannot be covered will have a means of escape for any animals that may fall in (e.g. sloping sides / ramps with a maximum of 1:2 gradient). Fuel, oil and chemicals will be stored in secure sites within the construction compound and no fires will be lit.
- 8.132 With these measures in place, there will be a short term, adverse effect on badgers at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Amphibians and reptiles

- 8.133 The proposed development has been registered with Natural England under the District Level Licensing Scheme for great crested newts and a first stage conservation payment has been made. Prior to the commencement of the development, the required mitigation licence will be obtained from Natural England and the second stage conservation payment will be provided. The proposed development will proceed in accordance with the mitigation licence and no specific on-site mitigation is likely to be required during construction. No significant effects are therefore predicted on great crested newts.
- 8.134 Measures will be implemented during site clearance to avoid accidental killing or injury to reptiles and common amphibians. These will comprise habitat manipulation of the field margins proposed for removal to encourage any reptiles and amphibians to move into retained habitat outside of the working area. A two-stage cutting of the field margins will be carried out between April and mid-October. The vegetation will first be cut to 150 mm and then left for a week to allow reptiles / amphibians to move into adjacent habitat. The vegetation will then be cut to ground level to discourage reptiles / amphibians from re-entering the works area.
- 8.135 Both cuts will be supervised by the ECW. The latter cut will be preceded by a destructive search by the ecologist, removing any sheltering materials such as logs and refuse. The ECW will also supervise the removal of hedgerow sections. Any individual reptiles / amphibians found will be moved to suitable habitats outside the works area. Once complete, the vegetation will be maintained at a low level (<50 mm) until the start of the development works.
- 8.136 Ten hibernacula will be created in suitable habitat within the public open space, including adjacent to the new pond / wetland habitat, which will enhance the new habitats on site for reptiles and amphibians until they become established. This will be specified in the CEcoMP.
- 8.137 With these measures in place, there will be short term, adverse effects on amphibians and reptiles at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to receptors of low importance, leading to slight adverse effects that will not be significant.

Birds

- 8.138 Clearance of hedgerow sections will be undertaken between September and February inclusive (i.e. outside the main bird breeding season) to ensure that there will be no direct effects on nesting birds. If clearance is required during the nesting season, an ecologist will first check the affected habitats for active nests. If any are found, the nest(s) and immediate surroundings will be left undisturbed until the eggs hatch and young have fledged, or the breeding attempt is otherwise concluded (i.e. the nest is abandoned / predated). The ECW may establish a buffer zone around the nest (e.g. 5 m) to minimise the risk of accidental damage / destruction.
- 8.139 Schwegler Type 1A swift boxes (or similar approved) will be incorporated into new buildings within the site, at a minimum ratio of one box per dwelling. These will be suitable for use by swift, which is a red list species of conservation concern (Stanbury et al, 2021), and can also be used by other declining urban species such as house sparrow. Boxes will be integrated into the walls of new buildings at a minimum height of 4 m; the precise locations will be detailed in the CEcoMP.
- 8.140 A further 30 tree-mounted bird boxes, including small and large hole boxes, and a barn owl nest box will be installed on retained trees within the public open space in the south east of the site, close to suitable foraging habitat. The approximate locations of tree-mounted bird boxes will be detailed in the CEcoMP and the precise locations will be determined on site by the ECW.
- 8.141 With these measures in place, there will be a medium term, adverse effect on birds at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Otter

- 8.142 A pre-construction check of the watercourse will be undertaken by the ECW prior to construction to re-confirm that no holts or resting sites occur in the vicinity of the works. Any contractors' compounds will be located away from the watercourse to minimise potential lighting and disturbance impacts and any construction lighting within the site will be turned off prior to sunset. Any security lighting will be positioned at a low height and motion-activated on short timers. The best practice measures to be employed for badger, as set out above, will also mitigate any impact on otter should an individual enter the works area at night.
- 8.143 With these measures in place, there will be a short term, adverse effect on otters at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Other mammals

- 8.144 To ensure that hedgehogs are not killed or injured during construction, hedgerow clearance will be preceded by a search for sheltering hedgehogs by the ECW. Any sheltering hedgehogs will be relocated to retained hedgerows outside the development area.

- 8.145 With these measures in place, there will be a short term, adverse effect at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Invertebrates

- 8.146 The retention of the majority of the hedgerows and trees, buffering of the watercourse and off-site woodland and the protection of these habitats will ensure that the principal habitats for invertebrates will be retained and protected. Insect / bee bricks will be incorporated into the walls of at least 20% of the new dwellings and this requirement will be set out in the CEcoMP. Insect / bee bricks will be concentrated around areas of nectar- and pollen-rich planting within the public open space, with further insect / bee bricks integrated into walls within private gardens or the open space.
- 8.147 With these measures in place, there will be a medium term, adverse effect on invertebrates at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Post-construction mitigation

General mitigation measures

- 8.148 A landscape and ecological management plan (LEMP) will be produced to detail how retained and proposed habitats will be managed in the long term, which will be agreed with Wiltshire Council prior to the start of construction.

Designated sites

- 8.149 No mitigation is required for designated nature conservation sites post-construction.

Habitats on and adjacent to the site

- 8.150 New and retained hedgerows forming residential garden boundaries will be protected by a 1.8 m high post and wire mesh fence. The wire mesh will allow vegetation to grow through whilst also protecting the integrity of the developing / retained hedgerow. Relevant properties will also be subject to a restrictive covenant within their title deeds to limit the permitted management to ensure that the integrity of the hedgerows will be maintained.
- 8.151 The post-construction management of the new and retained habitats will be specified in the LEMP, which will detail the management of these habitats for the first ten years post-construction. It will be reviewed and renewed for the next ten-year period (and then on a rolling programme) in agreement with Wiltshire Council.
- 8.152 The terrestrial habitat creation on the site will lead to a long term, beneficial effect at the sub-parish level that is not significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight beneficial effect that will not be significant. No mitigation is required for habitats adjacent to the site post-construction.

Bats

- 8.153 The detailed design of the public realm lighting will seek to minimise the adverse effects on bats in accordance with current research and guidance (ILP, 2023; Rowse et al, 2016). Lighting will be avoided as far as possible within the public open space (where health and safety concerns permit) to maximise the value of the retained and new habitats for light-averse bat species. No artificial lighting is proposed within the landscape buffer zones or bat habitat corridor, with the exception of the cycleways and footpaths. Where essential, lighting will be the minimum necessary to meet public safety requirements and designed to direct light to discrete areas appropriate for the task and prevent spill on adjacent habitats. The lighting design will consider the following characteristics:
- Narrow spectrum lights with no UV content, e.g. warm white LED (up to 3,000 K)
 - Variable lighting regimes (motion sensors or part night lighting) in areas close to the watercourse and the site boundaries
 - Directional downlights – illuminating below the horizontal plane (ideally at least 20° below the horizontal)
 - Use of fore / rear shields to restrict light direction
 - Avoidance of upward light (e.g. ground-mounted floodlights up-lighting trees, buildings and vegetation)
- 8.154 The lighting proposals will be reviewed by a suitably qualified ecologist and will be subject to approval by Wiltshire Council, for example through an appropriate planning condition. Further detail is provided in the lighting impact assessment submitted in support of the planning application.
- 8.155 Bat boxes within buildings are designed to be maintenance-free and no management will be required. Bat boxes on trees will be maintained and replaced as necessary and this will be specified in the LEMP.
- 8.156 Overall, a long term, adverse effect on bats is predicted at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Badger

- 8.157 Details of the management of habitats adjacent to the retained badger setts and the avoidance of associated disturbance will be set out in the LEMP. The lighting parameters set out above for bats will avoid adverse effects on badger movement and foraging. Overall, a long term, adverse effect is predicted on badgers at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Amphibians and reptiles

- 8.158 The new landscape planting will provide suitable terrestrial habitat for amphibians and reptiles, with the ponds potentially providing suitable breeding habitat for amphibians. Ten hibernacula will be created within the site, as discussed above, to provide additional habitat for amphibians / reptiles while new wildflower meadow grassland becomes established. These habitats and

features will be managed in accordance with the LEMP, which will incorporate management measures that will benefit amphibians and reptiles, including details of the timing and height of grassland management.

- 8.159 Suitable measures will be included in the design of new roads to minimise the risk of great crested newt mortality (e.g. through entrapment in gully pots) and to ensure that great crested newts can traverse them. These measures will include inset kerb stones (such as the ACO Wildlife Kerb) around all gully pots. Kerbs either side of the inset kerb stones will also have a 45° batter to facilitate exit of amphibians from the highway. Overall, the effects on amphibians and reptiles will be neutral in the medium term onwards. In EIA terms, this equates to a negligible change to receptors of low importance, leading to a negligible effect that will not be significant.

Breeding birds

- 8.160 Measures to avoid impacts on nesting birds as a result of landscape management works will be included in the LEMP. Bird boxes on buildings are designed to be maintenance-free and no management of these will be required. Bird boxes on trees will be maintained and replaced as necessary, which will be specified in the LEMP.
- 8.161 A proportion of the wildflower grassland in the area of public open space in the east of the site will be managed to have a longer, tussocky sward suitable for small rodents, which will provide foraging habitat for barn owl. This will be specified in the LEMP.
- 8.162 Overall, the effects on birds will be neutral in the medium term onwards. In EIA terms, this equates to a negligible change to a receptor of low importance, leading to a negligible effect that will not be significant.

Otter

- 8.163 The lighting parameters set out above will avoid adverse effects on otter movement as a result of light spill. Where new road crossings of the watercourse are proposed, these crossings will include 300 mm diameter pipes either side of the culvert to facilitate otter movement, details of which will be shown on the detailed construction drawings. Overall, a long term, adverse effect is predicted on otters at the sub-parish level that will not be significant. In EIA terms, this will be a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Other mammals

- 8.164 Hedgehog passes will be created within the new garden fences to allow hedgehogs to move around the site post-development. Each gap will have a minimum dimension of 13 cm x 13 cm and will be cut out of a gravel board on the bottom of the fence, or a similar size gap will be left at the end of a board. One hedgehog pass will be created in each boundary fence and specified in the hard landscape designs and CEcoMP. The effects on hedgehogs are considered to be neutral in the long term. In EIA terms, this equates to a negligible change to a receptor of low importance, leading to a negligible effect that will not be significant.

- 8.165 A long term adverse effect will remain on brown hare at the sub-parish level, which will not be significant. In EIA terms, this equates to a medium change to a receptor of low importance, leading to a slight adverse effect that will not be significant.

Invertebrates

- 8.166 The management of habitats in accordance with the LEMP will include habitat management measures for the benefit of invertebrates. Insect / bee bricks incorporated into walls within the proposed development are designed to be maintenance-free and no management will be required. This will lead to long term, beneficial effect at the sub-parish level that will not be significant. In EIA terms, this equates to a medium change to a receptor of low importance, leading to a slight beneficial effect that will not be significant.

Monitoring

- 8.167 An ECW will be appointed to assist in the delivery of avoidance and mitigation measures during the pre-construction / construction period. This will be set out in the CEcoMP. Post-construction monitoring of the retained, created and enhanced habitats will be undertaken to ensure successful establishment and management. A monitoring protocol will be set out in the LEMP.

Biodiversity net gain

- 8.168 The current and potential future biodiversity value of the site and the proposed development was evaluated using Defra's statutory metric. The assessment found that the proposed development will result in over a 35% net gain in habitat units, over a 20% net gain in hedgerow units and approximately an 8% net gain in watercourse units. The watercourse gain will be increased to at least 10% during detailed design and / or through off-site offsetting to ensure compliance with the mandatory biodiversity net gain requirements. Full details of the calculations are provided in technical appendix F.

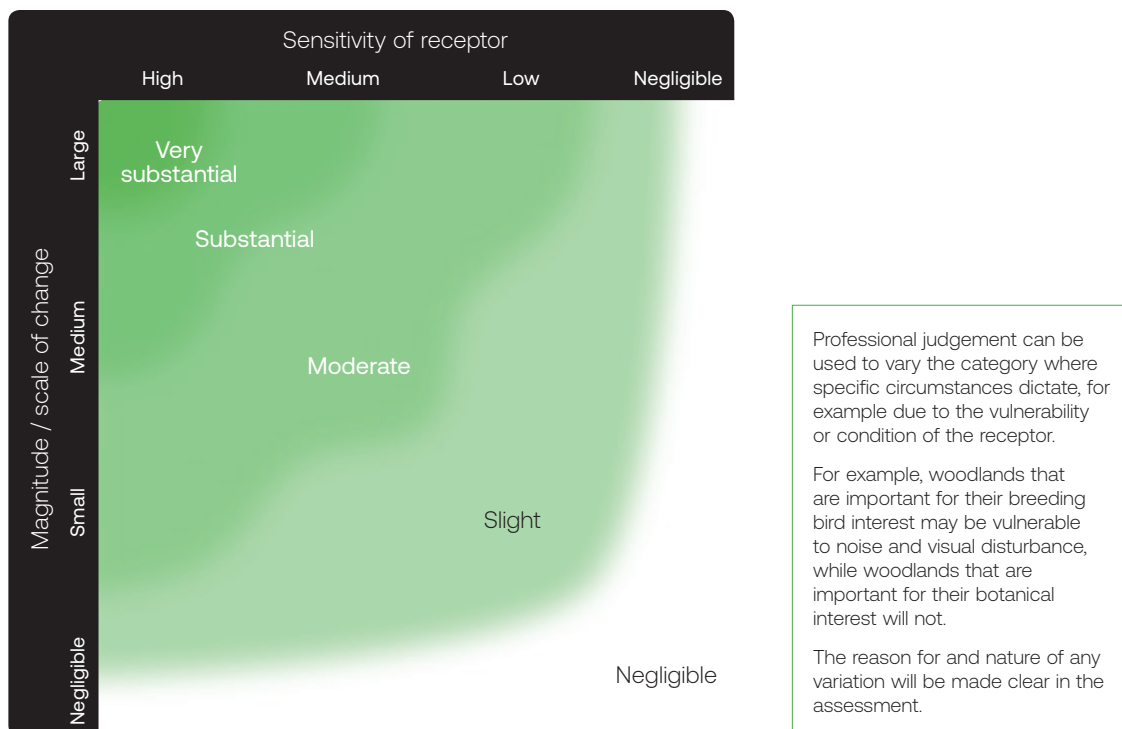
Residual effects

- 8.169 No significant residual effects are predicted as a result of the proposed development.

Magnitude of change – Natural heritage



Determination of effect matrix – Natural heritage



Degrees of effect

Very substantial

A major change in the numbers of one or more very important species or the composition or extent of very important communities, or those which support beneficial or very important species. This might be a reduction or complete eradication of a species, which for some organisms could lead to a negative effect on the functioning of the particular ecosystem and/or other connected ecosystems.

Substantial

A marked change in the numbers of one or more important or very important species or the composition or extent of important or very important communities, or those which support beneficial or important species.

Moderate

A marked change in population densities or community composition or extent, but not a change which results in total eradication of a species or community or which has any marked effect on important or beneficial species, or important communities.

Slight

Some change in the population densities or community composition or extent, but without total eradication of any species or community, and with no effects on important species or communities, or ecosystem function.

Negligible

No marked changes in any of the populations in the environment or in any ecosystem functions.

Significance

If the degree of effect is moderate or above, then the effect is considered to be significant.

