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Chapter 6: Ecology and Ornithology

Cossans Solar & BESS EIA Report

TRIO POWER Limited

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Making Sustainability Happen

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Table of Contents

6.	Ecology and Ornithology	6-5
6.1	Executive Summary	6-5
6.2	Introduction	6-6
6.3	Legislation, Policy & Guidance	6-7
6.4	Consultation	6-9
6.5	Assessment Methods & Significance Criteria	6-10
6.6	Baseline Conditions	6-24
6.7	Evaluation of Baseline Features	6-42
6.8	Scope of the Assessment	6-46
6.9	Standard and Embedded Mitigation Measures	6-51
6.10	Assessment of Potential Effects	6-54
6.11	Assessment of Residual Effects	6-62
6.12	Assessment of Cumulative Effects	6-62
6.13	References	6-66

Supporting Figures (Volume 2a)

Figure 6.1: Site Location Figure 6.2a: Designated Sites within 2km Figure 6.2b: European Designated Sites within 20km Figure 6.3: Extended UK Habitat Results

Technical Appendices (Volume 3)

Technical Appendix 6.1: Preliminary Ecological Appraisal Report Technical Appendix 6.3: Breeding Birds Survey Report Technical Appendix 6.4: Shadow Habitat Regulations Appraisal Technical Appendix 6.5: Outline Biodiversity Enhancement and Restoration Plan

Confidential Technical Appendices (Volume 4)

Confidential Technical Appendix 6.2: Protected Mammals Survey Report

Acronyms and Abbreviations

AWI	Ancient Woodland Inventory
ВСТ	Bat Conservation Trust
BESS	Battery Energy Storage System
BoCC	Birds of Conservation Concern
вто	British Trust for Ornithology
DEMP	Decommissioning Environmental Management Plan
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
ESA	Environmentally Sensitive Area
GLTA	Ground Level Tree Assessment
GWDTE	Ground Water Dependant Terrestrial Ecosystem
HRA	Habitat Regulations Assessment
IEFs	Important Ecological Features
IOFs	Important Ornithological features
LBAP	Local Biodiversity Action Plan
LBS	Local Biodiversity Site
LDP	Local Development Plan
LNCS	Local Nature Conservation Site
LNR	Local Nature Reserve
NBN	National Biodiversity Network
NESBReC	North East Scotland Biological Records Centre
NNR	National Nature Reserve
NPF4	National Planning Framework 4
PPP	Pollution Prevention Plan
PRA	Preliminary Roost Assessment
PRF	Potential Roosting Features
qPCR	quantitative Polymerase Chain Reaction
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
sHRA	Shadow HRA
SINC	Site of Interest for Nature Conservation
SPA	Special Protection Area
SPP	Scottish Planning Policy
SQE	Suitably Qualified Ecologist



SRP	Site Restoration Plan
SSSI	Site of Special Scientific Interest
SuDs	Sustainable Urban Drainage Systems
SWTR	Scottish Wildlife Trust Reserve
UKHab	UK Habitat Classification
WANE	Wildlife and Natural Environment (Scotland) Act
WCA	Wildlife and Countryside Act 1981 (as amended)
Zol	Zone of Influence

6. Ecology and Ornithology

6.1 Executive Summary

- 6.1.1 This chapter considers the potential effects of the Cossans Solar and Battery Energy Storage System (BESS) development (the 'Proposed Development') on ecology and ornithology. A desk study and a suite of surveys have been conducted to inform the ecological and ornithological baseline of the Site. Special Protection Areas (SPA) and Ramsars, in addition to a Special Area of Conservation lie within the Zone of Influence (ZoI) of the Proposed Development and thus have been subject to a Shadow Habitat Regulations Assessment (HRA). A single Local Nature Conservation Site (LNCS) lies adjacent to the Site to the west.
- 6.1.2 The baseline assessments have confirmed the Site habitats to be predominantly arable and of limited value, with the exception of the Ballindarg Burn that passes through the Site, and lines of mature trees that run adjacent to the access track. Habitats of higher conservation value are located adjacent to the Site including an area of Ancient Woodland Inventory (AWI) listed woodland directly west. The Site supports habitat for roosting bats in mature trees, and foraging and commuting habitat of moderate suitability along the Site boundaries and watercourse. Otter, beaver and badger are confirmed present within the Study Area, and red squirrel are presumed to be present in the woodland to the west. Breeding birds are confirmed to hold territories within the Site during the breeding season including wader species, and red and amber list species. Wintering birds are presumed to use the Site for loafing and foraging based on the suitability of the habitat. Fish species including salmonoids and lamprey are considered likely present within the Ballindarg Burn, and common amphibian species and reptiles likely use the Site field boundary habitats. Great crested newt are likely absent.
- 6.1.3 With embedded and design mitigation in place, along with best practice working measures, the majority of ecological receptors have been scoped out of further assessment within this Chapter. International designated sites (SPAs and Ramsars), along with the breeding wader assemblage have been taken forward for further assessment during construction and operation, though with the embedded and standard mitigation in place, in additional to ecological enhancements through the Outline Biodiversity Enhancement Plan (OBEMP), effects are concluded to be minor adverse or negligible and not be significant. No additional mitigation measures beyond standard and embedded measures and biodiversity enhancements have been prescribed.
- 6.1.4 An OBEMP has been produced to outline the proposal for biodiversity enhancements on Site and within an off-Site area immediately south. It is considered that with the design and embedded mitigation, and biodiversity enhancements, the Proposed Development meets obligations of relevant legislation and planning policy.

6.2 Introduction

- 6.2.1 This chapter considers the potential effects of the Proposed Development on ecology and ornithology. It details the ecological baseline conditions and identifies Important Ecological Features (IEFs) and Important Ornithological Features (IOFs). An Ecological Impact Assessment (EcIA) is then carried out for IEFs or IOFs which may be vulnerable to effects from the Proposed Development.
- 6.2.2 The chapter should be read with reference to the scheme description **in Chapter 3**: **Proposed Development Description**, as well as other chapters as referenced throughout.
- 6.2.3 The Ecology and Ornithology assessment was undertaken by SLR Consulting. The chapter has been authored by Cara Hoggan BSc (Hons) ACIEEM, Richard King BSc (Hons) MCIEEM and Alison Hood BSc (Hons.) MSc MCIEEM.

Scope of the Assessment

Effects Assessed

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

Construction

- 6.2.5 The following potential effects are assessed in the chapter:
 - Direct or indirect effects on nature conservation designations;
 - Damage/modification and loss of habitat IEFs;
 - Habitat fragmentation and disturbance/displacement of protected species IEFs;
 - Pollution events and sedimentation of aquatic habitat; and
 - Death/injury and or disturbance to IEFs, including destruction/removal of habitat.

Operation

- 6.2.6 The following potential effects are assessed in the chapter:
 - Disturbance/displacement of faunal species once site is in operation;
 - General site maintenance activities including vehicle collisions with faunal species; and
 - Pollution events and sedimentation which may be caused by site maintenance.

Decommissioning

6.2.7 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 approximately 12 months and therefore would be a much shorter process than the approximate 24-month construction period.

- 6.2.8 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.
- 6.2.9 Decommissioning is therefore scoped out of the assessment.

Cumulative Effects

- 6.2.10 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

6.2.11 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 6.8** for further details of these ecological features.

6.3 Legislation, Policy & Guidance

6.3.1 Details of relevant legislation, policy and guidelines that have been taken into consideration during the assessment are detailed below.

Legislation

- 6.3.2 Relevant legislation and guidance documents have been reviewed and taken into account as part of this assessment. Of particular relevance are:
 - European Union Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive');
 - European Union Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive');
 - The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
 - Environmental Impact Assessment Directive 2014/52/EU;
 - The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended);
 - Wildlife and Countryside Act 1981 (as amended) (WCA);
 - The Nature Conservation (Scotland) Act 2004 (as amended);
 - The Wildlife and Natural Environment (Scotland) (WANE) Act, 2011 (as amended); and
 - The Protection of Badgers Act 1992, as amended by the Wildlife and Natural Environment (Scotland) Act 2011.

Planning Policy

- 6.3.3 The Planning Statement associated with this Section 36 application sets out the planning policy framework that is relevant to the EIA. Of relevance to the assessment presented within this chapter, regard has been had to the following policies:
 - National Planning Framework 4 (NPF4) (Scottish Government, 2023);
 - Planning Advice Note 60: Planning for Natural Heritage (Scottish Government, 2000);
 - Angus Council Local Development Plan (LDP) (Angus Council, 2016);
 - Tayside Local Biodiversity Action Plan (LBAP) 2016 2026 (Tayside Biodiversity Partnership, 2016);
 - Scottish Biodiversity List (SBL), a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland (Scottish Government, 2013);
 - Birds of Conservation Concern 5 (BoCC) (Stanbury, et al., 2021); and
 - Scottish Environment Protection Agency (SEPA) Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA, 2017).

Guidance

- 6.3.4 Cognisance has been taken of the following best practice guidelines/guidance:
 - Guidelines for Ecological Impact Assessment in the UK and Ireland version 1.3 (Chartered Institute of Ecology and Environmental Managers (CIEEM, 2024);
- 6.3.5 In addition, the following best practice guidelines and survey method publications in relation to habitats and protected species have been applied:
 - Habitats:
 - o UK Habitat (UKHab) Classification methodology (UKHab Ltd., 2023);
 - Scottish Environment Protection Agency (SEPA) Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA, 2017).
 - Great Crested Newt:
 - Amphibian and Reptile Groups of the United Kingdom, (ARG UK) (2010).
 Advice Note 5: Great Crested Newt Habitat Suitability Index. (ARG UK, 2010).
 - Langton et al. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth. (Langton et al., 2001).

Oldham et al., (2000) Evaluating the suitability of habitat for the great crested newt (Triturus cristatus). Herpetological Journal. 10: 143-155. (Oldham et al., 2000).

Bats:

- Ground Level Tree Assessment and Preliminary Roost Assessment (for bats):
 - ~ Competencies for Species Survey: Bats (CIEEM, 2013); and
 - Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th Edition (Collins, 2023).
- Otter survey:
 - o Competencies for Species Survey: Otter (CIEEM, 2013); and
 - Monitoring the Otter Lutra lutra (Chanin, 2003).
- Beaver survey:
 - The Eurasian Beaver Handbook: Ecology and Management of *Castor fiber* (Campbell-Palmer, et al., 2016); and
 - The Eurasian Beaver (Campbell-Palmer, Gow, Needham, Jones, & Rosell, 2015).
- Water vole survey:
 - Competencies for Species Survey: Water vole (CIEEM, 2013); and
 - Water Vole Mitigation Handbook (Dean, Strachan, Gow, & Andrews, 2016).
 - Ornithology Breeding Bird Survey
 - Bird Survey & Assessment Steering Group. (2024). Bird Survey Guidelines for assessing ecological impacts, <u>https://birdsurveyguidelines.org</u>

6.4 Consultation

6.4.1 In undertaking the ecology and ornithology baseline and impact assessments, consideration has been given to relevant consultation. **Table 6.1** provides details of consultation responses relevant to terrestrial ecology and ornithology and outlines how they have been addressed.

Consultee	Consultation Response	Applicant Action
NatureScot (06/09/2024). Applicant query to confirm requirement (if necessary) for wintering bird surveys and Habitat Regulations Assessment (HRA).	The proposal is within the foraging range of greylag geese and whooper swan from Loch of Lintrathen SPA as well as greylag and pink-footed geese from Loch of Kinnordy SPA. The proposal site contains suitable foraging habitat for these species. Surveys will only be required if you are trying to demonstrate that the Site in not currently used by these species for foraging.	Assumed presence of greylag goose, pink- footed goose, and whooper swan on site, which have been assessed accordingly within this chapter and within the shadow HRA (sHRA), Technical Appendix 6.4 .
	If you work on the assumption that the Site is utilised by birds for foraging and will be lost to them for the lifespan of the proposal, surveys will not be required.	

Table 6.1: Consultation Responses

Consultee	Consultation Response	Applicant Action
	On this basis, if we are formally consulted by the planning authority on this proposal, we are likely to advise them that there will be a likely significant effect on the above species due to disturbance and loss of foraging habitat. However, due to the scale of the proposal and the total area of foraging habitat available to the birds, the proposal will not adversely affect the integrity of the species as qualifying features of the SPAs.	

6.5 Assessment Methods & Significance Criteria

Desk Study

- 6.5.1 The ecological desk study was carried out using a range of publicly available information sources to provide an understanding of the ecological context of the Study Area.
- 6.5.2 In terms of statutory nature conservation designations, the desk study identified any international designations, such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), and Ramsars within 5 km of the Site boundary (extended to 20 km for SPAs and Ramsars with goose features), national designated sites such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) or Local Nature Reserves (LNRs) within 2 km. Only ecological (biological) features were considered relevant to the present study. Any non-statutory designations, such as Environmentally Sensitive Areas (ESA), Local Biodiversity Sites (LBS), Sites of Interest for Nature Conservation (SINCs), RSPB Important Bird Areas, Scottish Wildlife Trust Reserves (SWTR) or woodland areas included on the Ancient Woodland Inventory (AWI), were identified within a 1 km distance of the Site boundary.
- 6.5.3 Existing records for protected or otherwise notable species (e.g. SBL/LBAP priority species) were identified with a 2 km distance of the centre point of the Site. Only records from the last 10 years were considered relevant to the study.
- 6.5.4 The local biological records centre, North East Scotland Biological Records Centre (NESBReC), was approached for records. Additional (publicly available) data sources consulted included the following online databases:
 - NBN Atlas (NBN, 2024);
 - NatureScot SiteLink (NatureScot, 2022);
 - Scotland's Environment Web (SEPA, 2015); and
 - Ancient Woodland Inventory (Scotland) (NatureScot, 2023).

Site Visit

Extended Habitat Survey

- 6.5.5 An extended UK Habitat Classification survey was carried out of the Study Area (within the Site and a 50 m survey buffer but extended to up to 250 m for areas of potential GWDTEs, access permitting) on the 13th June 2024 and was based on the UK Habitat (UKHab) Classification methodology (UKHab Ltd, 2023). Each of the habitats present within the Study Area was mapped. The surveyor recorded all habitat features (areas, lines and/or points) within the Study Area with each feature assigned a Primary Habitat based on the UK Habitat Key and Secondary Code(s) as appropriate.
- 6.5.6 The survey also recorded incidental evidence of protected or otherwise notable species, as well as habitats or features with the potential to support such species within the Study Area. All other fauna were identified and recorded on an *ad hoc* basis while evidence of breeding birds was undertaken across the Study Area.

Great Crested Newt

Initial screening and Habitat Suitability Assessment

6.5.7 A map-based assessment was undertaken to identify potential waterbodies within 250m of the Site. Each of these was then visited in the field on the 30th April 2024. Fiver water bodies were identified within 250m of the Site and were subject to assessment using the Habitat Suitability Index (Oldham, Keeble, Swan, & Jeffcote, 2000) (ARG UK, 2010), with water turbidity also recorded.

Presence/Likely Absence using environmental DNA (eDNA)

6.5.8 All five waterbodies were subject to presence/likely absence of great crested newts on 30th April 2024 using the eDNA technique following the standard protocol (Biggs, et al., 2014.). This involved the collection of water samples from each waterbody by a licensed surveyor. The samples were then sent to a specialist laboratory (SureScreen Scientifics) for analysis using quantitative Polymerase Chain Reaction (qPCR).

Breeding Birds

Breeding Birds Survey

6.5.9 Breeding bird surveys followed the methodology described by the 2024 Bird Survey Guidelines (Bird Survey and Assessment Steering Group, 2025), which involved the surveyor walking a transect at a slow, ambling pace, ensuring all accessible land within 50m of the transect was covered. Adjacent inaccessible land parcels were surveyed from the field boundary. The direction that the survey transect route was walked was varied between visits to ensure different parts of the Study Area were accessed at different times. Surveyors followed access agreements as per landowners' responses and requirements.

- 6.5.10 Surveys were undertaken in suitable weather conditions, avoiding heavy rain, strong winds (Beaufort force >5) and low visibility (e.g. fog).
- 6.5.11 Surveys were carried out in the field using paper maps and forms. Following the survey, the data was subject to quality assurance, by the surveyor and others in the project team. Survey data was then digitised for analysis and inclusion in this report. All visual and auditory contact with all species was recorded 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 or aggressive encounters between adults, etc.).
- 6.5.12 Bird Survey Guidelines adopt a default position that a minimum of six survey visits should be carried out during the breeding season, unless a robust justification can be made as to why fewer visits are required. In this case, given the scale of the development and that most effects on breeding bird species will be temporary in nature, three visits were deemed to be sufficient between May and July 2024. The three visits were completed during a total of 14.5 survey hours. The dates, times and corresponding weather conditions for each survey are provided in **Technical Appendix 6.3**, **Table A- 1**, **Appendix B**.

Data Analysis

- 6.5.13 The method aims to measure in what way the Study Area is important for avian diversity and which species may be breeding. The results are therefore presented as figures showing all registrations of target species, including behavioural notation, recorded across all visits. The breeding status of target species was determined using the BTO criteria (BTO, Undated) (as detailed in **Table 6.2**).
- 6.5.14 The bird records are presented in **Technical Appendix 6.3**, **Figures 2-5 Appendix A**.

Breeding Status	Evidence criteria
Confirmed breeding	Distraction display or injury feigning.
	 Used nests or eggshells found (occupied or laid within the survey period).
	Recently fledged young or downy young.
	 Adults entering or leaving a nest site in circumstances indicating occupation.
	Nest or an adult sitting on nest.
	Adults carrying food for young or faecal sacs.
	Nest containing eggs.
	Nest with young seen or heard.
Probable breeding	• Pairs observed in suitable nesting habitat in the breeding season.
	• Permanent territory presumed through registration or territorial behaviour (song etc.) on at least two different days, a survey apart, at the same place.

Table 6.2: BTO breeding bird status criteria

Breeding Status	Evidence criteria
	Display and courtship.
	Visiting probable nest site.
	Agitated behaviour or anxiety calls from adults.
	Building nest or excavating nest hole.
Possible breeding	 Species observed in breeding season in possible nesting habitat. Singing male(s) present or breeding calls heard in breeding season.
Non-breeding	 Flying over. Species observed but suspected to be still on migration. Species observed but suspected to be summering non-breeder.

Bats

Ground Level Tree Assessment and Preliminary (bat) Roost Assessment

- 6.5.15 A Ground Level Tree Assessment (GLTA) of trees within the Site and up to a 50 m buffer (where access was permitted) was completed on 12th and 14th August 2024 to assess their suitability for use by roosting bats, using the Bat Conservation Trust (BCT) guidelines (Collins, 2023).
- 6.5.16 A GLTA is a detailed inspection of the tree from the ground level to look for features that bats could use for roosting (Potential Roosting Features (PRFs)). Trees were inspected (using binoculars and torch, where appropriate) searching for features with potential suitability to support roosting bats (e.g. woodpecker holes, rot holes, hazard beams, cankers and knot holes). Additionally, physical evidence of presence was searched for (e.g., droppings, scratch marks, and urine and grease staining).
- 6.5.17 The potential for individual features within a tree to support roosting bats was ranked in accordance with the criteria set out in the Bat (BCT) guidelines (Collins, 2023) as described in **Table 6.3**.

Suitability	Description
None	Either no PRFs were identified, or it is highly unlikely there will be PRFs in the tree.
FAR	Further assessment required to determine the suitability of PRF(s) present (i.e. if PRF(s) cannot be fully inspected from the ground).
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

Table 6.3: Guidelines for categorising the potential suitability of PRFs for a development site for bats (as adapted from Collins, 2023)

6.5.18 The need for further survey work or mitigation was determined following the iterative process outlined in the BCT guidelines (Collins, 2023).

Preliminary Roost Assessment

- 6.5.19 A High Level Preliminary (bat) Roost Assessment (PRA) of buildings was undertaken on 16th August 2024 from adjacent land using binoculars due to no access being permitted at the time of survey. The bridge over Ballindarg Burn was assessed on 8th November 2024.
- 6.5.20 During the PRA, buildings and structures were inspected from ground level searching for features with potential suitability to support roosting bats (e.g. raised slates, gaps under flashing, cracks and crevices in stonework). Additionally, physical evidence of presence was searched for (e.g. scratch marks, urine and grease staining) where access was permitted.
- 6.5.21 The potential for the buildings or structures to support roosting bats was ranked in accordance with the criteria set out in the BCT guidelines as follows:
 - None No habitat features present that are likely to be used by roosting bats at any time of year.
 - Negligible No obvious habitat features present that are likely to be used by roosting bats, however a small element of uncertainty remains as bats can use small, and seemly unsuitable features on occasion.
 - Low A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by large numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
 - Moderate A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat bat unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
 - High A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support a high conservation status roost (e.g. maternity or classic cool/stable hibernation site).

Otter Survey

6.5.22 Ballindarg Burn splits the Site in two in its central area and is fed by the Roundy Burn and two other unnamed ditches to the north. Ballindarg Burn enters the Site in its north-eastern region and eventually feeds into Dean Water to the south (part of the River Tay SAC), which is a main arterial ditch running along the Site's southern boundary. Several other smaller ditches are located throughout the western region of the Site. A survey was undertaken of all watercourses within the Site and within 250m of the Site boundary on 15th, 16th August 2024, 11th October and 8th November 2024 according to when access was permitted. Throughout the survey, overhanging banks, cavities, bankside vegetation and riparian features were searched for the following signs of otter use:

- Resting-up places comprising couches (areas of flattened vegetation) or hovers (lay-up areas, including ledges under rocks or hollows under fallen trees or roots);
- Potential holt sites holes or dens;
- Spraints -used for marking territories, and often located on prominent features within the channel or on the embankment (including bridges, rocks, tree roots, watercourse confluences, etc.);
- Footprints located in soft mud, silt or sand banks;
- Runs and trails pathways from the water into dense cover or around bankside trees;
- Slides present on banks as an entry to waterbodies; and
- Feeding remains e.g. remains of fish and amphibians.
- 6.5.23 It should be noted that features, such as resting-up places, holts, runs, trails or slides, require presence of either a spraint or footprint to confirm use by otter. These features cannot be used in isolation to definitively indicate otter usage.
- 6.5.24 For clarity, natal holts are defined as structures where cubs are born and breeding holts structures where cubs can be moved to after they are born. Both can be subject to buffer zones of up to 200m in relation to NatureScot disturbance licences and development.

Beaver Survey

- 6.5.25 The beaver survey was undertaken in tandem with the otter and water vole surveys and involved a search for evidence of beaver in the riparian zone within the Site and within 50 m upstream and downstream of the Site boundary.
- 6.5.26 Potential evidence of beaver searched for included the following:
 - Teeth marks on trees, felled and gnawed trees, ring barking / bark stripping;
 - Grazed lawns and cut vascular plants;
 - Feeding stations and food caches;
 - Scent mounds, faeces and footprints;
 - Haul outs and foraging trails;
 - Lodges and burrows;
 - Dams; and
 - Canals.
- 6.5.27 It should be noted that any single field sign recorded in isolation, especially when ambiguous (e.g. a burrow or footprints) would not be definitive in confirming presence.

Water Vole Survey

- 6.5.28 The field survey was undertaken in tandem with the otter and beaver survey on the 15th and 16th August 2024 and involved a search for evidence of water voles in the riparian zone and up to 2 m away from the water's edge, within the Site and up to 50 m from the Site boundary.
- 6.5.29 Potential evidence of water vole searched for included the following:
 - Latrines water vole droppings are often concentrated in discrete latrine sites near the burrow, at range boundaries and places where they regularly enter and exit the water;
 - Feeding stations and feeding remains feeding remains in the form of neat piles of chewed lengths of vegetation are often found in runways and at haul-out platforms;
 - Tunnel/burrow entrances these are typically found along the water's edge on top of the bank up to 5 m from the water's edge. Holes on top of the banks often have grazed 'lawns' around them;
 - Paths and runs at the water's edge;
 - Footprints these may be identified in soft mud or silt;
 - Sightings and/or sounds of water voles entering the water; and
 - Droppings while most droppings will be deposited in latrines, some may also be found scattered along runways in vegetation.
- 6.5.30 Specifically for watercourses, the approximate depth and speed of water flow, the waterway width, bankside vegetation and surrounding land use, was also noted, as these factors may determine the suitability of habitat for supporting water voles.
- 6.5.31 It should be noted that any single field sign recorded in isolation, especially when ambiguous (e.g. a burrow or footprints) would not be definitive in confirming presence.

Badger

- 6.5.32 Badger surveys were also carried out in tandem with the above surveys on 15th and 16th August 2024 and field signs including setts, day beds, latrines, evidence of foraging, badger paths, scratching posts, hair and footprints, were actively searched for within the Site and a 50 m buffer (where accessible). The survey was based on the methods described by Scottish Badgers (Scottish Badgers, 2018). The survey included all hedgerows, field boundaries, watercourses, paths and other linear features within the Study Area.
- 6.5.33 Where relevant, on identification of a badger sett, the observer noted the number of entrances, in addition to a description of the activity level and status of the sett where possible. The status of a sett was evaluated and determined, based on descriptions presented in Scottish Badgers Good Practice Guidelines (Scottish Badgers, 2018), which assigns setts into one of four categories:

- Main sett (used throughout the year and constitutes the main breeding sett);
- Annexe sett (forms part of the main sett area, but is not directly linked by an underground passage to the main sett, either due to a barrier (e.g. separated by a watercourse or ditch) or by distance);
- Subsidiary sett (offers an alternative large sett complex to the main sett but is usually although not always at least 50m away and are not always obviously linked by a well-used path); and
- Outlier sett (often comprising just one or two holes and is infrequently used by badgers).
- 6.5.34 Each sett entrance is classified according to its degree of usage:
 - Well-used: are clear of vegetation and debris, sides worn smooth but not necessarily excavated recently;
 - Partially used: not in regular use and have debris in the entrance; and
 - Disused: not in use for some time, are partially blocked and could not be used without considerable effort.
- 6.5.35 It should be noted that the status of a badger sett can change over a relatively short period of time. For example, some badger social groups will move the location of the main sett to other less used setts within their territory in response to external factors, such as disturbance.
- 6.5.36 Anecdotal evidence of presence of other protected mammals including red squirrel and pine marten was also searched for during this survey.

Assessment of Significance

- 6.5.37 The assessment presented within this chapter follows the principles set out in the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2024), with impact significance determined on the basis of the sensitivity of ecological features and the magnitude of change.
- 6.5.38 Starting with establishing the baseline through a mix of desk study and field survey, IEFs are identified and those requiring assessment established through a reasoned process of valuation and consideration of factors, such as statutory requirements, policy objectives for biodiversity, conservation status of the IEF (habitat or species), habitat connectivity and spatial separation from the Proposed Development. From this stage, these features are assessed for impacts with the assumption of this being in the presence of construction industry-standard mitigations and embedded mitigation to ameliorate impacts as far as practicably possible. Additional mitigation strategies can then be determined to minimise any residual impacts that would otherwise be experienced by the IEF and any opportunities for biodiversity gains identified.
- 6.5.39 In summary, the impact assessment process (CIEEM, 2024) involves:
 - Identifying and characterising impacts and their effects;

- Incorporating measures to avoid and mitigate negative effects;
- Assessing the significance of any residual effects after mitigation;
- Identifying the appropriate compensation methods to offset significant residual effects; and,
- Identifying opportunities for ecological enhancement.

Criteria for Assessing Sensitivity of Receptors

- 6.5.40 **Table 6.4**, below, lists the criteria used to determine the sensitivity value of ecological features in a geographical context.
- 6.5.41 The importance of an ecological receptor can be due to a variety of reasons and is defined through legislation and policies. 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.
- 6.5.42 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.
- 6.5.43 The evaluation of ecological features to a national or international importance level is relatively straightforward as guidance for defining these exists; for example, SACs or SSSIs. However, for identifying features at a regional or local level, criteria it is not as easily defined. Where possible, the importance of ecological features identified within the study area, have been defined by the geographical ranges in **Table 6.4**.

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 SAC, 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.	International nature conservation areas: Any SAC; Any SPA; 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.	
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 SSSI or a National Nature Reserve (NNR), this may also include off-site features	National nature conservation areas:	

Table 6.4: Geographical Importance of Ecological Features

Geological Importance	Criteria	Examples	
	on which the qualifying population(s) or habitat(s) are considered, from the best available evidence, to depend.	 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. 	
Regional (North East)	Nature conservation resource, e.g. a nature conservation designation, habitat or species of importance in the context of the region.	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 (SNH, 2012). 	
		A Council-scale important population/area of a species or habitat listed on the Scottish Biodiversity List (SBL) (Scottish Government, 2013) as requiring conservation action.	
		A regional-scale important population / area of a species or habitat listed on the BAP.	
		A regional-scale important population / assemblage of an EPS or species listed on Schedule 5 of the WCA.	
Local (i.e. within 2km of the site)	Nature conservation resource, e.g. a habitat or species of importance in the	A breeding population of a species on the SBL.	
	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	Common and widespread habitats and species of little/no intrinsic nature conservation value.	Common, widespread, agricultural and/or exotic species (such as escapees).	

Ecological Zone of Influence

- 6.5.44 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 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 features, where known;
 - The outline design of the Proposed Development and approach to construction; and
 - Through liaison with other technical specialists involved in the assessment, e.g. hydrologists and noise specialists.

Characterising Ecological Impacts and Effects

- 6.5.45 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.
- 6.5.46 In accordance with the CIEEM guidelines, when determining impacts on IEFs, reference is made to the following:
 - **Beneficial or adverse** i.e. whether the impact has a beneficial or adverse 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.
 - **Timing and frequency** i.e. whether impacts occur during critical life stages or seasons.
 - **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.
- 6.5.47 Both direct and indirect impacts are considered. Direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action but affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. fencing of a development site may cause scrub to invade marshy grassland.

Criteria for Assessing Magnitude of Change

6.5.48 CIEEM guidelines state that impacts should be quantified, if possible, and expressed in absolute or relative terms (e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population). This approach has been followed here, where possible. Magnitude refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population. However, following the language of other chapters in the EIA Report, impact magnitude has also been categorised with reference to the definitions in **Table 6.5**.

Level of Impact	Definition	
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 (Minor)	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 (Moderate)	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 (Major)	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.	
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. 		

Table 6.5: Levels of Impact

• Long term: More than 15 years.

Criteria for Assessing Significance

- 6.5.49 An EcIA is undertaken in relation to the baseline conditions that would be expected to occur in the absence of a Proposed Development (the 'do-nothing' scenario) and, therefore, may include possible predictions of future changes to baseline conditions, such as environmental trends and other completed or planned development. Both adverse and beneficial impacts/effects are possible.
- 6.5.50 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.

- 6.5.51 In accordance with the CIEEM guidelines, 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. the ecological significance of an effect is not dependent on the value of the feature in question. Rather, the value of a feature that will be significantly affected is used to determine the geographical scale at which the effect is significant.
- 6.5.52 In accordance with the current CIEEM guidelines, effects of impacts are assessed on the basis of standard mitigation and good practice measures (as set out above) being in place. Additional mitigation may be identified where it is required to reduce a significant effect.
- 6.5.53 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 legislation, policy and development control in determining the application.
- 6.5.54 Any significant effect remaining post-mitigation (the residual effect), together with
- 6.5.55 In addition to determining the significance of effects on valued ecological features, this chapter also identifies any legal requirements in relation to wildlife.
- 6.5.56 The predicted significance of the effect has been determined through a standard method of assessment based on professional judgement and a combination of sensitivity and magnitude of change.

Limitations to Assessment

Extended UK Habitat Classification Survey

6.5.57 Access was not provided beyond the Site boundary due to different landownerships. A detailed assessment of habitats beyond the Site boundary was therefore not possible and so these areas were viewed where possible using binoculars from field edges. Not all areas could be viewed however yet it is considered that broad habitat types and their potential for protected species have been sufficiently assessed and so this is not considered a significant limitation.

Breeding Bird Surveys

6.5.58 Access was not provided to the 50m buffer area beyond the northern and western Site boundary due to different land ownerships. The buffer area was therefore scanned from a distance by the surveyor using binoculars and it is considered that sufficient baseline information was collected.

Ground Level Tree Assessment / Preliminary Roost Assessment

6.5.59 There was no access to the woodland areas outside of the western Site boundary and to the buildings/trees in the garden in the central area of the Site during the GLTA and PRA surveys to complete a detailed inspection within the 50 m Study Area. However, based on design mitigation, suitable buffers around these features will be maintained and so this is not considered a significant limitation. Where these features may be impacted, further survey requirements are highlighted within the recommendations in Section 5.1.4 of **Confidential Technical Appendix 6.2.**

6.5.60 Potential roost features were assessed from ground level only. Where a feature could not be fully inspected an estimate of roosting suitability was made with recommendation for further survey (e.g. aerial inspection or active season survey) as appropriate. In addition, some trees could not be fully assessed due to the time of year the survey was undertaken and the trees being in leaf, which may have concealed potential roost features. Such trees were assessed as Further Assessment Required. See GLTA Table in **Appendix B** of **Confidential Technical Appendix 6.2** for all trees assessed.

Badger survey

6.5.61 As the badger survey was undertaken in August, the height of vegetation may have concealed setts, particularly in the western woodlands where access was not permitted and dense vegetation was present. Design mitigation has ensured a suitable buffer will be maintained around this woodland and so this is not considered a significant limitation.

Water vole survey

6.5.62 Rain prior to and during the water vole surveys meant many of the smaller ditches were quite full, concealing ledges / areas above the water where water vole droppings and latrines are often found. However, the Ballindarg Burn, which is the main watercourse (heavily aligned towards more of a linear ditch for agricultural purposes) within the Study Area and a tributary of Dean Water, was considered the most optimal water vole habitat within the Site and no signs were found despite many ledges still being exposed. This was considered sufficient to confirm likely absence of water voles within a potential zone of influence of the Proposed Development.

Red squirrel and Pine marten

6.5.63 Access was not permitted to the western woodlands during the badger survey; this area is considered suitable squirrel and pine marten habitat and a full assessment has not been possible. As a precaution, red squirrel and pine marten are confirmed as present within this woodland immediately west of the Site. Design mitigation has ensured a buffer will be maintained around this woodland and pre-construction surveys will be completed prior to commencement of works to inform any requirements for mitigation and licencing so this is not considered a significant limitation.

6.6 Baseline Conditions

6.6.1 This section details the results of the desk study and field surveys conducted across the site and respective study areas, which provides the baseline conditions from which the impact assessment is based.

Desk Study

Nature Conservation Designations

- 6.6.2 International statutory nature conservation designations within 5 km (and extended to 20 km for SPAs or Ramsars designated for Geese), statutory designations within 2 km and non-statutory designations within 1 km of the Site are shown in Figures
 6.2a and 6.2b and described in Table 6.6.
- 6.6.3 River Tay SAC was identified within 2 km and three SPAs and Ramsars whose qualifying interests include geese species were identified within 20 km of the Site boundary as detailed in **Table 6.6** below and shown on **Figures 6.2a** and **6.2b**. One non-statutory designation was identified within 2 km of the Site, Captain's Pond LNCS, as detailed in **Table 6.6** below and shown on **Figure 6.2a**.

Name	Designation	Distance and Direction from Site	Designated Features (of relevance to the Site)
Statutory Desi	gnations		
River Tay	SAC	0.18 km S	 Qualifying Interests for which the site is designated: Lampetra fluviatilis River lamprey Lampetra planeri Brook lamprey Lutra lutra Otter Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea- Clearwater lakes or lochs with aquatic vegetation and poor to moderate nutrient levels Petromyzon marinus Sea lamprey Salmo salar Atlantic salmon
River South Esk	SAC	3.94 km NE	 River South Esk SAC is designated for the following features: Atlantic salmon Salmo salar Freshwater pearl mussel Margaritifera margaritifera
Loch of Kinnordy	SPA	5.2 km NW	Loch of Kinnordy SPA qualifies under Article 4.2 by regularly supporting populations of European importance of the migratory species: greylag

 Table 6.6: Nature Conservation Designations

			goose Anser anser (1986/87 to 1990/91 average winter peak count of 910 individuals, 1% of the Iceland/UK/Ireland biogeographic population) and pink-footed goose Anser brachyrhynchus (1986/87 to 1990/91 average winter peak count of 3,960 individuals, 3% of the Eastern Greenland/Iceland/UK biogeographic population).
Loch of Kinnordy	Ramsar	5.2 km NW	 Loch of Kinnordy Ramsar site also qualifies under Ramsar Criterion 6 by regularly supporting 1% or more of the individuals in a population of waterbirds: Greylag goose (1986/87 to 1990/91, average winter peak count of 910 individuals, 1% of the Iceland/UK/Ireland biogeographic population); and Pink-footed goose (1986/87 to 1990/91, average winter peak count of 3,960 individuals, 3% of the Eastern Greenland/Iceland/UK biogeographic population).
Loch of Lintrathen	SPA	11.80 km NW	Loch of Lintrathen SPA qualifies under Article 4.2 by regularly supporting, in winter, internationally important numbers of the Icelandic population of greylag geese <i>Anser Anser</i> . In the five-winter period 1985/86 to 1989/90 an average peak of 2,100 birds was recorded, representing 2% of the total population, all of which winters in Britain. Loch of Lintrathen is also of importance for its assemblage of wintering birds typical of open water and associated wetlands. These include: whooper swan <i>Cygnus cygnus</i> (an Annex I species), wigeon <i>Anas penelope</i> , teal <i>Anas crecca</i> , mallard <i>Anas platyrhynchos</i> , and goosander <i>Mergus merganser</i> .
Loch of Lintrathen	Ramsar	11.80 km NW	 Loch of Lintrathen Ramsar site qualifies under Ramsar Criterion 6 by regularly supporting 1% or more of the individuals in a population of waterbirds: Greylag goose (1985/86 to 1989/90, winter peak mean of 2,100 individuals, 2% of the Iceland/UK/Ireland biogeographic population).
Firth of Tay and Eden Estuary	SPA	19.22 km S	The Firth of Tay and Eden Estuary SPA qualifies under Article 4.2 by regularly supporting populations of European importance of the migratory species: 1% of the Eastern Atlantic biogeographic population); greylag goose <i>Anser</i> <i>anser</i> (1990/91 to 1994/95 a winter peak mean of 1,200 individuals, 1% of the Iceland/UK/Ireland biogeographic population) and pink-footed goose <i>Anser brachyrhynchus</i> (1990/91 to 1994/95 a



			winter peak mean of 2,800 individuals, 1% of the Eastern Greenland/Iceland/UK biogeographic population).
			The Firth of Tay and Eden Estuary SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. During the period 1990/91 to 1994/95 a winter peak mean of 48,000 individual waterfowl was recorded, comprising 28,000 wildfowl and 20,000 waders, including nationally important populations of the following species: greylag goose (1,200 individuals, 1% of the GB population).
Firth of Tay and Eden Estuary	Ramsar	19.22 km S	 Firth of Tay and Eden Estuary Ramsar site qualifies under Ramsar Criterion 2 by supporting: Marsh harrier (1992 to 1996, an average of 4 females, 3% of the GB population), and Little tern (1993 to1997, an average of 25 pairs, 1% of the GB population).
			Firth of Tay and Eden Estuary Ramsar site further qualifies under Ramsar Criterion 5 by regularly supporting waterbirds in numbers of 20,000 individuals or more. In the period 1990/91 to 1994/95 a winter peak mean of 48,000 individual waterbirds was recorded, comprising 28,000 wildfowl and 20,000 waders.
			 Firth of Tay and Eden Estuary Ramsar site qualifies under Ramsar Criterion 2 by supporting: Marsh harrier (1992 to 1996, an average of 4 females, 3% of the GB population), and Little tern (1993 to1997, an average of 25 pairs, 1% of the GB population).
			Firth of Tay and Eden Estuary Ramsar site further qualifies under Ramsar Criterion 5 by regularly supporting waterbirds in numbers of 20,000 individuals or more. In the period 1990/91 to 1994/95 a winter peak mean of 48,000 individual waterbirds was recorded, comprising 28,000 wildfowl and 20,000 waders.
			The Site also qualifies under Ramsar Criterion 4 by supporting the following waterbird species at a critical stage in their life cycles:
			• Velvet scoter (730 individuals, 24% of the GB population).
			Cormorant (230 individuals, 2% of the GB population).
			• Shelduck (1,200 individuals, 2% of the GB population).

			• Eider (13,800 individuals, 18% of the GB population).
			• Common scoter (3,100 individuals, 9% of the GB population).
			• Black-tailed godwit (150 individuals, 2% of the GB population).
			• Goldeneye (230 individuals, 1% of the GB population).
			• Red-breasted merganser (470 individuals, 5% of the GB population).
			• Goosander (220 individuals, 2% of the GB population).
			• Oystercatcher (5,100 individuals, 1% of the GB population).
			• Grey plover (920 individuals, 2% of the GB population).
			• Sanderling (220 individuals, 1% of the GB population).
			• Dunlin (5,200 individuals, 1% of the GB population), and
			 Long-tailed duck (560 individuals, 2% of the GB population).
			Bar-tailed godwit, redshank, greylag goose and pink-footed goose, are also components of the waterbird assemblage.
			Firth of Tay and Eden Estuary Ramsar site also qualifies under Ramsar Criterion 6 by regularly supporting 1% or more of the individuals in a population of waterbirds (1990/91 to 1994/95):
			Bar-tailed godwit (a winter peak mean of 2,400 individuals, 2% of the Western European biogeographic population).
			 Redshank (a winter peak mean of 1,800 individuals, 1% of the Eastern Atlantic biogeographic population).
			 Greylag goose (a winter peak mean of 1,200 individuals, 1% of the Iceland/UK/Ireland biogeographic population), and
			 Pink-footed goose (a winter peak mean of 2,800 individuals, 1% of the Eastern Greenland/Iceland/UK biogeographic population.
Firth of Tay and Eden Estuary	SAC	19.22 km S	 The Firth of Tay and Eden Estuary SAC is designated for the following features: Estuaries Intertidal mudflats and sandbanks

			Phoca vitulina Common seal			
Non-Statutory	Non-Statutory Designations					
Captain's Pond	LNCS and Local Wildlife Site	Borders the western boundary of the Site	 Captain's Pond LNCS and Local Wildlife Site is designated for the following habitats: Basin bog; Semi-natural broadleaved woodland; Open water; Swamp; Marshy grassland; and Unimproved acid grassland. 			

6.6.4 As shown on **Figure 6.2a** and detailed below in **Table 6.7** below, 11 areas of ancient woodland were identified within 2 km of the Site boundary.

Name	Site Location	Size (ha)	Type
North Warren Plantation	Borders western Site boundary	26.92	Long- Established (of plantation origin)
Berrymoss Wood	20.68 m S	1.45	Long- Established (of plantation origin)
East Plantation/Lera Wood	1.42 km S	220.43	Long- Established (of plantation origin)
Unnamed	1.39 km S	2.16	Long- Established (of plantation origin)
Unnamed	1.69 km SE	3.42	Long- Established (of plantation origin)
Bents Wood	0.13 km SW	11.54	Long- Established (of plantation origin)
Warren Woods	1.15 km SW	32.11	Long- Established (of plantation origin)
Unnamed	0.71 km SW	8.17	Long- Established (of

Table 6.7: Ancient Woodland

Name	Site Location	Size (ha)	Туре
			plantation origin)
Bents Wood	0.33 km S	0.67	Long- Established (of plantation origin)
Bents Wood	0.78 km SW	0.81	Long- Established (of plantation origin)
Logie Woods	1.31 km NW	20.76	Long- Established (of plantation origin)

Protected Species and Notable Species

6.6.5 Data obtained from NBN Atlas (NBN, 2024) and NESBReC included records of three protected or otherwise notable species within 2 km of the Site boundary (see **Table 6.8**).

Common Name	Scientific Name	Legal/Conservation Status	Description
Mammals			
European otter	Lutra lutra	EPS under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)	1 record from 2024 located approximately 0.4 km north of the Site.
Red squirrel	Sciurus vulgaris	Protected under the Wildlife and Countryside Act 1981 (as amended). SBL: Priority species – conservation action needed; avoid negative impacts.	67 records of red squirrel were identified within 2 km of the Site boundary. The most recent was 1.94 km east of the Site boundary, recorded in 2023.
Beaver	Castor fiber	EPS under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)	417 records of beaver were identified within 2 km of the Site boundary.

Table 6.8: Protected or Otherwise Notable Species

Birds

6.6.6 The desk study returned five records of bird species within 2 km of the Site within the last ten years. Of these, none are Schedule 1 species, two are BoCC 'Red' listed, three are BoCC 'Amber' listed, and two are listed on the SBL; see **Table 6.9** below. The full list is provided in **Appendix G** of **Technical Appendix 6.1**.

Common Name	Scientific name	Schedule 1	Conservation needed	Avoid negative impacts	Watching brief only	BoCC5	LBAP
Black- headed gull	Chroicocephalus ridibundus		Х	х		Amber	
Dipper	Cinclus cinclus					Amber	
Dunnock	Prunella modularis					Amber	
Greenfinch	Chloris chloris					Red	
Herring gull	Larus argentatus		Х	Х		Red	

Table 6.9: Notable Bird Species Identified within 2 km of the Site Boundary

Invasive Non-native Species

6.6.7 Himalayan balsam has been recorded within 2 km of the Site (NBN, 2024).

Field Surveys

UK Habitat Classification

6.6.8 The UKHab results areas and habitat descriptions are detailed in the following sections, with areas provided in **Table 6.10** below.

Table 6.10: Habitats Recorded on Site and Within Study Area

Habitat Type	Baseline within Study Area (Ha)	% of Stud y Area	Baseli ne on Site (Ha)	% of Site
Arable and horticulture (c1)	1.63	1.59	1.58	1.93
Other cereal crops (c1c7)	65.04	55.83	48.84	57.86
Non-cereal crops (c1d)	35.52	26.72	29.11	32.35
Purple moor grass and rush pastures (f2b)	0.40	0.13	4.54	0.00
Other neutral grassland (g3c)	8.83	7.42	4.54	5.07
Holcus-Juncus neutral grassland (g3c8)	0.32	0.32	0.00	0.00
Modified grassland (g4)	2.72	2.73	1.29	1.58
Suburban mosaic of developed and natural surface (u1d)	1.03	0.99	0.09	0.11
Other broadleaved woodland (w1g)	3.41	1.70	0.32	0.39
Other woodland- mixed (w1h)	0.98	1.16	0.57	0.70
Other Scot's pine woodland (w2b)	1.65	1.41	0.00	0.00
TOTAL	121.51	100.0 0	90.87	100.0 0

Habitat Type	Baseline within Study Area (Ha)	% of Stud y Area	Baseli ne on Site (Ha)	% of Site
Linear features	Baseline within Study Area (m)	-	Baselin e within Study Area (m)	-
Other native hedgerow (h2a6)	134.76	-	0.00	-
Other standing water (r1g)	2519.09	-	1116.9 9	-
Other rivers and streams (r2b)	445.00	-	367.00	-
Built linear features (u1e)	2177.07	-	1421.9 7	-
Other broadleaved woodland (w1g)	1368.41	-	1268.0 3	-

Arable and horticulture (c1) / Other cereal crops (c1c7) / Non-cereal crops (c1d)

6.6.9 The majority of the Site is in active arable production, which at the time of the survey comprised oilseed rape, barley and potatoes. Some fallow, weedy patches were mapped as the Level 3 category 'Arable and horticulture'. These had cut cereal stalks spread on the ground and vegetation comprised frequent broad-leaved dock, occasional creeping buttercup and cleavers (**Technical Appendix 6.1**, TN11).

Other woodland; mixed (w1h)

6.6.10 Mixed semi-natural woodland (w1h 29) lies to the west of the Site along the Site boundary. This woodland is listed on the AWI as semi-natural (of plantation origin) and now has some semi-natural characteristics. The woodland is quite wet in places with reed canary grass. The trees range from young to mature and species include frequent Scots pine, silver birch, goat willow, with frequent elder, and red elder (non-native), European larch being rare. Ground flora comprises Yorkshire fog, common male fern, cock's-foot, false oat-grass, common nettle, cleavers, raspberry, broad buckler fern, reed canary grass, red fescue, rough meadow grass, lesser stitchwort, germander speedwell, broom, and heath bedstraw.

Other woodland – mixed – mainly broadleaved w1h5

6.6.11 A stand of mature sessile oak, beech and Scots pine lies just south of the access track towards the centre of the Site. Trees here are over 1m in diameter (at breast height). No regeneration is present and the ground flora comprises grassland with abundant cock's-foot, frequent creeping soft-grass, occasional false oat-grass, common nettle, cleavers and common hogweed.

Purple moor-grass and rush pastures (f2b)

6.6.12 One area recorded as this habitat was present outside the south-western Site boundary (**Technical Appendix 6.1**, TN6). This wetland habitat did not closely match any UKHab categories, and f2b was chosen as 'best fit'. The habitat did not closely match any NVC community but the best fit would be modified M6c or the non-NVC vegetation *Juncus effusus* acid grassland (Averis & Averis, 2020). The vegetation appeared to be on peat/ peaty soil and included abundant wavy hair-grass, tormentil, heath bedstraw and *Polytrichum commune*; frequent rough meadow-grass, soft-rush and common sorrel; occasional tufted hair-grass, Yorkshire-fog and marsh violet; rare purple moor-grass, heath wood-rush, heather, devil's-bit scabious and Sphagnum fallax. The habitat was separated from the Site by ditches and a low embankment with a track/footpath.

Other neutral grassland (g3c) / Holcus-Juncus neutral grassland (g3c8)

6.6.13 Twelve areas of g3c were recorded, comprising strips of vegetation bordering ditches, streams and tracks (**Technical Appendix 6.1**, TN3, 8, 19) as well as some uncropped areas of arable fields (**Technical Appendix 6.1**, TN18). These areas typically had frequent or abundant cock's-foot, Yorkshire-fog and false oat-grass. One area of g3c8 was recorded outside the northern Site boundary, consisting of grassland with soft-rush on former clearfell.

Modified grassland (g4)

6.6.14 Two areas of modified grassland were recorded. One comprised an uncropped area of previously cultivated land in the northern part of the Site (Technical Appendix 6.1, TN12). The vegetation comprised abundant Yorkshire-fog and creeping buttercup with occasional rough meadow-grass, soft-rush, creeping thistle, field forget-me-not and common hemp-nettle. The second area was outside the Site boundary, across the ditch from the first area, and comprised grassland with scattered scrub and trees on former clearfell.

Other native hedgerow (h2a6)

6.6.15 One short stretch of defunct hedgerow was recorded along the existing road/track (**Technical Appendix 6.1**, TN17). This was unmanaged and had become a line of outgrown hawthorns with occasional elder and goat willow.

Other standing water (r1g)

6.6.16 This habitat consisted of the network of drainage ditches across the Site (**Technical Appendix 6.1**, TN3, TN8). The ditches were sometimes unvegetated but sometimes supported reed canary grass, floating sweet grass, lesser reedmace, water forget-me-not, water plantain and branched bur-reed. The ditches were bounded by un-cropped strips of neutral grassland, typically including abundant Yorkshire-fog and frequent reed canary grass.

Other rivers and streams (r2b)

6.6.17 One named watercourse (Ballindarg Burn) was recorded on the Site (**Technical Appendix 6.1**, TN19). The burn was approximately 3 m in width, <0.5 m in depth and had a silty substrate and muddy, vegetated banks. The burn was modified and in a man-made ditch. It was bounded by a strip of neutral grassland of the same habitat as the ditches on the Site. The burn flows into Dean Water, which is a tributary/channel of the River Tay SAC.

Suburban mosaic of developed and natural surface (u1d)

6.6.18 This habitat comprised the farmsteading, consisting of a private residential house and garden, agricultural buildings, farmyard and adjacent sparsely vegetated land. The private garden, including a band of young to mature sycamore, beech and horse chestnut trees, lies adjacent to the track.

Built linear features (u1e)

6.6.19 A dry-stone wall (**Technical Appendix 6.1**, TN4) was present at the western Site boundary, between the cropped field and the plantation. A road/track ran partly outside the Site boundary and partly within it, leading to the farmstead.

Lines of trees (w1g, 33, 34)

6.6.20 Four lines of trees were recorded, comprising three (33) windbreak lines of hybrid poplar (with occasional sycamore and ash) (**Technical Appendix 6.1**, TN21) as well as an intermittent ecologically valuable line of trees (34) along the north-eastern track/road including immature, semi-mature and mature pedunculate oak, possibly hybrid oaks, sycamore and beech (including copper beech) (**Technical Appendix 6.1**, TN22).

Other broadleaved woodland (w1g)

6.6.21 Four parcels of this habitat were recorded, all outside the Site boundary. These comprised a plantation of silver birch outside the north-west corner of the Site; a stand of downy birch woodland outside the south-west of the Site (**Technical Appendix 6.1**, TN7); a plantation of young silver birch outside the northern Site boundary (**Technical Appendix 6.1**, TN13); a plantation of silver birch, an alien birch species, ash, hawthorn and European larch on former clearfell outside the northern Site boundary (**Technical Appendix 6.1**, TN13);

Other Scots pine woodland (w2b)

6.6.22 One area of Scots pine plantation (**Technical Appendix 6.1**, TN5) was present outside the western Site boundary. The habitat included the non-native species red elder as well as the invasive non-native species *Rhododendron ponticum*.

Potential GWDTEs

- 6.6.23 Three areas of potential GWDTEs have been identified within the Study Area and are mapped on **Figure 6.3**. All three of these areas are located immediately outside the Site boundary. It is considered that all three of these areas are highly unlikely to be groundwater fed due to poor fit of species with any NVC vegetative community, as well as the presence of a long-established drainage ditch network and known regular episodes of localised flooding from nearby water courses, which is considered to be the likely cause of wetter ground conditions. Invasive Plant Species
- 6.6.24 No invasive plant species were recorded on the Site itself, however *Rhododendron ponticum* was recorded in the woodland to the west of the Site.

Protected Species

Bats

Foraging and Commuting Habitat

6.6.25 Due to the arable nature of the majority of the Site, it is largely exposed and an intensively managed habitat and as a result, there is limited foraging habitat within the Site boundary. However, the mature tree-lined track which runs adjacent to and occasionally within the Site from east to north-west, provides good links for commuting bats to features within the Site that may be used by foraging bats. These include a small, wooded copse, mature tree lines and hedgerow and sections of watercourses with roughly vegetated margins. This in turn, provides links to more suitable foraging areas adjacent to the Sites' boundaries such as the scattered trees to the north, the woodlands to the west and Dean Water to the south. Linear and wooded habitats within the Site or along site boundaries were assessed as being of **Moderate** suitability for foraging and commuting bats and the arable land which represents the majority of the Site assessed as **Low** suitability.

Roosting Habitat - Trees

- 6.6.26 The GLTA identified fifty trees within the 50 m Study Area with features suitable for use by roosting bats (see **Appendix B**-GLTA Table and **Figure 2** in **Confidential Technical Appendix 6.2**).
- 6.6.27 Of the fifty trees, twenty-seven were within the Site boundary, twenty-five of which were in a small copse in the central area of the Site (**Confidential Technical Appendix 6.2**, Trees 27-50 and Tree 19 adjacent to the copse) and two trees (**Confidential Technical Appendix 6.2**, 22 and 23) beside the track which passes across the western region of the Site. The remainder of the trees were along the same access track adjacent to the Site boundary in the east of the Study Area. Of the trees within the Site boundary, the trees in the copse had eleven trees assessed as PRF-M, thirteen assessed as PRF-I and some of these trees also requiring further assessment due to foliage obscuring the view of the track in the western



region of the Site were assessed as PRF-I. The remaining twenty-three trees all lie close to the Site boundary along the aforementioned track (**Confidential Technical Appendix 6.2**, Trees 1-18, 20-21 and 24-26). Of these, ten were assessed as PRF-I, seven as PRF-M and six as further assessment required.

Roosting Habitat – Buildings and Structures

- 6.6.28 See Table C1 in Appendix C and Figure 2 in Confidential Technical Appendix6.2, for buildings and structures with bat roosting potential within the study area.
- 6.6.29 There are no buildings within the Site. There is a complex of farm buildings and a farmhouse adjacent to the Site boundary and a bungalow approximately 100 m south of the Site boundary, both in the central region of the Study Area (PRA1, **Confidential Technical Appendix 6.2**, Table C1 in Appendix C). These were assessed as between Low to Moderate bat roost suitability. It should be noted a detailed inspection of these properties was not undertaken as access was not permitted and the assessment was undertaken from adjacent areas within the Site with binoculars. The bridge over Ballindarg Burn is within the Site and had a number of potential roost features including gaps from missing pointing on its southern aspect (PRA2, **Confidential Technical Appendix 6.2**, Table 1 in Appendix C) and was assessed as Low bat roost suitability.

Otter

Field survey

- 6.6.30 Target notes discussed in this section are detailed in full in the Target Note Table C2, in **Confidential Technical Appendix 6.2**, Appendix C.
- 6.6.31 The larger burns and drainage ditches provide otters with potential resting sites, foraging and commuting habitat and the smaller ditches are considered to offer suitable commuting habitat at best. Incidental evidence of otter was recorded including a spraint beneath the stone bridge on Ballindarg Burn within the Site (OTT4) and further upstream on a concrete culvert (OTT5) within the 250m otter survey buffer. Three potential holts were noted in beaver burrows along the watercourses within the 250m buffer. These included a large beaver burrow with otter footprints at the entrance (OTT1); a very large waterside burrow with several mammal footprints within (OTT2) upstream of OTT1; and another potential beaver burrow which now could be being used as an otter holt due to the presence of spraints at the entrance (OTT3). In addition, a trail of dry vegetation was noted within the tunnel, reminiscent of badger bedding although this could be old beaver foragings or bedding which is indicative of breeding otters. The full extent of these burrows could not be seen and appeared to go further up into the bank. A final potential holt was noted on the north bank of one of the watercourses and was a small burrow at the bottom of the bank at the water's edge/reedbed (OTT6). The feature was small and looked disused but was on a trodden pathway across the reeds and linked to a pathway on the southern bank where fresh and recent spraint were noted on top of grass tussock.

Camera monitoring

- 6.6.32 Camera monitoring of OTT1 OTT3 was undertaken between 8th November 6th December 2024 (4 weeks duration) due to otter footprints noted at OTT1, indistinct/unconfirmed mammal footprints at OTT2 and spraint and potential bedding. OTT6 was not subject to camera monitoring as it appeared to be disused and at a distance of 250m from the Site boundary was considered a suitable distance from the works with NatureScot advice requiring a 200m buffer for breeding holts.
- 6.6.33 OTT1 was confirmed as a non-breeding holt with three, brief, entries/exits into the holt by a single adult otter in the first two-weeks of monitoring and nothing in the latter two-weeks. These results show an otter is visiting the feature and could be used further at some point in the future.
- 6.6.34 OTT2 was confirmed as an active beaver burrow and therefore no longer classed as a potential holt (See BV8 in **Section 6.6.41** below). No otters were seen on any of the footage during the monitoring period.
- 6.6.35 OTT3 was confirmed an otter breeding holt with a bitch and two cubs (both around ¾ her size) seen briefly entering/exiting the holt on one occasion during the monitoring period. A single adult otter (likely the same bitch) was seen on a further four occasions briefly entering/exiting the holt and sprainting at the entrance on one of the occasions.

Water vole

6.6.36 Habitat considered to be optimal for water vole was noted on Ballindarg Burn within the water vole Study Area. This watercourse had steep earth banks suitable for burrowing; suitable margins of dense vegetation for food and cover; and a good water depth with a slow flow and with a sandy/silty substrate. Drainage ditches in the northern and western area of the Site were also considered suitable habitat although some were drying in parts and/or choked with vegetation and the southwestern ditch was shaded. Ditches elsewhere were dry/drying out with a lack of cover and considered sub-optimal. No evidence of water vole was found along any of the watercourses surveyed within the Study Area.

Beaver

Field Survey

- 6.6.37 Target notes discussed in this section are detailed in Table C3 in **Confidential Technical Appendix 6.2**, Appendix C.
- 6.6.38 Beavers were found to be active along the Ballindarg Burn during the otter survey although no active field sign was found within the 50 m beaver Study Area. A simple beaver burrow was found on Ballindarg Burn within the beaver Study Area but had vegetation growing in the entrance, was approximately 1.5 m in length and could be fully inspected and considered disused (BV1).

- 6.6.39 Outwith the 50 m Study Area, a possible chambered burrow, to which the extent of the feature could not be fully viewed, was located on Ballindarg Burn (BV7). The burrow did not appear to be active, with no fresh trails leading to it, or additional beaver field sign. The remaining burrows found are as described under (OTT1-3) and potentially associated with otter use. The most recent beaver field signs were found south of the bridge on Ballindarg Burn and included freshly foraged wheat lying in the channel coupled with a pathway into the adjacent crop (BV6), fresh pathways out of the water with tail drag (BV5) and gnawed wood (BV4). With the exception of the burrows mentioned above, all beaver signs found north of the bridge over Ballindarg Burn were old. These included gnawed wood at BV3 and also at BV2 which may have also been an old lodge due to a pile of large old stumps being found, overgrown with vegetation and next to a now dry channel. No lodges or dams were found throughout the beaver or otter Study Areas with fresh field sign being confined to the area south of the bridge described above which shortly connects to Dean Water, a large ditch considered optimal beaver habitat. Several likely beaver pathways were noted on Dean Water and a single, disused simple burrow during the otter survey.
- 6.6.40 It is pertinent to note two NatureScot beaver traps were found at the side of a field within the eastern Site boundary and also chicken wire noted wrapped around the base of a tree within the western otter Study Area so the Site has been subject to beaver mitigation in the past. Evidence of fresh sign south of the bridge may suggest beavers are re-colonising the Site and surrounding area so worth noting the above, despite no fresh signs being noted within the 50 m beaver Study Area.

Camera Monitoring

6.6.41 Camera monitoring of OTT1 – OTT3 in relation to otters was undertaken between 8th November – 6th December 2024 (4 weeks duration) and confirmed OTT2 as an active beaver burrow (now BV8). Several beaver passes were observed on the footage during the latter two weeks of monitoring, also a beaver feeding outside the burrow was noted and one entry into the burrow taking food in.

Badger

- 6.6.42 Target notes discussed in this section are detailed in Table C4 in **Confidential Technical Appendix 6.2**, Appendix C.
- 6.6.43 One latrine with fresh deposits was found during the badger survey (B2) in the western area of the Site. No further badger setts or field sign were found within the Site or within the 50m badger Study Area where access was permitted. A two-entrance, active sett was found during the otter survey on 11th October 2024 in the woodland to the north-west of the Site but was approximately 200 m from the Site boundary (B1).

Red squirrel

6.6.44 No evidence of squirrel was noted within the Site. The main area of suitable drey habitat was noted in the small copse in the central area of the Site, although the copse is isolated and considered sub-optimal. Suitable habitat was noted within the western woodlands although access was not permitted at the time of survey. A high-level assessment of these woodlands was undertaken with binoculars from the Site and no dreys were noted but the area is complex and cluttered and the desk study has returned numerous records of this species within this area. It is concluded that red squirrel are therefore likely present within the woodlands to the west of the Site.

Pine Marten

6.6.45 No evidence of pine marten was noted within the Site. The main area of suitable den habitat was noted in the small copse in the central area of the Site, although the copse is isolated and considered sub-optimal. Suitable habitat was noted within the western woodlands although access was not permitted at the time of survey. A high-level assessment of these woodlands was undertaken with binoculars from the Site and no evidence of pine marten was noted but the area is complex and cluttered. The desk study did not return records of this species within this area however based on the suitability of the woodlands to the west of the Site, there is potential for pine marten to be present here.

Fish

6.6.46 A fish habitat survey has not been completed for the Site, however suitable habitat for fish species does exist within burns present, including the Ballindarg Burn that runs through the central area of the Site. With direct connectivity of the Ballindarg Burn to the Dean Water (part of the River Tay SAC) to the south, it is highly likely that fish populations present within the Dean Water and wider SAC may inhabit the Ballindarg Burn and other channels that are connected across the Site. The River Tay SAC supports river lamprey, brook lamprey, Atlantic salmon, sea lamprey and other species are likely present within the Dean Water and therefore presence within the Ballindarg Burn and connected ditches is also presumed.

Amphibians

6.6.47 A great crested newt survey of five water bodies within 250 m of the Site confirmed the likely absence of great crested newt from these water bodies, and so this species is considered likely absent from the Site and Study Area. No dedicated survey was completed for other amphibian species, though it is considered the aforementioned waterbodies may support common species of amphibian, which may use adjacent woodland and grassland adjacent to ditch habitats during their terrestrial phase. The majority of habitats on Site including the arable fields and modified grassland are unlikely to support amphibian species.

Reptiles

6.6.48 No dedicated survey was completed for reptiles, and limited habitat for reptiles exists on Site with the arable fields and modified grassland being sub-optimal. The adjacent woodland and ditch habitats with strips of grassland, may however support reptile species and so their presence in these habitats is presumed.

Breeding Birds

Breeding bird surveys

6.6.49 A total of 44 species were recorded during the Breeding Bird Survey in 2024. A full list of all species recorded during the three survey visits can be found in **Technical Appendix 6.3**, Table A- 2, Appendix C, and survey registrations are illustrated in Figures 2-5. The assigned breeding status for non-priority species is listed in **Technical Appendix 6.3**, Table A-2, Appendix C.

Target species

6.6.50 The following target species (i.e. either Annex I, Schedule 1, Red or Amber BoCC and SBL) were recorded within the Study Area. Specific details of registrations made during survey visits are listed in **Technical Appendix 6.3**, Table 3 3, alongside a summary of when the species was recorded and the number of individual registrations.

Summary of Breeding Status

- 6.6.51 Breeding was confirmed for six target species: dunnock (family), lapwing (adults with chicks), oystercatcher (adult with chick), tree sparrow (family), whitethroat (family) and yellowhammer (family).
- 6.6.52 **Table 6.11** summarises the observations for each target species, their distribution and abundance within the Study Area, and their assigned breeding status. Figures 2-5 in **Technical Appendix 6.3** illustrate all registrations from all visits for each target species.

Target Species	Conservation status	Summary of observations	Breeding status
Black-headed gull	Amber, SBL	One record of 10 birds foraging within a field in the east of the Study Area on 8 July.	Non- breeding
Bullfinch	Amber	A male and female recorded near broadleaved woodland in the west of the Study Area on 8 July.	Probable
Curlew	Red, SBL	One record of a singing bird on 23 May and a bird calling from the same location on 4 th June, denoting one probable territory.	Probable
Dunnock	Amber	A family was recorded on 8 July, in the west of the Study Area.	Confirmed

Table 6.11:Summary of target species observations, conservation status in Scotland and breeding status within Study Area

Target Species	Conservation status	Summary of observations	Breeding status
Greylag goose	Amber	A pair observed in the north-west of the Study Area on 23 May, however suitable nesting habitat is not present on site.	Non- breeding
Grey partridge	Red, SBL	One pair recorded in suitable habitat on 23 May.	Probable
Herring gull	Red, SBL	Multiple records of birds foraging on and flying over the Study Area. No evidence of breeding recorded.	Non- breeding
House sparrow	Red, SBL	One calling bird observed in suitable habitat on 8 th July, in the west of the site.	Possible
Lapwing	Red, SBL	Multiple records of pairs and birds alarming on site through the three survey visits. Four alarm calling adults with chicks were recorded during the 2 nd survey visit on 4 th June, denoting four confirmed territories.	Confirmed
Lesser redpoll	Red, SBL	One bird was recorded calling in the north-west of the Study Area on 8 July. Hedgerows, young woodland and gardens are present nearby.	Possible
Linnet	Red, SBL	A pair of birds and six additional birds were observed in suitable habitat on the third survey visit on 8 July. Four birds were also observed in suitable habitat on the second survey visit on 4 June.	Probable
Mistle thrush	Red	One observation of two flying birds on 8 July and one foraging bird on 23 May. Woodland suitable for breeding is present on site nearby.	Possible
Oystercatcher	Amber	One confirmed territory was recorded, with an adult observed with young, and one further probable territory was observed, with a pair alarm calling.	Confirmed
Red kite	Ann. I, Sch. 1 (1A)*, SBL	One observation of a flying bird on 8 July and one bird taking off on 23 May near suitable nesting habitat (patch of woodland)	Possible
Reed bunting	Amber, SBL	Record of a singing male at the same location on both the first and second survey visit.	Probable
Rook	Amber	91 observations of foraging and flying birds during the three survey visits. No evidence of breeding recorded.	Non- breeding
Sedge warbler	Amber	12 observations across the Study Area with multiple territories.	Probable
Siskin	SBL	One observation of a calling bird in an area of mixed woodland.	Possible
Skylark	Red, SBL	70 observations of singing and calling birds during all survey visits, with numerous territories recorded.	Probable
Starling	Red, SBL	Four observations during all survey visits, in the east of the Study Area, including 2 birds near farm buildings.	Possible
Stock dove	Amber	Three observations during the first and second survey visit, including one singing bird.	Possible

Target Species	Conservation status	Summary of observations	Breeding status
Swift	Red, SBL	Three observations of flying birds on 8 July.	Non- breeding
Tree sparrow	Red, SBL	Seven registrations across the whole Study Area, including one family observed on 8 July.	Confirmed
Whitethroat	Amber	13 registrations across the whole Study Area, including a family observed on 8 July.	Confirmed
Willow warbler	Amber	23 registrations across the whole Study Area, with clusters of birds, including singing birds.	Probable
Woodpigeon	Amber	Seven registrations within the Study Area, including within woodland and lines of trees.	Possible
Wren	Amber	12 registrations across the whole Study Area, with clusters of birds, including singing birds.	Probable
Yellowhammer	Red, SBL	29 registrations within the Study Area, with clusters of birds, including singing birds and one family, noted on 8 July.	Confirmed
Annex I: of the EU Birds Directive			
Schedule 1: Wildlife and Countryside Act 1981			
*Birds listed as Schedule 1A are provided additional protection in that they may not be intentionally or recklessly harassed at any time.			e
Red, Amber and Green: Birds of Conservation Concern 5 (BOCC5)			
SBL: Scottish Biodiversity List			

- 6.6.53 Of the total of 28 target species registered during surveys, these were identified as six confirmed, nine probable, or eight possible breeders within the Study Area, with the remaining five species classed as non-breeding (**Technical Appendix 6.3**, Table A- 2, Appendix C).
- 6.6.54 **Table 6.12** presents target species by assessed breeding status following the breeding bird survey.

Assigned breeding status			
Confirmed	Probable	Possible	Non-breeding
Dunnock	Bullfinch	House sparrow	Black-headed gull
Lapwing	Curlew	Lesser redpoll	Greylag goose
Oystercatcher	Grey partridge	Mistle thrush	Herring gull
Tree sparrow	Linnet	Red kite	Rook
Whitethroat	Reed bunting	Siskin	Swift
Yellowhammer	Sedge warbler	Starling	
	Skylark	Stock dove	
	Willow warbler	Woodpigeon	
	Wren		

 Table 6.12: Summary of breeding status of target species.

Assigned breeding status

- Annex I/ Schedule 1 species are font colour blue
- BoCC Red listed species in red
- BoCC Amber listed species in orange
- SBL species in green
- 6.6.55 The most frequently recorded species were skylark (70 registrations), yellowhammer (25), willow warbler (23) and lapwing (21). Yellowhammer and lapwing were confirmed breeders, while skylark and willow warbler were probable breeders. These typical farmland species were followed in abundance by a suite of species associated with linear woody, semi-natural or rural habitats, i.e., bullfinch, dunnock, grey partridge, linnet, reed bunting, sedge warbler, tree sparrow, whitethroat, willow warbler, wren and yellowhammer all confirmed or probable breeders. Red listed confirmed breeders include also tree sparrow and yellowhammer.
- 6.6.56 For further details of non-target species territory and survey data please refer to **Technical Appendix 6.3.**

6.7 Evaluation of Baseline Features

6.7.1 An evaluation of the baseline ecological features is presented in **Table 6.13** below. Features of local or higher value (council, national and international) are considered IEFs or IOFs.

Feature	Evaluation Reasoning	Level of Importance
River Tay SAC	The level of value follows the level of designation	International
River South Esk SAC	The level of value follows the level of designation	International
Loch of Kinordy SPA & Ramsar	The level of value follows the level of designation. No wintering surveys were undertaken, however (as agreed via the consultation with NatureScot) for the purposes of this assessment greylag goose and pink- footed goose are assumed to be present during the winter and use the Site for foraging.	International
Loch of Lintrathen SPA & Ramsar	The level of value follows the level of designation. No wintering surveys were undertaken, however (as agreed via the consultation with NatureScot) for the purposes of this assessment greylag goose and whooper swan are assumed to be present during the winter and use the Site for foraging.	International
Firth of Tay and Eden Estuary SPA & Ramsar	The level of value follows the level of designation.	International

Table	6.13·	Evaluation	of	ecological	features
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Feature	Evaluation Reasoning	Level of Importance
Captain's Pond LNCS	The level of value follows the level of designation.	Council Area
AWI-listed woodlands	Non-statutory designation and a conservation focus at the council area scale.	Council Area
Arable and horticulture (c1)	No appreciable ecological value and does not align with either SBL or Tayside LBAP priorities.	Less than local
Other cereal crops (c1c7)	No appreciable ecological value and does not align with either SBL or Tayside LBAP priorities.	Less than local
Non-cereal crops (c1d)	No appreciable ecological value and does not align with either SBL or Tayside LBAP priorities.	Less than local
Purple moor grass and rush pastures (f2b)	The habitat does not closely align with the f2b classification, and this was chosen as best fit, and so considered to be an SBL habitat, yet is of very small extent with no connectivity to larger areas of similar habitat.	Less than local
Other neutral grassland (g3c)	Does not align with either SBL or Tayside LBAP priorities.	Less than local
Holcus-Juncus neutral grassland (g3c8)	Does not align with either SBL or Tayside LBAP priorities.	Less than local
Modified grassland (g4)	No appreciable ecological value and does not align with either SBL or Tayside LBAP priorities.	Less than local
Suburban mosaic of developed and natural surface (u1d)	Does not align with either SBL or Tayside LBAP priorities.	Less than local
Other broadleaved woodland (w1g)	Plantation broadleaved woodland is present within the Site and adjacent. This habitat does not align with either SBL or Tayside LBAP priorities.	Less than Local
Other woodland- mixed (w1h)	Plantation mixed woodland is present adjacent to the Site. This habitat does not align with either SBL or Tayside LBAP priorities.	Less than local
Other Scot's pine woodland (w2b)	Plantation broadleaved woodland is present adjacent to the Site. This habitat does not align with either SBL but as a significant area of planted coniferous woodland it does align with the Tayside LBAP priorities, and is included on the AWI.	Local
Line of trees (33)	The lines of trees do not align with either SBL or Tayside LBAP priorities.	Less than local
Ecologically valuable line of trees (34)	The lines of trees do not align with SBL priorities, though are listed on the Tayside LBAP and are an ecological valuable line of trees (33) which contains a number of mature trees.	Local
Other rivers and streams (r2b)	The Ballindarg Burn runs through the central area of the Site and connects directly into the River Tay SAC. This watercourse is an SBL habitat and is a priority habitat under the Tayside LBAP.	Local

Feature		Evaluation Reasoning	Level of Importance
Other stand (r1g)	ding water	Man-made drainage ditches cross the Site. This habitat does not align with either SBL or Tayside LBAP priorities.	Less than local
Other nativ (h2a6)	e hedgerow	A defunct hedgerow is present along the southern boundary of the Site. This is an SBL habitat and is a priority habitat under the Tayside LBAP, though is small in extent, is defunct and lacking connectivity to other hedgerows.	Less than local
GWDTEs		Consideration of comparative NVC vegetative communities identified three areas with some potential for groundwater dependency, although the vegetation was noted as a very poor fit in terms of NVC community in each case. The surrounding hydrological regime indicates that any areas of wetter substrate are more likely resulting from the wider ditch and watercourse network. As such, it is considered that all of these areas are very unlikely to be groundwater fed due to poor fit of species with NVC categories and presence of drainage ditches which are the likely cause of wetter ground.	Less than local
INNS		Subject to control under Schedule 9 of WCA and considered threats to native biodiversity. INNS confirmed as likely absent from the Site, but rhododendron recorded off-Site in the adjacent woodland.	Less than local
Red Kite		Red kite is protected as a Schedule 1(1A), Annex 1 and SBL species. Red kite were assessed as possibly breeding due to two separate single birds registered in flight near suitable nesting habitat (woodland).	Local
Breeding Birds	Waders	Curlew: one probable territory. Lapwing: four confirmed territories. Oystercatcher: one probable and one confirmed territory.	Local
	Breeding Bird Assemblage (BoCC Red and Amber list passerines)	Two BoCC red-list species (tree sparrow and yellowhammer), two BoCC amber-list species (dunnock and whitethroat) were confirmed as breeding. Skylark, linnet and grey partridge (all red-listed) were assessed as probable breeders. Bullfinch, sedge warbler, willow warbler, wren and reed bunting (all amber-listed) were assessed as probable breeders.	Local
Bats		Bats are protected as EPS and a priority on the SBL and within the Tayside LBAP. Numerous potential roost features are located on Site, some of which were identified as PRF-M and having potential to support a maternity roost. The Site boundaries and linear features are also of moderate suitability for commuting and foraging bats.	Council Area
Otter		Protected as an EPS and through its inclusion on Schedule 5 of the WCA 1981. Also, a priority species on	Council Area

Feature	Evaluation Reasoning	Level of Importance
	the SBL and a breeding holt confirmed within the Study Area.	
Water vole	Protected through its inclusion on Schedule 5 of the WCA 1981. Also, a priority species on the SBL. Despite potentially suitable habitat being present, no evidence was recorded of the species on Site and no recent records have been identified of water vole from the local area. The species is therefore unlikely to be present.	Less than local
Beaver	Protected as an EPS and through its inclusion on Schedule 5 of the WCA 1981. Beaver are confirmed present on Site.	Council Area
Badger	Badgers and their setts are strictly protected under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011. A single sett has been identified within the Study Area but none are present on Site. The Site may support foraging and commuting badger.	Local
Red squirrel	Protected through their inclusion on Schedules 5 and 6 of the WCA 1981. Suitable habitat is present within woodland adjacent to the Site and red squirrels have been recorded within the local area. No evidence of red squirrel was found during the surveys, and they are likely absent from the Site itself but assumed as present within the Study Area.	Local
Pine marten	Protected through their inclusion on Schedules 5 and 6 of the WCA 1981. Suitable habitat is present within woodland adjacent to the Site. No evidence was found during the surveys, and they are likely absent from the Site itself but assumed as present within the Study Area.	Local
Fish	Salmonoid and lamprey species are assumed as present within the Ballingdarg Brun that passes through the Site, due to its direct connectivity with the River Tay SAC for which salmonoids and lampreys are a key feature. These species are priority species on the SBL and Tayside LBAP. Their importance within the SAC context is included above as being of International importance though are otherwise considered to be of local importance.	Local
Amphibians	Amphibians are subject to limited protection under the WCA and common toad and great crested newt are priority species on the SBL. Great crested newt are confirmed as likely absent. Small numbers of common amphibian species may exist along Site boundaries but likely absent from the majority of the Site.	Less than local
Reptiles	Reptiles are subject to limited protection under the WCA and are also priority species on the SBL. Small numbers of reptile may exist along Site boundaries but likely absent from the majority of the Site.	Less than local

Future Baseline

- 6.7.2 The Site is currently under agricultural management and in the absence of any development this would continue, therefore the future baseline of the majority of the Site is considered likely to remain as it is currently.
- 6.7.3 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.

6.8 Scope of the Assessment

Receptors Scoped Out

- 6.8.1 Due to a range of factors, some of the IEFs or IOFs can be scoped out of further consideration if they are not vulnerable to effects from the Proposed Development with the standard and embedded mitigation in place.
- 6.8.2 Following evaluation of the baseline data, including desk study and field survey data, and considering the standard and embedded mitigation measures, as described in **Section 6.9**, some potential effects can be scoped out of the assessment, as described in **Table 6.14** below. This is based on professional judgement and experience from other relevant projects in the region.

IEF	Rationale for Scoping Out
River Tay SAC	Embedded and standard mitigation measures that are to be applied during construction includes the implementation of Site-wide pollution and contamination prevention measures to be detailed within a Construction Environment Management Plan (CEMP) as well as pre and post-construction monitoring of fish populations (which are key features of the SAC) within the Ballindarg Burn on Site. There is an existing water course crossing along the access track, however no upgrade works are proposed to this crossing point for the Proposed Development and so no direct impacts to fish are likely to occur. Otter are also a key feature of the SAC and confirmed as present within the Study Area. Mitigation has been designed to ensure appropriate buffers are in place around the natal holt and non-breeding holt to avoid adverse impacts. The River Tay SAC is scoped out of further assessment based on the embedded and standard mitigation measures that are to be applied during construction and operation.
River South Esk SAC	The Site lies just over 4 km southwest of the River South Esk at its nearest point. However, the River South Esk lies within a different water catchment and so is considered to not be hydrologically connected with the Site. The River South Esk is therefore scoped out of further assessment.

Table 6.14: IEFs scoped Out of Further Assessment

Firth of Tay and Eden Estuary SPA & Ramsar	The SPA and Ramsar lies just within the 20 km search area (situated 19.22 km to the south of the Site) for potentially connected (and Functionally Linked Land [FLL]) when considering the foraging range for swan and goose species. When considering use of the area, according to the historical distribution of both pink-footed goose and greylag goose summarised by Mitchell (2012), there are no records of either species of this SPA provenance. Assumed presence of either pink-footed goose and greylag goose in terms of potential impacts presented by the Proposed Development are made in relation to the Loch of Kinnordy SPA and Loch of Lintrathen. As such, the Firth of Tay and Eden Estuary SPA and Ramsar site are scoped out the assessment.
	SPA and Ramsar site is made within Technical Appendix 6.4 .
Captain's Pond LNCS	This LNCS is located off-Site and a small proportion of the LNCS borders the western boundary of the Site. Standard measures including a Site-wide pollution and contamination prevention measures to be detailed within a CEMP will avoid the potential for significant adverse effects. With embedded mitigation, the LNCS has been buffered from the Proposed Development by a minimum 20m. It is considered that this is an appropriate buffer to avoid impacts to the habitats of LNCS for which it is designated including basin bog, woodland, open water, swamp, marshy grassland and unimproved acid grassland, which in reality the majority of which all lie beyond 20m distance. As these habitats have been assessed as unlikely to be GWDTE, then indirect impacts are also not anticipated.
AWI-listed woodlands	The AWI-listed woodlands are adjacent to the western boundary of the Site and are scoped out of further assessment. Design mitigation has ensured that this woodland habitat is appropriately buffered from the Proposed Development by a minimum of 20m. 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, AWI- listed woodland is scoped out of further assessment.
Other Scots Pine Woodland	See above for AWI-listed woodland which covers the same parcel. As such, other Scots pine woodland is scoped out of further assessment.
Ecologically Valuable Line of Trees	This line of trees runs along the access track to the north-east of the Site and comprises a number of mature trees. This habitat has been appropriately buffered through design mitigation including a minimum of 15m between the Proposed Development to the south and the line of trees. At this distance, 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. It is acknowledged that the access track adjacent to the line of trees will likely be used for access purposes for construction, however this is an existing track in regular use by farm vehicles and machinery and no additional track upgrade works are proposed as part of the development. A tree protection plan will be incorporated into a CEMP to ensure best practice measures are followed throughout construction and operational maintenance including any passage of vehicles along the access track.
Bats	Bats are an EPS and likely use the Site boundaries, linear woodland edges and watercourses for foraging and commuting. In addition, a number of trees

	on Site have been identified as being suitable for supporting roosting bats, a number of which may support maternity roosts. Bats are scoped out of further assessment due to embedded mitigation measures which have incorporated suitable buffers around all features that may be of value to bats. This has included a minimum 20m buffer between the Proposed Development and adjacent woodland edges and watercourses to ensure no disruption to commuting corridors. The Proposed Development will not result in a loss of key bat foraging or commuting habitat with main habitat losses pertaining to arable land only. Furthermore, all lighting will be sensitively designed to avoid any indirect impacts as a result of new lighting on Site. All trees identified as having suitability to support roosting bats will be retained and have been appropriately buffered to avoid disturbance. This has included a buffer of 20-30m for heavy construction works, including construction of the substation, and a minimum 15m buffer for other works such as fence and access track construction. It is acknowledged that the access track adjacent to the line of trees will likely be used for access purposes for construction and many of these trees contain features suitable for roosting bats, however this is an existing track in regular use by farm vehicles and machinery and no additional track upgrade works are proposed as part of the development. A bat protection plan will be incorporated into a CEMP to ensure best practice measures are followed throughout construction and an Ecological Clerk of Works (ECOW) will be present to oversee any works within 20m of potential bat roosts and carry out any pre-construction checks, as required.
Otter	Otter have been confirmed as present and breeding within the Study Area with the presence of a natal holt and resting site. Otter are scoped out of further assessment as design mitigation has ensured appropriate buffers are in place around the natal holt and the resting site. This has included the buffering of the natal holt by 200m whereby no works will take place within this buffer to avoid any disturbance to breeding otter. The (non-breeding) resting site has also been buffered by approximately 58m (which is above the minimum based on best practice guidance of 30m). The Ballindarg burn is likely used by otter for commuting and foraging, and this feature will be retained and protected. A pre-construction otter survey will be undertaken to update the status of otter ahead of construction works commencing and an otter species protection plan will be incorporated into a CEMP to ensure best practice measures are followed throughout construction, including any requirements for additional mitigation or licencing. Additional consideration in terms of HRA for the River Tay SAC, for which otter are listed as a key feature, is made within Technical Appendix 6.4 .
Badger	Badger are confirmed as present within the Study Area, with a sett located off- site but over 200m away. Badger presence was confirmed on Site and so it is likely used for foraging and commuting. Due to the distance of the known setts, there is no potential for direct or indirect impacts to badgers in the sett, or the sett itself. A pre-construction badger survey will be completed ahead of construction works to update the status of badger on Site and within 50m and appropriate measures will be implemented as required. A badger species protection plan will be incorporated into the CEMP and will include best practice measures and any requirements for additional mitigation or licencing. 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 6.5 , 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.
Beaver	Beaver are confirmed as present within the Study Area with a confirmed beaver burrow present off-site to the north. This burrow is approximately 124m from the Site boundary and so no negative effects to beavers or their burrows are anticipated. It is likely that beaver use the Ballindarg Burn and so a pre-construction beaver survey will be completed to confirm if any new resting sites are present. If a new resting site is identified, appropriate mitigation measures will be implemented and licencing attained, as required. A beaver species protection plan will be incorporated into the CEMP, and will include best practice measures. As such, beavers are scoped out of further assessment.
Red Squirrel	Red squirrel are likely absent from Site so no direct impacts or habitat loss in anticipated. This species is however presumed present within woodland habitat adjacent to the western Site boundary, based on records returned through the desk study. No dreys were identified within the edge of the woodland habitat during the surveys, though dreys may be present further into the woodland. Design mitigation has ensured that this woodland habitat is to be retained and buffered from the Proposed Development by a minimum of 20m and pre-construction red squirrel surveys will be conducted ahead of any works within 50m of this habitat to confirm the status of red squirrel in this area and identify the need for any further mitigation measures or licencing requirements due to potential for disturbance. A red squirrel species protection plan will be incorporated into the CEMP to include any requirements for additional mitigation or licencing, as required.
Pine marten	Pine marten are likely absent from Site so no direct impacts or habitat loss in anticipated. Pine marten may be present within woodland habitat adjacent to the western Site boundary. No evidence was identified on Site or within the edge of the woodland habitat during the surveys, though a full survey was not conducted. Design mitigation has ensured that this woodland habitat is to be retained and buffered from the Proposed Development by a minimum of 20m and pre-construction pine marten surveys will be conducted ahead of any works within 50m of this habitat to confirm the status of pine marten in this area and identify the need for any further mitigation measures or licencing requirements due to potential for disturbance. A pine marten species protection plan will be incorporated into the CEMP to include any requirements for additional mitigation or licencing, as required.
Fish	Fish including salmonoid and lamprey species are likely present in water courses in the Study Area, including the Ballindarg Burn on Site. Embedded and standard mitigation measures are to be applied during construction which will include the implementation of Site-wide pollution and contamination prevention measures to be detailed within a CEMP along with pre- and post- construction monitoring of fish populations within the Ballindarg Burn on Site. There is an existing water course crossing along the access track, however no upgrade works are proposed to this crossing point for the Proposed

	Development and so no direct impacts to fish are likely to occur. As such, fish are scoped out of further assessment. Additional consideration in terms of HRA for the River Tay SAC, for which fish are listed as a key feature, is made within Technical Appendix 6.4.
Red Kite	Red kite are a Schedule 1A species and were assessed as possibly breeding within the Study Area. The habitats within Table 6.13 are not suitable for nesting red kite, however some of the wooded areas in the wider area are. If red kite were to take up residence and nest within a potential disturbance distance of proposed construction works then this would constitute a criminal offence. However, as per the measures proposed in Section 6.9 (namely, the pre-construction survey checks, appointment of a suitably experienced ECoW, and the establishment of adequate no-work zones in the event that red kite are found to be present) it is considered that any potential for risk is mitigated for.
	As such, red kite are scoped out of the assessment.
Breeding Bird Assemblage	A total of 36 species were assessed as confirmed (7), probable (13) or possible (16) breeders within the survey area, with the remaining species (7) classed as non-breeding (excluding red kite, see above feature). Of those species confirmed breeding, two are BoCC Red listed and two are Amber listed species. The Proposed Development requires the temporary removal of habitats during construction, predominantly arable/cereal crops and a small area of modified grassland, most of which is considered suitable breeding habitat for BoCC red listed species (i.e. yellowhammer and skylark). This will lead to disturbance and displacement effects to breeding birds due to the construction works. This effect will be short-term and temporary in nature. The OBEMP (see para. 6.10.46 and Technical Appendix 6.5) has several aims, with the enhancement of areas of arable, non-cereal/cereal crop habitat to species-rich grassland meadow (including wet meadow in some open and suitable areas). Further measures include the creation of woodland/scrub habitat corridors, and enhancement of hedgerow features surrounding the Site. These measures are anticipated to significantly enhance floral diversity from the baseline in terms of foraging and nesting potential for the breeding bird assemblage found at the Site.
	Although these species are BoCC red and amber-listed, they are typical farmland species of the habitats found at the Site. Potential effects resulting from the construction of the Proposed Development are considered to be primarily relating to temporary disturbance and/or displacement to the breeding bird assemblage. When considering the proposed enhancement measures, as well as the mitigation proposed in Section 6.9, it is considered that any potential impact would be short-term and ultimately the conditions enhanced so that there would be a residual medium beneficial impact for breeding birds.
	As such, the breeding bird assemblage is scoped out of the assessment.

Receptors Requiring Assessment

- 6.8.3 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 are vulnerable to potential effects in the absence of mitigation (excluding embedded mitigation). These IEFs or IOFs comprise the following:
 - Loch of Kinnordy SPA & Ramsar: greylag goose and pink-footed goose.
 - Loch of Lintrathen SPA & Ramsar: greylag goose and whooper swan.
 - Breeding waders: curlew, lapwing and oystercatcher.

6.9 Standard and Embedded Mitigation Measures

- 6.9.1 Embedded mitigation proposals are those mitigation measures that are inherent to the Proposed Development. Embedded mitigation includes all mitigation usually assumed to be in place during construction, operation and decommissioning, and is generally regarded as industry standard or Best Practice. Construction and environmental management plans are introduced in **Chapter 3: Proposed Project Description**. This has included appropriate buffering of sensitive ecological features including the River Tay SAC and Ballindarg Burn, AWI woodland, bat commuting and foraging habitat, trees with potential for roosting bats, a confirmed otter natal den and resting site, and a confirmed beaver burrow.
- 6.9.2 As previously noted, following CIEEM (2024) guidance, the assessment process assumes the application of standard mitigation measures. This section of the assessment details the mitigation measures that are recommended to ameliorate identified impacts associated with the construction and operational phase of the Proposed Development. These measures have been developed to prevent, reduce or offset any likely significant effects of the Proposed Development on IEFs. This approach is in accordance with good practice guidance and UK, Scottish and Local Government environmental, planning and sustainability policies and legislation.
- 6.9.3 The principles and objectives for mitigation associated with the Proposed Development have been developed through an iterative process with the Applicant's design team and taking into consideration of consultation and other stakeholders responses.
- 6.9.4 Mitigation includes good practice methods and principles applied to the Proposed Development as a whole (standard measures) as well as site specific mitigation measures applied to individual locations (specific measures).
- 6.9.5 All ecological mitigation will be incorporated into the CEMP. This CEMP will also outline a timetable of actions and form part of the contract documents to ensure delivery of mitigation specified in this chapter. In addition, the CEMP will incorporate the provision of an ECoW to oversee the implementation of committed mitigation.

- 6.9.6 Following consent, the mitigation measures that apply to all IEFs and IOFs, and assumed to be implemented for the purposes of assessing potential impacts, are outlined below:
 - In order to prevent pollution of watercourses within the site (with particulate matter or other pollutants such as fuel), best practice techniques, as well as Site-wide pollution and contamination prevention measures, will be employed and these will be set out in the Pollution Prevention Plan (PPP) which will form an integral part of the CEMP. The CEMP will be agreed with Angus Council, in consultation with NatureScot and SEPA, post-consent and prior to the construction of the Proposed Development commencing.
 - Not more than 12 months prior to construction of the Proposed Development, the Applicant will engage a Suitably Qualified Ecologist (SQE) to undertake a series of pre-construction ecological and ornithological surveys to update the baseline information reported in this chapter. The aim of these surveys would be to provide up to date information in order to inform Species Protection Plans and finalise the requirements for mitigation and licencing (if required).
 - Recommended disturbance buffers apply for protected species places of rest and/or denning/natal sites and bird species at their nest sites, with recommended distances outlined by Goodship and Furness (2022) and the Forestry Commission (FCS, 2007). Any disturbance or intentional or reckless harassment to Schedule 1A species is considered to be a criminal offence and therefore should any nests or activity from such species be identified from future precommencement surveys and ongoing monitoring, the following protocols should be maintained:
 - No heavy construction works will take place within the recommended guidance distances, as determined by the appointed ECoW (i.e. 150-300m for red kite).
 - Risk of "harassment" of roosting birds can be minimised by avoiding activity overnight and within two hours of dusk (two hours before official sunset time) and dawn (two hours after official sunrise time).
 - In order to avoid the abandonment of nests or breeding territories as a result of disturbance during the breeding season, all works including vegetation removal and/or site clearance will be undertaken outside of the breeding bird season wherever possible. If this is not possible, all works will be subject to preconstruction nesting bird checks. The appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified, then appropriate mitigation measures (such as suitable exclusion zones/buffers for all species) to protect nest sites will be implemented. The recommended (no) disturbance buffer required for heavy construction activities is 200-300m for curlew, and 50-100m for breeding locations of oystercatcher (Goodship and Furness, 2022). Lapwing is not mentioned within the guidance but another plover species, ringed plover, has recommended distance of 100-200m as has dunlin (Goodship and Furness, 2022) and so a similar value is presumed appropriate for lapwing.
 - Further to or incorporated into the update surveys above, protection of breeding bird nests from damage and/or destruction during the breeding season will need to be ensured. The appointed ECoW will monitor the vegetation that has been cleared in the non-breeding season ahead of construction to ensure that it has

not developed to a stage making it suitable for ground nesting birds. As the construction phases progress, during the breeding season the ECoW will check the following works area for any nesting birds within 48 hours preceding the scheduled works, and following any requirements for mitigation.

- Unnecessary disturbance to habitats will be avoided, by minimising the extent of ground clearance and other construction practices as far as practicable.
- An ecological toolbox talk will be given by the ECoW to all construction personnel as part of site induction on the potential presence of species and any measures that need to be undertaken should such species be discovered during construction activities. The toolbox talk will also include the requirement to report and log any protected species or bird casualties at the Proposed Development during construction and operation of the site.
- A sensitive lighting scheme that aims to avoid disruption to bat, otter and badger foraging and commuting behaviour and nesting bird activity will be adopted. 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 should 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) should 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 should be limited to provide dark periods.
- During the construction phase the following good practice measures, endorsed by NatureScot are recommended (NatureScot, 2020):
 - Wherever possible works should be undertaken during daylight hours, but avoiding the two hours from sunrise and the two hours before sunset (this can be reduced to one hour from November to February, inclusive, when daylight hours are limited);
 - Cover/fence-off any excavations, or provide escape ramps at the end of the working day to avoid animals becoming trapped (if an animal does become trapped, advice should be sought immediately from NatureScot); and
 - Cap any temporarily exposed pipe systems out of work hours.
- 6.9.7 Biodiversity Enhancement measures will be implemented through the Proposed Development and are outlined within **Technical Appendix 6.5: Outline biodiversity Enhancement and Management Plan.** The focus will be on creating priority meadow habitat, wetland features and connect existing blocks of woodland providing habitat corridors and enhanced resources for protected and priority

species. The enhancement measures will correspond with any required protected species mitigation. The following objectives are proposed:

- Species-rich meadow creation on and off-Site;
- Wetland scrapes and wet meadow creation both on and off-Site;
- Creation of species-rich hedgerows and tree planting;
- Native woodland and scrub planting, riparian planting and woodland edge enhancement;
- Wetland features of biodiversity value incorporated into Sustainable Urban Drainage Systems (SuDS); and
- Installation of bird boxes, and log piles.
- 6.9.8 As part of the Proposed Development, it will be necessary to develop and implement a Site Restoration Plan (SRP) as part of the CEMP to ensure the regeneration of those areas of habitat that have been temporarily disturbed through construction. In order to facilitate restoration, disturbed ground will be restored as soon as practicably possible using materials removed during the construction of access tracks, excavation of cable trenches and solar and/or BESS foundations. To achieve this, any excavated soil will need to be stored in such a manner that is suitable to facilitate retention of the seed bank. This will aid site restoration and help conserve floristic interests at the Site.

6.10 Assessment of Potential Effects

- 6.10.1 The main elements of the Proposed Development which have the potential to impact on IEFs or IOFs during construction and/or operation are:
 - Track construction, including culverting of watercourses/drainage ditches, mobile plant traffic movements and potential for dust generation;
 - Temporary potential for dust generation;
 - Cable-laying and grid connection infrastructure, including substations;
 - Installation of solar panels, BESS and associated infrastructure;
 - Temporary compound areas;
 - Temporary materials storage (soils and turves);
 - Site water management; and
 - Site restoration (track batters, compounds, etc.).
- 6.10.2 The above activities have the potential to cause the following construction impacts to the IOFs identified for the site:
 - Direct loss of foraging habitat and/or breeding habitat.
 - Indirect loss of foraging habitats and/or breeding habitat through displacement.
 - Disturbance (including noise, vibration, pollution) and displacement due to heavy machinery, noise and human activity associated with the construction works on

the site. Disturbance of ground vegetation may affect a zone of approximately 5m around all infrastructure.

- 6.10.3 The potential operational impacts have been identified as:
 - Direct habitat loss and indirect loss of foraging or breeding habitat due to displacement or avoidance.
 - Reflection / glare impacts due to solar panels.
 - Cumulative impacts of the Proposed Development in the context of other nearby developments (operational, consented and in planning).

Construction Effects

Loch of Kinnordy SPA and Ramsar Site

- 6.10.4 **Impact:** Displacement of features of the Loch of Kinnordy SPA and Ramsar site (i.e. greylag goose and pink-footed goose) from the Site during construction, either by temporary disturbance or because of direct habitat loss.
- 6.10.5 NCI / Conservation Status of the feature: As per Table 6.13, Loch of Kinnordy SPA and Ramsar site is of international importance. The condition of both the non-breeding greylag goose and non-breeding pink-footed goose features was most recently assessed in 2014 as being of unfavourable (no change) condition (see Table 6.6).
- 6.10.6 **Magnitude of Impact:** The Loch of Kinnordy SPA and Ramsar site lies 5.2 km northwest of the Proposed Development. The construction activities within the development area will cause an increase in baseline levels of noise on the Site, which are low, with dominant noise sources in the local area being from farming activities. The development will result in an increase in noise levels above baseline conditions during the construction phase. All construction and operational-related noise impacts have been fully considered and assessed within EIAR Chapter 10 Noise. The assessment considers three dwellings adjacent to the Site boundary as "noise sensitive receptors", with no predicted noise level anticipated more than 23dB above baseline conditions resulting in all three having low impacts that are not significant.
- 6.10.7 When considering documented feeding distributions of SPA-provenance greylag and pink-footed goose in Scotland (Mitchel 2012), both species are considered to actively use the area the Site lies within when including all species data (recorded 1986/87 to 2011/12), although this analysis is based on a lack of quantitative data. When the more recent data are considered (i.e. "new records" for 2007/08 to 2011/12) both species are shown to be absent from the 1 km square holding the Site. Furthermore, the author states that few birds (both greylag goose and pink-footed goose) now roost at the Loch of Kinnordy SPA and Ramsar site (Mitchel 2012).
- 6.10.8 Wintering bird surveys were not completed at the Site. For the purposes of considering the features of the Loch of Kinnordy SPA and Ramsar site, as confirmed



through consultation with NatureScot (see **Table 6.1**), it is assumed that they use land within the Proposed Development boundary for foraging. As such, this assessment is made on the basis that the area is lost to the birds for foraging purposes.

- 6.10.9 On this basis, given the distance from the Site, any birds originating from the SPA that may use the Site for foraging will be displaced elsewhere through disturbance and habitat loss effects resulting from the construction phase of the Proposed Development. However, there is considerable additional similar and suitable foraging habitat within the wider region that is available to foraging pink-footed and greylag goose.
- 6.10.10 Given the availability of significant alternative areas available to foraging SPA species within the region, the impact of displacement due to disturbance and/or habitat loss during construction, the overall impact is considered to be direct, short-term and of negligible magnitude.
- 6.10.11 **Significance of Effect:** As outlined above, the magnitude of the impact on the goose features of the Loch of Kinnordy SPA and Ramsar site as a result of construction is deemed to be low, and short-term. The NCI is high. The effect is therefore considered to be minor adverse for the features of the Loch of Kinnordy SPA and Ramsar site and **not significant** under the EIA Regulations.

6.10.14Loch of Lintrathen SPA and Ramsar

- 6.10.12 **Impact:** Displacement of features of the Loch of Lintrathen SPA and Ramsar site (i.e. greylag goose and whooper swan) from the Site during construction, either by temporary disturbance or because of direct habitat loss.
- 6.10.13 NCI / Conservation Status of the feature: As per Table 6.13, Loch of Lintrathen SPA and Ramsar site is of international importance. The condition of the SPA nonbreeding greylag goose feature was most recently assessed in 2014 as being of unfavourable (no change) condition (see Table 6.6). As whooper swan are not a qualifying feature of the SPA, but as noteworthy fauna of the Ramsar as a species occurring at levels of national importance (as cited for the Ramsar site designation), there is no condition assessment available.
- 6.10.14 **Magnitude of Impact:** The Loch of Lintrathen SPA and Ramsar site lies 11.8 km northwest of the Proposed Development. The construction activities within the development area will cause an increase in baseline levels of noise on the Site, which are currently low, with dominant noise sources in the local area being from farming activities. The development will result in an increase in noise levels above baseline conditions during the construction phase.
- 6.10.15 When considering documented feeding distributions of SPA-provenance greylag in Scotland (Mitchel 2012), they are considered to actively use the area the Site lies within when including all species data (recorded 1986/87 to 2011/12), although this analysis is based on a lack of quantitative data. When the more recent data are

considered (i.e. "new records" for 2007/08 to 2011/12) greylag goose are shown to be absent from the 1 km square holding the Site. Furthermore, the author states that as far fewer greylag goose now roost at the Loch of Lintrathen SPA and Ramsar site there are now fewer feeding records with most now coming from the south and southwest of the SPA (Mitchel 2012).

- 6.10.16 A previous species population account for whooper swan, undertaken by the British Trust for Ornithology (BTO), defined the cited population of 85 birds at the Loch of Lintrathen (using data from the winters of 2001/02 through till 2005/06)¹. Whereas the most recent species account for whooper swan from the BTO, that considers population counts from the winters of 2005/06 through to 2009/10, indicates that whooper swan are no longer using the Loch of Lintrathen despite a trend of wintering populations increasing throughout the UK over the previous 25years ².
- 6.10.17 Wintering bird surveys were not completed at the Site. For the purposes of considering the features of the SPA and Ramsar site, as confirmed through consultation with NatureScot (see **Table 6.1**), it is assumed that they use land within the Proposed Development boundary for foraging. As such, this assessment is made on the basis that the area is lost to the birds for foraging purposes.
- 6.10.18 On this basis, given the distance from the Site, any birds originating from the SPA that may use the Site for foraging will be displaced elsewhere through disturbance and habitat loss effects resulting from the construction phase of the Proposed Development. However, there is considerable additional similar and suitable foraging habitat within the wider region that is available to foraging greylag goose and whooper swan.
- 6.10.19 Given the availability of significant alternative areas available to foraging SPA and Ramsar species within the region, the impact of displacement due to disturbance and/or habitat loss during construction, the overall impact is considered to be direct, short-term and of negligible magnitude.
- 6.10.20 **Significance of Effect:** As outlined above, the magnitude of the impact on the goose features of the Loch of Lintrathen SPA and Ramsar site as a result of construction is deemed to be low, and short-term. The NCI is high. The effect is therefore considered to be minor adverse for the features of the Loch of Lintrathen SPA and Ramsar site and **not significant** under the EIA Regulations.

Breeding Waders (curlew, lapwing, oystercatcher)

6.10.21 **Impact**: Displacement of breeding, foraging or roosting waders from the site during construction, either by disturbance or because of direct habitat loss.

¹ https://www.bto.org/sites/default/files/u18/downloads/publications/wituk200506_3.pdf

² https://www.bto.org/sites/default/files/u18/downloads/publications/wituk0910_section3.pdf

- 6.10.22 **Conservation Status of the Receptor**: As per **Table 6.13**, curlew, lapwing and oystercatcher are Medium NCI. Curlew and lapwing are both BoCC Red list species, while oystercatcher is Amber, and therefore all three species of wader are considered to be of unfavourable status due to the downward trend in UK population numbers. Overall sensitivity of these breeding waders is considered to be medium.
- 6.10.23 **Magnitude of Impact**: The breeding bird survey identified one probable curlew territory (just outwith the southern Site boundary), lapwing were confirmed as breeding within the Study Area as well as four probable territories, and oystercatcher had one confirmed territory with one further probable.
- 6.10.24 The construction activities within the Site are likely to result in displacement of breeding waders from the Site. The recommended (no) disturbance buffer required for heavy construction activities is 200-300m for curlew, and 50-100m for breeding locations of oystercatcher (Goodship and Furness, 2022). Lapwing is not mentioned within the guidance but another plover species, ringed plover, has recommended distance of 100-200m as has dunlin (Goodship and Furness, 2022) and so a similar value is presumed appropriate for lapwing.
- 6.10.25 Given the presence of breeding curlew, lapwing and oystercatcher recorded within these disturbance distances during breeding surveys, impacts during construction are considered a possibility, if undertaken during the breeding season. Likely impacts on both these wader species during construction could include potential mortality as a result of construction activities, displacement from breeding habitat, temporary disturbance as a result of soil stripping and increased noise and vibration and habitat loss. Mortality may result if construction activities are undertaken during the bird breeding season where nests and chicks may be destroyed.
- 6.10.26 Potential disturbance during construction may result in the temporary displacement from the areas of land clearance and a slightly wider area adjacent to it. During the breeding season, in order to avoid the abandonment of nests or breeding territories as a result of disturbance, the mitigation measures outlined above in Section 6.9 will be undertaken, including vegetation removal outside of the breeding bird season as well as pre-construction checks. The appointed ECoW will identify active nesting locations prior to any works taking place. If nest sites are identified, then appropriate mitigation measures (such as suitable exclusion zones/buffers outlined above) to protect nest sites will be implemented.
- 6.10.27 Given relatively low numbers of confirmed breeding pairs of waders recorded on site, and with relatively few numbers of probable territories within the Study Area, it is considered more likely that the breeding pairs would move away from the disturbance areas into nearby suitable habitat rather than be lost to the local population, meaning any impacts on local populations will be minimal.
- 6.10.28 Given the potential for small numbers of the breeding populations of breeding lapwing and oystercatcher and probable curlew to be affected during construction, the overall impact on waders is considered to be direct, medium-term and low magnitude.

6.10.29 **Significance of Effect**: As outlined above, the magnitude of the impact on the populations of curlew, lapwing, and oystercatcher as a result of construction is deemed to be low, and short-term. The NCI is medium. The effect is therefore considered to be negligible and **not significant** under the EIA Regulations.

Operational Effects

- 6.10.30 The two main ways in which birds can be affected by operational solar farms and BESS are:
 - through displacement due to loss of habitat from the solar panels, BESS and substations and ongoing disturbance caused and by periodic servicing of them; and
 - displacement from the area due to potential impacts of glint and glare from solar panels.

Displacement Effect

- 6.10.31 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 Construction Effects Section above).
- 6.10.32 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 by BSG Ecology (Taylor, Conway, Gabb, & Gillespie, 2019) 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 (Bernath et al., 2001) while Harrison et al. (2017) 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 (Smith et al., 2010, Monteg et al., 2016). 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.
- 6.10.33 A recent study undertaken by the RSPB and Cambridge University considered how solar farm habitat management influences breeding birds within an arable dominated landscape (Copping *et al.*, 2025). 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 (Copping *et al.*, 2025).

Loch of Kinnordy SPA and Ramsar Site

- 6.10.34 The discussion on the impact presented to the qualifying features of the Loch of Kinnordy SPA and Ramsar site are discussed in detail in **Paragraphs 6.10.4** to **6.10.10**. Operational impacts are considered to be similar to construction phase, although reduced in severity due to there being far less noise associated with the ongoing maintenance and operation of the Proposed Development. As such, given the distance from the Site, any birds originating from the SPA that may use the Site for foraging will be permanently displaced elsewhere through habitat loss effects resulting from the operational phase for the lifetime of the Proposed Development. However, there is considerable additional similar and suitable foraging habitat within the wider region that is available to foraging pink-footed and greylag goose.
- 6.10.35 Given the availability of significant alternative areas to foraging SPA species within the region, the impact of displacement due to disturbance and/or habitat loss during construction, the overall impact is considered to be adverse direct, permanent for the lifetime of the Proposed Development but of negligible magnitude.
- 6.10.36 **Significance of Effect:** As outlined above, the magnitude of the impact on the goose features of the Loch of Kinnordy SPA and Ramsar site as a result of operation is deemed to be low, but for the duration of the lifetime of the Proposed Development. The NCI is high. However, due to the readily available alternative habitat within the region as a foraging resource the effect is considered to be minor adverse for the features of the Loch of Kinnordy SPA and Ramsar site and **not significant** under the EIA Regulations.

Loch of Lintrathen SPA and Ramsar

- 6.10.37 The discussion on the impact presented to the qualifying features of the Loch of Lintrathen SPA and Ramsar site are discussed in detail in **Paragraphs 6.10.14** to **6.10.19**. Operational impacts are considered to be similar to construction phase, although reduced in severity due to there being far less noise associated with the ongoing maintenance and operation of the Proposed Development. As such, given the distance from the Site, any birds originating from the SPA that may use the Site for foraging will be permanently displaced elsewhere through habitat loss effects resulting from the operational phase for the lifetime of the Proposed Development. However, there is considerable additional similar and suitable foraging habitat within the wider region that is available to foraging greylag goose and whooper swan.
- 6.10.38 Given the availability of significant alternative areas to foraging SPA species within the region, the impact of displacement due to disturbance and/or habitat loss during construction, the overall impact is considered to be adverse direct, permanent for the lifetime of the Proposed Development but of negligible magnitude.
- 6.10.39 **Significance of Effect:** As outlined above, the magnitude of the impact on the goose features of the Loch of Lintrathen SPA and Ramsar site as a result of operation is deemed to be low, but for the duration of the lifetime of the Proposed Development. The NCI is high. However, due to the readily available alternative

habitat within the region as a foraging resource the effect is considered to be minor adverse for the features of the Loch of Lintrathen SPA and Ramsar site and **not significant** under the EIA Regulations.

Breeding Waders (curlew, lapwing, oystercatcher)

- 6.10.40 **Impact:** Displacement of breeding waders from the site during lifetime of the Proposed Development by disturbance, direct habitat loss or due to the reflective nature of the solar panels.
- 6.10.41 **NCI / Conservation Status of the receptor:** As per **Table 6.13**, curlew, lapwing and oystercatcher are Medium NCI. Curlew and lapwing are both BoCC Red list species, while oystercatcher is Amber, and therefore all three species of wader are considered to be of unfavourable status due to the downward trend in UK population numbers. Overall sensitivity of these breeding waders is considered to be medium.
- 6.10.42 **Magnitude of Impact:** The presence of solar panels within the southern development area will mean areas of grassland for breeding and foraging will be lost underneath the operational panels, while the reflective nature of the solar panels may lead to flying waders avoiding the area.
- 6.10.43 As discussed above, the breeding bird survey identified one probable curlew territory (just outwith the southern Site boundary), lapwing were confirmed as breeding within the Study Area as well as four probable territories, and oystercatcher had one confirmed territory with one further probable.
- 6.10.44 The recommended (no) disturbance buffer is 200-300m for curlew, and 50-100m for breeding locations of oystercatcher (Goodship and Furness, 2022). Lapwing is not mentioned within the guidance but another plover species, ringed plover, has recommended distance of 100-200m as has dunlin (Goodship and Furness, 2022) so a similar value is presumed for lapwing.
- 6.10.45 Given the presence of breeding curlew, lapwing and oystercatcher recorded within these disturbance distances during breeding surveys, the solar farm operation may lead to displacement from breeding habitat, due to habitat loss and / or the potential impact of reflective glare of the panels. This may lead to the loss of the breeding population within the direct vicinity of the Proposed Development, although it is considered more likely that if they are impacted that breeding pairs will simply relocate to other breeding locations in the local area. Oystercatcher in particular are often found breeding within areas of man-made construction, nesting on roundabouts and on industrial building rooves and therefore may not be impacted at all by a solar farm.
- 6.10.46 Furthermore, the proposed enhancements forming key objectives of the Outline Biodiversity Enhancement and Management Plan (OBEMP) (to be superseded by the detailed BEMP post-planning phase) are designed to improve conditions for waders as well as other species of bird (refer to **Technical Appendix 6.5**). Habitat objectives considered relevant specifically to waders within the OBEMP include:

- Creation of species-rich meadow;
- Wetland scrapes with species-rich wet meadow; and,
- Wetland features of biodiversity value incorporated into Sustainable Urban Drainage Systems (SuDS).
- 6.10.47 Relatively low numbers of breeding pairs of waders were confirmed on site, and with relatively few numbers of probable territories within the Study Area. It is considered more likely that any breeding pairs would move away from the Proposed Development area into nearby suitable habitat rather than be lost to the local population, meaning any impacts on local populations will be minimal.
- 6.10.48 There is potential for small numbers of the breeding lapwing and oystercatcher, and probable curlew, to be affected during operational period. The overall impact on waders is considered to be direct, medium-term and low magnitude. When considering the proposed enhancement measures within the OBEMP forming a key part of the Proposed Development, including the development of new areas and enhancement of existing wetlands for breeding and foraging waders, this is anticipated to off-set the negative impact.
- 6.10.49 **Significance of Effect:** As outlined above, the magnitude of the impact on the waders found onsite as a result of operation is deemed to be low, and mediumterm. The NCI is medium. When considering the proposed enhancement areas proposed as part of the OBEMP, the overall effect is considered to be negligible and **not significant** under the EIA Regulations.

6.11 Assessment of Residual Effects

- 6.11.1 Given that no likely significant effects are anticipated as a result of the construction, operational or decommissioning phases of the Proposed Development the residual effect is expected to be negligible adverse and **not significant** under EIA Regulations.
- 6.11.2 Through the delivery of the OBEMP the Proposed Development is expected to deliver an enhanced level of biodiversity from the baseline conditions (as detailed in **Technical Appendix 6.5**), which represents a **moderate beneficial and significant effect** under the EIA Regulations.

6.12 Assessment of Cumulative Effects

- 6.12.1 It is noted that there are two consented solar development within the Study Area, namely the consented Suttieside Solar Farm and the consented Craignathro Farm Solar Array and Battery Storage. Potential cumulative effects of the Proposed Development are considered below.
- 6.12.2 Craignathro Farm Solar Array and Battery Storage consented development is located approximately 3.8km south-east of the Site. This site covers a small area approximately 12ha of arable and improved grassland. The impact assessment

concluded that the development would not result in significant adverse effects to ecological features. Due to the distance from the Site and its small scale, in addition to the abundance of suitable habitat in the local area and **no significant effects** as a result of the Proposed Development, **no cumulative effects** are anticipated in relation to this development.

6.12.3 Suttieside Solar Farm is a consented solar fam located approximately 3.8km northeast of the Site. This site covers an area of arable and improved grassland directly north of the town of Forfar. The ecology report concluded that the development would not result in any significant effects to ecological features. Due to the distance from the Site and its proximity to the town, in addition to the abundance of suitable habitat in the local area and **no significant effects** as a result of the Proposed Development, **no cumulative effects** are anticipated in relation to this development.

Description of Effect	Significance of Potential Effect		Mitigation Measures	Significance of Residual Effect					
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse				
During Construction & Decommissioning									
Displacement of features of the Loch of Kinnordy SPA and Ramsar site	Minor	Adverse	Standard & Embedded Mitigation	Minor	Adverse				
Displacement of features of the Loch of Lintrathen SPA and Ramsar site	Minor	Adverse	Standard & Embedded Mitigation	Minor	Adverse				
Displacement of breeding, foraging or roosting waders from the site	Negligible	n/a	Standard & Embedded Mitigation	Negligible	n/a				
During Operation									
Displacement of features of the Loch of Kinnordy SPA and Ramsar site	Minor	Adverse	Standard & Embedded Mitigation, including OBEMP	Minor	Adverse				
Displacement of features of the Loch of Lintrathen SPA and Ramsar site	Minor	Adverse	Standard & Embedded Mitigation, including OBEMP	Minor	Adverse				
Displacement of breeding, foraging or roosting waders from the site	Negligible	n/a	Standard & Embedded Mitigation, including OBEMP	Negligible	n/a				

Table 6.15: Summary Table

Description of Effect	Significance of Potential Effect		Mitigation Measures	Significance of Residual Effect						
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse					
Cumulative Effects										
Displacement of features of the Loch of Kinnordy SPA and Ramsar site/	Negligible	n/a	Standard & Embedded Mitigation, including OBEMP	Negligible	n/a					
Displacement of features of the Loch of Lintrathen SPA and Ramsar site/										
Displacement of breeding, foraging or roosting waders from the site										

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