Chapter 5: Ecology and Ornithology

Kirknewton Solar & BESS EIA Report

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Non-Technical Summary

5.1.1 This chapter sets out the methods used to describe and evaluate the potential significant effects on the ecological, ornithological, and nature conservation interests arising from the Proposed Development.

5.1.2 Statutory and non-statutory sites for nature conservation are present within 10 km of the Proposed Development, and 20 km in the context of Special Protection Areas (SPAs) with geese and / or swan populations. This includes potential connectivity of foraging resources associated with Westwater and Firth of Forth SPA / Ramsar sites, LBS and AWI woodland.

5.1.3 The Site largely consists of arable fields and modified grassland. The Site is bordered by hedgerows, broadleaved, mixed and coniferous woodland. Evidence of protected species was recorded across the Study Area, including evidence of badger, bats, otter, hare, and breeding birds. In addition, there is suitable habitat for herptiles and wintering birds.

5.1.4 Potential impacts associated with the construction phase include: habitat loss and / or fragmentation, potential disturbance, injury or death to protected species, and construction related pollution impacts. Potential impacts associated with the operational phase include: disturbance due to vegetation management required for routine maintenance requirements infrastructure, displacement of species due to loss of habitat and displacement due to glint and glare from panels.

5.1.5 The Proposed Development has been designed to avoid and minimise impacts on important habitats and protected species where practicable. This has been achieved through an iterative design process and commitment to embedded mitigation. This process is combined with further commitments to the implementation of mitigation measures both prior to construction and throughout the construction period.

5.1.6 The impact assessment concluded that following the successful implementation of mitigation measures, guided by the development of Species Protection Plans, (SPPs), the Outline Biodiversity Enhancement Management Plan (OBEMP) and Construction Environmental Management Plan (CEMP), there will be no residual effects anticipated on Important Ecological Features (IEFs) and Important Ornithological Features (OEFs) arising from the Proposed Development, either alone or in combination with other plans or projects. Successful implementation of mitigation measures and those included as part of the OBEMP will be assessed by operational monitoring.

5.1.7 A detailed assessment of the impacts on the qualifying features of the Westwater and Firth of Forth SPA / Ramsar sites has been undertaken in a Shadow Habitats Regulations Appraisal (HRA) for the Proposed Development to meet the requirements of the Conservation of Habitats and Species Regulations (the 2017 Habitat and Species Regulations).

Acronyms and Abbreviations

Acronym / Abbreviation	
AI	Artificial Intelligence
AIA	Arboricultural Impact Assessment
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BESS	Battery Energy Storage System
BoCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CBC	Common Birds Census
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
cSAC	Candidate Special Area of Conservation
cSPA	Candidate Special Protection Area
DBW	Daytime Bat Walkover
DEMP	Decommissioning Environmental Management Plan
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EPS	European Protected Species
EZoI	Ecological Zone of Influence
FLL	Functionally Linked Land
FRDA	Flood Risk Assessment & Drainage Impact Assessment
GCN	Great crested newt
GLTA	Ground Level Tree Assessment
GPP	Guidance for Pollution Prevention
GWDTE	Ground Water Dependant Terrestrial Ecosystem
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Appraisal
HSI	Habitat Suitability Index
IEF	Important Ecological Feature
INNS	Invasive Non-native Species
IOF	Important Ornithological Feature
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan

Acronym / Abbreviation	
LBS	Local Biodiversity Site
LDP	Local Development Plan
LEPO	Long-Established Woodland of Plantation Origin
LERC	Local Environmental Recording Centre
LNCS	Local Nature Conservation Site
LNR	Local Nature Reserve
MAGIC	Multi Agency Geographic Information Centre
NBN	National Biodiversity Network
NHZ	Natural Heritage Zone
NNR	National Nature Reserve
NPF4	National Planning Framework 4
NVA	Night Vision Aid
OBEMP	Outline Biodiversity Enhancement Management Plan
OBSMP	Outline Battery Safety Management Plan
PAN	Planning Advice Note
PEA	Preliminary Ecological Appraisal
pLBS	Proposed Local Biodiversity Site
PPP	Pollution Prevention Plan
PRA	Preliminary Roost Assessment
PRF	Preliminary Roost Feature
PV	Photovoltaic
RIAA	Reports to Inform Appropriate Assessment
RPA	Root Protection Areas
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Species Protection Plan
SQE	Suitably Qualified Ecologist
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWTR	Scottish Wildlife Trust Reserve
TWIC	The Wildlife Information Centre
UKHab	UK Habitat Classification
WANE	Wildlife and Natural Environment (Scotland) Act

Acronym / Abbreviation	
WCA	Wildlife and Countryside Act 1981 (as amended)
WeBS	Wetland Bird Survey
WLC	West Lothian Council
ZoI	Zone of Influence

6.0 Ecology and Ornithology

6.1 Introduction

6.1.1 This chapter assesses the likely significant effects of the Proposed Development upon sensitive receptors in the vicinity of the Site during the construction and operational phases.

6.1.2 This chapter is supported by the following figures, which are presented in Environmental Impact Assessment (EIA) Report Volume II:

- **Figure 5.1** – Statutory Designated Sites
- **Figure 5.2** – Non-Statutory Designated Sites
- **Figure 5.3** – UKHabitat Classification Survey Results
- **Figure 5.4** – Protected Species Survey Results
- **Figure 5.5** – Breeding Bird Survey Results

6.1.3 This chapter is supported by the following technical appendices, which are presented in EIA Report Volume III:

- **Technical Appendix 5.1** – Legislation, Policy and Guidance
- **Technical Appendix 5.2** – Preliminary Ecological Appraisal
- **Technical Appendix 5.4** – Bat Survey Reports
- **Technical Appendix 5.5** – Ornithology Baseline Report
- **Technical Appendix 5.6** – Outline Biodiversity Enhancement Management Plan
- **Technical Appendix 5.7** – Shadow Habitats Regulations Assessment

6.1.4 This chapter is supported by the following confidential technical appendix, which is presented in EIA Report Volume IV:

- **Confidential Technical Appendix 5.3** – Protected Species Survey Report

6.1.5 This chapter has been prepared by Kristie Watkin Bourne of SLR consulting Ltd. Kristie is a senior ecologist with over six years ecological consultancy experience and a further two years in energy consultancy. Kristie has broad environmental expertise with skills that encompass both freshwater and terrestrial ecology for habitat and site appraisals, species monitoring, and impact assessment, with a strong focus in project managing the delivery of infrastructure projects and preparation of ecological assessments for Appropriate Assessment and Environmental Impact Assessments across Scotland and the Republic Ireland.

6.1.6 Ornithology input was provided by Daniel Piec, SLR Senior Ornithologist with over 20 years' experience in managing large conservation and ecology projects in the UK and abroad. He has contributed to the development of a number of EIA

documents such as HRA screening reports, ornithology chapters and technical appendices, and reports to inform appropriate assessment (RIAA).

6.2 Relevant Legislation, Policy and Guidance

6.2.1 This chapter has been prepared with reference to the following legislation, policy and guidance. Further information is provided in **Technical Appendix 5.1.**

Legislation

6.2.2 This chapter takes account of the following legislation:

- European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive');
- Council Directive 2009/147/EC on the conservation of wild birds (the "Birds Directive") [1] as transposed into Scots law by The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) [2];
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) ('the Habitats Regulations')[3];
- Environmental Impact Assessment Directive 2014/52/EU[4];
- The Ramsar Convention on Wetlands (1975)[5];
- The Wildlife and Countryside Act 1981 (as amended) (WCA)[6];The Nature Conservation (Scotland) Act 2004 (as amended)[7];
- The Wildlife and Natural Environment (Scotland) (WANE) Act, 2011 (as amended)[8];
- The Protection of Badgers Act 1992, as amended by the Wildlife and Natural Environment (Scotland) Act (2011)[9];
- The Water Environment and Water Services (Scotland) Act 2003)[10];

[1] Available online at: https://eur-lex.europa.eu/eli/dir/2009/147/oj/eng

[2] Available at: https://www.legislation.gov.uk/uksi/1994/2716/contents

[3] UK Government, 1994. *The Conservation (Natural Habitats, &c.) Regulations 1994*. Available at: https://www.legislation.gov.uk/uksi/1994/2716/contents [Last accessed 17/07/2025].

[4]UK Government, 2014. Environmental Impact Assessment Directive 2014/52/EU. Available at: https://www.legislation.gov.uk/eudr/2014/52/contents

[5] The Ramsar convention on wetlands, 1975. [Online] Available at: https://www.ramsar.org/

[6] UK Government, 1981. The Wildlife and Countryside Act 1981 (as amended) Available at: https://www.legislation.gov.uk/ukpga/1981/69/contents/ .

[7] Scottish Government, 2004. Nature Conservation (Scotland) Act 2004. [Online] Available at: https://www.legislation.gov.uk/asp/2004/6/contents

[8] Scottish Government, 2011. The Wildlife and Natural Environment (Scotland) (WANE) Act, 2011. Available at: https://www.legislation.gov.uk/asp/2011/6/contents

[9] Scottish Government, 2011. The Protection of Badgers Act 1992. As amended by the Wildlife and Natural Environment (Scotland) Act, 2011. Available at: https://www.legislation.gov.uk/ukpga/1992/51/contents.

[10] Scottish Government, 2003. The Water Environment and Water Services (Scotland) Act 2003. Available at: https://www.legislation.gov.uk/asp/2003/3/contents

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[11] ('the EIA Regulations'); and
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011[12].

Planning Policy and Guidance

6.2.3 This chapter take account of the following planning policy and guidance:

- National Planning Framework 4 (NPF 4)[13]
- Planning Advice Note (PAN) 60[14]
- Scottish Biodiversity Strategy to 2045[15]
- Scottish Biodiversity List (SBL)[16];
- West Lothian Council Biodiversity Action Plan (LBAP) 2025-35[17];
- The West Lothian Council Local Development plan (LDP)[18];
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Marine. Chartered Institute of Ecology and Environmental Management (CIEEM)[19];
- Goodship and Furness (2022)[20]. Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species;
- NatureScot (2024). Standing Advice for Planning Consultations – Birds[21];

[11] HM Government, 2017. The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: https://www.legislation.gov.uk/ssi/2017/101/contents/made.

[12] Scottish Government, 2011. The Water Environment (Controlled Activities) (Scotland) Regulations 2011. Available at: https://www.legislation.gov.uk/ssi/2011/209/contents

[13] Scottish Government, 2023. National Planning Framework 4. [Online]

Available at: https://www.gov.scot/publications/national-planning-framework-4/documents/

[14] Scottish Government, 2000. Planning for Natural Heritage: Planning Advice Note 60. [Online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2000/01/pan-60-natural-heritage/documents/planning-advice-note-60-planning-natural-heritage-pdf/planning-advice-note-60-planning-natural-heritage-pdf/govscot%3Adocument/Planning%2BAdvice%2BNote%2B60%2BPlanning%2Bfor%2BNatural%2BHeritage.pdf

[15] Scottish Government, 2023. Scottish Biodiversity Strategy to 2045 [Online] Available at Tackling the Nature Emergency - Scottish biodiversity strategy to 2045 - gov.scot

[16] NatureScot (2020) Scottish Biodiversity List. Available at: https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy/scottish-biodiversity-list [Last accessed 22/07/2025]

[17] West Lothian Council, 2025. The West Lothian Biodiversity Action Plan [Online] Available at: https://www.westlothian.gov.uk/article/75251/Local-Biodiversity-Action-Plan

[18] West Lothian Council, 2018. The West Lothian Local Development Plan [Online]. Available at https://www.westlothian.gov.uk/LDP

[19] CIEEM, 2024. Available at: https://cieem.net/wp-content/uploads/2018/08/EcIA-Guidelines-v1.3-Sept-2024.pdf [Last accessed 22/07/2025].

[20] NatureScot (2022) Disturbance Distances in selected Scottish Bird Species – NatureScot Guidance. Available online: https://www.nature.scot/doc/disturbance-distances-selected-scottish-bird-species-naturescot-guidance [Accessed: October 2025]

[21] NatureScot (2024). Standing Advice for Planning Consultations – Birds. Available online: https://www.nature.scot/doc/standing-advice-planning-consultations-birds [Accessed: October 2025]

- NatureScot (2025). NatureScot pre-application guidance for solar farms[22];
- Scottish Natural Heritage (SNH) (now NatureScot) (2016a). Assessing Connectivity with Special Protection Areas (SPAs)[23];
- SNH (2016b). Environmental Statements and Annexes of Environmentally Sensitive Bird Information[24];
- SNH (2017). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms, Version 2[25]; and
- Stanbury *et al*. (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[26].

6.3 Assessment Methodology

Consultation

6.3.1 In undertaking the ecology and ornithology baseline and impact assessments, consideration has been given to the EIA Screening Opinion issued by West Lothian Council (WLC), and direct consultation with NatureScot and WLC. **Table 6-1**: below provides a summary of the key responses which are relevant to ecology and ornithology and outlines how they have been addressed.

Table 6-1: Consultation Responses

Consultee	Summary of Consultation Response	Ecological Response
NatureScot email consultation (07/08/2025)	Guidance for protected species, and biodiversity enhancement requirements detailed on NatureScot website	NatureScot guidance, in addition to legislative requirements provided in **Section 6.2,** has been incorporated into survey and assessment methodologies
	A HRA is required for Firth of Forth SPA and possibly Westwater SPA, for pink footed geese, with the arable land offering potential for foraging habitat. No winter bird surveys or observations have been undertaken to establish	A shadow HRA has been provided within **Technical Appendix 5.7: Shadow Habitats Regulations Assessment**

[22] NatureScot (2025). NatureScot pre-application guidance for solar farms. Available online: https://www.nature.scot/doc/naturescot-pre-application-guidance-solar-farms#birds [Accessed: October 2025]

[23] NatureScot (2016). Assessing Connectivity with Special Protection Areas (SPAs). Available online: https://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf [Accessed: October 2025]

[24] NatureScot (2016). Environmental Statements and Annexes of Environmentally Sensitive Bird Information Available online: https://www.nature.scot/doc/environmental-statements-and-annexes-environmentally-sensitive-bird-information [Accessed: October 2025]

[25] SNH (2017). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms, Version 2. Available online: https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms [Accessed: October 2025]

[26] 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. British Birds 114: 723-747.

Consultee	Summary of Consultation Response	Ecological Response
	whether geese use the Site or not. Therefore, it should be assumed they are, even if in small numbers, with some kind of assessment of the loss of the fields/supporting habitat in the context of other similar habitat that may be around/abundance of other supporting habitat in the area.	
West Lothian Council email consultation following screening request (09/09/2025)	Ecological Impact Assessment (EcIA) including all necessary protected species survey reports, and an Outline Biodiversity Enhancement Management Plan (OBEMP).	Ecological Impact assessment is provided within **Section 5.5** to **Section 5.8** of this chapter. Protected Species Survey Reports: • Preliminary Ecological Appraisal (PEA) (**Technical Appendix 5.2**) • Confidential Protected Species Report (**Technical Confidential Appendix 5.3**) • Bat Survey Reports (**Technical Appendix 5.4**) • Ornithology Baseline Report (**Technical Appendix 5.5**) An oBEMP is provided within **Technical Appendix 5.6**
	HRA screening report and wintering bird survey required. The Site is within 15 km of the Firth of Forth SPA and there's potential for Pink Footed Geese up to 20 km from the SPA and towards the Pentland Hills.	A shadow HRA has been provided within **Technical Appendix 5.7: Shadow Habitats Regulations Assessment.** Wintering bird surveys have not been undertaken. Based on the scale of the development, the Applicant proposed that a desk-based assessment would be sufficient to inform the EIA and shadow HRA. This approach was consulted with NatureScot who advised on 7 August 2025 that in the absence of winter bird surveys the assessment should be carried out based on an assumption of presence and the loss of habitat relative to availability of alternative foraging areas (see above). This approach was also discussed with WLC and the ecology officer in a meeting held on the 8 October 2025. The Applicant therefore proposed to carry out the assessment based on the above approach and the results of the desk study.
West Lothian Council Screening	EIA required for the Proposed Development	EIA chapter provided

Consultee	Summary of Consultation Response	Ecological Response
Determination (09/10/2025)		

Ecological Desk Study

6.3.2 A desk study was carried out to identify statutorily, nationally and internationally recognised sites within 10 km of the Site which are designated for their nature conservation interest (including Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar wetlands, and National Nature Reserves (NNRs). This distance is extended to 20km in the case of SPAs which support geese as a qualifying feature.

6.3.3 Any Local Nature Reserves (LNRs), Ancient Woodland Inventory (AWI) and Non-statutory ecological sites within 2 km of the Site were also identified.

6.3.4 A data request was sent to The Wildlife Information Centre (TWIC) on 14 April 2025 for records of protected and notable species within 2 km of the Site boundary. For the purposes of ensuring that information is up to date and relevant, only records from the last 15 years were considered.

6.3.5 Additional data for protected, notable, and invasive species within 2 km of the Site (within the last 15 years) was obtained from the National Biodiversity Network Atlas (NBN)[27]. Note that only records available for commercial use have been reported, with the data owner(s) cited or acknowledged as required[28].

6.3.6 Potential ecological constraints have been identified through a desk-based review of the above and other relevant online resources, as summarised in **Table 6-2**:.

Table 6-2: Sources of Existing Ecological Data

Source	Baseline Information Provided
NatureScot Sitelink web-based application[29] and the Multi Agency Geographic Information for the Countryside (MAGIC) web-based mapping tool[30]	Statutory designated nature conservation sites within 10 km (non-avian) and 20 km (relating to geese) of the Site boundary.
Spatial Hub online tool[31]	Non-statutory designated nature conservation sites within 2 km of the Site boundary

[27] NBN Atlas, Available at: https://docs.nbnatlas.org/

[28] https://docs.nbnatlas.org/data-licenses/

[29] https://sitelink.nature.scot/map

[30] https://magic.defra.gov.uk/

[31] https://data.spatialhub.scot/

Ancient Woodland Inventory (AWI) of Scotland[32]	Ancient[33] and long-established woodland of plantation origin[34] (LEPO) within 2km of the Site boundary.
Aerial imagery (Google Earth[35] and Bing Maps[36])	Habitats and features of nature conservation interest both within and surrounding the Site.
Ordnance Survey 1st and 2nd edition mapping	Habitats and features of nature conservation interest both within and surrounding the Site.
Carbon and Peatland 2016 Map of Scotland[37]	Distribution of carbon-rich and peat soil across Scotland and associated values (soil class). This mapping is for initial desk assessment and considered for indicative purposes only. It is not to be relied upon in the absence of peat survey data.

6.3.7 Full details of the desk study can be found in **Technical Appendix 5.2: PEA**.

Field Surveys

6.3.8 The area within which field surveys were undertaken varied depending on the feature. Specific details of the extent of the study area are presented below in **Table 6-3** with full details provided in **Technical Appendix 6.1: PEA.**

6.3.9 Field study areas were designed to consider appropriate buffers required for habitat and protected species survey methodologies, as detailed below:

- Habitat surveys: undertaken within the application boundary; and
- Protected species surveys: undertaken within 50 m of the application boundary, though this was extended to 200 m upstream and downstream of watercourses to survey for otter *Lutra lutra* presence and 100 m for breeding birds.

Table 6-3 Ecology Survey Areas

Survey Type	Extent of Study Area	Survey Date	Surveyor
UK Habitat Classification Surveys	The Site	07/4/2025 - 08/4/2025 24/6/2025 16/8/2025	SLR
Protected Species Surveys - Bats	Daytime bat walkover (DBW): 200m buffer from application boundary.	07/4/2025 - 08/4/2025	SLR

[32] https://www.data.gov.uk/dataset/c2f57ed9-5601-4864-af5f-a6e73e977f54/ancient-woodland-inventory-scotland

[33] Ancient woodland is interpreted as semi-natural woodland that has been continuously wooded since year 1750 (category 1a) or 1860 (category 2a) to present day.

[34] Long-established woodland refers to plantation woodland that has been present since year 1750 (category 1b) or 1860 (category 2b). Many of these sites have developed semi-natural characteristics, and some may be as rich as ancient woodland.

[35] https://earth.google.com/web

[36] https://www.bing.com/maps/

[37] https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/

	Ground Level Tree Assessment (GLTA) / Preliminary Roost Assessment (PRA): 30m buffer from application boundary.	16/8/2025	SLR
	Aerial Bat Roost Inspection: PRF-M tree within Site Boundary	22/8/2025	R&D Ecology
	Bat Emergence Surveys: PRF-M tree within Site Boundary	12/9/2025 30/09/2025	Pica Ecology
Protected Species – Terrestrial	Otter and water vole *Arvicola amphibius*: 200m upstream and downstream of any watercourses. Additional protected species: pine marten *Martes martes*, red squirrel *Sciurus vulgaris*, badger Meles meles, brown hare *Lepus europaeus*, hedgehog *Erinaceus europaeus*, and hertpiles: 50m buffer from Site boundary.	07/4/2025 - 08/4/2025 24/6/2025 16/8/2025 03/9/2025	SLR
Protected Species – Avian	Breeding Bird Surveys: 100m buffer from Site boundary	April – July 2025	SLR

UK Habitat Survey

6.3.10 Full details of the UKHab survey can be found in **Technical Appendix 5.2: PEA**.

6.3.11 An initial walkover survey of the Site was conducted on the 7 and 8 April 2025, with subsequent visits on the 24June and 16 August 2025.

6.3.12 During the walkover survey, habitats on Site were mapped in accordance with the UK Habitat Classification (UKHab) methodology[38]. The Survey Area comprised of a buffer of 50 m from the Site boundary, which was extended to 200 m for watercourses (i.e. the Survey Area). The UKHab system comprises a principal hierarchy (the Primary Habitats) which involves the identification of broad habitats and Priority habitats, as well as the use of non-hierarchical Secondary codes.

6.3.13 The methodology was extended to include searches for features of interest, such as notable or protected species of flora and fauna, as well as habitats capable of supporting such species.

6.3.14 In addition, invasive non-native species (INNS) of plant were searched for. Invasive non-native species are defined as those species which occur outside of their natural range and have an adverse effect on native fauna/ flora. Such species include but are not limited to: Japanese knotweed *Fallopia japonica*, Himalayan balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum*. In Scotland, the law on INNS is amended from the WCA via the Natural Environment (Scotland) Act 2012, which means it is an offence to plant, or otherwise cause to grow, a plant in the wild at a location outside its native range.

Protected Species Surveys

[38] UKHab Ltd, 2023, Uk habitat classification version 2.0. Available at: https://ukhab.org/ (Accessed 01/09/2025)

6.3.15 Full details of the protected species and bat surveys can be found in their respective baseline reports, **Technical Appendix 5.2: PEA** and **Technical Appendix 5.4: Bat Survey Reports**.

Badger

6.3.16 The survey comprised a search for setts and other signs of badger *Meles meles* activity, e.g. latrines, dung pits, pathways, snagged hair and signs of foraging in line with NatureScot guidance[39]. Where setts were identified within the Survey Area, each sett entrance was mapped and photographed with sett entrances grouped and classified as main, annex, subsidiary or outlier setts.

Otter and Water Vole

6.3.17 A survey for field signs indicting the presence of otter *Lutra lutra* and water vole *Arvicola amphibius* was carried out on all suitable watercourses within the Survey Area and within 20 m of either bankside. Signs indicating the presence of otter such as feeding remains, footprints, slides, resting places and potential holt / natal den sites were searched for and overhanging banks, cavities, bankside vegetation and riparian features, such as boulders and mud, were searched for signs of otter use following survey methodology described by NatureScot[40], and Chanin[41].

6.3.18 Signs indicating the presence of water vole such as latrines, burrows, feeding stations, paths / runs at the water's edge, and footprints were also searched for in accordance with relevant guidelines[42],[43].

Great crested newt

6.3.19 A Habitat Suitability Index (HSI) assessment of standing water bodies was carried out with respect to great crested newt (GCN) *Triturus cristatus* within a 500 m radius

[39] NatureScot, 2020. Planning and development: standing advice and guidance documents. Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-standing-advice-and-guidance-documents [Last accessed 22/07/2025]

[40] NatureScot, 2024. Standing advice for planning consultations – Otters . Available at: www.nature.scot: https://www.nature.scot/doc/standing-advice-planning-consultations-otters [Last accessed 17/07/ 2025]

[41] Chanin, 2003. Conserving Natura 2000 Rivers Monitoring Series no. 10. Monitoring the Otter. Peterborough: English Nature. Available at: cieem.net: https://cieem.net/resource/monitoring-the-otter/ [Last accessed 17/07/2025]

[42] Dean, M., Strachan, R., Gow, D., Andrews, R., Matthews, F., & Chanin, P. (2016). Watervole mitigation handbook. Mammal Society Mitigation Guidance Series. The Mammal Society.

[43] Strachan, R., Moorhouse, T., & Gelling, M. (2011). Water vole conservation handbook. Wildlife Conservation Research Unit.

of the Site where possible[44]. This was reduced to 250 m where barriers to movement was evidenced between ponds and the Site.

6.3.20 Ponds were either unsuitable or not accessible for Environmental DNA (eDNA) assessment, therefore further survey work was not carried out.

Ground Level Tree Assessment

6.3.21 A GLTA was carried out on the 16 August 2025 for trees on Site and within a 20 m buffer of the Proposed Development infrastructure (i.e. the Survey Area) which had potential Roosts Features (PRF's) (e.g. hazard beams, lifting bark, knot holes). Additionally, physical evidence of presence was searched for (e.g., bat corpses, droppings, feeding remains, scratch marks, urine and grease staining). The GLTA also included an assessment of buildings and structures with features with the potential to support roosting bats (e.g. raised slates, gaps under flashing, cracks and crevices in stonework.)

6.3.22 Methodology followed Bat Conservation Trust (BCT) guidelines[45] which sets out the criteria below for classifying PRFs according to their level of suitability for individual or multiple bats:

- PRF-I – Roost feature is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
- PRF-M – Roost feature is suitable for multiple bats and may therefore be used by a maternity colony.

[44] Oldham RS, Keeble J, Swan MJS and Jeffcote M (2000) Evaluating the suitability of habitat for the great crested newt (Triturus cristatus). Herpetological Journal. 10: 143-155. Available at: https://www.thebhs.org/publications/the-herpetological-journal/volume-10-number-4-october-2000/1617-03-evaluating-the-suitability-of-habitat-for-the-great-crested-newt-triturus-cristatus/file

[45] (Collins, J (ed) 2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition. Bat Conservation Trust (BCT). Available at: https://www.bats.org.uk/resources/guidance-for-professionals/bat-surveys-for-professional-ecologists-good-practice-guidelines-4th-edition [Last accessed 05/08/2025.]

6.3.23 The need for further survey work (e.g. aerial tree inspections, presence/likely absence surveys) was determined following the iterative process outlined in the BCT guidelines[27].

6.3.24 Some of the trees within the Survey Area had PRFs which were accessible from ground level and these were inspected by a licensed and experienced ecologist using an endoscope at the time of the GLTA survey.

Aerial Bat Roost Inspection

6.3.25 An aerial assessment was undertaken on 22 August 2025 by qualified climbers (Dawn Thompson BSC (Hons) MCIEEM MECW (NatureScot Bat Survey Licence Number: 292142) and Rhys Newell ACIEEM).

6.3.26 Surveyors used an endoscope and a high-powered torch where necessary to search for signs of bat presence and suitable roosting features. All survey works and assessment has been undertaken in accordance with best practice guidance.

6.3.27 Signs of bats commonly found during searches include:

- Droppings – typically found on the ground beneath roost exits, or within cavities
- Urine spots on window glass and other smooth surfaces.
- Fur oil stains, indicating a roost entrance.

6.3.28 The following categories have been used for the assessment of the suitability of trees for bats:

- None: No Potential Roost Features (PRFs)
- FAR: Further assessment required to establish if PRFs are present within tree
- PRF: A tree with at least one PRF.

6.3.29 Based on the BTC Guidelines[45], trees assessed as PRF-M require three surveys during the bat active season. If a feature can be fully inspected, these surveys can comprise an inspection by a licensed bat worker using an endoscope and high-powered torch searching for evidence of roosting bats (e.g. bats, droppings) during three separate visits.

6.3.30 Where a feature cannot be fully assessed, emergence surveys are required to confirm presence or absence of roosting bats. In this case the aerial inspection, could not fully assess the tree, and therefore required emergence surveys.

Bat Emergence Surveys

6.3.31 Following an aerial bat roost inspection survey (as detailed above), a total of two dusk emergence surveys were conducted on the 12th September and 30th September 2025 by experienced ecologists Jenny Diack BSc (Hons) MCIEEM (NatureScot Bat Licence 253674) and Adrian Taylor BSc (Hons) C. Env. MCIEEM.

6.3.32 The dusk emergence surveys commenced at least 15 minutes prior to sunset and continued for a minimum of ninety minutes after sunset. During the survey, two surveyors watched for bats existing or entering the potential roost features. Night

Vision Aids (NVAs) were used to assist with observing bat activity in low light conditions and darkness.

6.3.33 Recordings were analysed using Kaleidoscope and Analook Insight software for identification of bat calls to species level.

Breeding Bird Surveys

6.3.34 Breeding bird surveys followed an adapted version of the Common Birds Census (CBC) methodology[46] and the Breeding Bird Survey Guidelines[47], which involved the surveyor walking a transect at a slow pace, ensuring all accessible land within the Site plus a 100 m buffer was covered (Survey Area). Six survey visits were undertaken following the published methodology, taking place between April and early July and separated by at least one week.

6.3.35 The route approached all parts of the Survey Area to within 50 m where possible, such that the surveyor could cover all parts of the Survey Area (e.g. from the edge of an arable field). All visual and auditory contact with all target species was recorded, mapping the locations on a field map using British Trust for Ornithology (BTO) species codes. Behavioural notation was used to record the bird behaviour for each encounter (e.g., singing, alarm calling and flight paths). Target species were all species listed on Annex I of the Birds Directive[48], Schedule 1 of the Wildlife and Countryside Act 1981 (as amended in Scotland)[49], the Scottish Biodiversity List[50], and those listed in the 5th Birds of Conservation Concern (BoCC) report as Red or Amber [51].

6.3.36 Five surveys were undertaken between half an hour before sunrise and 11:00, plus one nocturnal survey (dusk) that was undertaken from 18:40 to one hour after sunset. Surveys were undertaken in suitable weather conditions, avoiding heavy rain, strong winds (Beaufort force >5) and low visibility (e.g. fog) Further information on survey conditions and results are within **Technical Appendix 5.5: Ornithology Baseline Report**.

6.3.37 Six visits were completed across the breeding season on the following dates:

- Visit 1 – 8 April
- Visit 2 – 29 April
- Visit 3 – 30 May

[46] Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy.

[47] Bird Survey and Assessment Steering Group. 2025. Bird Survey Guidelines for assessing ecological impacts, https://birdsurveyguidelines.org/ [Accessed September 2025]

[48] European Union (EU) Directive on the Conservation of Wild Birds (2009/147/EC) Available online at: https://eur-lex.europa.eu/eli/dir/2009/147/oj/eng

[49] Wildlife and Countryside Act 1981 (as amended in Scotland). Available online at: https://www.legislation.gov.uk/ukpga/1981/69/contents

[50] Scottish Government, 2013. Scottish Biodiversity List. [Online] Available at: https://www.nature.scot/doc/scottish-biodiversity-list

[51] Stanbury, A. J. et al., 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. British Birds 114.

- Visit 4 – 12 June
- Visit 5 – 25 June
- Visit 6 – 3 July (dusk visit)

6.3.38 The survey method aims to establish the numbers and distribution of breeding territories in order to inform an impact assessment. This is achieved by presenting territory mapping, typically showing a single BTO species code to represent an indicative territory centre. This is done for all target species. Further details of territory analysis can be found in **Technical Appendix 5.5: Ornithology Baseline Report**.

Approach to Impact Assessment

Ecological Zone of Influence

6.3.39 The Ecological Zone of Influence (EZoI) is defined as the area within which there may be ecological features subject to effects from the Proposed Development. Such effects could be direct, e.g. habitat loss resulting from land-take or removal of a building occupied by roosting bats, or indirect, e.g. noise or visual disturbance causing a species to move out of the EZoI. The EZoI was determined through:

- Review of the existing baseline conditions based on desk study results, field surveys and information supplied by consultees;
- Identification of sensitivities of ecological and ornithological features, where known;
- The outline design of the Proposed Development and approach to construction; and
- Liaison with other technical specialists involved in the assessment, e.g. hydrologists or hydrogeologists.

Characterising Ecological Impacts and Effects

6.3.40 In accordance with the CIEEM guidelines, the following definitions are used for the terms ‘impact’ and ‘effect’:

- **Impact –** Actions resulting in changes to an ecological feature. For example, the construction activities of a development removing a hedgerow.
- **Effect –** Outcome to an ecological feature from an impact. For example, the effects on a species population from loss of a hedgerow.

6.3.41 In accordance with the CIEEM guidelines, when determining impacts on Important Ecological Features (IEFs) and Important Ornithological Features (IOFs), reference is made to the following:

- **Beneficial or adverse** – i.e. whether the impact has a beneficial (positive) or adverse (negative) effect in terms of nature conservation objectives and policy.
- **Magnitude** – i.e. the size of an impact, in quantitative terms where possible.
- **Extent** – i.e. the area over which an impact occurs.

- **Duration** – i.e. the time for which an impact is expected to last. Where possible, defined in relation to ecological characteristics i.e. species lifetimes, habitat recoverability.
- **Timing and frequency** – i.e. whether impacts occur during critical life stages or seasons, or how many times the IEF/ IOF may be impacted by an activity.
- **Reversibility** – i.e. a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which a spontaneous recovery is possible.

Assessment of Effects

6.3.42 The following effects have been identified for consideration in this assessment:

Construction

6.3.43 Construction is anticipated to take eight to twelve months. The following potential effects are assessed in the chapter:

- Direct or indirect effects on nature conservation designations;
- Damage/modification and loss of habitat of IEFs and IOFs;
- Habitat fragmentation and disturbance/displacement of IEFs and IOFs;
- Pollution events and sedimentation of aquatic habitat; and
- Death/injury and or disturbance to IEFs and IOFs, including destruction/removal of habitat.

Operation

6.3.44 The following potential effects are assessed in the chapter:

- Disturbance/displacement of faunal IEFs and IOFs once Site is in operation;
- Death/injury and or disturbance to IEFs and IOFs during general Site maintenance activities including vehicle collisions with faunal species; and,
- Pollution events and sedimentation which may be caused by Site maintenance.

Decommissioning

6.3.45 The environmental effects of decommissioning are considered to be similar to those during construction, excluding the loss of habitat which will have already occurred under construction. Also, decommissioning is anticipated to take up to 12 months.

6.3.46 Prior to decommissioning, a Decommissioning Environmental Management Plan (DEMP) will be produced to reflect then current legislation and policy and will be agreed with the relevant statutory authorities.

6.3.47 Decommissioning is therefore scoped out of the assessment.

Cumulative Effects

6.3.48 Cumulative effects as a result of the Proposed Development have been considered as follows:

- Cumulative effects during construction on ecology and ornithology.
- Cumulative effects during operation on ecology and ornithology.

Effects Scoped Out

6.3.49 Where design mitigation and embedded/standard practice measures have reduced the potential for significant effects to receptors, those receptors have been scoped out of further assessment. Only ecological or ornithological features which are important from a conservation perspective, as identified in a review of baseline information, and which are potentially sensitive to impacts associated with the Proposed Development, are taken forward to detailed assessment in this chapter. See **Section** Error! Reference source not found. for further details of these ecological and ornithological features.

Criteria for Assessing Sensitivity of Receptors

6.3.50 The assessment presented within this chapter follows the principles set out in the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland [19] with impact significance determined on the basis of the sensitivity of ecological features and the magnitude of change. **Table 6-4**: lists the criteria used to determine the value of ecological and ornithological features in a geographical context.

6.3.51 The sensitivity of an ecological receptor is a measure of the receptor's tolerance to disturbance, resilience, ecological service and conservation importance. These factors are reflected through legislation and policies, and geographical importance criteria, **Table 6-4**:. Determination of the level of sensitivity of an IEF and IOFs is based on a combination of its geographical importance criteria and conservation status. The importance of an ecological receptor can be due to a variety of reasons. For example, importance can be as a result of the quality or extent of designated habitats or areas, habitat or species rarity, or the extent of the species range and/or decline.

6.3.52 In assigning a level of value to the population of bird species, it is necessary to consider its distribution and status, including a consideration of trends based on

available historical records. Reference has therefore been made to published lists and criteria where available.

6.3.53 Examples of relevant lists include:

- species of European conservation importance (as listed on Annex I of the Birds Directive);
- species with enhanced legal protection (as listed on Schedule 1 of the Wildlife and Countryside Act (as amended in Scotland); and
- species considered to be of principal importance for biodiversity in Scotland, as listed on the SBL.

6.3.54 Criteria for the evaluation include the SPA and SSSI selection guidelines published by the Joint Nature Conservation Committee (JNCC). Reference has also been made in particular to published bird population estimates such as Wilson et al. (2015)[52] for Natural Heritage Zones (NHZs) within Scotland and Woodward et al. (2020)[53] for Great Britain.

6.3.55 Where appropriate, the value of species populations has been determined using the standard '1% criterion' method (e.g. Holt et al., 2012)[54]. Using this, the presence of >1% of the international population of a species is considered internationally important; >1% of the national population is considered nationally important; etc.

6.3.56 Categories of geographical importance (from international to less than local level) which relate to ecological or nature conservation importance, together with examples and criteria of how to place a site – defined by its ecological attributes – are set out in the CIEEM guidance[19].

Table 6-4: Geographical Importance of Ecological Features

Geological Importance	Criteria	Examples
International	Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species of international importance. N.B. For designations, such as a SPA/ SAC or Ramsar, this may also include off-site features on which the qualifying	International nature conservation areas: • Any SPA; • Any SAC; • Any candidate SAC or SPA (cSAC, cSPA); and • Any Ramsar wetland. Significant numbers of a designated population outside the designated area. A site supporting more than 1% of the EU population of a species.

[52] Wilson, M. W., Austin, G. E., Gillings S. and Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number SWBSG_1504. pp72. Available online: http://www.swbsg.org/images/SWBSG_Commissioned_Report_No_1504.pdf [Accessed: October 2025]

[53] Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D.A. & Noble, D. (2020). Population estimates of birds in Great Britain and the United Kingdom. British Birds 113: 69–104.

[54] Holt, B.G., Lessard, J.P., Borregaard, M.K., Fritz, S.A., Araújo, M.B., Dimitrov, D., Fabre, P.H., Graham, C.H., Graves, G.R., Jønsson, K.A., Nogués-Bravo, D., Wang, Z., Whittaker, R.J., Fjeldså, J. and Rahbek, C., 2012. An update of Wallace's zoogeographic regions of the world. Science, 339(6115), pp.74–78. https://doi.org/10.1126/science.1228282

Geological Importance	Criteria	Examples
	population(s) or habitat(s) are considered, from the best available evidence, to depend. This is referred to as Functionally Linked Land (FLL).	A bird species which is either unique or sufficiently unusual (in terms of distribution and/or abundance) to be considered as being a population of the highest quality example in an international/national context that the site is likely to be designated as an SPA.
National (i.e. Scotland)	Nature conservation resource, i.e. designated nature conservation area, habitat or populations of species of national importance. N.B. For designations, such as a Site of Special Scientific Interest (SSSI) or a National Nature Reserve (NNR), this may also include off-site features on which the qualifying population(s) or habitat(s) are considered, from the best available evidence, to depend.	National nature conservation areas: • Any SSSI or NNR designated for biological feature(s). • A site supporting more than 1% of the UK population of a species. Nationally important population/ assemblage of a European Protected Species (EPS) or species listed on Schedule 5 of the WCA[6]. A population of a bird species which is either unique or sufficiently unusual (in terms of distribution and/or abundance) to be considered as being of nature conservation value at up to a country context. This includes Wildlife and Countryside Act Schedule 1 (as amended in Scotland) species, a red- or amber- listed species (as in Birds of Conservation Concern) and a priority Scottish species.
Region (West Lothian and NHZ 16 Eastern Lowlands)	Nature conservation resource, i.e. nature conservation designation, habitat or species, of importance on a regional scale.	Statutory and non-statutory nature conservation designations: • Any Local Nature Reserve (LNR); • Any Scottish Wildlife Trust (SWT) reserve; • Any Local Biodiversity Site (LBS); and • Ancient Woodland listed on the NatureScot Ancient Woodland Inventory[55] • A regional-scale important population/area of a species or habitat listed on the Scottish Biodiversity List (SBL)[16] as requiring conservation action. A regional-scale important population / area of a species or habitat listed on the BAP[56]. A regional-scale important population / assemblage of an EPS or species listed on Schedule 5 of the WCA[6]. Sites supporting a regularly occurring, regionally significant number of internationally or nationally important bird species in the context of NHZ 16 Eastern Lowlands.
Local (i.e. within 2 km of the	Nature conservation resource, e.g. a habitat or species of importance in	A breeding population of a species on the SBL[16].

[55] NatureScot, 2000. Ancient Woodland Inventory. Available at: https://opendata.nature.scot/datasets/ancient-woodland-inventory/explore.

[56] West Lothian Council (2025) A Biodiversity Action Plan for West Lothian. Available at WL_BAP_2025-35_Text_Approved_-_updated.pdf

Geological Importance	Criteria	Examples
Proposed Development	the context of the local district.	A breeding population of a species or a viable area of a habitat that is listed in a Local BAP because of its rarity in the locality. An area supporting 0.05%-0.5% of the UK population of a species.
Less than Local	Unremarkable, common and widespread habitats and species of little/no intrinsic nature conservation value.	Common, widespread, agricultural and/or exotic species (such as non-native escapees).

6.3.57 Where an ecological feature (i.e. a habitat or species) qualifies under two or more importance criteria, the higher value is applied to the feature. Within this Chapter any ecological feature of local or higher value is considered an IEF.

Assessment of Magnitude

6.3.58 The magnitude of impact is the degree of change to which a receptor will be subject as a result of the construction and/or operation of the Proposed Development.

6.3.59 **Table 6-5**: describes the scale of impact magnitude according to the nature of the assessed impact relevant to this technical assessment.

Table 6-5: Scale of Magnitude

Scale of Magnitude	Description of Impact
No Impact	No detectable impacts on the ecological resource, even in the immediate term.
Negligible	Detectable impact but reversible within 12 months. Not expected to affect the conservation status of the nature conservation designation, habitat or species under consideration.
Low	Detectable impacts, and may be irreversible, but either of sufficiently small-scale or of short-term duration to have no material impact on the conservation status of the nature conservation designation, habitat or species population.
Medium	Detectable impact on the status of the nature conservation designation, habitat or species population in the medium term but is reversible/replaceable given time, and not a threat to the long-term integrity of the feature.
High	Irreversible impact on the status of the nature conservation designation, habitat or species and likely to threaten the long-term integrity of the feature. Not reversible or replaceable. Will remain detectable in the medium and long term.

6.3.60 The following definitions have been applied in respect to timescales:

- Immediate: Within approximately 12 months
- Short term: Within approximately 1-5 years
- Medium term: Within approximately 6-15 years
- Long term: More than 15 years.

Assessment of Significance

6.3.61 The significance of effect is a product of the sensitivity of the receptor and the magnitude of the impact. **Table 5-6-6** sets out how the significance of effects has been ascribed in this technical assessment.

Table 5-6-6: Significance of Effect

Scale of Magnitude	Description of Impact
Major	Significant effect, as the impact is likely to result in a long term significant negative effect on the conservation status of the feature.
Moderate	Significant effect, as the impact is likely to result in a medium term or partially significant negative effect on the conservation status of the feature.
Minor	The impact is likely to have a negative effect on the feature at an insignificant level by virtue of its limited duration and/ or extent, but there will probably be no effect on its conservation status. The level of effect would be Minor and Not Significant.
Negligible	No material effect. The effect is assessed to be Not Significant.

6.3.62 For the purposes of this assessment, effects of moderate significance and above are deemed to be significant in EIA terms.

6.3.63 An EcIA is undertaken in relation to the baseline conditions that would be expected to occur in the absence of a proposed development and, therefore, may include possible predictions of future changes to baseline conditions, such as environmental trends and other completed or planned developments. Both adverse and beneficial impacts/effects are possible.

6.3.64 A significant effect, in ecological terms, is defined as an effect (whether adverse or beneficial) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area, including cumulative and in-combination impacts. In accordance with CIEEM guidelines, a significant effect is an effect that supports or undermines biodiversity conservation objectives for IEFs, or for biodiversity in general.

6.3.65 For the purposes of the ornithology assessment, in accordance with CIEEM guidelines, under the EIA Regulations, a ‘significant effect’ is ‘one that is sufficiently important to require assessment and reporting so that the decision-maker is adequately informed as to the environmental consequences of permitting the project’. Effects can be considered significant at a wide range of scales from international to local. For example, a significant effect on a regionally important population of a species is likely to be of regional significance. They are also significant if they do not comply with legal and policy protection. Consideration of

conservation status is important for evaluating the effects of impacts on bird species and assessing their significance. Conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area (which, for the purposes of the Birds Directive, is the EU).

6.3.66 The approach adopted in this chapter aims to determine if the effect of an impact is significant or not based on a discussion of the factors that characterise it, i.e. significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystem and the conservation status of habitats and species (including extent, abundance and distribution). Additionally, significant effects should be determined with reference to an appropriate geographic scale.

6.3.67 In accordance with the current CIEEM guidelines, effects of impacts on IEFs are assessed on the basis of standard mitigation and good practice measures (as set out in **Section 6.5**) being in place. Additional mitigation may be identified where it is required to reduce a significant effect: mitigation will be consistent with the geographic scale at which an effect is deemed significant.

6.3.68 A sequential process has been adopted to avoid, mitigate and compensate for impacts on IOFs. This is referred to as the 'mitigation hierarchy'.

6.3.69 The differences between avoidance, mitigation, compensation and enhancement are defined here as follows:

- Avoidance is used where an impact such as disturbance or displacement of breeding IOFs e.g., through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ i.e., direct habitat loss which may reduce a breeding or foraging range;
- Compensation describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary. Such measures can be set out in species specific biodiversity action plans.

6.3.70 Any significant effect remaining post-mitigation (the residual effect), together with an assessment of the likelihood of success of the mitigation, are the factors to be considered against ecological objectives (legislation, policy and development control) in determining the application.

6.3.71 In addition to determining the significance of effects on valued ecological features, this chapter also identifies any statutory requirements in relation to wildlife, to

ensure legal compliance of the Proposed Development during both construction and operation.

Limitations to Assessment

Desk Study

6.3.72 NBN data was used in addition to Local Environmental Recording Centre (LERC) data from The Wildlife Information Centre (TWIC). Within NBN data the use of Creative Commons with attribution non-commercial (CC-BY-NC) licenced species records have been excluded from this chapter. This removes data records that are deemed not for commercial use by the data holder. Review of the NBN dataset deemed that the exclusion of CC-BY-NC data would not significantly impact the outcomes of this report.

6.3.73 Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the study. It is therefore possible that important habitats or protected species not identified during the data search do in fact occur within the vicinity of the Site. Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area.

Field Survey

6.3.74 The Site was fully accessible during surveys with the exception of accessing riparian areas with overgrown scrub. Outside of the Site, woodland to the south not accessed due to the presence of private land and trees present within fields west of the Site were not accessed due to the presence of young cattle. These areas were surveyed by sight from the adjacent land, however, as these areas are buffered from infrastructure, they are unlikely to be impacted by the Proposed Development. As such, these are not considered a significant limitation.

6.3.75 Pond 1 is 155 m to the south-east of the site. Surveys were not granted access to this pond therefore surveys were unable to take place. This limitation has been brought into the assessment.

6.3.76 There are ecological connections through foraging opportunities within the Site, i.e., Functionally Linked Land (FLL) for pink-footed geese of Westwater and the Firth of Forth SPA / Ramsar sites. Winter bird surveys were not carried out and instead the presence of geese utilising the Site for foraging was assumed to be the case for a desk-based assessment.

6.3.77 General assumptions and limitations that apply to all technical chapters are set out in **Chapter 2: Approach to EIA**.

6.4 Baseline Conditions

Desk Study

Statutory Designated Sites

6.4.1 The Site does not overlap, or intersect, any Statutory Designated Sites for nature conservation. The data search for Statutory Designated Sites of nature conservation interest returned five sites of international importance (SAC, Ramsar), two sites of European importance (SPA) and six sites of national importance (SSSI) within 10 km of the Site, extended to 20 km for statutory designated sites with goose and/or swan qualifying interests. Details of each are provided in **Table 6-7** and illustrated in **Figure 5.1**.

Table 6-7 Statutory Designated Sites with Nature Conservation Interest within 10 km (Extended to 20 km for Sites with Goose Interest)

Site Name	Designation	Relevant Qualifying / Notified Ecological Features	Distance (km) and Direction from Site Boundary[57]
Linhouse Valley	SSSI	• Lowland acid grassland; • Lowland neutral grassland; • Upland mixed ash woodland; and • Valley fen	2.6 km W
Calderwood	SSSI	• Upland oak woodland; and • Valley fen	3.1 km NW
Balerno Common	SSSI	• Bryophyte assemblage; • Mesotrophic loch; • Raised bog; and • Transition open fen	4.7 km SE
North Esk Valley	SSSI	• Lowland acid grassland; and • Valley fen	7.4 km SE
Hermand Birchwood	SSSI	• Upland birch woodland	7.7 km SE
Habbies Howe-Logan Burn	SSSI	• Bryophyte assemblage; and • Lichen assemblage	7.7 km SE
Cobbinshaw Moss	SSSI	• Intermediate bog (blanket)	8.8 km SE
Craigengar	SSSI	• Blanket bog; • Marsh saxifrage *Saxifraga hirculus*; • Spring-head, rill and flush; and • Subalpine dry heath	8.9 km S
Tailend moss	SSSI	• Raised bog	9.3 km NW
River Tweed	SAC	• Atlantic salmon *Salmo salar*; • Brook lamprey *Lampetra planeri*; • Otter *Lutra lutra*; • River lamprey *Lampetra fluviatilis*; • Rivers with floating vegetation often dominated by water-crowfoot; and	9.8 km SE

[57] Measured from the nearest point “as the crow flies”.

Site Name	Designation	Relevant Qualifying / Notified Ecological Features	Distance (km) and Direction from Site Boundary[57]
		• Sea lamprey *Petromyzon marinus*	
Westwater	SPA Ramsar	• Pink-footed goose *Anser brachyrhynchus*, non-breeding • Waterfowl assemblage, non-breeding (not functionally linked at this distance)	11.8 km S
Firth of Forth	SPA Ramsar	• Pink-footed goose, non-breeding A further 27 qualifying features are notified, however they are not considered to be functionally linked at this distance from the Site.	13.9 km N

Non-Statutory Designated Sites

6.4.2 A total of four non-statutory designated sites were identified within 2 km of the Site. These are provided in **Table 6-8**.

Table 6-8 Local Biodiversity Sites

Site Name	Relevant Qualifying / Notified Ecological Features	Distance (km) and Direction from Site Boundary[58]
Leyden Road Verge proposed Local Biodiversity Site (pLBS)	N/A – Not formally recognised as a LBS	0.2 km north of the Site boundary
Kirknewton Estate Local Biodiversity Site (LBS)	Estate with broadleaved woodlands and ponds, with nationally scarce and rare lichens, locally rare plants and invertebrates and badger	1 km to the north-east of the Site boundary
Greenburn and Gogar Burn to Hatton Bridge LBS	Burn and associated woodland and scrub habitats, with locally rare and Scottish Biodiversity List plants and protected mammals	800 m downstream of the Proposed Development via the Green Burn
Water of Leith – Inveror to Glenbrook and Cock Burn LBS	Rural section of the Water of Leith, including Cock Burn tributary, associated broadleaved woodland, scrub and marsh habitats, with a species-rich wetland flora, many locally rare plants and protected mammals.	1.6 km south-east of the Site boundary

[58] Measured from the nearest point “as the crow flies”.

6.4.3 In addition, four areas of woodland listed under the AWI border the boundary of the Site. Two of these woodlands intersect the Site. In total, 18 areas of ancient woodland were identified within 2 km of the Site (see **Table 6-9** below).

6.4.4 AWI sites within 2 km of the Site boundary are shown in **Figure 5.2.**

Table 6-9 Ancient Woodland Inventory (AWI) Sites

Site Name (Woodland ID)	Woodland type	Distance / direction from Site
Unnamed woodland (ID: 34214)	LEPO	Intersected by Site in central area of site and borders southern boundary
Unnamed woodland (ID: 34210)	LEPO	Intersected by Site and borders eastern boundary
Overton Wood/Green Burn Wood	LEPO	Borders northern boundary of Site
Selm Muir Wood	LEPO	Borders north-western boundary of Site
Unnamed woodland (ID: 34215)	LEPO	107 m E
Jubilee Wood	LEPO	0.6 km NE
Unnamed woodland (ID: 34199)	LEPO	0.9 km NE
Unnamed woodland (ID: 33461)	Ancient (of semi-natural origin)	1 km NNW
Unnamed woodland (ID: 34196)	LEPO	1.1 km NE
Unnamed woodland (ID: 34218)	LEPO	1.1 km E
Unnamed woodland (ID: 34200)	LEPO	1.4 km NE
Kaimes Wood	LEPO	1.48 km NE
The Dean	LEPO	1.54 km NE
Unnamed woodland (ID: 34194)	Ancient (of semi-natural origin)	1.64 km SE
Unnamed woodland (ID: 34198)	LEPO	1.7 km NE
Unnamed woodland (ID: 34190)	Ancient (of semi-natural origin)	1.75 km NE
Unnamed woodland (ID: 34221)	LEPO	1.8 km SE
Unnamed woodland (ID: 34191)	Ancient (of semi-natural origin)	1.8 km NE

Data Request Records

6.4.5 The TWIC data search returned numerous records of protected and notable species occurring within 2 km of the Site within the last 15 years. These records have been included in full in **Technical Appendix 5.2 PEA: Annex D** and are summarised below:

Flora

6.4.6 The TWIC data search returned records of three flowering plant species and two species of lichen which are included on the SBL[50]:

- Fodder Burnet Poterium *sanguisorba subsp. Balearica*,

- Greater Celandine *Chelidonium majus*; and
- Salad Burnet *Poterium sanguisorba.*

6.4.7 The search also returned records of nine species of non-native invasive flowering plants:

- Hollyberry cotoneaster *Cotoneaster bullatus,*
- Cotoneaster *Cotoneaster horizontalis,*
- Himalayan cotoneaster *Cotoneaster simonsii,*
- Giant hogweed *Heracleum mantegazzianum,*
- Japanese rose *Rosa rugosa,*
- Montbretia *Crocosmia x crocosmiiflora,*
- *Rhododendron ponticum,*
- Shallon *Gaultheria shallon*; and,
- Variegated yellow archangel *Lamiastrum galeobdolon subsp. Argentatum.*

Mammals

6.4.8 The TWIC data search returned records of five protected species of mammal within 2 km of the Site within the last 15 years:

- Badger;
- Otter;
- Hedgehog *Erinaceus europaeus*; and
- Brown hare *Lepus europaeus*.

Invertebrates

6.4.9 The TWIC data search returned records of three species of butterfly which are included on the SBL:

- Small Pearl-bordered fritillary *Boloria selene;*
- Small Heath *Coenonympha pamphilus;* and
- Wall *Lasiommata megera.*

Herptiles

6.4.10 The TWIC data search returned records of two nationally important species of amphibian within 2 km of the Site within the past 15 years, the common frog *Rana*

temporaria and common toad *Bufo bufo*. These are both protected under the WCA (as amended in Scotland).

Birds

6.4.11 The TWIC data search identified four Annex I bird species:

- Golden plover *Pluvialis apricaria* (three records with a peak count of 280 birds);
- Merlin *Falco columbarius* (one records of single bird);
- Short-eared owl *Asio flammeus* (three records); and
- Whooper swan *Cygnus cygnus* (one record of two birds).

6.4.12 Furthermore, seven species which are included within Schedule 1 of the WCA (as amended in Scotland) were reported by TWIC:

- Barn Owl *Tyto alba*;
- Brambling *Fringilla montifringilla*;
- Crossbill *Loxia curvirostra*;
- Fieldfare *Turdus pilaris*; and
- Goldeneye*, Bucephala clangula*;
- Redwing *Turdus iliacus*.

6.4.13 Five records of pink-footed goose *Anser brachyrhynchus* within 2 km from the Site recorded in 2013 with a peak count of 1,200 birds were also confirmed. All records are from 2013.

Table 6-10: TWIC records of pink-footed goose within 2km from the Site.

10km^2 National Grid Square	Count
NT06Y (west of the Site)	500 Count of present
NT06X (west of the Site)	1,200 Count of present
NT16B (east of the Site)	148 Count of present
NT16C east of the Site)	20 Count of present
NT16G east of the Site)	205 Count of present

6.4.14 Mitchell (2012)[59] provides an overview of wintering pink-footed geese distribution around SPAs designated for this species based on data from 2007-08 to 2011-12. Areas of medium to highest sensitivity index for foraging pink-footed geese of Westwater SPA and the Firth of Forth SPA are located approximately 4 km

[59] Mitchell, C. (2012) Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. Available online: https://www.bto.org/sites/default/files/mitchel_2012_mapping_distirbution_feeding_pinkfooted_and_greylag_geese_scotland_wwtsnh_report.pdf [Accessed: October 2025]

southeast of the Site on fields southwest of Balerno, within the NT16 10km^2 grid square. This means that geese can utilise this area for foraging on a regular basis.

6.4.15 The BTO wetland bird survey (WeBS) results[60] from Threipmuir and Harlaw Reservoirs including Bevelaw Marsh (located c. 6 km from the Site) show a five-year winter average (2019/20 – 2023/24) of 605 pink-footed geese with a peak count of 941 in 2019-20[61]. The 5-year mean for the same period at Harperrig Reservoir, which is located c. 9.5 km from the Site, was 206 birds with a peak count of 530 in 2023-24[62].

6.4.16 Several other birds of National and/or Local importance that are Red or Amber-listed, SBL species and/or LBAP priority species were reported (**Technical Appendix 5.2 PEA: Annex D**).

6.4.17 Scotland Habitat and Land Cover Map – 2022[63] available under the Open Government Licence v3.0[64] was used to assess habitat availability within 20 km radius from SPA pink-footed goose roosts. Habitat and land cover map was created by Space Intelligence[65] in partnership with NatureScot using Artificial Intelligence (AI) to classify satellite data to EUNIS Level 2[66] habitat classification which uses 28 different classes[67].

6.4.18 The map was converted from GeoTIFF raster layer to vector shapefile to enable analyses of area coverage of habitat classes, which are key for foraging pink-footed goose, i.e., arable land and three types of grassland: mesic, dry and seasonally wet.

Field Surveys

6.4.19 The following section summarises the results of the field surveys undertaken as part of the PEA. For full details of the field survey results, please refer to **Technical Appendix 5.2: PEA** and **Technical Appendix 5.3: Bat Survey Results.**

Habitats and Flora

6.4.20 A total of 11 habitat types were recorded within the Survey Area.

6.4.21 The results of the UKHab classification surveys are presented below in **Table 6-11**: displayed in **Figure 5.3**. These figures illustrate the location and extent of vegetation

[60] Calbrade, N.A., Birtles, G.A., Woodward, I.D., Feather, A., Hiza, B., Caulfield, E., Balmer, D.E., Peck, K., Wotton, S.R., Shaw, J.M., and Frost, T.M. 2025. Waterbirds in the UK 2023/24: The Wetland Bird Survey and Goose & Swan Monitoring Programme. BTO/RSPB/JNCC/NatureScot. Thetford.

[61] https://app.bto.org/webs-reporting/numbers.jsp?locid=LOC656965 [Accessed: October 2025]

[62] https://app.bto.org/webs-reporting/numbers.jsp?locid=LOC649361 [Accessed: October 2025]

[63] https://spatialdata.gov.scot/geonetwork/srv/eng/catalog.search#/metadata/8462f345-6e9c-45de-b1d2-665a55b9d74a [Accessed: October 2025]

[64] http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/ [Accessed: October 2025]

[65] https://www.space-intelligence.com/ [Accessed: October 2025]

[66] https://ogc.nature.scot/geoserver/www/maps/naturescot-data-viewer.html?layer=habitatsandspecies:HLCM_2022_EUNIS_LEVEL2 [Accessed: October 2025]

[67] https://eunis.eea.europa.eu/habitats.jsp [Accessed: October 2025]

types recorded within the Survey Area. For a full description of the survey results, please refer to **Technical Appendix 5.2: PEA**.

Table 6-11: Habitat Survey Results

UK Habitat Classification	Conservation Status	Area/Length within the Site Boundary (ha/km)
Arrhenatherum Neutral Grassland (g3c5)	LBAP	0.8 ha
Other Neutral Grassland (g3c)	LBAP	0.8 ha
Modified Grassland (g4)	None	31.1 ha
Broadleaved and Mixed Woodland (w1)	LBAP; SBL	1.9 km Individual trees mapped as TNs
Other Broadleaved Woodland (w1g)	LBAP; SBL	0.5 ha
Other Woodland; Mixed (w1h)	LBAP; SBL	0.3 ha
Other Coniferous Woodland (w2c)	LBAP	1.3 ha
Other Native Hedgerow (H2a6)	LBAP; SBL	0.3 km
Arable and Horticulture (c1)	None	14.3 ha
C1c	None	27.0 ha
Other Standing Water (r1g)	LBAP	0.5 km 0.01 ha
Other Rivers and Streams (r2b)	LBAP	0.7 km
Gorse Scrub (h3e)	None	0.04 ha

***Arrhenatherum* Neutral Grassland (g3c5)**

6.4.22 This habitat is present within the north-western part of the Site and is associated with the watercourse in this area which borders the mixed woodland along the north-western edge of the Site; here, the habitat is dominated by false oat grass, *Arrhenatherum elatius,* with flowering plants such as creeping thistle, *Cirsium arvense*, meadowsweet, *Filipendula ulmaria,* and marsh wound wort*, Stachys palustris*. This habitat also occurs within a small area in the eastern part of the Site.

6.4.23 This habitat is considered to be of **Local Ecological Importance** due to its species diversity in the context of the wider environment.

Other Neutral Grassland (g3c)

6.4.24 Thin strips of neutral grassland occur along the borders to the fields within the western half of the Site. This habitat is dominated by forbs such as dead nettle, *Lamium purpureum*, scentless mayweed, *Tripleurospermum inodorum,* redshank

Persicaria maculosa and pineapple weed, *Matricaria discoidea*, with grasses such as common bent, *Agrostis capillaris,* and meadow foxtail, *Alopecurus pratensis*.

6.4.25 This habitat is considered to be of **Less than Local Ecological Importance** due to its poor species diversity and disturbed nature.

Modified Grassland (g4)

6.4.26 Modified grassland is one of the dominant habitats on the Site and fields containing this habitat type are present throughout. Species include cock's foot, *Dactylus glomerata*, perennial ryegrass, *Lolium perenne*, and bulbous buttercup, *Ranunculus bulbosus*, amongst other grass and herb species. Some areas, such as the fields along the northern and western boundaries of the Site are grazed by livestock and the sward is short and generally species poor. Some of the fields within the eastern half of the Site appear to have been previously managed for crops. In the spring, these areas were generally species poor (2-4 species per m^2 and were characterised by short grasses, with taller stems of up to 15 cm and bare earth forming 10-20% of the surface. When the Site was revisited in July, for the GLTA survey, there appeared to be a greater variety of species in these fields, with the field in the centre of the eastern half of the Site containing a mix of red shank, white clover, *Trifolium repens*, vetch*, Vicia sativa*, and fairy flax, *Linum catharticum*.

6.4.27 This habitat is considered to be of **Less than Local Ecological Importance** due to its poor species diversity and managed nature.

Broadleaved and Mixed Woodland (w1)

6.4.28 Broadleaved and mixed woodland is present throughout the Site as thin strips and lines of trees bordering field margins and along the northern, eastern and southern boundaries of the Site. Within the west of the Site, along the edges of the crop fields, the treelines are dominated by hawthorn, *Crataegus monogyna,* with some beech, *Fagus sylvatica*, alder, *Alnus glutinosa,* and rowan, *Sorbus aucuparia.* The strip of broadleaved and mixed woodland between the two crop fields in the east of the Site is dominated by mature beech trees. There are also several individual trees scattered throughout this part of the Site, most of which are semi-mature beech trees. Along the northeastern edge of the Site is a larger area of broadleaved and mixed woodland containing mature Scot's pine, *Pinus sylvestris,* and birch, *Betula*. sp., willow, *Salix sp.*, sycamore, *Acer pseudoplatanus*, ash, *Fraxinus excelsior*, European larch, *Larix decidua*, holly, *Ilex aquifolium,* and beech trees.

6.4.29 This habitat is considered to be of **Local Ecological Importance** in accordance with NPF4 policies on forestry retention.

Other Broadleaved Woodland (w1g)

6.4.30 A linear section of other broadleaved woodland is present bordering an existing watercourse within the east of the Site. This woodland section presents as the field boundary between two areas of cropland, and also borders the southern boundary of the Site. Canopy species are dominated by mature beech with a largely uniform

height of 12-14 m. Understorey vegetation is categorised by tussocky grass species representative of neutral grassland (g3c) discussion above or bare ground.

6.4.31 This habitat within the Site boundary is considered to be of **Local Ecological Importance** in accordance with NPF4 policies on forestry retention. Where this habitat is designated as AWI woodland on the southern border of the Site, it is assessed under this designation in **Section 0**.

Other Woodland; Mixed (w1h)

6.4.32 This habitat is not present within the Site boundary however it borders the Site at the north-east and north-west boundaries. These areas are mapped as AWI woodland (Overton Wood / Green Burn Wood and Selm Muir Wood, respectively).

6.4.33 Overton Wood / Green Burn Wood is considered secondary woodland and is characterised by an abundance of Scots pine, with lower canopy broadleaf species present including sycamore, birch, ash, hawthorn, willow, larch, holly, and beech.

6.4.34 Selm Muir Wood is largely mixed woodland, however, features a line of planted beech trees bordering the Site. Additional species include rowan, birch, willow, Scots pine, spruce sp, with gorse bramble scrub in fringe areas.

Other Coniferous Woodland (w2c)

6.4.35 This habitat is present within the central area of the Site, adjacent to the existing Leydon Road at OS NGR NT 10319 64907 and at the eastern site boundary. In addition, these sites are designated on the AWI (Woodland ID: 34210 and 34214) and border the southern boundary. Coniferous woodland dominated by densely planted spruce trees with occasional Scots pine, bramble *Rubus fruticosus,* and elder *Sambucus nigra*, scrub. Further details are provided within **Technical Appendix 2.8: Arboricultural Impact Assessment (AIA).**

6.4.36 This habitat is assessed under its AWI designation where relevant, all other habitat areas not associated with an AWI designation are considered to be of **Local Ecological Importance** in accordance with NPF4 policies on forestry retention.

Other Native Hedgerow (H2a6)

6.4.37 This habitat type is present bordering the road that runs through the centre of the Site. Hawthorn is the dominant species, with rowan and ash also present.

6.4.38 This habitat is considered to be of **Local Ecological Importance** in accordance with SBL priorities.

Arable and Horticulture (c1)

6.4.39 Cereal crops are the other dominant habitat type within the Site and there are several large fields within both the eastern and western halves of the Site. During

the spring, these fields were ploughed. In the summer the crops had grown, with barley and wheat forming the main crops.

6.4.40 This habitat is considered to be of **Less than Local Ecological Importance** due to its poor species diversity and managed nature.

Other Standing Water (r1g)

6.4.41 There is a large, mostly dry ditch which runs through the mixed broadleaved woodland in the southeast of the Site. The banks are steep and tall.

6.4.42 There is a small area of potential standing water in the north-west of the Site, mapped as Pond 3 in **Technical Appendix 5.2: PEA, Figure 4: Location of Ponds** and inferred from desk study data. When surveyed this area was dry. It is not visible on aerial mapping therefore is likely ephemeral and dry for most of the year.

6.4.43 Along a watercourse within the east of the site, at the field boundary, there is an area of poor drainage dominated by soft rush *Juncus effusus*. This habitat contained no visible standing water and is more consistent with area of poor drainage / flush associated with the adjacent watercourse This is mapped as Pond 2 in **Technical Appendix 5.2 PEA, Figure 4: Location of Ponds**.

Other Rivers and Streams (r2b)

6.4.44 A small watercourse runs through east of the Site. It has a low flow, a stone and silt channel bed, some pooling and a 5 cm depth. The banks are grassy leading to the woodland in the south, and there is a culvert over the field crossings.

6.4.45 There is another watercourse which runs along the northwestern border of the Site, however, this could not be accessed fully due to dense vegetation blocking access for the surveyors.

6.4.46 This habitat is considered to be of **Local Ecological Importance** in accordance with SBL priorities.

Gorse Scrub (h3e)

6.4.47 Gorse scrub occurs within the north-west of the Site, surrounding the crop fields. Gorse *Ulex europeous is* the dominant species, with creeping thistle, meadow vetchling *Lathyrus pratensis*, redshank, bent, Yorkshire fog *Holcus lanatus*, creeping buttercup, cocks foot, broadleaved dock *Rumex obtusifolius*, perennial ryegrass, sow thistle *Sonchus oleraceus* and meadowsweet occurring within the understory.

Ground Water Dependent Terrestrial Ecosystems (GWDTEs)

6.4.48 No habitats with potential for supporting GWDTEs were recorded during the field survey.

Notable Flora

6.4.49 No protected or notable species of plants were recorded during the field survey.

Invasive Non-Native Species

6.4.50 No invasive non-native species of plants were recorded within the Site Boundary however *Rhododendron* was recorded within the woodland bordering the south of the Site. This was present in several large areas scattered within the woodland and did not appear to have received management. The closest area was 30 m south of the Site Boundary.

Protected Species

Badger

6.4.51 There is suitable habitat on Site for badger populations and evidence of badger activity was recorded within the Survey area. In order to maintain species protection and confidentiality, relevant stakeholders can consider the full results and discussion relating to badger surveys, as provided within **Confidential Technical Appendix 5.3: Protected Species Survey Report.**

6.4.52 Badger are not an EPS or SBL species, however due to their presence on Site with regards to their importance to the wider population, and protection under the Protection of Badgers Act 1992, Badger are considered to be of **Local Ecological Importance**. As such they are carried forward for assessment in this report.

Otter

6.4.53 There is suitable habitat on Site for otter populations and evidence of otter activity was recorded within the Survey Area. In order to maintain species protection and confidentiality, relevant stakeholders can consider the full results and discussion relating to otter surveys, as provided within **Confidential Technical Appendix 5.3: Protected Species Survey Report.**

6.4.54 Although otters are an Annex I species, local populations are not considered to be linked with SACs within the wider area. Otter populations within the local area are therefore considered to be of **Regional Ecological Importance** in line with their EPS status and SBL priorities.

Water Vole

6.4.55 Field survey results are provided in **Figure 5.4**. There is limited suitable habitat on Site for water vole populations. The watercourse which runs through the centre of the eastern Site boundary is small and slow flowing and the tall vegetation would provide cover from predators. However, shallow water levels reduce the suitability of this habitat for water vole, therefore categorised as sub-optimal. Potential water vole feeding evidence was recorded alongside a small mammal trail in the grass

however no evidence was identified on the second survey visit. Several small mammal burrows were recorded along the dry ditches and the watercourse within the Site although given the quality of the habitat nearby, it is unlikely that these field signs were made by water vole and no other evidence was recorded nearby. It should be noted that any single field sign recorded in isolation, especially when ambiguous (e.g. a burrow or footprints) is not considered to be definitive in confirming presence.

6.4.56 The large ditch in the south-east of the Site was mostly dry during both visits to the Site in spring and summer and the ditch within the northeast of the Site also contains very little water. In addition, the ditch bordering the north-west of the Site was highly overgrown and choked with vegetation, containing very little water. As such, these water bodies are considered unsuitable for water vole.

6.4.57 Water vole are considered to be of **Local Ecological Importance**, in line with SBL priorities.

Bats

6.4.58 Field survey results are provided in **Figure 5.4** and **Technical Appendix 5.4: Bat Survey Results**.

6.4.59 There is suitable habitat for roosting, commuting and foraging bats within the Site. Of greatest value is the woodland habitats bordering the Site containing mature and semi mature trees suitable for roosting bats. These areas are assessed as offering high suitability for roosting and foraging/commuting potential. Linear habitats such as watercourses, ditches and lines of trees / hedgerows also provide high suitability commuting and foraging habitat. In addition, the Site's open, arable and grassland habitats are likely to provide some value for foraging and commuting bats utilising the Site, however, is assessed as low suitability for foraging/commuting.

6.4.60 A PRA was conducted on a derelict single storey structure, known as the former Newlands farmstead, within the east of the Site. The building was of stone build and was lacking a roof structure and several walls. The structure was assessed to be of negligible suitability for hibernating bats due to temperature instability. It was considered to have low suitability for summer opportunistic roosting due to the presence of occasional gaps within stonework.

6.4.61 A GLTA was conducted on trees within 30 m of the Site boundary. A total of 17 trees with PRFs were recorded during the GLTA. Of the features identified, six trees were classed as PRF-M, with the potential to be used by multiple bats or a maternity colony. The remainder of the features assessed were classed as PRF-I (suitable for individual roosting bats) or FAR (required further assessment). No other evidence of bats was observed by the surveyor.

6.4.62 An endoscope survey was conducted on one PRF-M tree (TN84 **Figure 5.4**) adjacent to the proposed access track in August 2025. The endoscope survey concluded the cavity is suitable to support a large number of bats, including a maternity roost. Although no bats were recorded during the endoscope survey, the

cavity was noted to be too large to fully reach all areas, thus requiring two additional emergence surveys.

6.4.63 Follow up emergence surveys were carried out in September 2025. No bats emerged from the potential roost features. Surveys recorded low bat activity within the Site, largely observing soprano and common pipistrelle, with one *Myotis* bat pass recorded. A soprano pipistrelle bat pass was recorded on both surveys approximately ten minutes after sunset, indicating the likely presence of a roost close to the Site.

Other Mammals

6.4.64 Field survey results are provided in **Figure 5.4**. Brown hare *Lepus europaeus* were sighted within the crop fields in the west of the Site. Grey squirrel *Sciurus carolinensis*, were confirmed to be on Site with three live sightings during the survey. Feeding signs and a potential drey were also recorded, these cannot be assigned to either red or grey squirrels, however, given the grey squirrel sightings and the geographical location of the Site, it is considered likely that dreys are utilised by grey squirrel.

6.4.65 No evidence of hedgehog was recorded field surveys, however, it is possible that these species are present within the wider surroundings in woodland habitat.

Breeding Birds

6.4.66 The habitats on Site are considered to be suitable for some species of breeding birds such as woodland and farmland passerines.

6.4.67 A total of 53 species were recorded over the six breeding bird survey visits. Of these:

- 29 were target species;
- 24 were non-target species;
- None were listed on the Annex I of the Birds Directive;
- One species (crossbill) is listed on Schedule 1 of the WCA;
- 14 species were on the Scottish biodiversity list (SBL);
- 11 species were BoCC5 red listed;
- 16 species were BoCC5 amber listed;
- 24 were BoCC5 green listed; and
- Two species were classified as not assessed.

6.4.68 Two species of Conservation Concern were identified on camera traps outside of the breeding season, i.e. both amber listed redstart and tawny owl on 23 August and 30 August 2025, respectively.

6.4.69 A full account of target species, their breeding status and corresponding legal and conservation status is in **Table 6-116-12**: below.

Table 6-116-12: Breeding Bird Survey Results

Common name	Conservation status	Number of territories	Summary of observations and distribution
Greylag goose *Anser anser*	BoCC5 Amber	0	Recorded flying over and foraging within the east of the Site
Mallard *Anas platyrhynchos*	BoCC5 Amber	0	Recorded in flight over the Survey Area
Swift *Apus apus*	BoCC5 Red, SBL	0	Recorded in flight and aerial foraging within the Survey Area
Cuckoo *Cuculus canorus*	BoCC5 Red, SBL	0	One bird was recorded in the east of the site during the fourth survey visit
Stock dove *Columba oenas*	BoCC5 Amber	0	One signing bird was recorded within woodland in the Site buffer during the fifth survey visit
Woodpigeon *Columba palumbus*	BoCC5 Amber	11	All territories are within areas of coniferous and mixed plantation within the Survey Area
Oystercatcher *Haematopus ostralegus*	BoCC5 Amber	0	Small numbers of birds were recorded in flight over the Survey Area during three of the survey visits. A territory is thought to be present outwith the survey area, in a field to the west of the survey area, with a display heard during the fifth survey visit
Lapwing *Vanellus vanellus*	BoCC5 Red, SBL	1	One territory was recorded within an arable field in the east of the Site
Black-headed gull *Chroicocephalus ridibundus*	BoCC5 Amber, SBL	0	Recorded flying over and foraging within the survey area on several survey visits
Common gull *Larus canus*	BoCC5 Red	0	Recorded flying over and foraging in the east of the site during two survey visits
Herring gull *Larus argentatus*	BoCC5 Red, SBL	0	Recorded flying over and foraging throughout the Survey Area and throughout all survey visits
Lesser black-backed gull *Larus fuscus*	BoCC5 Amber	0	Recorded flying over and foraging throughout the Survey Area, during four survey visits
Sparrowhawk *Accipiter nisus*	BoCC5 Amber	0	A male sparrowhawk was recorded in flight over the northwest of the Site, carrying food, during the fifth survey visit. A female was also recorded in flight over the west of the site during the first survey visit. This suggests that a sparrowhawk breeding territory is present

Common name	Conservation status	Number of territories	Summary of observations and distribution
			within woodland in the area surrounding the site, outwith the Survey Area
Rook *Corvus frugilegus*	BoCC5 Amber	0	Large numbers recorded flying over and foraging within the Survey Area, during five survey visits
Skylark *Alauda arvensis*	BoCC5 Red, SBL	2	Two territories were identified within arable fields in the west of the Site
House martin *Delichon urbicum*	BoCC5 Red	0	Three birds recorded flying over the northeast of the Site during the fifth survey visit
Willow warbler *Phylloscopus trochilus*	BoCC5 Amber	5	Five territories were identified within mixed plantation in the survey buffer
Whitethroat *Curruca communis*	BoCC5 Amber	2	Two territories were recorded within areas of hedgerow and scrub in the western half of the Site, by Leyden Road.
Wren *Troglodytes troglodytes*	BoCC5 Amber	19	Territories were recorded throughout the Site, in areas of mixed plantation, strips of broadleaved trees, and in areas of scrub.
Starling *Sturnus vulgaris*	BoCC5 Red, SBL	1	One territory was recorded at the northwest of the Site, with an adult observed feeding a juvenile
Song thrush *Turdus philomelos*	BoCC5 Amber, SBL	3	Three territories were recorded within areas of mixed and broadleaved strips of woodland within the survey area
Spotted flycatcher *Muscicapa striata*	BoCC5 Red, SBL	1	One territory was recorded within an area of mixed woodland within the survey buffer, south of the Site
Dunnock *Prunella modularis*	BoCC5 Amber, SBL	1	One territory was recorded within an area of scrub within the survey buffer
Pied wagtail *Motacilla alba*	BoCC5 Amber	0	One bird observed at northeast of site during fourth survey visit
Bullfinch *Pyrrhula pyrrhula*	BoCC5 Amber, SBL	0	One bird heard calling from woodland within the survey buffer during the fourth survey visit
Linnet *Linaria cannabina*	BoCC5 Red, SBL	2	Two territories were identified, one within an area of scrub near the centre of the Site, and one within an area of hedgerow in the southwestern survey buffer
Crossbill *Loxia curvirostra*	BoCC5 Green, Sch 1	0	Small numbers recorded flying over the Survey Area during the last three survey visits
Siskin *Spinus spinus*	BoCC5 Green, SBL	1	One territory was identified in an area of mixed plantation at the west of the Site
Yellowhammer Emberiza citrinella	BoCC5 Red, SBL	10	Territories were recorded throughout the Survey Area, in areas of scrub, hedgerow and arable fields

Amphibians

6.4.70 No amphibians were recorded during the PEA survey. The wet grassland alongside the watercourse in the east of the Site, the mixed woodland and the field margins offer some suitability for amphibians. There are four ponds within 500 m of the Site identified within the desk study, including an area of standing water / poor drainage (named Pond 2 for the purposes of this assessment) along the watercourse in the east of the Site. The ponds within and nearby the Site are likely to be of poor water quality due to the surrounding agricultural land. The locations of the ponds are shown on **Technical Appendix 5.2 PEA, Figure 4: Location of Ponds.**

6.4.71 Ponds within 250 m were considered for GCN potential during the surveys due to barriers of movement associated with Pond 4 situated within an existing developed area. Pond 4 is therefore scoped out of further assessment.

6.4.72 Pond 2 in the east of the Site and Pond 3 in the north-west of the Site appear to be ephemeral and dry for most or all of the year as they are not visible on aerial imagery. Pond 2 was surveyed and contained no visible standing water and is more consistent with area of poor drainage / flush associated with the adjacent watercourse rather than a pond and is unlikely to be suitable for breeding GCN. Pond 3 appeared dry, and likely ephemeral and therefore not suitable for breeding amphibians.

6.4.73 Pond 1 is 155 m to the south-east of the site. Surveys were not granted access to this pond therefore surveys were unable to take place.

6.4.74 As surveys were not undertaken within Pond 1, the presence of GCN cannot be ruled out. GCN populations are considered to be **Regional Ecological Importance**, in line with their EPS status and SBL priorities.

6.4.75 Remaining amphibian populations are considered to be of **Local Ecological Importance**, in line with SBL priorities.

Reptiles

6.4.76 The Site has limited suitability for reptiles although areas of rougher grassland along the field edges are considered to be suitable for reptiles. Two potential hibernacula were also noted during the field survey, a pile of dead branches and piles of rubble from ruined buildings. No reptiles were observed by the surveyor.

6.4.77 Herptile populations are considered to be of **Local Ecological Importance**, in line with SBL priorities.

Invertebrates

6.4.78 No protected species of invertebrates were recorded during the field survey. Agricultural lands within the Site do not offer significant habitat suitability for invertebrates due to management regimes and low species diversity. Areas of deadwood and neutral grassland around field boundaries may offer greater diversity of plant species which may support invertebrate populations however agricultural

practices likely involve chemical pesticide use. As such, the Site is not considered to support significant invertebrate populations.

6.4.79 Evaluation of Baseline Features

6.4.80 A number of sensitive receptors have been identified following the baseline review, as listed in **Table 6-13** below.

Table 6-13 Baseline Ecological Features

Ecological Feature	Scale at which Feature is Important	Comments on Legal Status and/or Importance
Designated Sites		
River Tweed SAC	International	Habitats Directive; Birds Directive; RAMSAR Convention
Westwater SPA and Ramsar	International	
Firth of Forth SPA and Ramsar	International	
Linhouse Valley SSSI	National	Nature Conservation (Scotland) Act 2004.
Calderwood SSSI	National	
Balerno Common SSSI	National	
North Esk Valley SSSI	National	
Hermand Birchwood SSSI	National	
Habbies Howe- Logan Burn SSSI	National	
Cobbinshaw Moss SSSI	National	
Craigengar SSSI	National	
Tailend moss SSSI	National	
Kirknewton estate Local Biodiversity Site	Council Area	LBAP
AWI Woodland	Council Area	NPF4
Habitats and Flora		
Arrhenatherum neutral grassland (g3c5)	Local	LBAP
Other neutral grassland (g3c)	Less than Local	LBAP
Modified grassland (g4)	Less than Local	N/A
Broadleaved and mixed woodland (w1)	Local	NPF4
Other Broadleaved Woodland (w1g)	Local	NPF4
Other Woodland; Mixed (w1h)	Council Area (Assessed under AWI designation)	NPF4

Ecological Feature	Scale at which Feature is Important	Comments on Legal Status and/or Importance
Other coniferous woodland (w2c)	Local	NPF4
Other native hedgerow (H2a6)	Local	LBAP; SBL
Arable and horticulture (c1)	Less than Local	N/A
Other standing water (r1g)	Local	LBAP; WFD
Other rivers and streams (r2b)	Local	LBAP; WFD
Gorse scrub (h3e)	Less than Local	N/A
GWDTE	N/A – scoped out	WFD
Invasive Non-Native Species	N/A (Legal Obligation)	WCA 1981 as amended by the Natural Environment (Scotland) Act 2012
Fauna		
Great Crested Newt	Regional	Full protection – EPS; SBL species
Herptiles (excluding GCN)	Local	Partial protection - WCA 1981 (as amended).
Breeding Birds	Local	All nesting birds are fully protected under WCA 1981, however the species recorded breeding on Site are common in lowland farms of Scotland and NHZ 16 and therefore of Local importance.
Wintering Birds – Pink-footed goose	International	Pink-footed goose is a BoCC amber-listed species, and are protected under Article 4.2 of the Birds Directive as regularly occurring migratory species. The species is a qualifying interest of Westwater and the Firth of Forth SPA/ Ramsar. NHZ 16 holds the largest proportion of this species in Scotland, estimated at 162,039 birds (Wilson *et al.* 2015)[52]. The birds potentially present within the Site can be functionally linked with the European/ international sites and therefore are of international importance.
Badger	Local	Protection of Badgers Act 1992
Otter	Regional	Full protection – EPS; WCA 1981 (as amended); Nature Conservation (Scotland) Act 2004 (as amended); SBL species
Water Vole	Local	Partial protection - WCA 1981 (as amended)
Bats	Local	Full protection – EPS; SBL species
Other Mammals	Local	Partial protection - WCA 1981 (as amended)

Ecological Feature	Scale at which Feature is Important	Comments on Legal Status and/or Importance
Invertebrates	Less than Local	None

6.4.81 Future Baseline

6.4.82 The Site is currently under agricultural management and in the absence of any development this would likely continue, therefore the future baseline of the majority of the Site is considered likely to remain as it is currently.

6.4.83 It is considered that habitats within the Survey Area are likely to currently support protected and notable species at or near to its carrying capacity. This means that a net increase in species population numbers would not be expected, should the Proposed Development not proceed.

6.4.84 Other changes over time may occur as a result of climatic change; these are difficult to predict but are likely to involve increased precipitation and risk of severe weather events as well as gradual increases in average temperatures. Some change in the vegetation assemblage is likely to occur as a result of these changes. An increase in flash flooding events may lead to interruptions and degradation of in-stream habitats and may also causing flooding issues further downstream.

6.5 Design Considerations and Embedded Mitigation

6.5.1 Embedded Design Considerations

6.5.2 The ecological baseline has been considered throughout the design process for the Proposed Development, including design consultations with specialists' input to subsequent design iterations. This was with an aim to either eliminate or reduce the potential for any significant effects on receptors, in accordance with the mitigation hierarchy[68,69].

6.5.3 In line with current CIEEM guidelines, the assessment of likely significant effects is carried out on the basis of embedded design and standard good practice measures being in place during construction. The following embedded design measures have been applied to the design or will be applied during Proposed Development construction, to ensure that any effects on IEFs are avoided or reduced:

- Using existing access tracks as far as practicable to reduce the need for new tracks;
- A minimum 10 m buffer for any infrastructure or construction activity around all watercourses;
- A minimum of 30 m buffer for any infrastructure or construction activity around known resting places used by otter and badger;

[68] SSEN Transmission: a Network for Net Zero (2019) (online) available at: https://www.ssen-transmission.co.uk/globalassets/documents/a-network-for-net-zero/supporting-evidence/our-approach-to-implementing-biodiversity-net-gain-.pdf [last accessed 14/08/2025]

[69] CIEEM: Good Practise principles for development (2016) (online) available at: https://cieem.net/resource/biodiversity-net-gain-good-practice-principles-for-development/ [last accessed 14/08/2025]

- A minimum of 30 m buffer between woodland habitats and infrastructure;
- The avoidance of areas of priority habitats including AWI woodland, as far as practicable;
- The protection of retained habitats including woodland, to minimise impacts as far as practicable; and,
- To minimise potential for impact to potential GWDTEs.

6.5.4 A sensitive lighting scheme during the construction phase that aims to avoid disruption to bat, otter and badger foraging and commuting behaviour, as well as nesting bird activity, will be adopted. There will be no operational lighting required for the photovoltaic (PV) panels, however, lighting may be required in certain areas for construction and maintenance. The following measures are to be incorporated into the design and installation of temporary lighting during works, and the permanent lighting scheme:

- Any lighting will be directional (using fittings such as hoods, cowls or shields to direct light downwards wherever possible and avoid unnecessary light spill);
- LED Luminaires will be used, where possible, due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;
- A warm white spectrum (ideally <2700 Kelvin, max 4000 Kelvin) will be adopted to reduce the blue light component;
- Lighting will be positioned to avoid illuminating suitable foraging, commuting and nesting habitat within hedgerows and edge habitat adjacent to the Site and any newly created woodland and hedgerow habitats that form part of the planting design for the Site; and
- The times during which lighting is on will be limited to provide illumination during dark periods.

6.5.5 The design has ensured the avoidance of lighting requirements during the operational phase.

6.5.6 Good Practice Measures

6.5.7 The following good practice measures shall be in place during construction of the Proposed Development.

6.5.7.1 Pre-Construction Surveys / ECoW

6.5.8 The Applicant will appoint a suitably qualified Ecological Clerk of Works (ECoW) prior to the commencement of any construction activities. The ECoW will be present and oversee all construction activities where ecological consideration is required, provide toolbox talks to all site personnel with regards to priority species and habitats, as well as undertake monitoring works, and brief relevant staff and contractors as appropriate.

6.5.9 The ECoW (or other suitably qualified and experienced ecologist) will carry out pre-construction surveys for relevant protected species. In line with NatureScot

guidance[70], these pre-construction surveys would take place no more than three months before commencing works (including facilitating works such as vegetation clearance). Surveys shall take place no less than eight weeks prior to construction to allow time for potential licence applications (if required) and thus avoid possible project delays. Follow up pre-construction surveys and checks will then be conducted immediately before works as required;

- Pre-construction surveys will include additional efforts to confirm access to Pond 1 to allow a surveyor to undertake a HSI survey and eDNA sample, if between mid April to the end of June. The results of the survey will determine whether additional mitigation measures, and a NatureScot licence is required, as appropriate.

6.5.10 The ECoW (or other suitably qualified and experienced ecologist) will carry out a survey for INNS of plants prior to commencement of works and, if required, update the CEMP with appropriate mitigation measures to prevent the spread of INNS.

6.5.11 A Species Protection Plan (SPP) will be produced for key target species and agreed prior to commencement of construction and implemented as required. SPPs will be prepared for bats, otter, water vole, badger, hare, breeding birds, wintering birds, and herptiles. Mitigation measures outlined in the SPPs shall include, but not be limited to, the following:

- Detailed measures to safeguard protected species known to be in the area and will include pre-construction surveys (complimenting the seasonality of the construction start date), as well as ensuring the use of best practice measures to minimise ecological impact during all construction activities (such as sensitive lighting, sensitively timed vegetation clearance or phased clearance, ramps exiting open excavations, consideration of key foraging areas, etc.). Timings required for pre-construction works are detailed below:
    - For all works undertaken during the nesting bird season (March to August, inclusive), the ECoW will undertake nesting bird checks no more than 72 hours (preferably within 24 hours) in advance of works to identify any constraints and to ensure that no disturbance will occur. If necessary, site works should be stopped within a species-specific buffer[71] to be determined by the ECoW until chicks have fledged and dispersed from the area. It should be noted that whilst the main bird breeding season runs between March and August, some birds can nest at any time of year, including woodpigeon, and protections for nesting birds must be implemented regardless of the time of year.
    - In line with NatureScot guidance[72], these pre-construction surveys would take place no more than three months before commencing works for terrestrial species (including facilitating works such as vegetation clearance). Surveys shall take place no less than eight weeks prior to construction to allow time for

[70] NatureScot (2024) pre-application guidance for onshore wind farms (online) available at: https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms [last accessed 14/08/2025]

[71] Goodship, N.M. and Furness, R.W. (MacArthur Green) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283. Available online https://www.nature.scot/doc/naturescot-research-report-1283-disturbance-distances-review-updated-literature-review-disturbance [Accessed: October 2025]

[72] NatureScot (2024) pre-application guidance for onshore wind farms (online) available at: https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms [last accessed 14/08/2025]

potential licence applications and thus avoid possible project delays. Follow up pre-construction surveys and checks will then be conducted immediately before works, as required;

- The SPP will describe the process to be followed in the case that new protected or notable species are recorded on site that will therefore also need to be protected during construction works, as well ensuring the implementation of effective toolbox talks to raise awareness to site personnel of sensitive ecological receptors on site; and,
- The SPP will ensure that working methods shall be adopted to minimise the chance of protected species being killed or injured during construction works. An ECoW shall be present during all Site clearance works.

6.5.11.1 Water Quality Measures

6.5.12 To prevent accidental pollution of watercourses and impacts on the aquatic environment within the Site or areas downstream (with particulate matter or other pollutants such as fuel), best practice techniques will be employed. Measures will include safe storage of soils and hazardous materials, no direct discharges into rivers or streams, and pollution response plans. In addition, a robust sedimentation strategy will be employed and set out in the Pollution Prevention Plan (PPP) which will form an integral part of the CEMP. Protection measures to control the risk of pollution to water will be consistent with SEPA's Guidance for Pollution Prevention (GPP) Note 5 – Works and maintenance in or near water[73]. Where reasonably practicable, the use of materials that could pollute groundwater will be avoided. This will include special consideration for the use of hazardous and non-hazardous substances as defined by SEPA's GPP Note 5. The CEMP will be finalised post-consent and prior to commencement of construction, and shall be agreed with West Lothian Council, in consultation with NatureScot and SEPA, as appropriate.

6.5.13 Operational sustainable drainage systems (SuDs) measures are provided within **Technical Appendix 2.5: Flood Risk Assessment & Drainage Impact Assessment (FRDA).**

6.5.13.1 Vegetation Clearance and Biosecurity

6.5.14 Works near or at any retained native trees or semi-natural woodland would follow guidance in British Standard 5837 (2012) "Trees in Relation to Design, Demolition and Construction – Recommendations" (British Standards Institution, 2012)[74]. An OBEMP has been provided within **Technical Appendix 5.6**. This will be finalised post-consent and will detail habitat types to protect, methods to restore and

[73] https://netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf

[74] British Standards Institution (2012). Trees in relation to design, demolition and construction – Recommendations. BSI. Available at: https://www.bathnes.gov.uk/sites/default/files/2020-01/BS5837%202012%20Trees.pdf [Last accessed 22/07/2025.]

enhance habitats that are being retained, and the creation of new habitats to contribute to biodiversity enhancement.

6.5.15 In order to avoid the introduction or spread of INNS, biosecurity measures will be included within the CEMP and an INNS management plan will be developed. This will include and be informed by:

- Pre-construction surveys for INNS be undertaken by a suitability qualified ecologist (SQE) prior to the commencement of site clearance activities. In the event that INNS have become established on Site since the baseline surveys were undertaken, exclusion fencing shall be installed around the host area. The SQE will confirm the appropriate stand-off distances.
- The SQE will provide an environmental briefing to individuals working on Site. The briefing will communicate key legislation and obligations concerning invasive species, how to identify the species that may be present on the property, and how to report any invasive species observations or possible sightings.
- Tool-box talks shall highlight appropriate biosecurity practices to be undertaken on Site. These include cleaning and disinfecting footwear, tools and vehicles before entering and after leaving the construction site. Appropriate measures will be in accordance with guidance provided by Scottish Government[75] and SEPA[76]
- Additional measures such as wash down areas shall be detailed within the CEMP as required following pre-construction surveys.

6.5.15.1 Fire Management

6.5.16 Industry standard measures require the provision of an Outline Battery Safety Management Plan (OBSMP). This will provide the basis for the safety management processes and procedures required to comply with guidelines and best practice for safe operation of the Proposed Development, including fire safety. This is provided within **Technical Appendix 2.2**: **OBSMP** and will be finalised post-consent. Fire Water Management details are included within the **Technical Appendix 2.5: FRDA**

[75] Scottish Government, 2012. Non-native species: code of practice [Online] Available at https://www.gov.scot/publications/non-native-species-code-practice/

[76] Scottish Environmental Protection Agency, no date. Biosecurity and management of invasive non-native species for construction sites and Controlled Activities [Online] Available at https://www.sepa.org.uk/media/163480/biosecurity-and-management-of-invasive-non-native-species-construction-sites.pdf

which demonstrates how firewater runoff volume will be controlled and managed on Site as standard.

6.6 Scope of the Assessment

6.6.1 Receptors Scoped Out

6.6.2 Due to a range of factors, some of the IEFs and IOFs can be scoped out of further assessment if they are not vulnerable to effects from the Proposed Development with the standard and embedded mitigation in place.

6.6.3 Features of local and / or higher value are considered IEFs/ IOFs. Furthermore, only those with potential to experience significant effects following the implementation of the embedded and standard mitigation have been taken forward for detailed assessment.

6.6.4 IEFs and IOFs scoped out of further assessment are described in **Table 6-136-14**: below. This is based on professional judgement and experience from other relevant projects in the region.

Table 6-136-14: IEFs/IOFs Scoped out of Further Assessment

IEF	Rationale for Scoping Out
Nature Conservation Designations	
River Tweed SAC	The River Tweed SAC is designated for the presence of Atlantic salmon, brook lamprey, river lamprey and otter. It is located 9.8 km south-east of the Proposed Development and located within a different hydrological catchment (River Tweed Catchment) to the Proposed Development which discharges into the River Almond Catchment. As it is not hydrologically connected to the Proposed Development, this site is scoped out of further assessment based on a lack of functional connectivity.
Linhouse Valley SSSI Calderwood SSSI Balerno Common SSSI North Esk Valley SSSI Hermand Birchwood SSSI Habbies Howe-Logan Burn SSSI Cobbinshaw Moss SSSI Craigengar SSSI Tailend moss SSSI	These sites are designated for their presence of valuable habitats, flora, and bryophyte/lichen assemblages. The closest SSSI designation is located 2.6 km (Linhouse Valley SSSI) from the Proposed Development and the furthest designation is located 9.3 km from the Proposed Development. These sites are not functionally connected to the Proposed Development, via direct habitat connectivity or hydrological connectivity. As such, significant effects from the Proposed Development are very unlikely, and these sites have been scoped out of further assessment.

IEF	Rationale for Scoping Out
Kirknewton Estate LBS	Kirknewton Estate LBS is located 1 km to the north-east of the Site boundary and is not functionally connected to the Site, via direct habitat connectivity or hydrological connectivity, or mobility of species. As such, significant effects from the Proposed Development are very unlikely, and these sites have been scoped out of further assessment.
Leyden Road Verge proposed Local Biodiversity Site (pLBS)	Leyden Road Verge pLBS is located *c.* 200 m north of the Site boundary and is not connected to the Site via direct habitat connectivity or hydrological connectivity, however, the existing road network (Leydon Road) connects these Sites north to south. Access to facilitate the construction of the Proposed Development is routed from the south of the existing Leydon Road network, therefore avoiding any connectivity with the pLBS. As such, significant effects from the Proposed Development are very unlikely, and this site have been scoped out of further assessment.
Greenburn and Gogar Burn to Hatton Bridge LBS	The Greenburn and Gogar Burn to Hatton Bridge LBS designated for valuable riparian habitats, notable flora, and protected mammals including badger and otter. There is functional connectivity to this site 800 m downstream of the Proposed Development via the Green Burn. Embedded and standard mitigation measures that are to be applied during construction include the implementation of Site-wide pollution and contamination prevention measures to be detailed within a Construction Environment Management Plan (CEMP). These measures will ensure significant effects from the Proposed Development are avoided. As such, this LNCS has been scoped out of further assessment.
Water of Leith – Inveror to Glenbrook and Cock Burn LBS.	The Water of Leith – Inveror to Glenbrook and Cock Burn LBS is designated for valuable riparian habitats, notable flora, and protected mammals including badger and otter. The site is located 1.6 km south-east of the Site boundary and is not functionally connected to the Site, via direct habitat connectivity or hydrological connectivity, or mobility of species. As such, significant effects from the Proposed Development are very unlikely, and these sites have been scoped out of further assessment.
AWI woodland	There are 18 areas listed on the AWI within 2 km of the Site, four areas of woodland border or are intersected by the Site. An unnamed woodland (ID: 34214) intersected within the central area of the Site is scoped in for further assessment and is considered in more detail below in **Section 6.6.5.** The remaining 17 AWI sites are scoped out of further assessment by way of embedded design mitigation. Design mitigation has ensured that this woodland habitat is appropriately buffered from the Proposed Development by a minimum of 20 m. At this distance, it is considered that there will be no direct or indirect impacts to the AWI-listed woodland, including both above ground habitat and the root systems. A habitat and tree protection plan will be incorporated into a CEMP to ensure best practice measures are followed throughout construction and operational maintenance. As such, with the exception of the AWI coupe considered further in **Section 6.6.5**, the remaining 17 AWI-listed woodland coupes are scoped out of further assessment.
Habitats and Flora	
Arrhenatherum neutral grassland (g3c5)	This habitat is present within areas of land that have been buffered through design mitigation. As there is no requirement for direct or indirect habitat loss, *Arrhenatherum* neutral grassland (g3c5) is scoped out of further assessment.

IEF	Rationale for Scoping Out
Broadleaved and Mixed Woodland (w1)	This habitat has been appropriately buffered through design mitigation. Boundary tree lines or individual trees have been buffered by a minimum of 10 m from proposed fences, extending to 15-30 m for construction works associated with PV panels. The defunct hedgerow, present within the south-east of the Site, is buffered by a minimum of 6 m from construction works. At these distances, it is considered that there will be no direct or indirect impacts to the line of trees including both above ground habitat and the root system. A tree protection plan will be incorporated into the CEMP to ensure best practice measures are followed throughout construction and operational maintenance. As such, broadleaved and mixed woodland (w1) is scoped out of further assessment
Other Broadleaved Woodland (w1g)	This habitat has been appropriately buffered through design mitigation. Boundary tree lines or individual trees have been buffered by a minimum of 10 m from PV panels. At these distances, it is considered that there will be no direct or indirect impacts to the woodland including both above ground habitat and the root system. A tree protection plan will be incorporated into the CEMP to ensure best practice measures are followed throughout construction and operational maintenance. As such, other broadleaved woodland (w1g) is scoped out of further assessment
Other Woodland; Mixed (w1h)	This habitat has been appropriately buffered through design mitigation including a minimum of 15 m between construction works and woodland habitats. At this distance, it is considered that there will be no direct or indirect impacts to the habitat including both above ground habitat and the root system. A tree protection plan will be incorporated into the CEMP to ensure best practice measures are followed throughout construction and operational maintenance. As such, broadleaved and mixed woodland (w1) is scoped out of further assessment.
Other Coniferous Woodland (w2c)	See above for AWI-listed woodland which covers this same area of woodland habitat. As such, other Scots pine woodland is scoped out of further assessment
Other Native Hedgerow (H2a6)	This habitat has been appropriately buffered through design mitigation. Hedgerows have been buffered by a minimum of 5 m from proposed fences, extending to 10 m for construction works associated with PV panels. At these distances, it is considered that there will be no direct or indirect impacts to the line of trees including both above ground habitat and the root system. A tree protection plan will be incorporated into the CEMP to ensure best practice measures are followed throughout construction and operational maintenance. As such, other native hedgerow (H2a6) is scoped out of further assessment.
Other Standing Water (r1g) Other Rivers and Streams (r2b)	This habitat has been appropriately buffered through design mitigation. Water courses have been buffered by a minimum of 5 m from proposed fences, extending to 15 m for construction works associated with PV panels. In addition, embedded and standard mitigation measures that are to be applied during construction include the implementation of Site-wide pollution and contamination prevention measures to be detailed within the CEMP. These measures will ensure significant effects from the Proposed Development are avoided. As such, other standing water (r1g) and other rivers and streams (r2b) have been scoped out of further assessment.
GWDTEs	As there were no habitats with potential GWDTEs present, this habitat is scoped out of further assessment.

IEF	Rationale for Scoping Out
Invasive Non-Native Species	No scheduled INNS were noted during the survey. It is possible that invasive species may be introduced into the local environment in the interim period between ecological surveys and commencement of pre-construction works. Best practice measures including pre-construction surveys informing the CEMP and ongoing biosecurity measures implemented throughout the construction and operational period, will ensure that significant adverse effects are avoided. As such, invasive species are scoped out from further assessment.
Protected Species	
Badger	Badger are confirmed as active within the Survey Area. Embedded design mitigation measures have ensured that appropriate buffers (of a minimum of 30 m) have been incorporated from construction works that badger setts are appropriately buffered a minimum of 30 m from construction works associated with the Proposed Development. Additional measures ensured by the SPP, complimented by pre-construction surveys and an on-site ECoW, will ensure the avoidance of any significant impacts on badgers. Passages/gaps under fencing will also be incorporated to ensure continued use of the Site for badgers for commuting and foraging purposes to ensure no long-term loss of foraging areas or access to foraging areas. Furthermore, Site boundaries will remain open and freely accessible and when considering the proposed enhancement measures, as outlined in **Technical Appendix 5.6**, it is considered that any potential impact would be short-term and ultimately the foraging conditions enhanced so that there would be a residual beneficial impact for badger. As such, badgers are scoped out of further assessment.
Otter	Otter are confirmed as present within the Survey Area. Embedded design mitigation measures have ensured that identified resting places are appropriately buffered a minimum of 30 m from construction works associated with the Proposed Development. There are no natal dens identified on Site. Additional measures ensured by the SPP, complimented by pre-construction surveys and an on-site ECoW, will ensure the avoidance of any significant impacts on otter. There will be no direct loss of aquatic or riparian habitat for otter. However, standard mitigation measures that are to be applied during construction include the implementation of Site-wide pollution and contamination prevention measures to be detailed within the CEMP (to be conditioned under an appropriately worded consent). These measures will ensure that any longer-term habitat degradation impacts from the Proposed Development are avoided. As such, otter are scoped out of further assessment.
Water vole	Habitat suitability for water vole is sub-optimal across the Site, with water bodies dry or sub-optimal. Despite this, measures ensured by the SPP, complimented by pre-construction surveys and an on-site ECoW, will ensure the avoidance of any significant impacts on water vole. Embedded design measures are included at all water courses to establish a minimum buffer of 5 m from proposed fences, extending to 15 m for construction works associated with PV panels. In the event of water vole being identified during pre-construction surveys, micro-siting commitments will be made to adjust fencing distances to allow a 10 m buffer from any confirmed water vole burrows. In addition, embedded and standard mitigation measures that are to be applied during construction include the implementation of Site-wide pollution and contamination prevention measures to be detailed within the CEMP. These measures will ensure that any longer-term habitat degradation impacts from the Proposed Development are avoided. As such, otter are scoped out of further assessment.

IEF	Rationale for Scoping Out
Other mammals	Incidental records of brown hare and grey squirrel were recorded during field surveys. No evidence of hedgehog observed during field surveys however may be present in woodland in the wider surroundings. The measures ensured by the SPP, complimented by pre-construction surveys and the presence of an ECoW during vegetation clearance works, will ensure the avoidance of any significant impacts on small mammals.
Breeding Birds	Breeding birds are partially scoped out. The measures ensured by the SPP and checks completed by the designated ECoW during ground clearance and construction works will ensure the avoidance of injury and/or mortality to birds nesting within field boundaries and therefore scoped out. In addition, embedded and standard mitigation measures that are to be applied during construction include the implementation of Site-wide pollution and contamination prevention measures to be detailed within the CEMP. These measures will ensure that any longer-term habitat degradation impacts from pollution are avoided and therefore scoped out. Maintenance is expected to consist mostly of routine Site inspections by technicians, as well as some unscheduled visits when required. Site traffic will be limited to maintenance vehicles and is unlikely to comprise of several cars at any one period. Maintenance activities will be similar to a baseline level of agriculture and other types of activities taking place in the vicinity of the Site. Therefore, disturbance during the operational phase development is not considered significant and therefore scoped out. Impacts taken forward in the assessments are habitat loss and disturbance due to construction.
Wintering Birds	Disturbance of wintering birds during operation is scoped out with the same rationale as for breeding birds above. Impacts taken forward in the assessment are habitat loss and disturbance during construction.
Great Crested Newt	GCN were not recorded during any of the field surveys. In addition, ponds within the site were dry and therefore unsuitable for eDNA analysis. Pond 1 is 155 m to the south-east of the Site, however surveyors were not granted access to undertake eDNA surveys at this location. As such the presence of GCN within this pond cannot be ruled out. A review of aerial imagery has been undertaken to identify likely migration routes between ponds in the wider area. Given the lack of suitable ponds within a 500 m radius which would require GCN populations to travel across the Site, it is unlikely that GCN populations would utilise the Site. In addition, the wider environment is fragmented by roads, ponds within the wider environment, they are not considered to have sufficient connectivity. As such, it is not considered likely that GCN populations are present on Site or within adjacent lands. However, precautionary embedded mitigation is included by way of an SPP, complimented by pre-construction surveys and the presence of an ECoW during vegetation clearance works. These measures will ensure the avoidance of any significant impacts on GCN and will ensure that the appropriate EPS licences are applied for following pre-construction surveys. As such, GCN are scoped out of further assessment.
Herptiles (excluding GCN)	No incidental observations of herptiles were recorded during field surveys. The measures ensured by the SPP and checks completed by the designated ECoW will ensure the avoidance of any potential impacts presented to herptiles and to protect any hibernaculum and / or breeding sites during the construction phase. In addition, embedded and standard mitigation measures that are to be applied during construction include the implementation of Site-wide pollution and contamination prevention measures to be detailed within the CEMP. These

IEF	Rationale for Scoping Out
	measures will ensure that any longer-term habitat degradation impacts from the Proposed Development are avoided. As such, herptiles are scoped out of further assessment.

6.6.5 Receptors Requiring Assessment

6.6.6 The subsequent assessment of effects will be applied to IEFs or IOFs considered to be of local, regional, national, and international nature conservation value (**Table 6-13**) that are known to be present within the Site or surrounding area (as confirmed through survey results and consultations outlined above) and remain vulnerable to potential effects following the application of embedded mitigation, as outlined in **Section 6.5**. These IEFs or IOFs comprise the following:

- Westwater SPA/ Ramsar;
- Firth of Forth SPA/ Ramsar;
- AWI Woodland (Woodland ID 34214);
- Bats;
- Breeding birds; and
- Wintering birds.

6.7 Assessment of Potential Effects

6.7.1 Construction Effects

6.7.2 The main elements of the Proposed Development which have the potential to impact on IEFs or IOFs during construction are:

- Habitat loss or habitat degradation (permanent and temporary) due to construction of Proposed Development infrastructure;
- Inadvertent killing or injuring of fauna during vegetation clearance or construction activities;
- Disturbance to fauna due to vehicular traffic, operating plant and the presence of construction workers, machinery and materials; and
- Sedimentation or other accidental pollution of watercourses from construction activities and vehicular traffic.

6.7.2.1 Nature Conservation Sites

6.7.3 Please see **Technical Appendix 5.7: Habitats Regulations Assessment** for the full assessment of effects on integrity and conservation objectives of the Westwater and Firth of Forth SPA and Ramsar sites.

Westwater SPA and Ramsar

6.7.4 **Importance and Conservation Status:** Westwater SPA qualifies under Article 4.2 by regularly supporting a population of European importance of the migratory species: pink-footed goose (1986/87 to 1990/91, an average peak winter count of 29,600 individuals, 15% of the Eastern Greenland/ Iceland/UK population). Westwater SPA further qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. In the five-year winter period 1986/87 to 1990/91 the

average peak count was 30,000 individual waterfowl including a nationally important population of pink-footed goose (29,600 individuals, 15% of the GB population)[77].

6.7.5 The pink-footed goose qualifying feature of the Westwater SPA was last assessed in February 2017 and considered to be in Favourable (maintained) condition.

6.7.6 The national wintering population of pink-footed goose has increased significantly since the 1950s and is currently estimated at 510,000 birds[53]. However, more recent WeBS data suggest a slight decline has occurred since mid-2010s[78]. The average five-year WeBS peak count for 2019/20 – 2023/24 was 5,772 individuals, with a subsequent peak count of 7,450 birds in the winter of 2020/21[79].

Habitat Loss

6.7.7 **Impact**: There are suitable foraging habitats for pink-footed goose within the Site which will be permanently lost through construction of the Proposed Development. Therefore, there is a risk undermining Conservation Objectives for this qualifying feature with regards to avoiding and maintaining structure, function and processes of habitats supporting this species.

6.7.8 **Magnitude**: It is anticipated that approximately 76 ha of suitable foraging habitat will be permanently lost.

6.7.9 **Significance of effect:** Analyses of the Scotland Habitat and Land Cover Map – 2022 revealed that three EUNIS grassland categories (mesic, dry and seasonally wet grasslands) covered almost 66,324 ha, which constitutes 54% of a total of 123,688 ha of all classified habitats within 20 km radius from the Westwater SPA/ Ramsar site. Arable land category constitutes a further 6.63% (8,198 ha) of the total area (**Table 5-14**).

Table 6-15: Area and % coverage of key pink-footed goose habitats in EUNIS classification within 20km radius from Westwater SPA/ Ramsar

EUNIS Habitat Category	Area [Ha]	% cover of the total assessed area
Mesic grasslands	37,020.63	29.93%
Dry grasslands	15,767.90	12.75%
Seasonally wet and wet grasslands	13,535.87	10.94%
Arable land and market gardens	8,198.00	6.63%
Other habitats assessed	49,166	39.75%
Total suitable	**74,522.40**	**60.25%**
Total area assessed	**123,687.99**	

6.7.10 At a smaller scale, within the wider 5 km from the Site, there are 2,506 ha of mesic grassland (25% of a total of 9,960 ha assessed), 1,467 ha or arable land (15%),

[77] https://www.nature.scot/sites/default/files/special-protection-area/8591/spa-citation.pdf [Accessed: October 2025]

[78] https://www.bto.org/learn/about-birds/birdfacts/pink-footed-goose [Accessed: October 2025]

[79] https://app.bto.org/webs-reporting/numbers.jsp?locid=LOC645836 [Accessed: October 2025]

1,207 ha of seasonally wet grassland (12%) and 607 ha of dry grassland (6%). This total suitable habitat within the wider 5 km area from the Site is 7.77% of the available foraging habitat within 20 km of the SPA.

6.7.11 The area of approximately 76 ha (0.76 km^2) lost to the Proposed Development represents approx. 0.1% of a total of 74,522 ha of suitable foraging habitats within 20 km radius from the SPA and it is also a relatively small area compared to the existing alternative habitats locally within 5 km from the Site (i.e. 1.31% of the total 5,787 ha available suitable habitat).

6.7.12 The pink-footed geese of Westwater SPA/ Ramsar have therefore vast availability of foraging habitats during autumn and spring and are less likely utilising the Site as most forage in areas to the east at West Linton and to the south-west in the Biggar area[59].

6.7.13 Therefore, a permanent loss of such a small area of suitable foraging habitat from the Proposed Development is considered to be **Negligible** and **Not Significant** under the EIA Regulations.

Disturbance

6.7.14 **Impact**: There are records of pink-footed geese within 5 km from the Site and therefore there is a risk of disturbance through construction activities.

6.7.15 Goodship & Furness (2022)[71] carried out a review of disturbance distances and reported 350-500m flight initiation distance during hunting in Denmark in the migration and non-breeding season (two studies). NatureScot recommends 200-600 m disturbance buffer[80] during construction activities.

6.7.16 Disturbance should be judged as significant if an action cause impacts on populations of a species through either (i) changed local distribution on a continuing basis; and/or (ii) changed local abundance on a sustained basis; and/or (iii) the reduction of ability of any significant group of birds to survive, breed, or rear their young[81].

6.7.17 **Magnitude**: Any construction-related disturbance effects will be short in duration (within maximum one non-breeding seasons during the development) and also limited to a relatively small area compared to alternative habitats available locally.

[80] NatureScot (2022) Disturbance Distances in selected Scottish Bird Species – NatureScot Guidance. Available online: https://www.nature.scot/doc/disturbance-distances-selected-scottish-bird-species-naturescot-guidance [Accessed: October 2025]

[81] Fox, A.D. and Madsen, J. (1997) Behavioural and distributional effects of hunting disturbance on waterbirds in Europe: implications for refuge design. Journal of applied ecology, pp.1-13.

Any disturbance effect presented is also considered to likely affect only a small proportion of the total SPA population.

6.7.18 **Significance of effects**: It is considered that construction related disturbance effects do not constitute significant disturbance as they are relatively minor in magnitude, short term in duration and limited in extent.

6.7.19 Therefore, construction disturbance effects associated with the Proposed Development are considered to be **Negligible** and **Not Significant** under the EIA Regulations.

The Firth of Forth SPA/ Ramsar

6.7.20 **Importance and Conservation Status:** The Firth of Forth SPA qualifies under Article 4.2 by regularly supporting populations of European importance of the migratory species (1993/94 to 1997/98 winter peak means): pink-footed goose (10,852 individuals, 6% of the Eastern Greenland/Iceland/UK biogeographic population and other wintering waterbird species[82].

6.7.21 The pink-footed goose qualifying feature of the Firth of Forth SPA was last assessed in June 2018 and considered to be in Favourable (maintained) condition.

6.7.22 The national wintering population has increased significantly since the 1950s and is currently estimated at 510,000 birds[53]. However, WeBS data suggest as a slight decline since mid-2010s[83]. The average five-year WeBS peak count for at Forth Estuary for 2019/20 – 2023/24 was 14,693 individuals with a peak count of 22,125 birds in the winter of 2020/21[84].

Habitat Loss

6.7.23 **Impact**: There are foraging habitats suitable for use by pink-footed goose within the Site which will be permanently lost through construction of the Proposed Development. Therefore, there is a risk undermining Conservation Objectives for this qualifying feature with regards to avoiding and maintaining structure, function and processes of habitats supporting this species.

6.7.24 **Magnitude**: It is anticipated that approximately 76 ha of suitable foraging habitat will be permanently lost.

6.7.25 **Significance of effect:** Analyses of the Scotland Habitat and Land Cover Map – 2022 revealed that three EUNIS grassland categories (mesic, dry and seasonally wet grasslands) covered almost 40% (47,304 ha) of a total of 119,527 ha of classified habitats within 20 km radius from the nearest located roost associated with the Firth of Forth SPA/ Ramsar (i.e. the Skinflats roost)[59,85]. Arable land category constituted 12.70% (15,185 ha) of the total area assessed within 20 km

[82] https://www.nature.scot/sites/default/files/special-protection-area/8499/spa-citation.pdf [Accessed: October 2025]

[83] https://www.bto.org/learn/about-birds/birdfacts/pink-footed-goose [Accessed: October 2025]

[84] https://app.bto.org/webs-reporting/numbers.jsp?locid=LOC645836 [Accessed: October 2025]

[85] https://www.bto.org/sites/default/files/u18/downloads/publications/ewlt_section3.pdf [Accessed: October 2025]

radius. There is also a good availability of alternative foraging habitats within 5 km from the Development Site (see above assessment of Westwater SPA).

6.7.26 The 76 ha lost to the development is approximately 0.12% of a total of 62,489 ha of suitable habitat with 20 km radius from the Skinflats roost. Therefore, the pink-footed geese roosting within the Firth of Forth SPA/ Ramsar have a significant resource available in the wider region during winter within 20 km foraging range and locally within 5 km from the development. Moreover, pink-footed geese potentially utilising the Site are considered unlikely to be of Firth of Forth SPA provenance as the Skinflats roost is located approximately 25 km from the Site. Furthermore, Mitchell (2012)[59] indicates that most of the geese from the Skinflats roost forage north of the SPA, around Clackmannan and west towards Stirling.

6.7.27 Therefore, a permanent loss of such a small area of suitable foraging habitat from the Proposed Development is considered to be **Negligible** and **Not Significant** under the EIA Regulations.

Disturbance

6.7.28 **Impact:** As the potential for disturbance impacts are the same, please see the assessment of pink-footed goose disturbance sensitivity as discussed in relation to the Westwater SPA and Ramsar site above.

6.7.29 **Magnitude:** As with the case of Westwater SPA and Ramsar site, any construction-related disturbance will be short term in duration (consisting of a maximum of one non-breeding season), limited to a relatively small area compared to alternative habitats available locally, and affecting a small proportion of the SPA population. Furthermore, the likelihood of birds present of Firth of Forth SPA provenance within the Site and wider area is low, as the nearest roost (Skinflats, 25 km away) is located beyond the foraging range of pink-footed geese roosting in the inner estuary (i.e. up to 20 km).

6.7.30 **Significance of effect:** It is considered that construction related disturbance effects do not constitute significant disturbance as they are relatively minor in magnitude, short term in duration and limited in extent.

6.7.31 Therefore, construction disturbance effects associated with the Proposed Development are considered to be **Negligible** and **Not Significant** under the EIA Regulations.

Ancient Woodland Inventory Sites

6.7.32 **Importance and Conservation Status:** An area of unnamed AWI woodland (ID: 34214) is intersected by the Site adjacent to the existing Leyden Road network and is assessed as being of Council Area importance. This woodland is classified as LEPO (AWI category 2b) interpreted as plantation from maps of 1860 and continuously wooded since, as such, many of these sites have developed semi-natural characteristics over this time.

6.7.33 **Impact**: There will be no direct loss of AWI habitat as a result of the Proposed Development. The existing access to Site intersects the AWI designated area within the eastern land parcel, however as the access route is currently unvegetated there is no requirement for direct habitat loss. The access route will require the currently

unvegetated area to be paved to facilitate a new access road network within the Site. As the access route is adjacent to woodland habitat, there is a risk of damage to tree root systems from construction traffic. An indicative Tree Protection Plan is provided in **Technical Appendix 2.8: Arboricultural Impact Assessment (AIA)**. Therefore, there is potential for habitat degradation impacts to arise from the Proposed Development.

6.7.34 In addition, there may be a requirement for trimming and delimbing of overhanging tree branches at the access junction to allow tall construction vehicles to enter the Site.

6.7.35 **Magnitude:** A total of 13 tree root protection areas (RPAs) fall within the area at risk of habitat degradation impacts via compaction from construction traffic and vegetation trimming to facilitate large vehicles (see **Technical Appendix 2.8: AIA**). Of these, six are classified as Category C and seven are in poor condition and classified as Category U[86]. In a worst-case scenario tree roots could be damaged, undermining the stability of the tree, leaving it suspectable to failure. Taking those factors into account, the impact magnitude is considered to be **Medium Extent** and **Permanent**.

6.7.36 **Significance of effect:** The sensitivity of the receptor is considered to be council importance and given the above consideration of magnitude with the potential indirect habitat degradation, the effect significance is considered to be **Moderate Adverse** and **Significant** under the terms of the EIA Regulations.

6.7.36.1 Protected Species

Bats

6.7.37 **Importance and Conservation Status:** Bats are assessed as being of Local importance in line with EPS and SBL designations.

6.7.38 **Impact (Roosting Bats):** Several trees on Site have been identified as being suitable for supporting roosting bats, a number of which may support maternity roosts. Design mitigation measures have incorporated suitable buffers around all features that may be of value to bats. This has included a minimum of 30 m around PRFs and a 20 m buffer where possible between the Proposed Development and adjacent treelines and woodland edges to avoid disruption to roosting bats and their commuting corridors. A 20 m buffer has not been possible at the proposed access route adjacent to the existing Leydon Road network. Although the Proposed Development shall utilise an existing access route, construction traffic will be routed adjacent to the existing woodland, there is a risk of damage to tree root systems from construction traffic.

6.7.39 There is one tree with potential roost features that is at risk of impact from the Proposed Development. A beech tree categorised as PRF-M is adjacent to the proposed access route which cannot be buffered from construction works. As such

[86] Category C: Low quality and value: currently in adequate condition (a minimum of 10 years life expectancy), or young trees with a stem diameter

Category U: Poor condition or dead / dying trees and / or infected: Less than 10 year life expectancy

this tree is at risk of construction disturbance and damage to the tree root system. In a worst-case scenario, a potential roost could be destroyed and bats displaced.

6.7.40 In addition, there may be a requirement for vegetation trimming at the access junction to allow tall construction vehicles to enter the Site, however, no PRFs have been identified within the area required for trimming.

6.7.41 **Magnitude (Roosting Bats):** One PRF-M tree is at risk of disturbance and habitat degradation impacts. Aerial inspections and emergence surveys have found no evidence that the features are currently used by roosting bats. As bats are known to use tree roosts opportunistically, particularly as transition roosts in the autumn, the presence of individual bats at any time cannot be completely ruled out. However, there is no evidence that the tree contains a roost either in regular use (if at all) or of conservation significance (e.g. maternity), therefore any displacement effects would likely affect individual bats utilising the potential roost opportunistically.

6.7.42 Taking those factors into account, the impact magnitude is considered to be **Medium Extent** and **Permanent**.

6.7.43 **Impact (Commuting / Foraging Bats):** Bats are confirmed to utilise the Site boundaries, linear woodland edges and watercourses for foraging and commuting. These habitats provide the greatest value for bat populations within the Site. Embedded mitigation measures have incorporated a sensitive lighting design and suitable buffers around all features that may be of value to bats. This has included a 10 m buffer around watercourses and 20 m around woodland / treelines where possible (excluding fence lines where a 10 m buffer has been applied for low impact works). A 20 m buffer has not been possible at the proposed access junction adjacent to the existing Leyden Road network. Although the Proposed Development shall utilise an existing access junction with bats likely habituated to a certain level of disturbance, construction traffic will be routed adjacent to the existing woodland, and therefore there is a risk of damage to tree root systems from construction traffic.

6.7.44 In addition, 20 m buffers have not been applied at two areas of woodland within the Site or Site boundary and one treeline. These areas do not contain PRFs, it is not considered this will affect commuting corridors during the construction phase as construction works will only take place within daylight hours and there is no construction lighting proposed in these areas.

6.7.45 **Magnitude (Commuting / Foraging Bats):** A total of 13 tree root protection areas (RPAs) fall within the area at risk of habitat degradation impacts via compaction from construction traffic and vegetation trimming to facilitate large vehicles (see **Technical Appendix 2.8: AIA**). In a worst-case scenario tree roots could be damaged, undermining the stability of the tree, leaving it suspectable to failure. This habitat loss has the potential to disrupt foraging routes.

6.7.46 There are no losses of high value bat foraging habitats. Losses of low value habitats (these habitats are not entirely lost, however will be unused due to presence of PV panels) are limited to open areas of modified grassland (10.7 ha loss) and cropland (14 ha loss).

6.7.47 When considering the proposed enhancement measures as outlined in **Technical Appendix 5.4**, it is considered that any potential impact would be short-term until trees grow to sufficient age to provide suitable foraging / commuting habitat. Taking

these factors into account, the impact magnitude is considered to be **Medium Extent** and **Medium-term**.

6.7.48 **Significance of effect:** The sensitivity of the receptor is considered to be council importance and given the above consideration of magnitude with the potential for roost and habitats losses, the effect significance is considered to be **Moderate Adverse** and **Significant** under the terms of the EIA Regulations.

Breeding Birds

6.7.49 **Importance and Conservation Status:** The Site provides suitable habitat for nesting birds and numerous birds were observed to be displaying breeding behaviour, including several BoCC red and amber listed species as well SBL species. All nesting birds are protected at the UK level under the Wildlife and Countryside Act 1981, but the breeding birds recorded in the survey are generally common and widespread in West Lothian. As such, breeding birds are assessed as being of Local importance in line with their protection under the WCA and BoCC list.

6.7.50 All but two species (lapwing and skylark) recorded breeding within the Site and 100 m survey buffer were associated with woody linear habitats such as hedgerows, woodland edge and scrub, with the highest densities of territories recorded for wren (19 territories), woodpigeon (11) and yellowhammer (10). Other species included willow warbles (5), song thrush (3), whitethroat (2) and linnet (2). Single spotted flycatcher territory was recorded in the buffer as well as single territories of dunnock, starling and siskin.

6.7.51 **Impact:** As breeding birds are known to be utilising the Site and the surrounding area, there is potential for habitat loss and disturbance effects due to construction of the Proposed Development.

6.7.52 **Magnitude:** The embedded mitigation ensures retaining and buffering of linear woody habitats and woodland edges, minimising the risk of fringe habitat loss. The construction phase is expected to be approximately 8 to 12 months, therefore in a worst-case scenario breeding birds could be displaced/ disturbed during two breeding seasons. However, in reality construction activities will be phased across the Site. The impact of displacement for most of the breeding species will therefore be temporal and localised.

6.7.53 **Significance of effect:** Given the local importance of the feature as well as availability of alternative nesting habitats in the vicinity of the development and the short-term, localised character of disturbance, these effects are considered to be **Minor Adverse** and **Not Significant** under the terms of the EIA Regulations.

Wintering Birds

6.7.54 Habitat loss, displacement and disturbance during construction could impact internationally important population of pink-footed geese associated with Westwater

and the Firth of Forth SPA/ Ramsar. These effects are considered and assessed above for both sites in **Section 6.7.2.1**.

6.7.55 Operational Effects

6.7.56 The likely operational effects of the Proposed Development are summarised below:

- Disturbance effects arising from routine maintenance of solar and Battery Energy Storage System (BESS) units;
- Displacement of protected species due loss of habitat due to the solar panels, BESS and substations and ongoing disturbance caused and by periodic servicing of them; and;
- Displacement of protected species from the area due to potential impacts of glint and glare from solar panels.

6.7.57 In its 2017 review of the impacts of solar farms (Natural England, 2017), Natural England recommends that:

"…*the potential for solar developments to attract or repel birds or bats should be considered, alongside the potential for negative interactions to occur between these taxa and solar farms*"

6.7.58 Research now indicates that solar farms managed with biodiversity in mind can be beneficial for bird species (Copping *et al.*, 2025[87]). Research in respect of bats (Tinsley *et al*., 2023[88] and Barré *et al*., 2024[89]) however indicates that this species group may avoid the area. This appeared most apparent in field boundary habitats however it should be noted that there is relatively limited evidence, and caution should be applied when extrapolating from it.

6.7.59 The displacement of nesting and foraging birds from the Site has the potential to extend beyond the construction phase, as described above, and to occur during the operational phase. It is recognised that disturbance may occur due to maintenance activities throughout the operational phase, although since these are likely to be of shorter duration and smaller extent than construction activities, effects will be lower than those predicted for construction effects (please refer to previous section).

6.7.60 The full effects of solar panels on birds are not yet fully understood, with detailed studies limited to date. A review of available literature undertaken in 2019 (BSG, 2019 [90]) details knowledge of mortality through collisions with solar arrays, although only in large concentrated solar arrays of the type unlikely to be found in the UK. There is some evidence of birds being attracted to sources of polarised light

[87] Copping, J. P., Waite, C. E., Balmford, A., Bradbury, R. B., Field, R. H., Morris, I., & Finch, T. (2025). Solar farm management influences breeding bird responses in an arable-dominated landscape. *Bird Study*, *72*(3), 217–222. Available at https://doi.org/10.1080/00063657.2025.2450392

[88] Tinsley, E., Froidevaux, J. S. P., Zsebők, S., Szabadi, K. L., & Jones, G. (2023). Renewable energies and biodiversity: Impact of ground-mounted solar photovoltaic sites on bat activity. *Journal of Applied Ecology*, 60, 1752–1762. Available at **https://doi.org/10.1111/1365-2664.14474**

[89] Barré, K., Baudouin, A., Froidevaux, J. S. P., Chartendrault, V., & Kerbiriou, C. (2024). Insectivorous bats alter their flight and feeding behaviour at ground-mounted solar farms. *Journal of Applied Ecology*, 61, 328–339. Available at **https://doi.org/10.1111/1365-2664.14555**

[90] Taylor, R., Conway, J., Gabb, O., & Gillespie, J. (2019). Potential Ecological Impacts of Ground Mounted Photovoltaic Solar Panels. [Online] Available at Solar-Panels-and-Wildlife-Review-2019.pdf

(Bernath *et al.*, 2001[91]) while Harrison *et al.* (2017)[92] suggested birds that drink on the wing such as swallow could be at risk of collision with solar panels. Studies suggest the impacts of solar farms include habitat loss and displacement, with ground nesting birds such as skylark displaced in part due to loss of habitat and in part due to the loss of line of sight (Montag *et al*., 2016[93]). Other studies are inconclusive with results showing bird densities reduced in some solar arrays and other studies showing the opposite with increased density with increased foraging opportunities for birds and shelter opportunities with solar arrays including biodiversity enhancements such as native meadow planting.

6.7.61 A recent study undertaken by the RSPB and Cambridge University**Error! Bookmark not defined.** considered how solar farm habitat management influences breeding birds within an arable dominated landscape. The study found that when solar farms located within arable landscapes are managed to enhance biodiversity, particularly floral diversity within the solar array to improve invertebrate species-richness and abundance, it can increase both species richness and abundance.

6.7.62 For both birds and bats, there is relatively limited evidence providing a clear indication as to the repercussions and caution should be applied when extrapolating from it. Nevertheless, it appears to point to the fact that management of habitats beneath and around the solar farm infrastructure is key in maintaining and enhancing use of the area by bird and bat species.

6.7.62.1 Nature Conservation Sites

Statutory Designated Sites

6.7.63 There will be no significant effects on International designated sites during operation. Please refer to **Technical Appendix 5.7: Habitats Regulations Assessment** for the full assessment.

Non-Statutory Designated Sites

Ancient Woodland Inventory Sites

6.7.64 Habitat impacts associated with the potential degradation of AWI woodland (LEPO) would be experienced throughout the operational period, however as the impact would take place during the construction period and is considered permanent, the impact assessment is provided in **Section 6.7.2.1.**

[91] Bernáth, B. & Szedenics, G. & Molnár, Gergely & Kriska, Gyorgy & Horvath, Gabor. (2001). Visual ecological impact of "Shiny black anthropogenic products" on aquatic insects: Oil reservoirs and plastic sheets as polarized traps for insects associated with water. Archives of Nature Conservation and Landscape Research. 40. 89-109.

[92] Harrison, C., Lloyd, H., & Field, C. (2017) Evidence review of the impact of solar farms on birds, bats and general ecology 2016 (NEER012). Manchester Metropolitan University. Available at Evidence review of the impact of solar farms on birds, bats and general ecology 2016 - NEER012

[93] Montag, H., Parker, G. and Clarkson, T., (2016). The effects of solar farms on local biodiversity: a comparative study. Clarkson and Woods and Wychwood Biodiversity. Available at The Effects of Solar Farms on Local Biodiversity

6.7.64.1 Protected Species

Bats

6.7.65 **Impact:** Habitat impacts associated with habitat loss and the potential degradation of AWI woodland (LEPO) potentially leading to roost loss would be experienced throughout the operational period, leading to long term displacement of species. However, as the impact would take place during the construction period and is considered permanent, the impact assessment is provided in **Section 6.7.2.1.**

6.7.66 The change in operational management of agricultural fields to solar PV panels has the potential to affect foraging and commuting routes resulting in displacement. Embedded design mitigation has incorporated a sensitive lighting design and has included buffers from woodland areas across the majority of field boundaries reducing the risk of disrupting commuting / foraging corridors. In addition, enhancement of field boundaries within landscaping plans will enhance these areas for bat populations (As discussed in **Technical Appendix 5.4: OBEMP)**. In terms of foraging and commuting impacts, field boundaries within the permanent infrastructure footprint which do not provide buffers of over 20 m to foraging/commuting routes include two areas of woodland within the Site or Site boundary and one treeline. A buffer of 10 m from PV panels is provided at woodland areas, and both woodland habitats are over 30 m in width providing large corridors for movement. The existing tree line is extremely gappy in nature and is not considered to provide valued foraging habitat. Reduced buffers within these areas is therefore not considered to negatively impact commuting / foraging bats. These areas do not contain PRFs, and therefore it is not considered this will affect roosting bats.

6.7.67 Potential disturbance impacts associated with Proposed Development operation are largely restricted to maintenance of infrastructure resulting in localised and temporary increases in human presence and vehicular traffic, and occasional vegetation trimming for the operational corridor. No barriers to movement are predicted during the operational phase due to absence of permanent overnight lighting across the Proposed Development. Temporary tracks required for the construction phase would be restored to baseline vegetation types during the operational phase, therefore no impacts are predicted at these locations.

6.7.68 The PRF-M tree is located over 30 m away from PV panels and operational areas within the Proposed Development, however, will be subject to occasional disturbance from the entry and exit of vehicles via the access track. It should be noted that this is an existing access track for agricultural usage including crop production, therefore noise levels are likely to reduce in comparison to existing levels. As any bats using this PRF would be habituated to a certain extent, no impacts are predicted in relation to roosting bats.

6.7.69 **Magnitude:** The occasional increases in human presence during maintenance requirements would be infrequent, **temporary** and **short-term** and therefore **low extent**. Effects on commuting and foraging bats is considered **permanent** and **very low extent**. Effects on existing bat roosts are considered **Negligible**.

6.7.70 **Significance:** Areas within limits of the Proposed Development are managed under ongoing agricultural practices, and therefore any populations of roosting bats in these areas would be habituated to a degree of human disturbance. Considering

the localised, infrequent and temporary nature of operational impacts, disturbance impacts are considered to be **Negligible**, and **Not Significant** in the context of the EIA Regulations.

Breeding Birds

6.7.71 **Impact:** There will be a permanent loss of breeding habitat for ground nesting birds i.e., one pair of lapwings and two skylark territories, largely due to installation of PV solar panels across much of the Site.

6.7.72 **Magnitude:** The built elements of the Proposed Development avoid the higher quality nesting habitats (e.g. woodland, field edges) and instead are situated in arable crop fields and modified grassland that are regularly disturbed and thus provided limited suitability for nesting birds. Losses of habitats are limited to modified grassland (10.7 ha loss) and cropland (14 ha loss). However, skylarks can to some extent utilise solar farms for nesting (Copping *et al.,* 2025)**Error! Bookmark not defined.** and there is a magnitude of alternative habitats for displaced lapwing and skylark within 5 km from the Site, i.e., 2,506 ha of mesic grassland (25% of a total of 9,960 ha assessed), 1,467 ha or arable land (15%), 1,207 ha of seasonally wet grassland (12%) and 607 ha of dry grassland (6%). Therefore, it is considered that the impact of the loss of breeding habitats will be **permanent** but **low in extent**.

6.7.73 **Significance of effect:** The sensitivity of the receptor is considered to be of a local importance and given the above consideration of low extent magnitude, the effect significance is considered to be **Minor Adverse** and **Not Significant** under the terms of the EIA Regulations.

6.8 Additional Mitigation & Monitoring

6.8.1 Construction Mitigation and Monitoring

6.8.1.1 Nature Conservation Designations

Statutory Designated Sites

6.8.2 No significant adverse effects were identified during the construction phase after consideration of primary mitigation and therefore no mitigation measures are required.

6.8.3 No additional construction monitoring is proposed.

Non-Statutory Designated Sites

Ancient Woodland Inventory Sites

6.8.4 A total of 13 tree root protection areas (RPAs) within the AWI site fall within the area at risk of habitat degradation impacts via compaction from construction traffic and vegetation trimming to facilitate large vehicles (see **Technical Appendix 2.8: AIA**).

6.8.5 Mitigation measures are required to avoid compaction impacts. A robust Tree Protection Plan with an Arboriculture Method Statement will include measures to protect retained trees. Protection plans will include the following measures:

- Access road width 10 m, using "geocell" membrane with type 6 stone with dust cover to cover 8 m with 1 m buffer zone either side of the camber. For example, using the EuroGravel PRO geocell over a permeable membrane;
- The load-bearing capacity of a filled gravel grid is 340 tons per m² to accommodate HGV lorry access. Geocell area should be increased to accommodate the bell mouth onto Leyden Road and be extended into the field (East) by 6 m, to protect tree T48 Beech;
- All works including levelling works to be done by hand, with no compaction of materials; and
- Tree RPAs will be shielded / impeded by adjoining direct impact trees with additional protections including fencing and the use of robust geocell with permeable membrane.

6.8.5.1 Protected Species

Bats

6.8.6 As discussed in **Section 6.5**, an SPP will form the primary mechanism by which mitigation measures for bats will be detailed and adhered to. An SPP will be provided prior to the construction of the Proposed Development and will be agreed with key consultees in advance of any construction works commencing. Furthermore, pre-construction surveys for protected species, as identified during baseline studies, will also be incorporated into the SPPs and subsequent mitigation or licencing procedures (if required). Additional measures, which will be brought into the final SPP, are also outlined below.

6.8.7 Embedded design mitigation has been incorporated to provide disturbance buffers around existing PRFs. However, as proposed, fence lines and PV panels tracks are located within close proximity to woodland edges and treelines / hedgerows in certain areas of the Site, pre-construction surveys will confirm if additional PRFs have become established in the interim period between field surveys and the

construction phase (such as in the event of storm or other damage exposing new features).

6.8.8 In the event that surveys identify potential bat roosts, disturbance protection buffers will be required around any new PRFs. **Table 6-16** outlines the required protection zones for different construction activities (adapted from Shawyer, 2011[94]).

Table 6-16: Required Disturbance Protection Zones

Predicted Level of Disturbance	Example Site Activities	Minimum Protection Zone
Low	• Pedestrian movement; • Storage of materials; • Fencing (via manual instillation); and • Artificial lighting (not directed towards potential roost feature)	10m
Moderate	General building and landscaping works – laying of concrete, bricks, roofing etc. using mechanised plant	15m
High	Heavy construction works – ground levelling, pile driving (incl. pile driven fence posts), use of compacting roller etc. using heavy plant	30m

6.8.9 Mitigation measures to protect existing woodland and the PRF-M tree are provided to protect AWI sites in **Section 5.8.5** above. These measures will ensure the protection of the root system of the PRF-M tree and, therefore, mitigate for potential damage associated with compaction and subsequent threat to the tree's integrity.

6.8.10 Works will only be conducted during daylight hours and embedded design mitigation includes sensitive lighting scheme. As such, no further mitigation in required.

Breeding Birds

6.8.11 No significant adverse effects were identified during the construction phase after consideration of primary mitigation and therefore no mitigation measures are required.

6.8.12 No additional construction monitoring is proposed.

Wintering Birds

6.8.13 No significant adverse effects were identified during the construction phase after consideration of primary mitigation and therefore no mitigation measures are required.

[94] Shawyer, 2011. Barn owl Tyto alba survey methodology and techniquest. Available at: https://cieem.net/resource/barn-owl-survey-methodology-and-techniques-for-use-in-ecological-assessment/ [Last accessed 22/07/2025]

Note this reference relates to barn owl (Tyto alba) mitigation; however, the reasoning behind the size of disturbance buffers is considered applicable to bats also, and similar bat disturbance buffers have been accepted by NatureScot on other schemes.

6.8.14 No additional construction monitoring is proposed.

6.8.15 Operational Mitigation and Monitoring

6.8.15.1 Nature Conservation Designations

6.8.16 No significant adverse effects were identified during the operational phase after consideration of primary mitigation and therefore no mitigation measures are required.

6.8.17 No additional operational monitoring is proposed.

6.8.17.1 Protected Species

6.8.18 No significant adverse effects were identified during the operational phase after consideration of primary mitigation and therefore no mitigation measures are required.

6.8.19 The monitoring of proposed habitat enhancement measures is an important part of the ongoing commitment to restoring and improving the levels of biodiversity, habitat quality, connectivity and value associated with the Site. Monitoring the condition and changes in ground conditions allows for an assessment of the efficacy of the measures undertaken, forming an essential feedback mechanism. This allows for flexibility and adaptation to emerging conditions to promote the best outcome for the investment of resources in line with biodiversity aim and commitments.

6.8.20 The proposed monitoring scheme is provided within the OBEMP (please see **Technical Appendix 5.6: OBEMP**).

6.9 Biodiversity Enhancement

6.9.1 In line with NPF4's focus on reversing the trend in biodiversity decline, the following measures are proposed to contribute to ecological enhancement as part of the Proposed Development.

6.9.2 The focus of ecological enhancement efforts have been designed to firstly avoid and minimise the loss of IEFs, as per the mitigation hierarchy, and provide enhancement opportunities to improve habitats on Site. Areas of enhancement shall be provided via the introduction of native edge woodland habitat and tree planting coupled with efforts to improve the quality of existing grassland and hedgerow habitats on site. An 'ecotone' shall also be created whereby habitats grade into one another. This shall contribute to enhancement botanical diversity across the Site, enhance wildlife corridors, and provide shelter and foraging opportunities for wildlife including ground nesting birds, bats, and reptile species.

6.9.3 The Proposed Development works are to include the creation of a sustainable drainage system (SuDS) basin which shall include wetland planting. This shall increase available habitat for fauna including amphibians and waders. There is good connectivity for movement of wildlife across the Site and wider Study Area.

6.9.4 Bird, bat and habitat boxes have been incorporated into the enhancement plan to provide shelter and nesting opportunities for species using the Site. Once

established, landscape planting will provide additional foraging and commuting resources within these locations, which therefore may encourage greater uptake of shelters provided.

Table 6-17: Habitat Creation and Enhancement

Landscape Feature	Area of feature being created / enhanced (ha / km)
Low Stocking Density Grazed Grassland (Beneath solar panels)	62.9 ha
Species Rich Grassland	8.97 ha
Native Scrub	1.05 ha
Native Woodland Edge	0.57 ha
Native Tree Planting	~72 no.
Native Hedgerow Creation and Enhancement	0.77 km
SuDs Pond	0.13 ha
Wetland Planting within SuDs pond	0.05 ha

6.10 Cumulative Effects

6.10.1 Consideration has also been given to the potential for likely significant cumulative effects to arise as a result of the Proposed Development alongside other identified cumulative schemes during both the construction and operational phases.

6.10.2 The cumulative schemes that are considered relevant to this technical assessment are shown in **Table 6-18**.

Table 6-18: Relevant Cumulative Schemes

Name	Proximity	Description	Status
Selms Muir Solar Farm with BESS	1.4 km north	Installation of ground-mounted solar panels (18 MW) and BESS, along with associated works.	Consented on 27 September 2022 (0442/FUL/22), not constructed.
Drumshoreland Road BESS	3.6 km north-west	Installation of 49.9 MW BESS and associated works	0255/FUL/22 Operational

6.10.3 Cumulative effects with Selms Muir and Drumshoreland Road Solar and BESS projects have been considered below; however, only a PEA was available for review for Selms Muir, no environmental assessments were available for Drumshoreland Road BESS within the West Lothian Council planning portal. As such the assessment is based on high-level habitat and species information available and/or desk based assessments.

6.10.4 Cumulative effects have been considered for receptors and scoped into this assessment. Other receptors have not been assessed cumulatively as they were

scoped out of this assessment and are not expected to experience significant interaction with other developments.

6.10.5 Designated Sites (including Ancient Woodland)

6.10.6 Selms Muir Solar and BESS proposed development is not expected to have any impact on the surrounding designated sites. Provided mitigation is implemented, the Proposed Development is not expected to have any negative effects on designated sites. As Drumshoreland Road BESS is operational, any habitat loss or degradation effects on Designated Sites are in effect, and therefore considered within the baseline.

6.10.7 Due to the small scale of Selms Muir Solar and BESS (0.014 ha application boundary) and Drumshoreland BESS (*c.* 2 ha) and no significant adverse effects anticipated from Kirknewton Solar and BESS development, significant cumulative effects are not anticipated.

6.10.8 Bats

6.10.9 Survey at Selms Muir Solar and BESS identified woodland to the north-west, west and south of the application boundary to provide suitable roosting, foraging and commuting habitat for bats. The trees to the north-west of the application boundary were found to have PRFs but no further assessment was undertaken.

6.10.10 Survey information is not publicly available with regards to Drumshoreland Road BESS however woodland is present within the surrounding area. Surveys at Kirknewton Solar and BESS recorded suitable roosting, foraging and commuting habitat for bats in the form of linear features and open arable and grassland habitats. The highest value habitats were deemed to be the woodland habitats bordering the application boundary. Standard embedded mitigation and good practice measures would also apply to these projects and there would be readily available alternative habitat bordering the developments. Therefore, it can be assumed that there would be no death/ injury effects from this project alone and effects of habitat loss and disturbance would be **temporary** and **low in extent** and therefore **Negligible**, and **Not Significant** in the context of the EIA Regulations.

6.10.11 With mitigation and compensation in place, no significant negative effects were predicted for Kirknewton Solar and BESS and so negative cumulative effects are unlikely to occur. The creation of new hedgerow planting and species-rich seeding, enhancement of scrub, and creation of SuDs will create areas of additional foraging habitats, which will offset habitat losses.

6.10.12 Breeding Birds

6.10.13 Both projects considered in combination would support suitable foraging and nesting habitat for a wide range of common bird species, particularly passerines. No further information was available for the consented Selms Muir Solar Farm with BESS, however standard embedded mitigation and good practice measures would also apply to this project and there would be readily available alternative nesting habitat. Therefore, it can be assumed that there would be no death / injury effects from this project alone and effects of habitat loss and disturbance would be

temporary and **low in extent** and therefore **Negligible**, and **Not Significant** in the context of the EIA Regulations.

6.10.14 Based on the above, it is considered that negative cumulative effects of this project in combination will be in the short to medium-term at the local level due to the loss of breeding and foraging habitat. The creation of new and enhanced hedgerow habitat and species-rich grassland seeding will however create high quality habitat mosaic, which will offset habitat losses.

6.10.15 Wintering Birds

6.10.16 Both developments considered in combination were granted planning permission based on PEA and standard mitigation against killing and injuring of birds and their nesting sites during breeding season. No considerations of foraging pink-footed geese were made, however in the light of the availability of alternative foraging habitats within the 5 km radius, in-combination effect of the development projects are not anticipated and any effects will be **Negligible** and **Not Significant** in the context of the EIA Regulations.

6.11 Likely Residual Effects

6.11.1 The likely residual effects of the Proposed Development are those that will arise after any secondary mitigation has been taken into account.

6.11.2 The likely residual effects of the Proposed Development during the construction and operational phases are set out in Error! Reference source not found..

6.11.3 Given that no likely significant effects are anticipated as a result of the construction or operational phases of the Proposed Development the residual effect is expected to be **Negligible Adverse** and **Not Significant** under EIA Regulations.

6.11.4 Through the delivery of the OBEMP, the Proposed Development is expected to deliver areas of biodiversity enhancement within the Site, from baseline conditions (as detailed in **Technical Appendix 5.6**).

Table 6-19 Summary of Effects

IEF/OEF	Potential Effect	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures Required	Residual Effect
Construction Phase				
HRA input	Species displacement / disturbance Habitat loss	Negligible	N/A	Negligible
AWI	Indirect habitat loss / degradation	Moderate Adverse Significant	Vegetation protection measures	No Effect
Bats	Indirect habitat loss / degradation Potential roost loss	Moderate Adverse Significant	Vegetation protection measures	Negligible

IEF/OEF	Potential Effect	Significance of Effect (with embedded mitigation)	Additional Mitigation Measures Required	Residual Effect
Construction Phase				
			Compensatory planting	
Breeding Birds	Species displacement / disturbance	Minor Adverse Not Significant	N/A	Negligible
Wintering Birds	Species displacement / disturbance Habitat loss	Negligible	N/A	Negligible
Operation Phase				
HRA input	N/A	N/A	N/A	No Effect
AWI	N/A	N/A	N/A	No Effect
Bats	Species displacement / disturbance	Negligible	N/A	Negligible
Breeding Birds	Habitat loss	Minor Adverse Not Significant	N/A	Negligible
Wintering Birds	N/A	N/A	N/A	No Effect
Cumulative Impacts				
Designated Sites	N/A	N/A	N/A	No Effect
Bats	Habitat Loss Species Disturbance / Displacement	N/A	OBEMP	Negligible
Breeding Birds	Habitat Loss Species Disturbance / Displacement	Minor Adverse Not Significant	OBEMP	Negligible
Wintering Birds	Species displacement / disturbance Habitat loss	Negligible	N/A	Negligible

6.12 Summary

6.12.1 This chapter has been undertaken using baseline data collected through a combination of desk study, targeted surveys, and consultation with relevant nature conservation and statutory organisations. Best practice guidelines, such as the CIEEM Guidelines, serve as the foundation for the impact assessment.

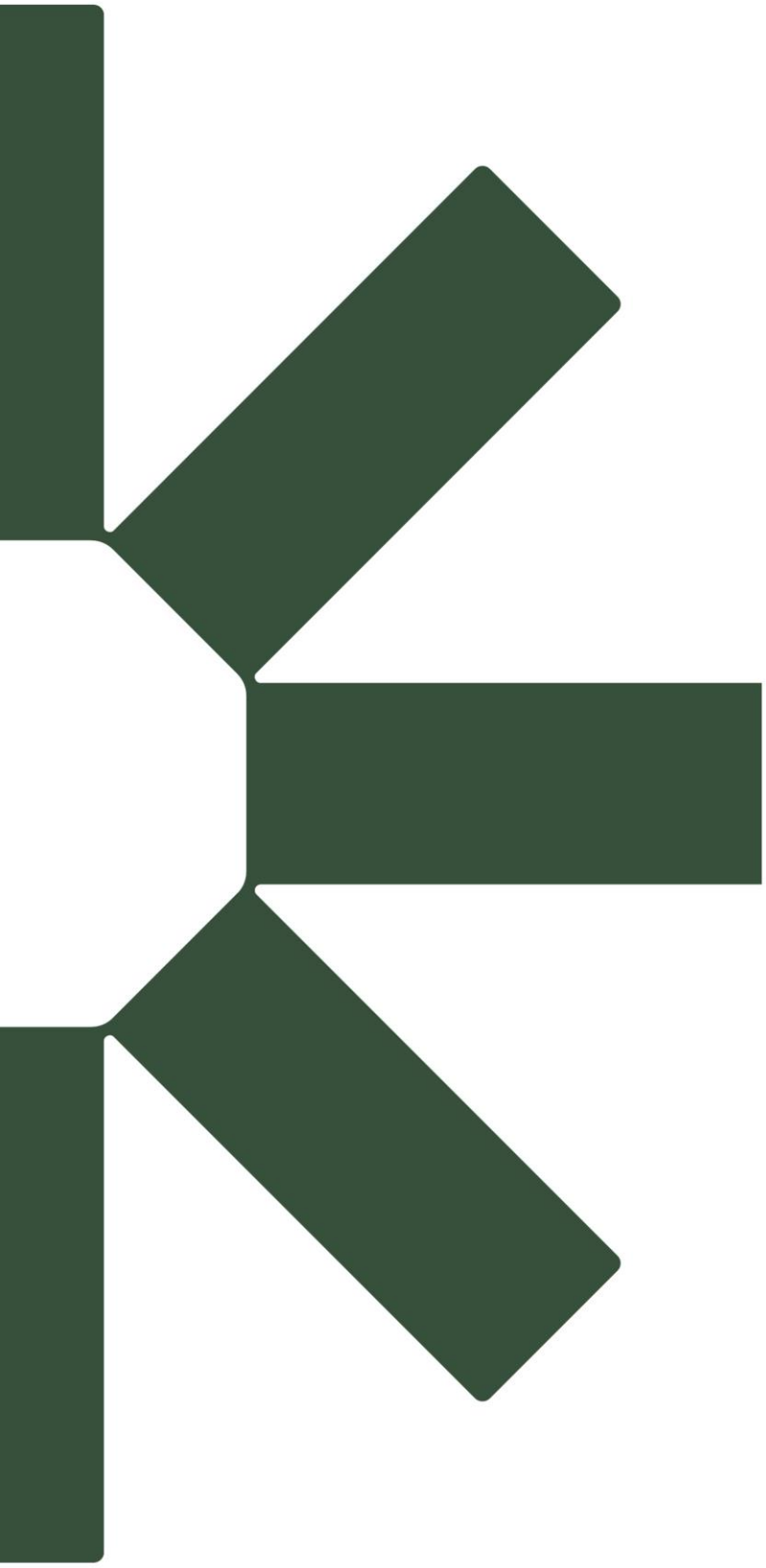
6.12.2 This process established ecological features that could potentially be affected by the Proposed Development. No potential adverse effects on statutory designated sites were identified.

6.12.3 The Proposed Development has been designed through careful constraints analysis and feedback to minimise the potential for impacts on important habitats, and protected species as far as practicable. This has been achieved through embedded mitigation and the iterative design process. This process, combined with further commitments to certain mitigation measures, during both pre-construction and construction phases, allowed potential effects on the majority of habitats and species present to be scoped-out of the assessment. The following IEFs were taken forward to the assessment stage:

6.12.4 Westwater SPA / RAMSAR, The Firth of Forth RAMSAR, AWI Woodland Site (unnamed woodland, ID: 34214), bats, breeding birds, and wintering birds.

6.12.5 The EIA assessment concluded that following the successful implementation of mitigation measures, guided by the development of SPPs, OBEMP, and a subsequent Construction Environmental Management Plan (CEMP). The potential residual impacts upon IEFs and IOFs were, therefore, considered **Negligible** or **No Effect** and therefore **Not Significant** under the EIA Regulations.

6.12.6 A detailed assessment of the impacts on the qualifying features of both the Westwater and the Firth of Forth SPA and Ramsar sites has been undertaken in the form of a shadow HRA for the Proposed Development to meet the requirements of the Conservation (Natural Habitats, &c.) Regulations 1994, as amended under the Conservation of Habitats and Species Regulations (the 2017 Habitat and Species Regulations).



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