Dupplin Solar Farm

Technical Appendix 6.3: shadow Habitats Regulations Appraisal (sHRA)

TRIO Dupplin Solar LLP

Prepared by:

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SLR Project No.: 405.065787.00003

19 January 2026

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	19 January 2026	Rowan Smith and Daniel Piec	Alison Hood and Michael Austin	Alison Hood and Michael Austin
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Acronyms and Abbreviations

AA	Appropriate Assessment
AEOI	Adverse Effect on Integrity
ALSE	Assessment of Likely Significant Effects
AWI	Ancient Woodland Inventory
BBS	Breeding Bird Survey
BTO	British Trust for Ornithology
CA	Competent Authority
CO	Conservation Objective
CJEU	Court of Justice of the European Union
EC	European Commission
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
FCS	Favourable Conservation Status
FD	Favourable Declining (species status)
FM	Favourable Maintained (species status)
GSMP	Goose and Swan Monitoring Programme
GWDTE	Ground Water Dependent Terrestrial Ecosystems
HRA	Habitats Regulations Appraisal
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
LoD	Limit of Deviation
NBN	National Biodiversity Network
NPF4	National Planning Framework 4
NVC	National Vegetation Classification
PKC	Perth and Kinross Council
PV	Photovoltaic
OBEMP	Outline Biodiversity Enhancement Management Plan
SAC	Special Area of Conservation
sHRA	Shadow Habitats Regulations Appraisal
SIAA	Statement to Inform the Appropriate Assessment
SPA	Special Protection Area
UKHab	UK Habitat Classification
UD	Unfavourable Declining (species status)
UNC	Unfavourable No Change (species status)

1.0 Introduction

1.1 Background

This Shadow Habitats Regulations Appraisal (sHRA) Report has been prepared by SLR Consulting Limited on behalf of TRIO Dupplin Solar LLP (herein referred to as the 'Applicant') and accompanies an application, submitted under Section 36 (S36) of the Electricity Act 1989, and Environmental Impact Assessment for the construction and operation of a solar photovoltaic (PV) farm.

This sHRA includes information for the Competent Authority, the Energy Consents Unit (ECU), who may defer to the local planning authority, in this case Perth and Kinross Council (PKC) to determine if the Proposed Development works are likely to have a significant effect on 'European' / Internationally important sites with regard to their conservation objectives and whether there will be an adverse effect on the integrity of any the sites or their features, with and without mitigation.

The following reports have been referred to in this assessment:

- Dupplin Solar PEA Report[1];
- Dupplin Solar EIA Chapter[2]
- Dupplin Solar Outline Biodiversity and Environment Management Plan[3]; and
- Dupplin Solar Breeding Bird Survey Report[4].

This does not provide an exhaustive list of reports compiled to support the EIA but includes those relevant to the HRA only.

1.2 Project Overview

The Proposed Development will comprise of a ground-mounted solar photovoltaic PV array and associated infrastructure, with a maximum generating capacity of up to 97.5-Megawatt peak (MWp) and an export capacity of 75 MW . The array will comprise PV modules arranged in rows, facing south at an angle of approximately 20º, with a maximum height of 2.678 m above ground level (AGL). Area within red line boundary is approximately 160 ha and the solar array area is approximately 126 ha.

1.3 Site Description

The Site is situated approximately 2.7 km west of Perth with an approximate address of Gateside, Tibbermore, Perth, PH1 1QH (British Grid reference: NO 04530 21766). The Site is comprised of 13 arable fields, sitting within the wider arable farmscape around Tibbermore, west of Perth. The Site borders the A9 to the south and coniferous plantation woodland to the west and east, and a small mixed woodland along the A9 to the south.

[1] SLR Consulting Ltd. (2025). Dupplin Solar. Preliminary Ecological Assessment. Technical Report for Trio Dupplin Solar LLP

[2] SLR Consulting Ltd. (2025). Dupplin Solar. Environmental Impact Assessment. Technical Report for Trio Dupplin Solar LLP

[3] SLR Consulting Ltd. (2025). Dupplin Solar. Outline Biodiversity and Environment Management Plan. Technical Report for Trio Dupplin Solar LLP

[4] SLR Consulting Ltd. (2025). Dupplin Solar. Breeding Bird Survey Report. Technical Report for Trio Dupplin Solar LLP

1.4 Report Purpose

The purpose of this sHRA is to provide the information for ECU to carry out a screening assessment for likely significant effects on European sites and, if applicable, an Appropriate Assessment (AA) of the Project, in accordance with and fulfilment of the requirements of the Conservation (Natural Habitats &c) Regulations, 1994, as amended.

1.5 Relevant Legislation and Policy

1.5.1 Legislation and Policy

The requirement for AA screening and AA is set out in the Conservation (Natural Habitats &c) Regulations, 1994, as amended. This requirement is extended as a matter of policy to Ramsar sites.

Policy 4 of the National Planning Framework 4 (NPF4) reiterates the legal requirement for AA. Policy 4(b) states that:

"*Development proposals that are likely to have a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection Areas) and are not directly connected with or necessary to their conservation management are required to be subject to an "appropriate assessment" of the implications for the conservation objectives*."

1.5.2 Amendments Post EU Exit

Post-Brexit, the Habitats Regulations, S36 Habitats Regulations, and the Offshore Habitats Regulations remain in force, with the same protections retained, but UK sites are no longer part of the EU's Natura 2000 network, instead forming a national network of protected sites. Key terminology is primarily unchanged, with the terms 'European site', 'European marine site', 'European offshore marine site', 'Special Area of Conservation (SAC)' and 'Special Protection Area (SPA)' all being retained.

In cases where no 'adverse effect on integrity' can be screened out the competent authority (i.e., ECU/PKC for a project of this type) would previously have been required to seek the opinion of the European Commission on whether the plan or project should be carried out for 'imperative reasons of overriding public interest'. Since exiting the European Union, this now falls under the remit of the Scottish Ministers, who must seek the opinion of the Secretary of State, the Joint Nature Conservation Committee (JNCC), and any other person the Scottish Ministers consider appropriate.

1.5.3 National and Local Planning Policy

The need for HRA is reiterated in national planning policy in Scotland (as noted above) and in the PKC Development Plan[5]. Although it is not necessary to prepare a sHRA until the Plan has been submitted to Scottish Ministers, it is considered advantageous to prepare in advance to inform and influence the Proposed Development to ensure it will not have an adverse effect on the integrity of a European Site.

1.5.4 Guidance Documents

Several guidance documents have been consulted in preparation of this shadow HRA:

[5] Perth and Kinross Council. (2019). Adopted Local Development Plan (LDP2). [Online] Available at: https://www.pkc.gov.uk/media/45242/Adopted-Local-Development-Plan-2019/pdf/LDP_2_2019_Adopted_Interactive.pdf?m=1576667143577 [Accessed: December 2025]

- NatureScot guidance “Habitats Regulations Appraisal”[6];
- Habitats Regulations Appraisal (HRA) on the Firth of Forth - A Guide for developers and regulators[7];
- EC (2013) Interpretation Manual of European Union Habitats EUR28. Brussels: European Commission[8];
- EC (2018) Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Brussels: European Commission[9];
- Commission notice Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC 2021/C 437/01[10];
- David Tyldesley and Associates (2015) Habitats Regulations Appraisal of Plans. Guidance for Plan-making Bodies in Scotland. Version 3.0, January 2015 SNH Ref 1739[11]; and
- DTA (2021) Habitat Regulations Assessment Handbook. DTA Publications Limited[12].

1.5.5 Case Law

Although the UK is no longer part of the EU, a series of prior rulings of the Court of Justice of the European Union (CJEU) remain relevant for the purposes of HRA. Case law of relevance is described in **Appendix B** and has been considered throughout this HRA screening exercise.

1.6 Evidence of Technical Competence and Experience

This assessment has been carried out by SLR Senior Ecologist Rowan Smith, BSc (Hons) MSc and SLR Senior Ornithologist Daniel Piec, MSc. Rowan has over 6 years’ experience in Ecology, in both ecological consultancy and research sectors. She has a broad environmental science background and expertise in terrestrial and aquatic ecology. Her experience includes undertaking and contributing to EIA/EcIA and HRA assessments for a range of energy generation projects including pumped storage hydro schemes, windfarms, solar and linear infrastructure projects. Daniel has over 20 years’ experience in managing large conservation and ecology projects in the UK and abroad. He has contributed to the development of a number of EIA documents such as HRA screening reports, ornithology chapters and technical appendices.

[6] Available online: https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra [Accessed: October 2025]

[7] Available online: https://www.nature.scot/doc/habitats-regulations-appraisal-hra-firth-forth-guide-developers-and-regulators [Accessed October 2025]

[8] Available online: https://www.mase.gov.it/sites/default/files/archivio/allegati/rete_natura_2000/int_manual_eu28.pdf [Accessed: October 2025]

[9] Available online: https://op.europa.eu/en/publication-detail/-/publication/2c9f4a14-8f97-43ac-a274-4946c142b541 [Accessed: October 2025]

[10] https://op.europa.eu/en/publication-detail/-/publication/99a99e59-3789-11ec-8daf-01aa75ed71a1/language-en [Accessed October 2025]

[11] Available online: https://www.nature.scot/sites/default/files/2019-07/Habitats%20Regulations%20Appraisal%20of%20Plans%20-%20plan-making%20bodies%20in%20Scotland%20-%20Jan%202015.pdf [Accessed: October 2025]

[12] Available online: https://www.dtapublications.co.uk/ [Accessed: October 2025]

The report was reviewed by Alison Hood BSc (Hons) MSc MCIEEM with respect of ecology. Alison is an experienced Ecological Consultant with over 12 years' experience working in the consultancy sector. Her portfolio of work covers renewables projects (wind, solar, BESS, grid connection), infrastructure projects, and commercial developments. Alison is experienced in producing technical outputs and has completed numerous Preliminary Ecological Appraisals, Ecological Impact Assessments, Habitat Regulations Assessments, mitigation design and biodiversity enhancement plans, and is proficient in Biodiversity Net Gain assessments.

The report was reviewed by Michael Austin, MCIEEM, with respect of ornithology. Mike is an Associate Consultant specialising in ornithology. Mike has spent his entire career (over 30 years) working within conservation and more recently consultancy. Mike is a leading ornithology team member in Scotland for SLR with technical expertise in a wide range of onshore survey techniques - in lowland, upland and inter-tidal environments. He undertakes technical reporting and assessment, including Collision Risk Modelling, EcIA and Habitats Regulations Assessment screening. He holds a Schedule 1 licence for survey work in Scotland, under which other SLR surveyors working in Scotland act as agents.

2.0 Consultation

Table 2-1 provides details of consultation undertaken with relevant regulatory bodies, together with action undertaken by the Applicant in response to consultation comments.

Table 2-1 Consultation responses

Consultee	Summary of Consultation Response	Ecological Response
Perth and Kinross Council (PKC) Pre-Application Consultation (17/07/2025)	Under NPF4 Policy 4 (Natural Places), detailed ecological survey in the form of an Ecological Impact Assessment (EcIA) is required, covering habitats, protected species, trees, and artificial lighting impacts. Submissions must evidence application of the mitigation hierarchy (avoid, reduce, compensate, enhance) and demonstrate avoidance of adverse impacts wherever possible, in line with PKC Planning for Nature Guidance: Planning Guidance - Planning & Biodiversity - Perth & Kinross Council (pkc.gov.uk) NPF4 Policy 3 (Biodiversity) requires that national and major developments deliver significant biodiversity enhancements, contributing to nature networks and habitat connectivity. The EcIA findings and PKC guidance should inform a Site Biodiversity Action Plan (BAP) detailing enhancement measures, locations, timescales, monitoring, and species record submission to the NBN Gateway. Under NPF4 Policy 6 (Forestry, Woodland and Trees), development will not be supported where it would result in the loss or degradation of ancient woodland, veteran trees, or high-biodiversity-value woodland and hedgerows. Tree and woodland surveys, a clear impact assessment, and compensatory planting at a 1:3 ratio are required, following PKC Planning for Nature Guidance Annex 1 (see link above).	**Chapter 6: Ecology and Ornithology** of the EIA Report has been provided including embedded mitigation and good practice measures. **Technical Appendix 6.1: PEA** details results of the UK Habitat Classification and protected species walkover surveys. Biodiversity enhancements are considered within **Technical Appendix 6.4: OBEMP.** Potential significant impacts on ancient woodland are considered within the Chapter.

Consultee	Summary of Consultation Response	Ecological Response
	Applicants are encouraged to refer to Annex 4 of the PKC guidance for a biodiversity information checklist to minimise delays.	
NatureScot (08/08/2025)	Consultation undertaken regarding the proposed scope and methodology for ecology and ornithology surveys. NatureScot advised that the Site lies adjacent to Dupplin Lakes SSSI and the South Tayside Goose Roosts (STGR) SPA/Ramsar, which support foraging geese. In addition to the proposed desk-based assessment, goose foraging surveys should be undertaken to provide up-to-date data to inform the HRA, in line with their wind farm bird survey guidance: https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms#7-8-wintering-and-migratory-waterfowl-especially-geese-and-swans. A shadow HRA should accompany any future application. For bats, NatureScot agreed that the proposed assessment is reasonable and proportionate and referred to their updated pre-application guidance for solar farms: https://www.nature.scot/doc/naturescot-pre-application-guidance-solar-farms, which includes reference to bird and bat survey requirements.	Surveys for geese have been undertaken in September and October. Methods and results of geese surveys are presented in **Section 4.1.6 and Section 5.2.3** of this sHRA, respectively. Appropriate surveys for roosting potential and an appraisal of foraging and commuting habitat for bats have been undertaken and results are presented in **Technical Appendix 6.1: PEA**. An assessment of potential impacts and mitigation for bats in detailed in **Section 6.13 and 6.14 of** the EIA Chapter.
NatureScot (7/11/2025)	In response to the desk study and goose feeding and roost survey results from September and October 2025, NatureScot concluded that *"the Site is suitable habitat for geese associated with the SPA/Ramsar and the reduced survey effort has indicated SPA/Ramsar geese are using the site. NatureScot advises the proposed development is therefore likely to have a significant effect on the SPA/Ramsar due to the loss of habitat supporting the species. The proposed desk-based assessment would be appropriate to assess the impacts and should include information to demonstrate that the proposed development will not have an adverse effect on the integrity of the SPA/Ramsar"*.	A desk-based Appropriate Assessment of Likely Significant Effects (LSEs) on SPA/ Ramsar qualifying interests are carried in **Section 8.0** of this sHRA.

3.0 Methodology

3.1 General approach

NatureScot guidance[13] describes a series of stages which should be completed when carrying out the assessment and these are followed here with the addition of sub-headings

[13] NatureScot. (2025). NatureScot pre-application guidance for solar farms. [Online] Available at: NatureScot pre-application guidance for solar farms | NatureScot (Accessed 20/10/2025)

for further clarity. The assessment applies only to European and Ramsar sites. More specifically, it only applies to the qualifying interest features of such sites i.e., the features which are the reason that the Site was designated. More information is available in **Appendix A**.

3.1.1 Meaning of Likely Significant Effect

For Habitats Regulations Appraisals, a 'likely' effect is one that 'may reasonably be predicted and cannot be excluded (or ruled out) without further assessment or mitigation'.

A 'significant' effect is one where the proposed development undermines one or more conservation objectives of one or more of the qualifying features of a European (or Ramsar) site.

3.1.2 Meaning of Significant Disturbance

Disturbance should be judged as significant if an action (alone or in combination with other effects) impacts on (water)birds in such a way as to be likely to cause impacts on populations of a species through either (i) changed local distribution on a continuing basis; and/or (ii) changed local abundance on a sustained basis; and/or (iii) the reduction of ability of any significant group of birds to survive, breed, or rear their young[14]. Significant disturbance affecting one or more qualifying features of a European or Ramsar site would undermine conservation objectives defined for this Site and features.

3.1.3 Initial Search Area & Source-Pathway-Receptor Model

All European sites within 10 km of the Site for terrestrial ecological receptors, and 20 km for ornithological receptors were identified in the first instance. Regarding the Project alone and in combination, the search area for developments in relation to International/ European sites discussed in this sHRA related to the specific features of the designated sites and pathways of effect; for example, yet not limited to, the home ranges of the relevant species.

Table 7-1 provides more detail per Site and receptor. This influenced the full Site search area in accordance with the 'source-pathway-receptor' model.

The relevant designated sites and their primary and secondary designated features are considered to be the 'receptors' in this model. The 'pathway' is the route or means through which the 'receptors' could be positively or negatively impacted by the 'source.' The 'source' is the design of the Proposed Development. If no pathway exists between the receptor and the source, then impacts on the receptor can be screened out. If a pathway does exist, then the impact on the receptor site must be quantified and it must be determined whether a LSE will occur on the receptor.

3.2 Assessment Methodology

The stages of HRA process described by NatureScot in their guidelines[6] are:

Stage 1: Project Description

Stage 1 is an outline description of the Project, including construction, operation and decommissioning, containing enough information for potential impact pathways to be understood, and the Site and its surroundings, focussing on the habitats and species that may form part of the qualifying interest of a European or Ramsar site.

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

Stage 2: Management of the Site

Stage 2 is to ascertain whether the Project is directly connected with or necessary to the management of a European or Ramsar site. Typically, this applies only to a management plan, or parts thereof, which has the purpose of maintaining or restoring the conservation interest of a European or Ramsar site, and which would not have a negative effect on any other European or Ramsar site.

Stage 3: Screening for Likely Significant Effects

This stage aims to ascertain if the Project might have a significant effect on the European and Ramsar sites. In order to determine those effects, it is necessary to:

(a) identify potential sources of impact either alone or in combination with other projects or plans;

(b) generate a list and compile basic information on the European and Ramsar sites potentially connected via an impact pathway to the Project;

(c) assess and conclude whether likely significant effects arising from the Project, alone and in combination with projects and plans, on European and Ramsar sites can be excluded, and if they cannot, which qualifying interest features/special conservation interest are at risk from significant effects, and the relevant impact sources and pathways. If the latter, an Appropriate Assessment will be required. The conclusion will not consider any mitigation measures designed to avoid likely significant effects on a European or Ramsar site.

Stage 4: Appropriate Assessment

This stage aims to undertake a scientific assessment of the potential effects of the Project on the qualifying interest features of the European and Ramsar sites, based on the impact factors and pathways identified at Stage 3. This is done for the Project alone and in combination with other plans and projects.

For any effect that could have an adverse effect on the integrity of a European or Ramsar site, avoidance and mitigation measures are identified with the aim of removing the risk to the integrity of the identified European and Ramsar sites, including in combination effects with other projects and plans. Measures to compensate for adverse effects must not be considered at this Stage, and neither are actions designed to enhance biodiversity.

Stage 5: Conclusion on Site Integrity

Considering the mitigation identified at Stage 4, this stage aims to determine whether the risk to the conservation objectives have been reduced or removed such that they will not be undermined, and adverse effects on the integrity of all European and Ramsar sites can be excluded.

More information is available in **Appendix A**.

4.0 Sources of Information

4.1 For the Project Alone

4.1.1 Ecological Desk Study

An ecological desk study was undertaken, comprising a search for:

- European and Ramsar sites within 10 km of the Site (terrestrial ecological receptors);
- European and Ramsar sites within 20 km of the Site (ornithological receptors);

- Annex I habitats and Annex II species (of the Habitats Directive) within 10 km of the Site; and
- Annex I bird species (of the Birds Directive) within 10 km of the Site.

These are initial search areas only, and the search area was expanded beyond this distance as knowledge of the Proposed Development and its potential effects was increased, to ensure that any European and Ramsar site, at whatever distance, which could be affected by the Project is included in the desk study. Such effects could be caused by emissions to air or water, changes to hydrology, or by the use of the Site or nearby by mobile or migratory species populations.

Online resources included ecology data held on:

- NatureScot Site Link[15] for information on statutory designated sites and their qualifying interests;
- The MAGIC tool online GIS tool[16] to obtain information on designated sites in the area surrounding the Site;
- NatureScot Carbon and Peatland Map[17] to identify the presence of carbon-rich soils, deep peat and priority habitat;
- National Biodiversity Network (NBN)[18] to search for European species and habitats;
- Goose and Swan Monitoring Programme (GSMP)[19] to obtain monitoring data for individual roost sites of the South Tayside Goose Roosts SPA/ Ramsar;
- PKC Planning Portal[20] to obtain any documents for developments within 10 km of the Site; and
- SEPA Water Classification Hub[21]; and
- Scotland Environment Web[22].

Additional information was sought through review of Environmental Impact Assessment (EIA) reports submitted as part of other planning applications and any post consent/construction information for solar farms and other developments within 5 km of the Site (where available).

4.1.2 Habitat Survey

A UK Habitat Classification (UKHab) survey was completed following the standard methods described by UKHab guidance (2023) and provided in the PEA Report[1]. The UKHab survey was conducted within the Site and a 200 m buffer. Standard habitat types were assigned, and ecological notes were recorded for each habitat type, recording dominant, typical and

[15] NatureScot. (2025). SiteLink. [Online] Available at: https://sitelink.nature.scot/ (Accessed 17/10/2025)

[16] DEFRA. (2025). Magic Maps. [Online] Available at: https://magic.defra.gov.uk/ (Accessed 17/10/2025)

[17] NatureScot. (2016). Carbon and Peatland 2016 Map. [Online] Available at: https://opendata.nature.scot/ (Accessed 17/10/2025)

[18] NBN Website available at: https://nbn.org.uk/ [Accessed 8/12/2025]

[19] GSMP Website available at. https://www.bto.org/get-involved/volunteer/projects/goose-and-swan-monitoring-programme [Accessed 8/12/2025]

[20] Perth and Kinross Council. (2025). View and comment on planning applications. [Online] Available at: View and comment on planning applications - Perth & Kinross Council (Accessed 20/10/2025)

[21] SEPA. (2025). Water Classification Hub. [Online] Available at: https://informatics.sepa.org.uk/WaterClassificationHub/ (Accessed 17/10/2025)

[22] Scotland's Environment Web. (2025). Map: Obstacles to Fish Migration. [Online] Available at: https://map.environment.gov.scot/sewebmap/ (Accessed 17/10/2025)

notable plant species, and relevant ecological characteristics. Floral nomenclature followed Stace (2019), with results reflecting the conditions at the time of survey. A full methodology is provided in the PEA Report.

4.1.3 Protected Species Surveys

The habitat survey was extended to assess the suitability for protected species on Site and up to a 200 m buffer where accessible, referred to as 'the Survey Area'. Follow up surveys for protected species were also conducted. Field signs of protected, notable and invasive species including badger, otter, water vole, pine marten and red squirrel were searched for and recorded under standard methodologies[23],[24],[25],[26].

4.1.4 Aquatic Surveys

A desk study was undertaken to support this HRA to identify watercourses classified by SEPA[27] and barriers to fish migration[28].

UKHab surveys identified the presence of ditches and watercourses within the Site; no fish habitat surveys were conducted. To inform this assessment, ditches and watercourses were assessed for connectivity to the wider catchment and suitability via aerial photography only.

4.1.5 Breeding Bird Surveys

Breeding bird surveys conducted followed the methodology described by the Bird Survey Guidelines[29] which is based on the Common Bird Census methodology developed by Marchant (1983)[30] and described in Gilbert *et al.* (1998)[31]. This involved the surveyor walking a survey route at a slow, ambling pace, ensuring all accessible land within the Site plus a 100 m buffer (Survey Area) was covered. The adapted method assumed six visits taking place between April and early July.

For full survey information dates and limitations refer to the Baseline Breeding Bird Survey Report[4].

4.1.6 Wintering Bird Surveys

Four goose feeding distribution and roost surveys were conducted fortnightly within the Site and 500 m buffer and at Dupplin Loch between September and October 2025. Target species were greylag *Anser anser* and pink-footed geese *Anser brachyrhynchus*, although any waterbird species encountered was recorded. The survey followed an adapted

[23] Scottish Badgers. (2018). Surveying for Badgers Good Practice Guidelines, Version 01. [Online] Available at: https://www.scottishbadgers.org.uk/wp-content/uploads/2020/12/Surveying-for-Badgers-Good-Practice-Guidelines_V1-2020-2455979.pdf (Accessed 21/10/2025).

[24] Bang, P. and Dahlstrøm, P. (2006). Animal Tracks and Signs. Oxford University Press, Oxford.

[25] Chanin, P. (2003). Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. English Nature, Peterborough

[26] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The water vole mitigation handbook* (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society London.

[27] SEPA. (2025). SEPA Water Classification Hub. [Online] Available at: Water Classification Hub (Accessed 21/10/2025).

[28] Scotland's Environment. (2025). Scotland's Environment Map. [Online] Available at: Map | Scotland's environment web (Accessed 21/10/2025).

[29] Bird Survey and Assessment Steering Group. (2025). Bird Survey Guidelines for assessing ecological impacts. [Online] Available at: https://birdsurveyguidelines.org/ (Accessed 01/09/2025).

[30] Marchant, J. H. (1983). BTO Common Birds Census instructions. BTO, Tring.

[31] Gilbert, G., Gibbons, D. W. and Evans, J. (1998). Bird Monitoring Methods: A Manual of Techniques for Key UK Species. RSPB, Sandy.

methodology based on NatureScot guidance[32] recommending that feeding distribution surveys of geese and swans should be carried out on a fortnightly basis where species are likely to be wintering or on a weekly basis for locations where birds are likely to be present in the migration period only. Feeding distribution surveys were undertaken by road/ track transects where the road network is suitable or by observations from vantage points to ensure that all potential feeding habitat was surveyed.

4.2 For the Project In-Combination

The assessment of potential 'in-combination' effects on the International/'European' sites/ features has been informed by a review of available information on consented and proposed developments within 5 km from the Site.

This data was accessed via the PKC Planning Portal, the Energy Consent Unit (ECU) portal and relevant project websites. The portals were searched for other relevant development applications within the area. A list of known projects is provided in **Table 4-1**.

The Applicant is not aware of any other operational or proposed solar PV developments, or other industrial developments, in the vicinity of the Site at this time.

Table 4-1: Developments considered for in-combination effects

Development	Details of Development	Application Status	Distance (km) and orientation to Proposed Development
Kinnon Park Farm Solar Array, 24/01188/FLM	49.9 MW solar farm and BESS comprising ground mounted solar arrays and ancillary infrastructure, and battery energy storage system	Application submitted	2.25 km north

5.0 Stage 1: Project Description

5.1 The Project

5.1.1 Overview

The Proposed Development will comprise of a ground-mounted solar photovoltaic (PV) array and associated infrastructure, with a maximum generating capacity of 97.5-Megawatt peak (MWp) and an export capacity of 75 MW . The array will comprise PV modules arranged in rows, facing south at an angle of approximately 20º, with a maximum height of 2.67 m above ground level. The infrastructure associated with the Proposed Development will include:

- PV module mounting frames;
- string inverters;
- field transformers;

[32] NatureScot. (2025). Recommended bird survey methods to inform impact assessment of onshore windfarms. [Online] Available at: Recommended bird survey methods to inform impact assessment of onshore windfarms | NatureScot (Accessed 13/11/2025).

- high voltage (HV) switchgear and control equipment;
- cabling and interconnectors;
- onsite substations and a control building;
- communications container;
- spares containers;
- access tracks;
- security fencing and CCTV; and
- temporary construction compound.

5.1.2 Construction Phase

The construction of the Proposed Development is expected to take place over eight to twelve months and is anticipated to commence in early 2030 due to the grid availability. Construction would include the principal activities listed below and is anticipated to conclude in 2031.

- construction of Site entrance;
- laying of new access track;
- erection of security fencing;
- establishing a temporary Site compound (which will include the temporary laydown and vehicle parking area);
- trenching and installation of electric cabling;
- piling and erection of the module mounting frames;
- installation of transformers, inverters and switchgears; and
- construction of the substation(s), spares and control buildings.

Normal construction hours will be between 07:00 and 19:00 Monday to Friday and 09:00 and 13:00 on Saturdays. These times have been chosen to minimise disturbance to local residents. It must, however, be noted that out of necessity due to weather conditions and health and safety requirements, some generally quiet activities may occur outside the specified hours stated. Any construction outwith these hours will be in line with agreed noise limits and advance warning of any works outwith the agreed working hours will be provided to PKC and local residents.

During construction, temporary materials storage will be located within the construction compound and set-down area. The temporary construction compound will comprise a small Portakabin and welfare facilities. The construction compound will not require any hardstanding.

5.1.3 Operational Phase

Once operational, the solar array will require scheduled and occasional unscheduled maintenance of the solar modules and associated infrastructure. The scheduled maintenance is expected to consist of a monthly routine Site inspection.

The land around the panels will remain as grass cover (forage crop) seeded with wildflower mix and will be managed for grazing (sheep will be rotated by the farmer).

5.1.4 Decommissioning Phase

The Applicant is applying for consent to operate the solar development for 40 years. The Applicant is committed to decommissioning and restoring the Site to its previous agricultural use. In the event that a decision was to be made that the Site could be re-powered/re-fitted, then a new consenting process, including supporting statement as to the potential environmental effects, would be required.

Decommissioning is a relatively straightforward process and similar to the construction process, with the majority of structures and equipment designed to be disassembled and removed in a straightforward manner (with inverters etc. being containerised and simply able to be detached from the piles they are placed on and the solar arrays disassembled, and piles pulled up).

The following will be required for decommissioning and removing the Proposed Development at the end of its operational lifespan:

- the substations, transformers, panels and frames will be dismantled and removed via the same access as will be used for construction;
- as much material as possible will be directed to recycling or salvage/re-use, likely to be dependent on demand, market conditions and recycling facilities available at the time; and
- the area will be restored to agricultural use by infilling structural holes, repairing cable trenches, and landscaping/re-seeding.

5.2 The Site

5.2.1 Annex I Habitats Summary

The application boundary is dominated by arable fields (c1c), planted with cereal crops at the time of survey. Field margins predominantly comprised of modified grassland (g4), species diversity was poor with fewer than 5 species regularly occurring per m^2.

The arable fields were bordered by sections of drystone wall and hedgerows. Hedgerows were largely considered defunct at a height of 1-1.5 m and non-continuous.

Invasive non-native species (INNS), Japanese knotweed, *Fallopia japonica,* was present within the Site.

No classified watercourses on the SEPA classification hub were present within the Site, however, drainage ditches within the Site have potential connectivity to the East Pow (d/s of Methven to River Almond confluence) (ID: 6510). The watercourse is considered to be in ‘moderate ecological status’ (last assessed 2023) and is noted as being heavily modified on account of physical alterations resulting from drainage of agricultural land.

No obstacles to migration of fish were noted within the Site or the East Pow, however, a passable barrier (weir) is noted on the mainstem of the River Almond below the confluence with the East Pow. As such it is considered likely that all notable migratory species (salmonids, European eel and lamprey (river and sea only) will be able to access the East Pow.

A wet ditch was present along the eastern edge of the Site which had a 2 m channel width and a 0.4 m wet width. The water was approximately <0.1 m deep, with a slow water velocity visible. The substrate was dominated by high organic matter/bare soil with occasional gravel and pebbles. The banks were steeply gradient with bare uniform sides and appeared to be subject to ongoing management/vegetation clearance. Riparian vegetation was extremely limited to small strips of modified grassland and occasional hawthorn, *Crataegus monogyna.*

A second ditch was identified within the western side of the Site and was partially wet where it emerged from the Cultmalundie Woods, but was dry within the Site and dominated with rush, *Juncus sp.*

Neither ditch was considered suitable to hold any fish species due to limitations in water volume, however, is likely to hold suitability for amphibians.

Review of the Carbon and Peatland 2016 Map of Scotland[33] indicates that the entirety of the Site occurs on non-peaty soils.

No Annex I Habitats were recorded within the Site or 200m survey buffer.

5.2.2 Annex II Non-Avian Species Summary

The desk study identified a number of protected species within the 2km search buffer including badger, *Meles meles,* red squirrel, *Scuirus vulgaris,* and beaver, *Castor fiber.*

No evidence of use of the Site by otter, *Lutra lutra,* water vole, *Arvicola amphibius* or beaver within ditches was identified during the PEA survey. Similarly, no evidence of pine marten, *Martes martes,* was identified within the Site but was present within woodland west of the Site.

Evidence of badger was identified within the Site (footprints); however, no setts were identified. Evidence of squirrel was also widely observed in woodland areas but could not be attributed to grey or red squirrels due to similarity of field signs.

Beaver were the sole Annex II Species recorded within the Site or 200 m survey buffer within the desk-study.

5.2.3 Annex I Bird Species Summary

Breeding Birds

The desk study identified one breeding species of bird included within Annex I of the Birds Directive:

- Kingfisher, *Alcedo atthis;*

No Annex I Bird Species were recorded within the Site and a 100 m survey buffer during breeding bird surveys.

Non-breeding Birds

The desk study identified smew *Mergellus albellus* and a total of seven records for pink-footed goose and nine records of greylag goose within 2 km of the Site. All of these were recorded within Dupplin Loch between 2009-2021.

The South Tayside Goose Roosts SPA/ Ramsar consist of three roosts, i.e., Dupplin Loch (0.8 km from the Site), Drummond Pond (17.1 km from the Site) and Carsebreck and Rhynd Lochs (19.7 km from the Site).

Wetland Bird Survey (WeBS) average five-year peak count for 2019/20-2023/24 for Dupplin and Pitcairnie Lakes was 56 greylag geese and 1 pink-footed goose[34]. The average five-year peak for the same period at Drummond Lake was 7,187 pink-footed geese with a peak count of 13,400 in 2023/24 and 63 greylag geese with a peak count of 121 in 2023/24. Carsebreck

[33] https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ [Accessed: October 2025]

[34] WeBS Report. Available online: https://app.bto.org/webs-reporting/numbers.jsp?locid=LOC645836 [Accessed: 9 December 2025]

and Rhynd Lochs supported most of the SPA population of pink-footed geese with average 5-year peak count of 15,510 birds and the highest peak of 24,000 birds recorded in 2019/20. Greylag goose average five-year peak count was 61 with the highest peak count of 139 birds recorded in 2021/22.

The Goose and Swan Monitoring Programme (GSMP) monitors the abundance and breeding success of the UK's native geese and migratory swans during the non-breeding season throughout the United Kingdom and Ireland, to provide data for the conservation of their populations. Selected sites are visited in the autumn and winter months to count numbers of migratory geese and swans and, where possible, assess a proportion of young birds present to monitor breeding success. GSMP dawn/ dusk roost data was obtained for three roosts of the South Tayside Goose Roosts SPA/ Ramsar for the period of 2014-2023. Most years data were collected in October and November and in some years in September, December, January, February and March (**Table 5-1)**.

Table 5-1: Peak counts of greylag and pink-footed geese at the South Tayside Goose Roosts SPA/ Ramsar roosts Dupplin Loch, Drummon Pond and Carsebreck and Rhynd Lochs between 2014 and 2023

Species/ site	Peak count/ year									
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Greylag Goose										
Carsebreck and Rhynd Lochs	77	0	83	104	140	0	16	139	33	71
Drummond Pond	7	4	2	390	575	28	6	33	29	121
Dupplin Lochs	0	0	0	0	0	0	0	0	0	0
Pink-footed Goose										
Carsebreck and Rhynd Lochs	20600	16900	13700	27000	22000	24000	17500	22500	6470	2850
Drummond Pond	0	0	1650	6520	3400	7450	2750	1933	10400	13400
Dupplin Lochs	0	0	0	2700	0	0	0	0	0	0

Mitchell (2012)[35] provides an overview of wintering pink-footed geese and greylag geese distribution around SPAs designated for these species based on data from 2007-08 to 2011-12 (new records in relation to older data presented in the same publication from 1986/87 to 2006/07). There are no sensitive feeding areas for the pink-footed and greylag geese of the South Tayside Goose Roosts SPA within the 10 km national grid square where the Site is located (NO02). The nearest areas of high and medium sensitivity index from modern data for foraging geese are located:

- 5.7 km SW near Gask for pink-footed goose; and
- 8.5 km W near Madderty for pink-footed goose.

Four goose feeding distribution and roost surveys were undertaken in September and October 2025. Two records of 88 and 237 birds pink-footed geese foraging were made within the 500 m buffer north west of the application boundary. Furthermore, up to an estimated 2,200 pink-footed geese were roosting at Dupplin Loch on 25 October 2025. No greylag geese were recorded (**Table 5-2**).

[35] Mitchell, C. 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. Wildfowl & Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp.

Table 5-2: Result of the feeding and roosting goose distribution surveys in September and October 2025

Date	Species	Feeding/ Roosting (location)	Total number (Number of records)
28/09/2025	Pink-footed goose	Roost	66 (3)
9/10/2025	Pink-footed goose	Feeding (buffer)	88 (1)
9/10/2025	Pink-footed goose	Roost	330 (6)
25/10/2025	Pink-footed goose	Feeding (buffer)	237 (1)
25/10/2025	Pink-footed goose	Roost	1,426-2,200 (4-7) (maximum range is an estimate due to poor visibility toward the end of the survey)

The above information was submitted to NatureScot with a request to consult on the sufficiency of an assessment of habitat availability based on a presumption that the site is regularly used by 100-300 pink-footed geese. NatureScot advised in their response that the proposed desk-based assessment would be appropriate to assess the impacts and should include information to demonstrate that the proposed development will not have an adverse effect on the integrity of the SPA/Ramsar (see more in **Section 2.0**).

Following this advice field surveys ceased, and a desk-based assessment of habitat availability was undertaken based on the Scotland Habitat and Land Cover Map – 2022[36] available under the Open Government Licence v3.0[37] to assess habitat availability within 20 km radius from SPA roosts and 5 km around the Site[38].

5.2.4 Ecological and Environmental Connections Summary

A screening parameter of 10 km has been applied to European sites with hydrological connectivity, and 2 km for airborne transmission of air pollutants. An initial screening parameter of 20 km has been applied for ornithological features, however, features beyond 20 km where sufficient connectivity is established have also been included, these are assessed per species, and in line with known connectivity guidance.

Nine European sites are within sufficient distances of the Site, or have sufficient connectivity to the Site to be considered:

- South Tayside Goose Roosts SPA/RAMSAR
- River Tay SAC;
- Methven Moss SAC;
- Pitkeathly mires SAC;
- Firth of Tay and Eden Estuary SPA/RAMSAR; and
- Loch Leven SPA/RAMSAR.

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

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

[38] Habitat and land cover map was created by Space Intelligence[38] in partnership with NatureScot using Artificial Intelligence to classify satellite data to EUNIS Level 2[38] habitat classification which uses 28 different classes[38]. The map was converted from GeoTIFF raster layer to vector shapefile to enable analyses of area coverage of habitat classes, which are key for foraging pink-footed goose, i.e., arable land and three types of grassland: mesic, dry and seasonally wet.

A summary of European sites considered to have potential connectivity is provided in **Table 5-3.**

Table 5-3: Summary of European Sites with Potential Connectivity

Statutory Site	Distance	Description
South Tayside Goose Roosts SPA/RAMSAR	0.79 km SW	The South Tayside Goose Roosts SPA/RAMSAR comprises seven lochs (notably Dupplin Loch and Pitcarinie Loch), and overlaps an area of active raised bog within the Shelforkie Moss SAC. The SPA qualified under Article 4.2 by regularly supporting populations of migratory species including wigeon, *Anas penelope,* pink-footed goose, *Anser brachyrhynchus,* and greylag goose *Anser anser.*
River Tay SAC	2.29 km N	The River Tay SAC is a large river approximately 193 km originating in Western Scotland flowing through Loch Dochart, Lubhair and Tay. The river has several major tributaries including the Earn, Isla, Tummel and Almond. It holds one of the strongest Atlantic salmon, *Salmo salar,* populations in Scotland as well as all species of lamprey, *Lampetra fluviatilus/planeri* and *Petromyzon marinus*.
Methven Moss SAC	2.44 km NW	Methven Moss SAC is an area covering 83.85 ha of active raised bog and degraded bog between the River Almond and Earn catchments. The SAC contains the largest raised bog in Perth and Kinross.
Pitkeathly Mires SAC	8.37 km SE	The Pitkeathly Mires SAC covers an area of 60.58 ha in a shallow valley on the north side of the Ochil Hills at an altitude of 250 m. The SAC is characterised by the presence of transition mires and quaking bogs and slender green feather-moss, *Hamatocaulis vernicosus,* the most northerly example in Scotland.
Firth of Tay and Eden Estuary SPA/RAMSAR	14.17 km SE	The Firth of Tay and Eden Estuary SPA covers complex estuarine and coastal habitats in eastern Scotland from the mouth of the River Earn in the inner Firth of Tay to the Fife coast. The SPA qualified under Article 4.1 by regularly supporting populations of Annex I species including marsh harrier, *Circus aeruginosus,* little tern, *Sternula albifrons, and* bar-tailed godwit, *Limosa lapponica,* and under Article 4.2 by supporting important migratory species and in excess of 20,000 waterfowl including pink-footed and greylag geese.
Loch Leven SPA/RAMSAR	18.99 km SSE	The SPA covers Loch Leven, the largest natural eutrophic waterbody in Britain, and islands. The loch is relatively shallow with a diverse aquatic flora and shoreline vegetation. The SPA qualified under Article 4.1 by supporting populations of wintering Icelandic whooper swan, *Cygnus cygnus,* and Article 4.2 by regularly supporting wintering geese and waterfowl.

6.0 Stage 2: Management of the Site

The Project is not wholly or partially connected with, or necessary for, the management of any statutory site and it does not contribute to achieving any European site's conservation objectives.

7.0 Stage 3: Likely Significant Effects

No European sites are located within the Site. Likely significant effects of the Project alone and in combination with other developments are outlined in Section 8.1. For the purposes of this assessment, it has been determined that decommissioning phase effects will be less than, or equal to effects caused by the construction phase and have thus been considered together.

7.1 Sources of Impact

Potential sources of impact from the Proposed Development are listed below in relation to different phases over the Proposed Development lifetime (construction, operation, decommission) alone or in combination with other plans/projects. **Section 7.3** provides the assessment of risks relevant to statutory sites and identified specific sources of impact.

Construction and Decommissioning:

- Factor 1: Direct or indirect habitat loss.
- Factor 2: Changes in surface water quality or hydrological regime.
- Factor 3: Disturbance of species due to construction (noise, light, vibration, construction worker presence).
- Factor 4: Direct or indirect injury and/or mortality of species.
- Factor 5: Direct or indirect injury and/or mortality of prey species.
- Factor 6: Spread of non-native invasive (plant) species

Operation:

- Factor 7: Loss of foraging area
- Factor 8: Disturbance resulting from increased operation noise and maintenance

7.2 European Sites

Nine European sites are within a 10 km (terrestrial and aquatic receptors) and 20 km (ornithological receptors) distance of the Site or have sufficient connectivity to the Site to be considered:

- South Tayside Goose Roosts SPA/RAMSAR;
- River Tay SAC;
- Methven Moss SAC;
- Pitkeathly mires SAC;
- Firth of Tay and Eden Estuary SPA/RAMSAR; and
- Loch Leven SPA/RAMSAR.

Three of the European sites are comprised of an SPA and RAMSAR that wholly overlap, as such are considered for likely significant effects (LSE) in tandem.

Information on the nine European sites considered is provided in **Table 7-1**. The table details qualifying interests, conservation objectives, condition, distance and orientation from the Site, as detailed in the relevant Conservation Advice Package (refer to **Appendix D**) and any connection to the Site.

Table 7-1: European sites initially considered for Source - Pathway - Receptor Links

European Site and EU Site Code	Qualifying Interest / Condition / Latest Assessed Condition and Conservation Objectives	Distance from Project	Connections
South Tayside Goose Roosts SPA/RAMSAR (SPA: UK9004401) (RAMSAR: UK13057)	Greylag goose, non-breeding (Unfavourable declining – UD, Oct 2017) Pink-footed goose, non-breeding (UD, Mar 2019) Wigeon, breeding (UD, Aug 2024) Waterfowl assemblage, non-breeding (Unfavourable no change UNC, Aug 2024) <u>Conservation Objectives</u> 1. To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained. 2. To ensure for the qualifying species that the following are maintained in the long term: ➢ Population of the species as a viable component of the site; ➢ Distribution of the species within site Distribution and extent of habitats supporting the species; ➢ Structure, function and supporting processes of habitats supporting the species; and ➢ No significant disturbance of the species.	0.79 km SW	The SPA is within the 2 km screening parameter for airborne pollutants. The SPA is not hydrologically connected to the Proposed Development, as such this pathway has been screened out of further assessment. Both greylag geese and pink-footed goose have core foraging ranges of 15-20 km from their night roost during winter periods, as such are considered to have connectivity. Due to the small distance from the Proposed Development and the risk of airborne pollutants, wigeon are considered to have connectivity. All qualifying interests are considered to have connectivity.
River Tay SAC (UK0030312)	Atlantic salmon (Favourable maintained – FM, Mar 2015) Brook lamprey (FM, Feb 2010) Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels (FM, May 2012)	2.29 km N	One unnamed tributary is present within the Site with potential connectivity to the East Pow, part of the River Tay SAC. The watercourse runs for approximately 1.1 km northwest within the eastern extent of the Site and is located 2.7 km upstream of the East Pow.

European Site and EU Site Code	Qualifying Interest / Condition / Latest Assessed Condition and Conservation Objectives	Distance from Project	Connections
	Otter (FM, Dec 2015) River lamprey (FM, Feb 2010) Sea lamprey (FM, Feb 2010) <u>Conservation Objectives</u> 1. To ensure that the qualifying feature of the River Tay SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status. 2. To ensure that the integrity of the River Tay is maintained by meeting objectives 2a, 2b and 2c for the qualifying feature. *Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels* 2a. Maintain the extent and distribution of clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels within the site; 2b. Maintain the structure, function and supporting processes of clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels; and 2c. Maintain the distribution and viability of typical species of clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels. *Species Features* 2a. Maintain the population of the [qualifying species] as viable components of the site (including a range of genetic types for Atlantic salmon); 2b. Maintain the distribution of the [qualifying species] throughout the site; and		The watercourse within the Site appears to be modified in nature, restricted to field margins with long sections of straightened watercourse and probable culverted sections where it is not present on the OS 1:25,000 Map. Given its fragmented and modified nature watercourses are unlikely to provide connectivity to the SAC for migratory species, as such they are considered unlikely to be present within the Site. This includes Atlantic salmon, river lamprey or sea lamprey, as such they have been screened out of further assessment. Brook lamprey are non-migratory and may still be present within the Site, however, given lack of connectivity to the East Pow they are not considered likely to form part of the River Tay meta-population and as such have been screened out of further assessment. Given the fragmented nature, watercourses are considered unlikely to facilitate the movement of pollutants to the SAC. No waterbodies designated for clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels are present within the Site or a 20 km buffer and has consequently been screened out of airborne and hydrological connectivity. Otter in the River Tay maintain large linear habitats (40km for male and 20km for female), as such otter from the SAC may utilise the watercourses within the application boundary for foraging and commuting. The SAC is outwith the 2 km screening parameter for airborne pollutants. Otter are the sole qualifying interest considered to have connectivity to the Proposed Development.

European Site and EU Site Code	Qualifying Interest / Condition / Latest Assessed Condition and Conservation Objectives	Distance from Project	Connections
	2c. Maintain the habitats supporting the [qualifying species] within the site, and availability of food.		
Methven Moss SAC (UK0030204)	Raised Active Bog (FM, Dec 2010) Degraded raised bog (Unfavourable recovering, Dec 2010) <u>Conservation Objectives</u> 1. To ensure that the qualifying features of Methven Moss SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status. 2. To ensure that the integrity of Methven Moss SAC is restored by meeting objectives 2a, 2b and 2c. 2a. Maintain the extent and distribution of the habitat within the site. 2b. Restore, the structure, function and supporting processes of the habitat. 2c. Restore the distribution and viability of typical species of the habitat.	2.44 km NW	The SAC is outwith the 2 km screening parameter for airborne pollutants. The Proposed Development is considered to be a sufficient distance to avoid hydrological effect from excavations (to a maximum of 5 m). Potential hydrological connectivity exists between the Site and the East Pow, however, the Methven Moss SAC is located upstream of the confluence between tributaries connected to the Site and the East Pow. As such there is no pathway for pollution or the potential for works on Site to affect water volume inputs to the SAC. The Methven Moss SAC has been screened out of further assessment due to lack of connectivity.
Pitkeathly Mires SAC (UK0030239)	Very wet mires often identified by an unstable ‘quaking’ surface (FM, Mar 2005) Slender green feather-moss (*Hamatocaulis vernicosus*) (FM, Jul 2010) <u>Conservation Objectives</u> 1. To ensure that the qualifying features of Pitkeathly Mires SAC are in favourable condition and make an appropriate contribution to achieving favourable conservation status.	8.37 km SE	The SAC is outwith the 2 km screening parameter for airborne pollutants. The Proposed Development is not hydrologically connected to the SAC and is considered to be in a different hydrological catchment (River Earn). The Pitkeathly Mires SAC has been screened out of further assessment due to lack of connectivity.

European Site and EU Site Code	Qualifying Interest / Condition / Latest Assessed Condition and Conservation Objectives	Distance from Project	Connections
	2. To ensure that the integrity of Pitkeathly Mires SAC is restored by meeting objectives 2a, 2b and 2c. *Very wet mires often identified by an unstable 'quaking' surface* 2a. Maintain the extent and distribution of very wet mires often identified by an unstable 'quaking' surface within the site. 2b. Maintain the structure, function and supporting processes of very wet mires often identified by an unstable 'quaking' surface. 2c. Maintain the distribution and viability of typiucal species of very wet mires often identified by an unstable 'quaking' surface. *Slender green feather-moss* 2a. Maintain the population of slender green feather-moss as a viable component of the site. 2b. Maintain the distribution of slender green feather-moss throughout the site. 2c. Maintain the habitats supporting the slender green feather-moss within the site and availability of food.		
Firth of Tay and Eden Estuary SPA/RAMSAR (SPA: UK9004121) (RAMSAR: UK13018)	Bar-tailed godwit *Limosa lapponica*, non-breeding (Favourable declining (FD), Feb, 2019) Common scoter, *Melanitta nigra,* non-breeding (UD, Feb 2019)* Cormorant, *Phalacrocorax carbo,* non-breeding (FM, Feb 2019)* Dunlin, *Calidris alpina,* non-breeding (FD, 2019)*	14.17 km SE	The following species have been selected as potentially linked to the Site. Remaining qualifying interest species do not occur inland or there are no habitats within the Site to support those species, or the Site is outwith a typical foraging range distance from the SPA/ Ramsar. Cormorants primarily feed on fish and may be present on both inland freshwater and in coastal areas, notably moving inland during winter periods. Due to the close proximity of the lochs associated with the South Tayside Goose Roosts SPA/Ramsar it is possible that cormorants may winter in the vicinity of the Proposed

European Site and EU Site Code	Qualifying Interest / Condition / Latest Assessed Condition and Conservation Objectives	Distance from Project	Connections
	Eider, *Somateria mollissima,* non-breeding (Favourable recovered, Feb 2019)* Goldeneye, *Bucephala clangula,* non-breeding (UD, Feb 2019)* Goosander, *Mergus maerganser,* non-breeding (FM, Feb 2019)* Grey plover, *Pluvialis squatarola,* non-breeding (FM, Feb 2019)* Greylag goose, non-breeding (UD, Feb 2019) Icelandic black-tailed godwit, *Limosa limosa,* non-breeding (FM, Feb 2019). Little tern, *Sternula albifrons,* breeding (Unfavourable no change, Mar 2005) Long-tailed duck, *Clangula hyemalis,* non-breeding (UD, Feb 2019)* Marsh harrier, *Circus aeruginosus,* breeding (FM, Feb 2019) Oystercatcher, *Haematopus ostralegus,* non-breeding (FM, Feb 2019)* Pink-footed goose, non-breeding (Favourable recovered, Jan 2016) Red-breasted merganser, *Mergus serrator,* non-breeding (UD, Feb 2019)* Redshank, *Tringa totanus,* non-breeding (FD, Feb 2019) Sanderling, *Calidris alba,* non-breeding (FM, Feb 2019)*		Development, however, at a distance of 0.8 km this is considered outwith the maximum disturbance buffers for most waterbird species[39] and are therefore not considered to have connectivity. Greylag goose have core foraging ranges of 15-20 km, as such they are considered to have potential connectivity and have been screened into further assessment. Pink footed goose have core foraging ranges of 15-20 km, as such they are considered to have potential connectivity and have been screened into further assessment. None of the individual waterfowl assemblage qualifier species were determined to have connectivity to the Site, as such the assemblage is not considered to have connectivity. Greylag goose and pink-footed goose have been screened into further assessment.

[39] NatureScot. (2022). Disturbance Distances in selected Scottish Bird Species – NatureScot Guidance. [Online] Available at: https://www.nature.scot/doc/disturbance-distances-selected-scottish-bird-species-naturescot-guidance (Accessed 13/11/2025).

European Site and EU Site Code	Qualifying Interest / Condition / Latest Assessed Condition and Conservation Objectives	Distance from Project	Connections
	Shelduck, *Tadorna tadorna,* non-breeding (UD, Feb 2019)* Velvet scoter, *Melanitta fusca,* non-breeding (UD, Feb 2019)* Waterfowl assemblage, non-breeding (FM, Mar 2019) <u>Conservation Objectives</u> 1. To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained. 2. To ensure for the qualifying species that the following are maintained in the long term: ➢ Population of the species as a viable component of the site; ➢ Distribution of the species within site; ➢ Distribution and extent of habitats supporting the species; ➢ Structure, function and supporting processes of habitats supporting the species; and ➢ No significant disturbance of the species. *indicates assemblage qualifier only		
Loch Leven SPA/RAMSAR (SPA: UK9004111) (RAMSAR: UK13033)	Cormorant, non-breeding (FM, Aug 2009)* Gadwall, *Anas strepera,* non-breeding (FM, Aug 2009)* Goldeneye, non-breeding (FM, Aug 2009)* Pink-footed goose, non-breeding (FM, Aug 2009) Pochard, *Aythya farina,* non-breeding (FM, Aug 2009)* Shoveler, *Anas clypeata,* non-breeding (FM, Oct 2009)	18.99 km SSE	The following species have been selected as potentially linked to the Site. Remaining qualifying interest species do not occur inland or there are no habitats within the Site to support those species, or the Site is outwith a typical foraging range distance from the SPA/ Ramsar. Cormorants primarily feed on fish and may be present on both inland freshwater and in coastal areas, notably moving inland during winter periods. Due to the close proximity of the lochs

European Site and EU Site Code	Qualifying Interest / Condition / Latest Assessed Condition and Conservation Objectives	Distance from Project	Connections
	Teal, *Anas crecca,* non-breeding (FM, Aug 2009)* Tufted duck, *Aythya fuligula,* non-breeding (FM, Aug 2009)* Waterfowl assemblage, non-breeding (FM, Aug 2009) Whooper swan, *Cygnus cygnus,* non-breeding (FM, Sept 2009)* <u>Conservation Objectives</u> 1. To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained. 2. To ensure for the qualifying species that the following are maintained in the long term: ➢ Population of the species as a viable component of the site; ➢ Distribution of the species within site; ➢ Distribution and extent of habitats supporting the species; ➢ Structure, function and supporting processes of habitats supporting the species; and ➢ No significant disturbance of the species. *indicates assemblage qualifier only		associated with the South Tayside Goose Roosts SPA/Ramsar it is possible that cormorants may winter in the vicinity of the Proposed Development, however, at a distance of 0.8 km this is considered out with the maximum disturbance buffers of waterbird species[39]. Pink footed goose have core foraging ranges of 15-20 km and have been recorded foraging in fields adjacent to the Proposed Development, as such they are considered to have potential connectivity and have been screened into further assessment. Whooper swan are considered to have a core foraging range of <5 km from their night roost during the winter season, as such they are not considered to have potential connectivity at a distance of c.19 km. Pink-footed goose are the sole species screened into further assessment.

It is considered that the following European sites and qualifying interests have connectivity to the Proposed Development and will require further consideration in the screening assessment:

- South Tayside Goose Roosts SPA/RAMSAR: all features;
- River Tay SAC: otter;
- Firth of Tay and Eden Estuary SPA/RAMSAR: greylag goose and pink-footed goose;
- Loch Leven SPA/RAMSAR: pink-footed goose.

Pitkeathly Mires SAC and Methven Moss SAC are not considered to have connectivity and have been screened out of further assessment.

7.3 Assessment of Likely Significant Effects (ALSE)

This section identifies the potential effect pathways through which the Project could impact the qualifying features of the European and Ramsar sites. Specifically, the aim is to establish if a particular potential impact is likely to have a significant impact and undermine conservation objectives.

7.3.1 For the Project Alone

7.3.1.1 South Tayside Goose Roosts SPA/RAMSAR

Relevant Ecological Information

The greylag goose population in Scotland comprises two populations, residents and wintering birds. Wintering birds will migrate from Iceland and spend winter across Scotland.

Pink-footed geese similarly winter in Scotland arriving in September and leaving around April. During winter and spring periods typical food supplies around estuaries and lochs are exhausted and geese may occupy arable lands to feed on winter and spring cereal crops. This wintering species does not breed in the United Kingdom.

Wigeon are predominantly a wintering species in Scotland, but with a small breeding population (c.200 pairs). The species qualified under Article 4.2 by regularly supporting migratory populations of European importance accounting for 5.3% of the British population)[40].

Sources of Impact

Sources of impact (**Section 7.1**) likely to result in adverse effect to the qualifying features of the SPA/RAMSAR have been identified.

Construction and Decommissioning

- Factor 2: Changes in surface water quality or hydrological regime.

The SPA lies 0.79 km west of the Site within the 2 km screening buffer afforded to airborne pollutants, with the nearest waterbody, Dupplin Loch, lying 0.85 km south west from the Site. There is potential for dust and pollution generation to affect water quality that may affecting prey species (e.g. fish) or macrophytes (e.g. through impaired photosynthetic ability). Given the minimal nature of ground disturbance required to install solar panels, ground clearance is likely limited to installation of welfare and control units, and the construction of the SuDs

[40] NatureScot. (2000). Citation for Special Protection Area (SPA): South Tayside Goose Roosts (UK9004401). [Online] Available at: https://www.nature.scot/sites/default/files/special-protection-area/8577/spa-citation.pdf (Accessed 11/11/2025).

pond. As such even under a worst-case scenario basis, for example prolonged dry conditions and the wind direction transporting dust directly to the SPA, it is not considered to be sufficient to have a measurable effect on water quality. Moreover, the presence of a sizeable block of woodland between the Site boundary and Dupplin Loch is likely to aid in blocking and/or trapping airborne dust before it reaches the Loch. **On this basis, this factor has been screened out of the Statement to Inform Appropriate Assessment (SIAA).**

- Factor 3: Disturbance of species due to construction (noise, light, vibration, construction worker presence).

Individuals within the SPA are considered unlikely to be affected by construction related activities due to the buffer effect created by surrounding woodland forming a barrier to artificial light, visual disturbance from construction workers and construction noise. The SPA is relatively closer to the A9 (0.34 km), which is considered likely to produce noise and vibration effects in excess of those resulting from the construction phase. Therefore, construction impacts are not likely to add to the existing background levels of noise and vibration due to distance and the barrier provided by the woodland.

Wigeon are considered likely to reside within the waterbodies only during breeding season and as such fall outwith the maximum disturbance buffers during the breeding (100 m) seasons at a minimum distance of 0.8 km and **have been screened out of the SIAA on this basis.**

Both greylag and pink-footed geese from the SPA are considered likely to use adjacent fields for foraging. Wintering bird surveys identified pink-footed geese within a 500 m buffer of the Site, as such are likely to be present within the non-breeding disturbance buffer of 200-600 m[39]. Greylag geese were not identified during wintering bird surveys, however, they are considered likely to utilise arable fields alongside pink-footed geese and have been included under a precautionary basis.

On this basis, this factor has been screened into the SIAA for both geese species.

- Factor 4: Direct or indirect injury and/or mortality of species.

In the absence of mitigation there is potential for injury and/or mortality of bird species when in contact with construction works; this includes but is not limited to injury and/or mortality caused by loud noises and contact with equipment (e.g. traffic contact).

Pink-footed and greylag geese are considered to have a medium sensitivity to disturbance[39], as such it is considered unlikely that machinery will be able to get close enough to individuals to cause injury/mortality without first triggering a flee response. Given the typical slow speed of machinery on terrain with no hard/compacted surface and the lack of visual obstructions within the Site, it is likely that geese will be able to avoid contact with machinery (disturbance is considered under Factor 3).

Wigeon are considered unlikely to be present within the Site during breeding season, and as such have negligible opportunity to come into contact with machinery/personnel within the Site.

On this basis, this factor has been screened out of the SIAA.

Operation:

- Factor 7: Loss of foraging area

It is anticipated that the Proposed Development will result in a loss of 126 ha of potential foraging grounds for pink-footed and greylag geese as a result of the development footprint. In the absence of mitigation, including those measures to mitigate biodiversity loss in the Outline Biodiversity Enhancement Management Plan (OBEMP), this factor has been screened into the SIAA.

- Factor 8: Disturbance resulting from increased operation noise and maintenance

It is anticipated that the Proposed Development will be remotely operated with minimal staff present at any one time, as such the risk of disturbance is considered minimal and no greater than the surrounding, existing disturbance levels. The OBEMP has outlined several habitat management commitments, including ongoing management for hedgerows and grassland/wildflower meadows. Given the existing land use of the Site and wider area as intensive agricultural land, it is considered that any management will be significantly reduced from baseline conditions providing an overall benefit, **as such this has been screened out of the SIAA.**

7.3.1.2 River Tay SAC

Relevant Ecological Information

Otter within the River Tay SAC have been identified as having large linear territories, with males up to 40 km and females 20 km. The home range of an otter will vary depending on their sex, habitat quality and food availability, and will vary between freshwater and coastal environments. At this SAC, some otters have parts of their territories within coastal waters that lie outwith the boundary of the SAC. In coastal areas, otter densities may be as high as 0.5 - 0.7 animals/km. The distribution of otter within the SAC can be affected by displacement and barrier effects both within and outwith the SAC. Otter within mainland Scotland do not follow established breeding seasons, therefore as such may breed at any time of year.

Due to the comparatively small linear habitats of coastal otters, and the distance between the Site and the nearest brackish/marine water, c. 24 km, it is considered for the purposes of this assessment that otters present are likely to exclusively inhabit freshwater.

Sources of Impact

Sources of impact, outlined in Step 1 (Section 8.1) likely to result in adverse effect to otter from the SAC have been identified.

Construction and Decommissioning

- Factor 1: Direct or indirect habitat loss.

There is no direct or indirect habitat loss within the River Tay SAC as a result of the Proposed Development; there is no overlap between the Site boundary and the SAC. Indirect effects of habitat degradation are considered separately within Factors 2-6.

- Factor 2: Changes in surface water quality or hydrological regime.

Otter have the potential to be indirectly affected by water quality deterioration affecting favoured prey species within the Site and relevant downstream areas (taken to be approximately 2 km downstream, for localised pollution).

Indirect habitat deterioration has the potential to occur due to pollution generation within the Site during the construction phase (e.g. suspended solids, hydrocarbons, changes in pH) being mobilised and transported to the SAC. The distance between the SAC and Site is c. 2.7 km, with the watercourse extremely fragmented in nature with multiple other field drains/watercourses joining. Given the minimal earthworks and non-destructive construction methods employed for the panel installation it is considered unlikely that significant pollution will be generated. Moreover, land use changes from intensive agriculture (including periods of soil exposure through ploughing) to managed grassland/wildflower meadow as a result of the Proposed Development, is likely reduce the volume of sediment input into watercourses; this has the potential to provide overall benefits to water quality within the SAC. However,

under a worst-case scenario basis, e.g. major fuel spill, fauna that otter are reliant on for food sources within the watercourse may be affected.

Aquatic prey species likely present within the watercourses are considered to be limited to non-migratory species tolerant of moderate pollution due to existing agricultural land use in the area. This is likely to include brown trout, *Salmo trutta,* European eel, *Anguilla Anguilla,* brook lamprey, *Lampetra planeri,* and amphibian species such as common frog, *Rana temporaria* and toad, *Bufo bufo.*

Although European eel (hereafter referred to as 'eel') are migratory, individuals are able to circumnavigate barriers impassable to salmonids by travelling overland (where riparian habitat allows), as such may also be present. Brown trout are sensitive to deterioration in water quality, notably sediments that may smother spawning nests (redds) and temperature/dissolved oxygen (that are inversely related), dependent on concentration this may cause deterrence/barrier effects, injury and/or mortality. Brook lamprey are non-migratory and could have been present before barriers were placed where they existed as self-sustaining populations in isolation and as such may also be present. The two proposed permanent watercourse crossings will comprise of bottomless arch culverts or equivalent, as such the watercourse bed would be maintained, as such there is considered to be no additional barrier effect as a result of the proposed Development to fish or otter.

Given a clear pathway for introduction of sediment and pollutants into tributaries of the SAC that otter may rely on for food sources **this factor has been screened into the SIAA**.

- Factor 3: Disturbance of species due to construction (noise, light, vibration, construction worker presence).

Otter are sensitive to visual and noise disturbance. Individuals that may be currently utilising the Site for commuting/foraging are likely to show a heighted tolerance to disturbance given existing agricultural land use, minor busy roads intersecting watercourses between the Site and the SAC, and major roads (A9 to the south of the Site) providing constant traffic noise and light. Despite this, an increased human and machinery presence surrounding watercourses in addition to construction related light and noise has the potential to cause disturbance. Construction related noise is likely be different to existing noise sources with hammer strikes/piles during panels installation providing short, loud noises that may trigger startle responses compared to the background noise of vehicles. As such, disturbance of otter may result in barrier effects of species preventing movement along established routes, loss of foraging area (as individuals are dissuaded from using established foraging ranges), increased energy expenditures (from flight response) and in extreme cases, effect on breeding success.

Moreover, established work periods are between 07:00 and 19:00 (with reduced schedules on Saturdays), during winter periods this coincides with dawn and dusk periods where otter are most active and susceptible to disturbance presenting opportunities for them to come into direct contact with construction works.

Given the potential for disturbance of otter **this factor has been screened into the SIAA**.

- Factor 4: Direct or indirect injury and/or mortality of species.

Otter are at risk of potential injury and/or mortality via a number of pathways including collision with construction vehicles, exposure to excavations, entrapment in equipment being stored within the Site, and indirectly through prey reduction via water quality deterioration (as discussed in Factor 2). **On this basis, this factor has been screened into the SIAA.**

- Factor 5: Direct or indirect injury and/or mortality of prey species.

Brown trout, eel and amphibians, all common prey species of otter, are likely to be present within the Site. Both species are at risk of disturbance relating to in-stream works or works immediately adjacent, water quality deterioration, movement of machinery across

watercourses and noise/vibration from construction related activities such as the use of hammering/piling equipment near watercourses. As such there are clear pathways that may result in injury and/or mortality prior to mitigation, **as such effects have been screened into the SIAA.**

- Factor 6: Spread of invasive non-native (plant) species

INNS have been identified within the Site. Further spread of INNS resulting from the construction period in suitable habitat for brown trout / eel / amphibians has the potential to deteriorate habitat for prey species. A number of pathways exist including via vehicles and construction equipment working alongside watercourses. Moreover, given hydrological connectivity to the SAC, seeds/plant matter has the potential to be carried downstream resulting in establishment, **as such this has been screened into the SIAA.**

Operation:

- Factor 8: Disturbance resulting from increased operation noise and maintenance

It is anticipated that the Proposed Development will be remotely operated with minimal staff present at any one time, as such the risk of disturbance is considered minimal and no greater than the surrounding, existing disturbance levels. The OBEMP has outlined several habitat management commitments, including ongoing management for hedgerows and grassland/wildflower meadows. Given the existing land use of the Site and wider area as intensive agricultural land, it is considered that any management will be significantly reduced from baseline conditions providing an overall benefit, **as such this has been screened out of the SIAA.**

7.3.1.3 Firth of Tay and Eden SPA/RAMSAR

Relevant Ecological Information

Refer to **Section 7.3.1.1** for information relating to greylag goose and pink-footed goose.

Sources of Impact

Sources of impact, outlined in Step 1 (**Section 7.1**) likely to result in adverse effect to the qualifying features of the SPA/RAMSAR have been identified.

Construction and Decommissioning

- Factor 3: Disturbance of species due to construction (noise, light, vibration, construction worker presence).

Greylag and pink-footed geese have the potential to use the Site as alternative foraging areas out with the SPA/Ramsar up to distances of 15-20 km, as such may come into direct contact with construction related activities.

Both greylag geese and pink-footed geese from the SPA are considered likely to use adjacent fields for foraging. Wintering bird surveys identified pink-footed geese within a 500 m buffer of the Site, as such are likely to be present within the non-breeding disturbance buffer of 200-600 m[39]. Under a precautionary basis greylag geese are likely to utilise arable fields alongside pink-footed geese within their non-breeding disturbance buffer of 200-600 m[39].

On this basis, this factor has been screened into the SIAA for geese.

- Factor 4: Direct or indirect injury and/or mortality of species.

In the absence of mitigation there is potential for injury and/or mortality of bird species when in contact with construction works; this includes but is not limited to injury and/or mortality caused by loud noises and contact with equipment (e.g. traffic contact).

Pink-footed and greylag geese are considered to have a medium sensitivity to disturbance[39], as such it is considered unlikely that machinery will be able to get close enough to individuals to cause injury/mortality without first triggering a flee response. Given the typical slow speed of machinery on terrain with no hard/compacted surface and the lack of visual obstructions within the Site, it is likely that geese will be able to avoid contact with machinery (disturbance is considered under Factor 3).

On this basis, this factor has been screened out of the SIAA.

Operation:

- Factor 7: Loss of foraging area

It is anticipated that the Proposed Development will result in a loss of 126 ha of potential foraging grounds for geese as a result of the panel footprint. In the absence of mitigation, including those measures to mitigate biodiversity loss in the OMBEMP, **this factor has been screened into the SIAA.**

- Factor 8: Disturbance resulting from increased operation noise and maintenance

It is anticipated that the Proposed Development will be remotely operated with minimal staff present at any one time, as such the risk of disturbance is considered minimal and no greater than the surrounding, existing disturbance levels. The OBEMP has outlined several habitat management commitments, including ongoing management for hedgerows and grassland/wildflower meadows. Given the existing land use of the Site and wider area as intensive agricultural land, it is considered that any management will be significant reduced from baseline conditions providing an overall benefit, **as such this has been screened out of the SIAA.**

7.3.1.4 Loch Leven SPA/RAMSAR

Relevant Ecological Information

Refer to **Section 7.3.1.1** for information relating to pink-footed goose.

Sources of Impact

Sources of impact, outlined in Step 1 (**Section 7.1**) likely to result in adverse effect to the qualifying features of the SPA/RAMSAR have been identified.

Construction and Decommissioning

- Factor 3: Disturbance of species due to construction (noise, light, vibration, construction worker presence).

Pink-footed geese have the potential to use the Site as alternative foraging areas out with the SPA/Ramsar up to distances of 15-20 km, as such may come into direct contact with construction related activities. Wintering bird surveys identified pink-footed geese within a 500 m buffer of the Site, as such are likely to be present within the non-breeding disturbance buffer of 200-600 m[39]. Individuals within the Site may originate from the Loch Leven SPA/RAMSAR. Pink-footed geese are considered to have a medium sensitivity to disturbance[39], as such it is considered that any prolonged activity within the Site could have a disturbance and or dissuasion effect.

On this basis, this factor has been screened into the SIAA for pink-footed goose.

- Factor 4: Direct or indirect injury and/or mortality of species.

In the absence of mitigation there is potential for injury and/or mortality of pink-footed goose when in contact with construction works; this includes but is not limited to injury and/or mortality caused by loud noises and contact with equipment (e.g. traffic contact).

Pink-footed geese are considered to have a high sensitivity to disturbance[39] and as such it is considered unlikely that machinery will be able to get close enough to individuals to cause injury/mortality without first triggering a flee response. Given the typical slow speed of machinery on terrain with no hard/compacted surface and the lack of visual obstructions within the Site, it is likely that geese will be able to avoid contact with machinery (disturbance is considered under Factor 3).

On this basis, this factor has been screened out of the SIAA.

Operation

- Factor 7: Loss of foraging area

It is anticipated that the Proposed Development will result in a loss of 126 ha of potential foraging grounds for geese as a result of the development footprint. In the absence of mitigation, including those measures to mitigate biodiversity loss in the OMBEMP, **this factor has been screened into the SIAA.**

- Factor 8: Disturbance resulting from increased operational noise and maintenance

It is anticipated that the Proposed Development will be remotely operated with minimal staff present at any one time, as such the risk of disturbance is considered minimal and no greater than the surrounding, existing disturbance levels. The OBEMP has outlined several habitat management commitments, including ongoing management for hedgerows and grassland/wildflower meadows. Given the existing land use of the Site and wider area as intensive agricultural land, it is considered that any management will be significant reduced from baseline conditions providing an overall benefit, **as such this has been screened out of the SIAA.**

7.3.2 Summary of Likely Significant Effects

A summary of predicted LSEs resulting from the Proposed Development are summarised in **Table 7-2** for both LSEs resulting from the Project alone, and those predicted from in-combination effects with other developments.

Table 7-2: Summary of LSEs

Factor	Phase	LSE predicted for Project Alone?	LSE predicted for In-Combination Effects?	Included in AA?
South Tayside Goose Roosts SPA/RAMSAR				
Factor 2: Changes in surface water quality or hydrological regime.	**Construction/ Decommissioning**	No	No	No
Factor 3: Disturbance of species due to construction		Yes	Yes	Yes
Factor 4: Direct or indirect injury and/or mortality of species.		No	No	No
Factor 7: Loss of foraging area	**Operation**	Yes	Yes	Yes
Factor 8: Disturbance resulting from increased operation noise and maintenance		No	No	No
River Tay SAC				
Factor 1: Direct or indirect habitat loss.	**Construction/ Decommissioning**	Yes	Yes	Yes
Factor 2: Changes in surface water quality or hydrological regime.		Yes	Yes	Yes
Factor 3: Disturbance of species due to construction		Yes	Yes	Yes
Factor 4: Direct or indirect injury and/or mortality of species.		Yes	Yes	Yes
Factor 5: Direct or indirect injury and/or mortality of prey species.		Yes	Yes	Yes
Factor 6: Spread of invasive non-native (plant) species		Yes	Yes	Yes
Factor 8: Disturbance resulting from increased operation noise and maintenance	**Operation**	No	No	No
Firth of Tay and Eden SPA/RAMSAR				
Factor 3: Disturbance of species due to construction		Yes	Yes	Yes

Factor	Phase	LSE predicted for Project Alone?	LSE predicted for In-Combination Effects?	Included in AA?
Factor 4: Direct or indirect injury and/or mortality of species.	**Construction/ Decommissioning**	No	No	No
Factor 7: Loss of foraging area	**Operation**	Yes	Yes	Yes
Factor 8: Disturbance resulting from increased operation noise and maintenance		No	No	No
Loch Leven SPA/RAMSAR				
Factor 3: Disturbance of species due to construction	**Construction/ Decommissioning**	Yes	Yes	Yes
Factor 4: Direct or indirect injury and/or mortality of species.		No	No	No
Factor 7: Loss of foraging area	**Operation**	Yes	Yes	Yes
Factor 8: Disturbance resulting from increased operation noise and maintenance		No	No	No

7.3.3 For the Project In-Combination

Plans or projects considered for in-combination effect are outlined in **Table 4-1**.

Sources of impact, likely to result in adverse effect to the qualifying features from in-combination effects are set out in **Section 7.1**. Mitigation for other developments has not been included in this assessment. Where stringent guidelines and/or construction regulations are in place for specific sectors, the inclusion of these in this assessment is stated.

In-combination effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a particular location. The potential for in-combination effects with other developments has been assessed here.

Given that there are potential pathways for LSE of the Proposed Development alone, potential effects of the Proposed Development in combination with other projects or plans are also screened into the SIAA, to allow for detailed assessment, and are therefore not discussed further in the Stage 1 Screening.

For aquatic receptors potential in-combination effects are only likely to be significant for other developments located relatively close by (i.e., within 10 km) and within the same hydrological sub-catchments, therefore, this SIAA has assessed the in-combination effects on aquatic receptors within the same sub-catchment (the East Pow within the River Tay catchment, the largest watercourse hydrologically connected to the Site within 10 km). As a precautionary approach, beyond 10 km, no discernible effects of pollution, with or in absence of mitigation, is deemed to have the potential to result in LSEs and they are considered outside of the Zone of Influence.

No pathways were identified for Pitkeathly Mires SAC and Methven Moss SAC in relation to the Proposed Development, the information presented above suggests that no current pathways exist that would contribute a LSE on the qualifying interests of the SPA/Ramsar. There is therefore no potential for LSE in combination with other plans or projects, thus in combination effects are screened out of the SIAA for both SACs.

7.4 Stage 3: Conclusion

This Stage 1: sHRA screening concludes that on the basis of objective evidence and in view of best scientific knowledge, that there will not be any likely significant effects from the construction, operation, or decommissioning activities from the Project alone, or in combination with other plans or projects, on the following European sites:

- Methven Moss SAC;
- Pitkeathly mires SAC;

Stage 1 highlighted that likely significant effects cannot yet be ruled out without further assessment and / or mitigation. Therefore, Stage 2 Appropriate Assessment is required for the following qualifying interests:

- South Tayside Goose Roosts SPA/RAMSAR (pink-footed and greylag goose);
- River Tay SAC (otter);
- Firth of Tay and Eden Estuary SPA/RAMSAR (pink-footed and greylag goose); and
- Loch Leven SPA/RAMSAR (pink-footed goose).

In combination effects will also be assessed for all European sites where LSE from the project alone has been identified.

8.0 Stage 4: Appropriate Assessment

8.1 Effects of the Project Alone

8.1.1 Pink-footed and greylag geese of the South Tayside Goose Roost SPA/ Ramsar

Condition assessment

The national wintering population of **pink-footed goose** has increased significantly since the 1950s and is currently estimated at 440,000 birds based on WeBS and GSMP rounded peak count from October 2022 within the period 2017/18 to 2022/23[41].

Two populations of **greylag goose** occur in the UK: the migratory Icelandic population and the resident British/Irish population. There is no evidence of international migration by resident British population. Historically, the British/Irish population was further divided into two groups based on geographic range, i.e., a relict native population confined to north-west Scotland and a re-established population from domesticated flocks largely restricted to England. However, by winter 2009/10, both resident populations had expanded their ranges to the extent that field distinction became untenable due to significant overlap[42]. The Icelandic and British/Irish populations of greylag goose are indistinguishable in the field, and their ranges overlap extensively across much of Scotland. As a result, confidently assigning individuals to either population is not feasible in many areas. With continued expansion and increasing numbers of resident birds, this attribution approach is becoming increasingly untenable[43,44] and the wintering population estimates started to be extrapolated[45]. Currently, the UK non-breeding population of greylag goose is estimated at 239,000 individuals, 180,000 (British/ Irish) and 59,000 Icelandic (rounded peak WeBS/ GSMP peak from November 2022 during the period of 2017/18 to 2022/23[41].

The South Tayside Goose Roosts SPA qualifies under Article 4.2 of the EU Birds Directive by regularly supporting populations of European importance of the migratory species: breeding **wigeon** (screened out from the Appropriate Assessment), **greylag goose** (1985/86 to 1989/90 a winter peak mean of 9,700 individuals, 10% of the Iceland/ UK/ Ireland biogeographic population) and **pink-footed goose** (31,800 individuals, 29% of the Eastern Greenland/ Iceland/ UK biogeographic population). South Tayside Goose Roosts SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl, i.e., pink-footed and greylag geese.

The **pink-footed goose** qualifying feature of the South Tayside Goose Roost SPA was last assessed in March 2019 and considered to be in unfavourable (declining) condition. **Greylag**

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[41] Caulfield, Woodward, Peck, Wotton & Frost (2025). *Overwinter population estimates of waterbirds in Great Britain*, *British Birds* 118: 642–657.

[42] BTO. Greylag Goose populations. Available online: https://www.bto.org/get-involved/volunteer/projects/wetland-bird-survey/publications/webs-annual-report/numbers-trends/methods/analysis-and-presentation/spatial-allocation/53 [Accessed: November 2025]

[43] BTO. Bird Facts. Greylag Goose. Available online: https://www.bto.org/learn/about-birds/birdfacts/greylag-goose#population-change [Accessed: November 2025]

[44] Natural England. Advice. The status of greylag goose: a summary. Available online: https://consult.defra.gov.uk/natural-england/general-and-class-licences/supporting_documents/Annex%20E%20%20Evidence%20Paper%20%20Greylag%20goose%20status.pdf [Accessed: November 2025]

[45] Musgrove, A.J., Austin, G.E., Hearn, R.D., Holt, C.A., Stroud, D.A. & Wotton, S.R. (2011). Overwinter population estimates of British waterbirds. British Birds 104: 364–397.

goose was last assessed in October 2017 as unfavourable declining. **Waterfowl assemblage** was assessed in August 2024 as unfavourable, no change.

The South Tayside Goose Roosts SPA/ Ramsar consist of three roosts, i.e., Dupplin Loch, Drummond Pond and Carsebreck and Rhynd Lochs.

The majority of the SPA population of **pink-footed goose** is supported by Carsebreck and Rhynd Lochs (5-year average WeBS peak for 2019/20-2022/23 of 15,510 and GSMP peak of 14,664), Drummond Pond with an average 5-year WeBS/ GSMP peak of 7,187 and only one GSMP record of 2,700 birds at Dupplin Loch in 2017. However, there were up to 2,200 roosting pink-footed geese recorded at Dupplin Loch in October 2023 as part of the field survey (detailed in **Section 5.2.3**). The 5-year average peak WeBS counts of greylag goose was similar between the three roosts with 56, 63 and 61 average 5-year peak for Dupplin Loch, Drummond Pond and Carsebreck and Rhynd Loch, respectively.

Habitat loss during construction and operation

Pink-footed geese wintering in Scotland forage mostly on stubble fields consuming spilt grain in autumn and predominantly on grass and newly sown cereal fields in spring, but will also feed on extensive areas of saltmarsh in estuaries[35,46].

The main winter habitats of **greylag goose** are very similar to pink-footed goose, i.e., arable farmland and grasslands with cereal stubbles preferred in the autumn, potatoes, swedes and carrots where available in winter and winter cereals and grass in the spring. Both species use inland waterbodies, reservoirs as well as estuaries for roosting[35].

Two records of 88 and 237 foraging pink-footed geese were made within the 500 m buffer from the Site boundary during the 2025 field surveys and it can be assumed that the Site is used by geese regularly.

It is anticipated that a maximum of 126 ha of suitable foraging habitat will be permanently taken by the PV array. Analyses of the Scotland Habitat and Land Cover Map – 2022 within 20 km radius from the Dupplin Loch roost of the South Tayside Goose Roosts SPA revealed that three EUNIS grassland categories (mesic, dry and seasonally wet grasslands) covered almost 44,460 ha, which constitutes 36% of a total of 123,535 ha of all classified habitats. Arable land category constituted a further 32,863 ha (26.60% of the total assessed area) **(Table 8-1**, **Plate 8-1**).

Table 8-1: Area and % coverage of key pink-footed goose and greylag goose habitats in EUNIS classification within 20 km radius from the Dupplin Loch roost of the South Tayside Goose Roosts SPA/ Ramsar

EUNIS Habitat Category	Area (Ha)	% cover of the total assessed area
Arable land and market gardens	32,863.65	26.60%
Mesic grasslands	23,885.38	19.33%
Dry grasslands	10,322.51	8.36%
Seasonally wet and wet grasslands	10,252.59	8.30%
Other habitats	46,210.73	37.41%
Total suitable foraging habitat	**77,324.13**	**62.59%**
Total areas assessed	**123,534.86**	

[46] Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

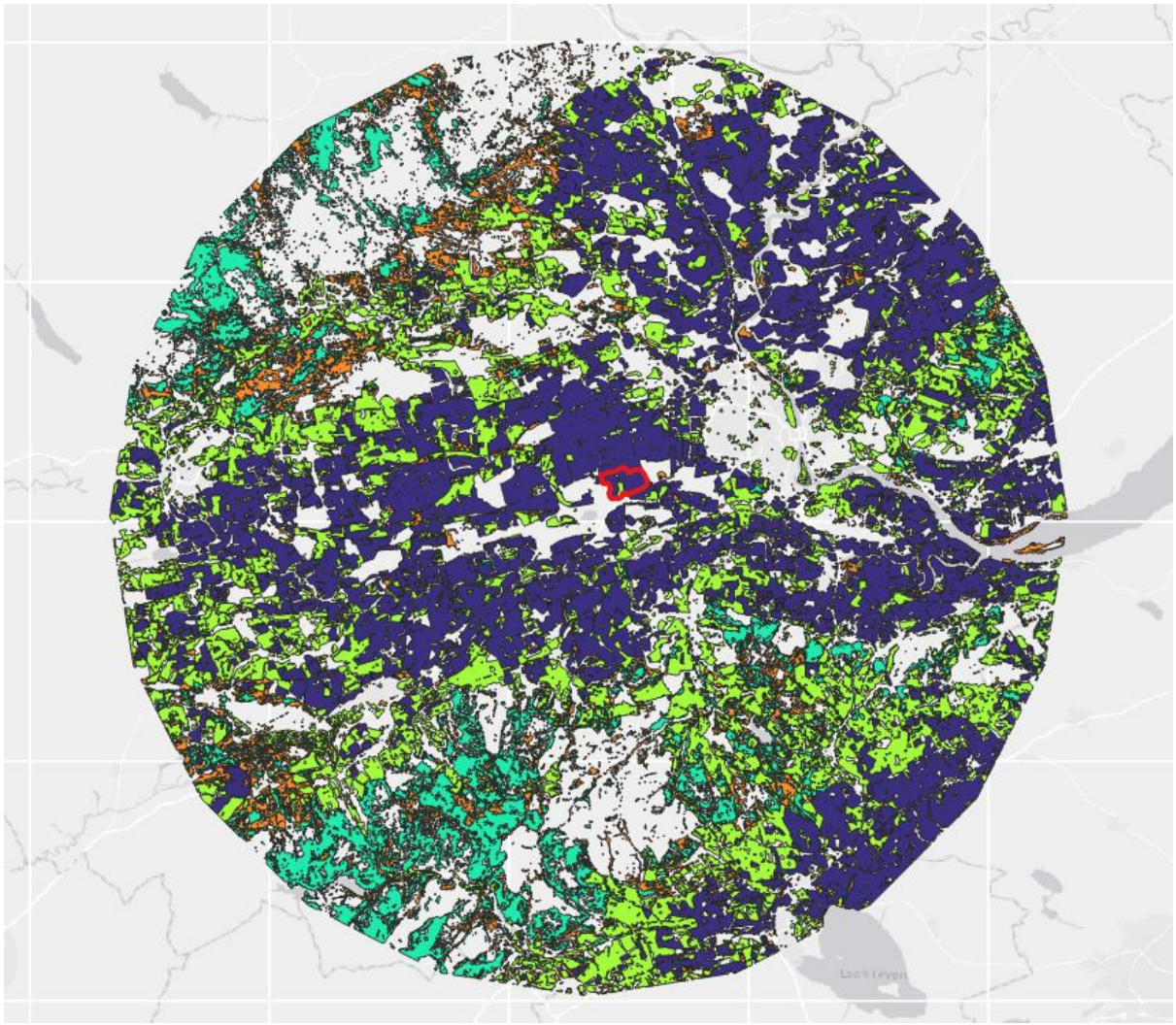

Plate 8-1: The distribution of arable land (dark blue), mesic grassland (green), dry grassland (teal) and seasonally wet grassland (orange) within 20 km from the Dupplin Loch roost of the South Tayside Goose Roosts SPA. The Site is marked with red boundary

At a more local level, there were 5,042 ha of arable land within 5 km from the Site (48% of a total of 10,530 ha assessed) and 1,774 ha of different types of grassland (17% of the total assessed area). The loss of a maximum of 126 ha is therefore approximately 1.85% of a total of 6,816.38 ha of available suitable habitat within 5 km radius from the Site (**Plate 8-2**).

Plate 8-2: The distribution of arable land (dark blue), mesic grassland (green), dry grassland (teal) and seasonally wet grassland (orange) within 5 km from the Site (red boundary)

The area of approximately 126 ha lost to the Proposed Development represents approx. 0.16% of a total of 77,324 ha of suitable foraging habitats within 20 km radius from the SPA roost at Dupplin Loch and it is also a relatively small area compared to the existing alternative habitats locally within 5 km from the Site (i.e. 2.5% of the total 6,816.38 ha of available suitable habitat).

The pink-footed geese using Dupplin Loch within the South Tayside Goose Roosts SPA have therefore vast availability of foraging habitats during autumn and spring. Moreover, they are less likely utilising the Site as most of them forage in areas to the east at West Linton and to the south-west in the Biggar area[35].

Therefore, considering all of the above, **a permanent loss of habitat from the Project alone due to construction and operation will not undermine conservation objectives in relation to avoiding habitat loss and maintaining population of pink-footed and greylag geese of the South Tayside Goose Roosts SPA/ Ramsar.**

Disturbance of bird species due to construction (noise, light, vibration, construction worker presence)

Pink-footed and greylag geese forage within 5 km from the Site. The construction of the Proposed Development has the potential to disturb or displace geese due to noise and movement of construction machinery and plant.

Goodship & Furness (2022)[46] carried out a review of disturbance distances and reported 350-500 m flight initiation distance during hunting in Denmark in the migration and non-breeding season for pink-footed goose. NatureScot recommends 200-600 m disturbance buffer for pink-footed goose and greylag goose during construction activities[39].

Disturbance should be judged as significant if an action cause impacts on populations of a species through either (i) changed local distribution on a continuing basis; and/or (ii) changed local abundance on a sustained basis; and/or (iii) the reduction of ability of any significant group of birds to survive, breed, or rear their young (see **Section 3.1.2**)[14].

Any construction-related disturbance effects will be short in duration (within maximum one non-breeding season during the development) and also limited to a relatively small area compared to alternative habitats available locally (**Table 8-1**, **Plate 8-1**, **Plate 8-2**). Any disturbance effect presented is also considered to likely affect only a small proportion of the total SPA population. The Dupplin Loch roost is beyond a disturbance distance range of 200-600 m also because it benefits from being sheltered from the Site by an area of woodland.

It is therefore considered that construction related disturbance effects do not constitute significant disturbance as they do not cause sustained changes in local distribution, abundance and ability of these birds to survive and breed. Thus, the project alone **will not undermine conservation objectives in relations to avoiding significant disturbance and maintaining population of pink-footed and greylag geese of South Tayside Goose Roosts SPA/ Ramsar**.

8.1.2 Otter of River Tay SAC

Conservation Objectives for all Qualifying Features

1. **To ensure that the qualifying feature of the River Tay SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.**

The assessment of Favourable Conservation Status (FCS) for qualifying features is determined via objectives 2a-c for otter, the sole species screened into the SIAA.

2. **To ensure that the integrity of the River Tay is maintained by meeting objectives 2a, 2b and 2c for the qualifying feature.**

2a. Maintain the population of otter as viable components of the site.

'*This conservation objective is considered to be met if the conditions for the species' long-term survival are in place'*. This includes:

- Avoiding effects that could lead to a permanent reduction in the otter population through mortality, injury, or impacts caused by disturbance or displacement. This includes for example the effects caused by development, river engineering, water pollution, roads without adequate crossing provision for otters or suitable culverts, or entanglement in fishing gear.
- Maintaining the species' ability to use all areas of importance within the site (to be considered under conservation objective 2b).
- Maintaining access to, and availability of, undisturbed resting places.

- Maintaining access to, and availability of, supporting habitats and prey (to be considered under conservation objective 2c).

Otter is a wide-ranging and highly mobile species. The population at the River Tay SAC is reliant on suitable habitat within the SAC and surrounding landscape, including with adjoining SACs and other major river catchments such as the River Earn.

The population is considered unlikely to be viable (capable of being self-sustaining) in isolation and thus connectivity to the wider landscape is important. The home range of an otter will vary depending on their sex, habitat quality and food availability. It will also vary between freshwater and coastal environments. Males living in freshwater (i.e. rivers and streams) can have a mean linear range size of around 40 km and females living in the same habitat can have a linear home range of around 20 km, however, males have been recorded ranging as far as 80 km.

Avoiding effects that could lead to a permanent reduction in the otter population through mortality, injury, or impacts caused by disturbance or displacement.

The death or injury of an otter could affect the conservation status of this species in the SAC and could represent an offence under relevant legislation.

The works are likely to require open trenches and large excavations (e.g. SuDs). As such in an unmitigated scenario, there is a risk of otter becoming trapped / injured in such features and/or being unable to care for young. Smaller turf/soil stripping will be required in areas to create level ground, e.g. for temporary work compounds and ancillary infrastructure, however, these are unlikely to be significant (<1 m in depth), with no realistic prospect of otters becoming trapped or injured in such features.

Otter are widespread locally and nationally, with the Scottish population estimated to be 8,000[47]. Otter on the River Tay have been reported as being in favourable maintained condition. Otter that live in freshwater habitats occupy very large home ranges which may contain up to 30 resting sites[48], and are able to adapt to a certain level of human disturbance[49]. NatureScot advise exclusion zones of 200 m around breeding holts, and 30 m around non-breeding resting places, with a development licence required if such exclusion zones are not possible[50]. No breeding or resting locations were identified within the Site or a 200 m buffer. Riparian habitat (taken to be 5 m in this case) was considered poor for breeding site availability with exposed banks characterised by minimal tree and scrub coverage, minimal large rocks or riverbank crevices, or other cavity forming features present. As such, it is considered unlikely without intervention that the Site will support significant breeding opportunities in the future. Therefore, the likelihood of establishment in the interim period between survey and construction beginning is low.

Given the location of the Proposed Development, it is considered that existing disturbance is high due to ongoing watercourse management, agricultural activity up to the riparian zones and adjacent major/busy road networks. As such, otter within the Site are likely to exhibit a higher level of tolerance to disturbance from the Proposed Development and is unlikely to cause significant long-term displacement effects.

Otter are most active during crepuscular periods (before dawn and after dusk), as such the risk of vehicle collision is highest during this period. During winter periods, October to February, proposed work hours of 07:00 to 19:00 overlap with dawn and dusk periods. One

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[47] NatureScot. (2024). Otter. [Online] Available at: https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/otter

[48] Environment Agency. (1999.) Otters and River Habitat Management. Environment Agency: Bristol.

[49] Chanin, P. (2003). Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature: Peterborough

[50] NatureScot. (2018). Protected Species Advice for Developers. [Online] Available at: https://www.nature.scot/sites/default/files/2018-09/Species%20Planning%20Advice%20-%20otter.pdf

section of proposed internal tracks runs alongside an existing watercourse to the west of the Site; it is believed that this runs underground for approx. 70 m at which point the track crosses the watercourse. Dependent on the design of the culvert, otter may be forced to use an alternative land route leaving them at high risk of vehicle collision.

Under a worst case scenario, in Perth (taken to be nearest location) on 21 December (2025 winter solstice) the sun rises at approximately 08:46 and sets at 15:37, this provides a total overlap of 5hrs and 9 minutes of working time and peak otter activity. As such otter are considered to be at a high risk of vehicle collision in the absence of mitigation.

Maintaining access to, and availability of, undisturbed resting places

No otter resting locations or suitable breeding habitats within 200 m would be damaged or disturbed as a result of the Proposed Development. Moreover, proposed infrastructure or temporary construction compounds are unlikely to result in the creation of obstructions between any future resting locations or foraging routes, located approx. 700 m from the nearest watercourse on the edge of Cultmalundie Woods. The aforementioned track is considered unlikely to provide a physical barrier given the watercourse has already been modified and fragmented (likely culverted).

In the absence of mitigation, the Proposed Development has the potential to undermine Conservation Objective 2a.

2b. Maintain the distribution of otter throughout the site.

Distribution of otter within the River Tay SAC is considered unlikely to be impacted by displacement and barrier effects from the Proposed Development, however, otter originating from the SAC may have some of their territory affected where it lies within the Site.

Two new watercourse crossings are proposed (refer to Technical Appendix: Schedule of Watercourse Crossings[51]). Both crossings would comprise of bottomless arch designs or equivalent, as such they are not considered to present a permanent barrier to otter movement, however, construction is likely to create a temporary barrier effect in the forms of noise, lighting and human/vehicle disturbance. During the construction period it is expected that otter are unlikely to significantly utilise the watercourses within the Site, however, given the minimal extent of watercourse affected, 1.12 km, in the context of their large home ranges (for females this is approximately 5.6% of their territory and 2.8% for males)[52], this is not considered to be sufficient to change the distribution or home ranges of otter. Whilst the deterrent may provide temporary barrier effects, this is not considered to be sufficient to prevent movement of otter between river catchments (to maintain population viability).

Maintaining the species' ability to use all areas of importance within the site

The CAP states 'the ability for otter to use and access all areas of importance within the SAC should be maintained'. Considering the Proposed Development is only likely to affect two highly modified connecting tributaries within the Site, and not the mainstem or designated tributaries, it is considered that the Proposed Development will maintain the species' ability to use all areas of importance within the SAC.

In the absence of mitigation, the Proposed Development is considered to have a low risk of undermining Conservation Objective 2b.

2c. Maintain the habitats supporting otter within the site, and availability of food.

No habitats within the SAC are predicted to be impacted by the Proposed Development due to being outwith a 2 km buffer afforded to airborne pollution and the fragmented and

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[51] SLR Consulting Ltd. (2026). Dupplin Solar. Schedule of Watercourse Crossings. Technical Report for Trio Dupplin Solar LLP

[52] Assuming a 20 km home range for female and 40 km home range for males

modified nature of connecting watercourses which are unlikely to facilitate the movement of pollutants to the SAC. However, potential pollution of watercourses within the Site could result in long-term damage to the productivity of aquatic habitats to support otter prey species, such as fishes and amphibians, causing both injury and/or mortality to otter. It is not anticipated that the watercourses present contain important prey resources and use is likely limited to commuting, however, they have been assessed on a precautionary basis to contain some foraging resource.

Pollutants from roads can be particularly detrimental during periods of high rainfall and subsequent surface water runoff, mobilising large volumes of fine sediments and toxic chemicals from vehicles[53]. Accidental (major) spillage of hydrocarbons (oil or diesel) has the potential to immediately reduce the availability of prey through fish kills, when in sufficient concentrations. Otter have high metabolic rates requiring 1-1.5 kg of food daily. Sudden food reduction is therefore particularly dangerous. Moreover, pollutants such as oil and diesel also have the potential to affect thermo-regulation qualities of otter's coats resulting in hypothermia and mortality[54]. Given the limitations to aquatic habitat within the Site, it is considered unlikely to comprise a major foraging resource within an otter territory.

Multiple pathways for pollution entry to watercourses exist during the construction stage including introduction of sediment, hydrocarbons and pH altering substances during the construction of the access track. Considering the access track runs parallel to one watercourse for a distance of 320 m and crosses the second, it is considered that there is pathway for windblown pollution and surface runoff in periods of high rainfall in the absence of mitigation measures. Ancillary infrastructure is considered to be at a sufficient distance, c.700 m, that they are unlikely to have measurable effects on water quality.

Maintaining access to, and availability of, supporting habitats and prey

Otter require suitable habitat for foraging, resting and breeding. Riparian habitat suitable for resting locations is limited within watercourses within the Site, with a lack of dense scrub or vegetation. Similarly, opportunities for holt creation is already limited with a lack of boulders, crevices and/or other cavity forming features such as tree roots which would be required to provide secure holts above flood waters. Ongoing watercourse management within the area is also likely to suppress vegetation establishment. Effects of pollution on watercourses, as a supporting habitat and habitat for prey species, are considered above.

It is considered that no changes to water flow or quantity will occur as a result of the Proposed Development, therefore effects on otter and their prey species have not been considered.

In the absence of mitigation, the Proposed Development has the potential to undermine Conservation Objective 2c.

8.1.3 Pink-footed and greylag geese of the Firth of Tay and Eden Estuary SPA/ Ramsar

Condition assessment

Please refer to the South Tayside Goose Roosts SPA/ Ramsar for the national population descriptions for pink-footed and greylag geese (**Section 7.3.1.1**).

[53] Conroy, J. W. H. and Chanin, P. R. F. (2000). The Status of the Eurasian otter (Lutra lutra) in Europe – a review.

[54] Kruuk, H. (1995). Wild Otters: Predation and Populations. OUP: Oxford.

The Firth of Tay and Eden Estuary SPA qualifies under Article 4.2 of the EU Birds Directive by regularly supporting populations of European importance of the migratory species, amongst others: **greylag goose** (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** (1990/91 to 1994/95 a winter peak mean of 2,800 individuals, 1% of the Eastern Greenland/ Iceland/ UK biogeographic population).

The **pink-footed goose** qualifying feature of the Firth of Tay and Eden Estuary SPA was last assessed in January 2016 and considered to be in Favourable (recovered) condition. **Greylag goose** was last assessed in February 2019 as unfavourable declining.

The average five-year WeBS peak count of pink-footed goose for Tay Estuary between for 2019/20 – 2023/24 was 3,179 individuals with a subsequent peak count of 5,024 birds in the winter of 2021/22. The estimated five-year peak count of greylag goose was 365 with a peak count of 407 in the winter of 2021/22[55]. It is important to note that the WeBS counts do not cover roosting birds and therefore they might represent underestimates.

Direct or indirect habitat loss habitat

Pink-footed geese wintering in Scotland forage mostly on stubble fields consuming spilt grain in autumn and on predominantly on grass and newly sown cereal fields in spring, but will also feed on extensive areas of saltmarsh in estuaries[35].

The main winter habitats of **greylag goose** are very similar to pink-footed goose, i.e., arable farmland and grasslands with cereal stubbles preferred in the autumn, potatoes, swedes and carrots in available in winter and winter cereals and grass in the spring. Both species use inland waterbodies, reservoirs as well estuaries for roosting[35].

Analyses of the Scotland Habitat and Land Cover Map – 2022[36] within the 20 km radius from the inner estuary roost[35] of the Firth of Tay and Eden Estuary SPA/ Ramsar revealed that there was 46,540 ha of arable land (40.80% of all habitats assessed) and the three EUNIS grassland categories (mesic, dry and seasonally wet grasslands) covered a total of 28,623 ha, which constitutes 25% of a total of 114,056 ha of all classified habitats (**Table 8-2**, **Plate 8-3**).

Table 8-2: Area and % coverage of key pink-footed goose and greylag habitats in EUNIS classification within 20 km radius from the Firth of Tay roost of the Firth of Tay and Eden Estuary SPA

EUNIS Habitat Category	Area [Ha]	% cover of the total assessed area
Arable land and market gardens	46,540.48	40.80%
Mesic grasslands	21,926.12	19.22%
Dry grasslands	3,390.61	2.97%
Seasonally wet and wet grasslands	3,306.69	2.90%
Other habitats	38,892.29	34.10%
Total suitable foraging habitat	**75,163.89**	**65.90%**
Total areas assessed	**114,056.20**	

[55] https://app.bto.org/webs-reporting/numbers.jsp [Accessed: November 2025]

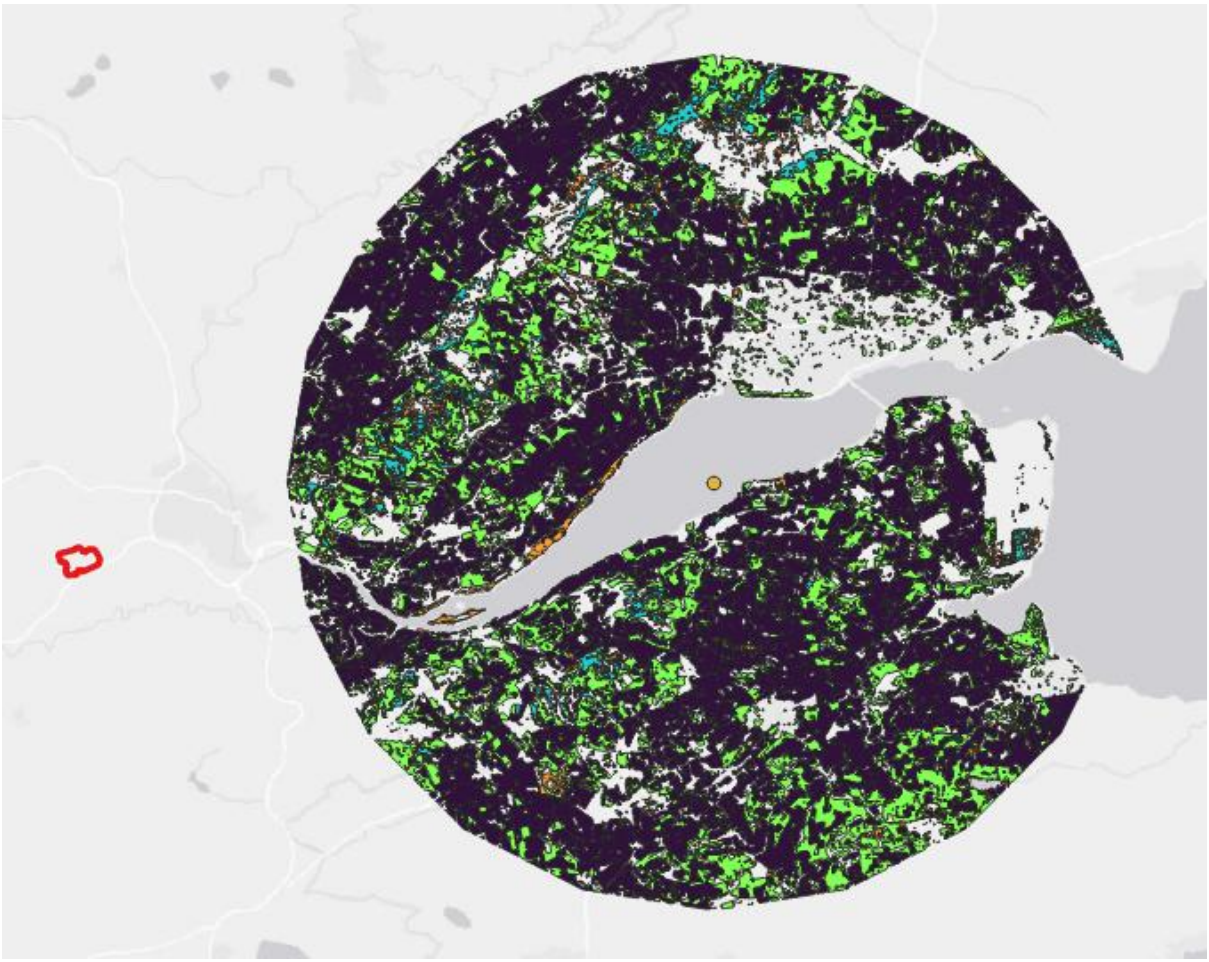

Plate 8-3: Distribution of key pink-footed and greylag foraging habitats in EUNIS classification within 20 km radius from the Firth of Tay roost of the Firth of Tay and Eden Estuary SPA (orange dot), arable land (dark blue), dry grassland (teal), mesic grassland (green) and seasonally wet grassland (orange). The Site is marked in red (outside of the 20 km radius as the roost is located in the middle of the SPA).

The area of approximately 126 ha lost to the Proposed Development represents approx. 0.17% of a total of 75,164 ha of suitable foraging habitats within 20 km radius from the SPA and it is also a relatively small area compared to the existing alternative habitats locally within 5 km from the Site i.e. 2.5% of the total 6,816.38 ha of available suitable habitat (**Plate 8-2**). The pink-footed and greylag geese of the Firth of Tay and Eden Estuary SPA/ Ramsar have therefore vast availability of foraging habitats during autumn and spring.

Moreover, they typically feed away from the Site. **Greylag geese** roosting on the Firth of Tay typically foraged to the north, in Southern Angus, with regular flight paths crossing the Sidlaw Hills into Strathmore. In the 1990s, a consistent winter roost of approximately 1,000 to 2,000 individuals developed on the Eden Estuary, where birds predominantly fed in nearby areas to the south and west of the estuary[35]. **Pink-footed geese** foraging from the Firth of Tay roost typically fed on farmland along the north shore or flew over the Sidlaw Hills to feeding areas around Wolfhill and Pitcur. Some birds also occasionally utilised the Rhynd peninsula, particularly within the area bounded by Inverarity, Letham, Arbirlot, and Monikie. Pink-footed goose numbers at the Eden Estuary roost were low during the mid-1980s, typically ranging from 100 to 300 individuals. However, more consistent use developed in the

1990s, with a peak count of 2,500 birds recorded in November 1993. These geese generally fed locally, often in the Craigie Farm area approximately 3 km to the north[35].

Therefore, considering all the above **a permanent loss of habitat from the Project alone due to construction and operation will not undermine conservation objectives in relation to avoiding habitat loss and maintaining population of pink-footed and greylag geese of the Firth of Tay and Eden Estuary SPA/ Ramsar.**

Disturbance of bird species due to construction (noise, light, vibration, construction worker presence)

Pink-footed and greylag geese are known to forage within 5 km from the Site. The construction of the Proposed Development has the potential to disturb or displace geese due to noise and movement of construction machinery and plant.

As the resulting pressure pathways are the same, please see the assessment of pink-footed and greylag geese disturbance sensitivity as discussed in relation to the South Tayside Goose Roosts SPA/ Ramsar above.

The disturbance assessment during construction is the same as for the South Tayside Goose Roosts (see above). Any construction-related disturbance effects will be short in duration (within maximum one non-breeding season during the development) and also limited to a relatively small area compared to alternative habitats available locally (**Table 8-3**, **Plate 8-3**, **Plate 8-2**). Any disturbance effect presented is also considered to likely affect only a small proportion of the total SPA population.

It is therefore considered that construction related disturbance effects do not constitute significant disturbance as they do not cause sustained changes in local distribution, abundance and ability of these birds to survive and breed. Thus, the project alone **will not undermine conservation objectives in relations to avoiding significant disturbance and maintaining population of pink-footed and greylag geese of the Firth of Tay and Eden Estuary SPA/ Ramsar SPA/ Ramsar**.

8.1.4 Pink-footed goose of Loch Leven SPA/ Ramsar

Condition assessment

Please refer to the South Tayside Goose Roosts SPA/ Ramsar for the national population descriptions for pink-footed and greylag geese (**Section 7.3.1.1**).

Loch Leven SPA qualifies under Article 4.2 of the EU Birds Directive by regularly supporting populations of European importance of wintering Icelandic/Greenlandic pink-footed geese (1993/94-97/98 winter peak mean of 17,163, 8% of total population, all of which winters in Britain).

The pink-footed goose qualifying feature of Loch Leven SPA was last assessed in August 2009 and considered to be in Favourable (maintained) condition.

The average five-year WeBS peak count at Loch Leven for 2019/20 – 2023/24 was 10,985 individuals with a peak count of 14,886 birds in the winter of 2019/20.

Direct or indirect habitat loss habitat

Analyses of the Scotland Habitat and Land Cover Map – 2022 within a 20 km radius from Loch Leven SPA revealed that arable land contributed 29,229 ha (24.33%) of a total of 120,162 ha assessed. The three EUNIS grassland habitat categories constituted a total of 44,327 ha (36.89% of all assessed habitats). In total, there are 73,556 ha (61%) of suitable foraging habitats within 20 km radius from the SPA (**Table 8-3**, **Plate 8-4**).

Table 8-3: Area and % coverage of key pink-footed habitats in EUNIS classification within 20 km radius from Loch Leven SPA

EUNIS Habitat Category	Area [Ha]	% cover of the total assessed area
Arable land and market gardens	29,229.49	24.33%
Mesic grasslands	28,511.61	23.73%
Dry grasslands	8,000.16	6.66%
Seasonally wet and wet grasslands	7,815.17	6.50%
Other habitats	46,605.27	38.79%
Total suitable	**73,556.43**	**61.21%**
Total assessed	**120,161.70**	

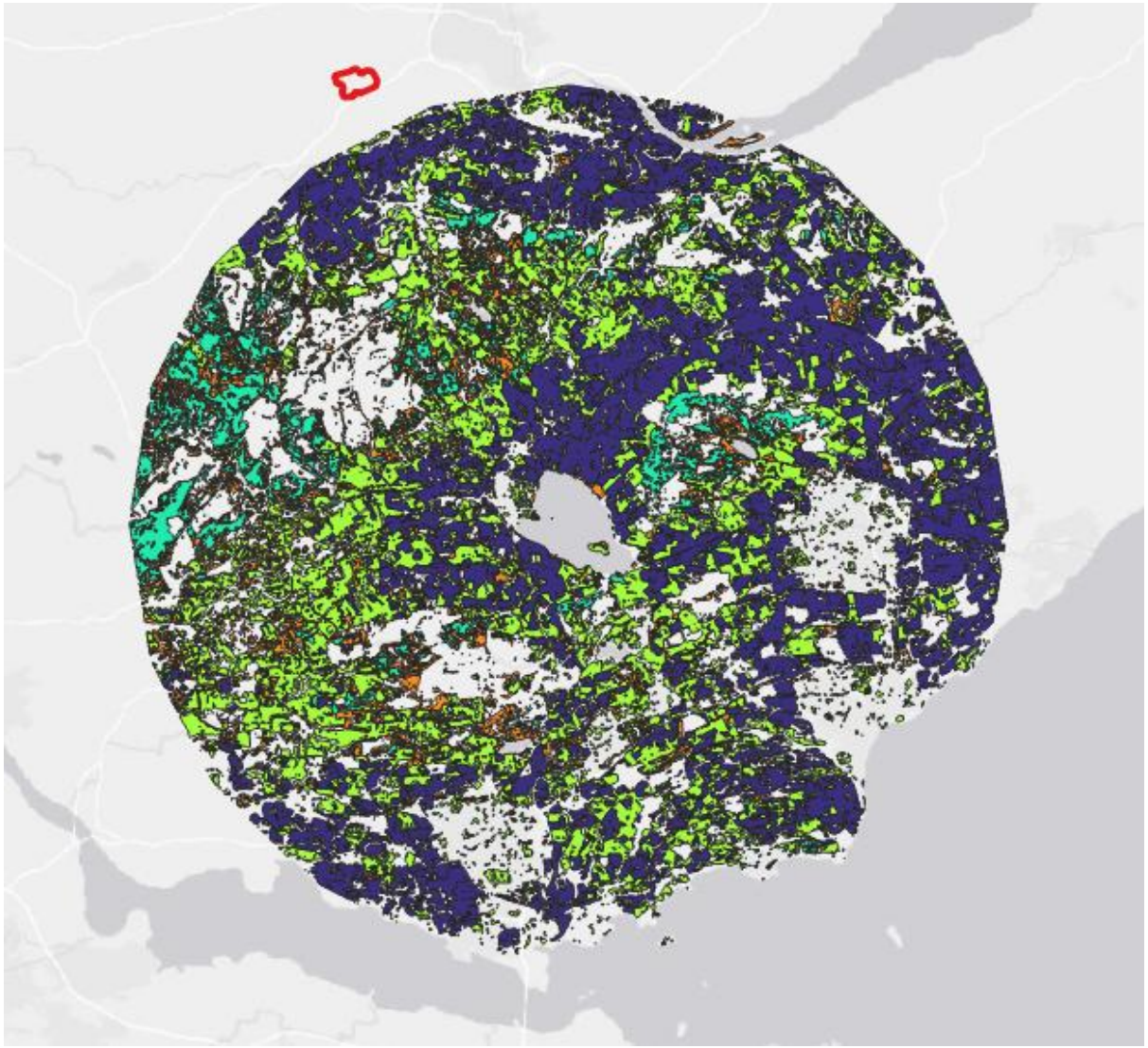

Plate 8-4: Distribution of key pink-footed foraging habitats in EUNIS classification within 20 km radius from Loch Leven SPA. arable land (blue), mesic grassland (green), dry grassland (teal) and seasonally wet grassland (orange). The Site is

marked in red (outside of the 20 km habitat assessment radius as the roost was located in the middle of the SPA).

The approximately 126 ha lost to the Site is approximately 0.17% of a total of 73,556 ha of suitable habitat with 20 km radius from Loch Leven SPA. Therefore, the pink-footed geese have a significant resource available in the wider region during winter within 20 km foraging range and locally within 5 km from the development (**Plate 8-4** and **Plate 8-2**, respectively). Moreover, pink-footed geese potentially utilising the Site are considered unlikely to be of Loch Leven SPA provenance as they mostly forage within 10 km from the SPA, mostly to the north and west of the Site[35]. Therefore, considering all the above **a permanent loss of habitat from the Project alone due to construction and operations will not undermine conservation objectives in relation to avoiding habitat loss and maintaining population of pink-footed goose of Loch Leven SPA/ Ramsar.**

Disturbance of bird species due to construction (noise, light, vibration, construction worker presence)

As the resulting pressure pathways are the same, please see the assessment of pink-footed and greylag geese disturbance sensitivity as discussed in relation to the South Tayside Goose Roosts SPA/ Ramsar and Firth of Tay and Eden Estuary SPA /Ramsar sites above.

Any construction-related disturbance will be short term in duration (consisting of a maximum of one non-breeding season), limited to a relatively small area compared to alternative habitats available locally, and affecting a small proportion of the SPA population. Furthermore, the presence of birds of Loch Leven SPA provenance within the Site and wider area is low.

It is therefore considered that there will be no significant disturbance able to affect local distribution, abundance and/or ability of this population to survive or breed and therefore the project alone **will not undermine conservation objectives in relations to avoiding significant disturbance and maintaining population of pink-footed geese of the Loch Leven SPA/ Ramsar**.

8.2 Effects of the Project In-Combination

Projects or plans which can have LSEs contributing to the discussed source-pathway-receptor model of habitat loss and disturbance due to construction/ decommissioning and operations are presented in **Section 4.2**. A single relevant planning application pertaining to a 49.9 MW solar and BESS with associated infrastructure at Kinnon Park, Methven (24/01188/FLM) was identified and considered in the sHRA.

8.2.1 Geese of South Tayside Goose Roosts, Firth of Tay and Eden Estuary and Loch Leven SPA/ Ramsar sites

Kinnon Park is located to the west of Perth and is approximately 134 ha in size, comprising a working farm dominated by arable land, broad-leaved woodland, hedgerows, scattered trees and ruderal vegetation. The Site is located 3.8 km from the South Tayside Goose Roosts SPA/ Ramsar. Other international sites located within 20 km from the Site were not considered in the Kinnon Park EcIA. Cumulative effects with Kinnon Park Farm Solar project have been considered for receptors scoped into this assessment, other receptors have not been assessed cumulatively as they were scoped out of this assessment and are not expected to experience significant interaction with other developments.

Direct or indirect habitat loss habitat

No breeding bird survey was conducted as part of the Kinnon Park planning application, however, winter bird surveys[56] were carried out in January and February 2024 which identified 2,500 pink-footed geese just outside of the development footprint. This was not included in the EcIA report with a conclusion following two winter bird survey visits that: *"Although it is acknowledged that the absence of evidence does not in itself exclude the use of the site by these species, it is considered highly unlikely that the site represents an important, regular or even occasional resource for resting birds."*[57].

It needs to be assumed however that pink-footed and greylag geese of the South Tayside Goose Roosts SPA/ Ramsar and other European/ international sites designated for these qualifying interests can utilise Kinnon Park and that a further 134 ha would be lost for foraging in the local area of 5km from the Dupplin Solar with a total of 260 ha lost in combination with Kinnon Park.

The area of approximately 260 ha cumulatively lost to the Proposed Development and Kinnon Park represents approx. 0.34% of a total of 77,324 ha of suitable foraging habitats within 20 km radius from the South Tayside Goose Roosts SPA Dupplin Loch roost and it is also a relatively small area compared to the existing alternative habitats locally within 5 km from the Site (i.e. 3.81% of the total 6,816.38 ha of available suitable habitat).

The area of approximately 260 ha cumulatively lost represents approx. 0.35% of a total of 75,164 ha of suitable foraging habitats within 20 km radius from the Firth of Tay and Eden Estuary SPA/ Ramsar.

The area of approximately 260 ha cumulatively lost represents approx. 0.35% of a total of 73,556 ha of suitable habitat with 20 km radius from Loch Leven SPA/ Ramsar.

Therefore, the pink-footed and greylag geese have a significant resource available in the wider region during winter within 20 km foraging range and locally within 5 km from the development. **Permanent loss of habitat from the Proposed Development in-combination with other developments due to construction and operation will not undermine conservation objectives in relation to avoiding habitat loss and maintaining population of pink-footed and greylag geese of the South Tayside Goose Roosts SPA/ Ramsar, pink-footed and greylag geese of the Firth of Tay and Eden Estuary SPA/ Ramsar and pink-footed goose of Loch Leven SPA/ Ramsar.**

Disturbance of bird species due to construction (noise, light, vibration, construction worker presence)

Pink-footed and greylag geese forage within 5 km from the Site. The construction of the Proposed Development has the potential to disturb or displace geese due to noise and movement of construction machinery and plant.

Goodship & Furness (2022)[46] carried out a review of disturbance distances and reported 350-500 m flight initiation distance during hunting in Denmark in the migration and non-breeding season for pink-footed goose. NatureScot recommends 200-600 m disturbance

[56] Ellendale Environmental Limited (2024). EEL606 Kinnon Park Farm – Wintering Bird Surveys 2024. Technical Report for Gray Planning & Development Ltd. Available online: https://planningapps.pkc.gov.uk/online-applications/files/848D7EC28552730B7B9FCB6DB47BE7EB/pdf/24_01188_FLM-WINTERING_BIRD_SURVEYS-2243534.pdf [Accessed: 10/12/2025]

[57] Ellendale Environmental Limited (2024). Kinnon Park Farm. Ecological Impact Assessment (EcIA). Technical Report for Namene Solar. Available online: https://planningapps.pkc.gov.uk/online-applications/files/971D6708608A740023D924E4BC7544D4/pdf/24_01188_FLM-EIA_REPORT-2243524.pdf [Accessed: December 2025]

buffer for both pink-footed and greylag geese during construction activities in the non-breeding season[39].

Disturbance should be judged as significant if an action cause impacts on populations of a species through either (i) changed local distribution on a continuing basis; and/or (ii) changed local abundance on a sustained basis; and/or (iii) the reduction of ability of any significant group of birds to survive, breed, or rear their young (see **Section 3.1.2**)[14].

The Kinnon Park planning application was submitted in April 2024 and it is still under consideration, however it is likely that it will be constructed earlier than Dupplin Solar which is scheduled for 2028/29. However, even with overlapping construction periods, any construction-related disturbance effects will be short in duration (within maximum one non-breeding season during the development) and also limited to a relatively small area compared to alternative habitats available locally (see above). Any disturbance effect presented is also considered to likely affect only a small proportion of the total SPA population. The Dupplin Loch roost is beyond a disturbance distance range of 200-600 m also because it is sheltered from the Site by a block of woodland.

It is therefore considered that construction related disturbance effects do not constitute significant disturbance as they do not cause sustained changes in local distribution, abundance and ability of these birds to survive and breed. **Thus, the Proposed Development in-combination with other projects will not undermine conservation objectives in relation to avoiding significant disturbance and maintaining population of pink-footed and greylag geese of the South Tayside Goose Roosts SPA/ Ramsar, pink-footed and greylag geese of the Firth of Tay and Eden Estuary SPA/ Ramsar and pink-footed goose of Loch Leven SPA/ Ramsar.**

8.2.2 River Tay SAC

The application boundary for Kinnon Park runs adjacent to the East Pow at a distance of 0.3 km, a designated tributary of the River Tay SAC. Although there is connectivity of both sites to the East Pow, Kinnon Park construction is due to take place in 2026 (compared to 2028 for Dupplin), as such there would be no overlap in construction periods and an interim period of c. 1 year. As such in-combination effects on water quality and disturbance to otter are not considered likely given limited pathways for the Site alone.

Both developments are not considered to impact otters during the operational phase due to minimal activity predicted to be equal or less than existing disturbance from agricultural activities. Due to this, otters are considered to be habituated to this level of disturbance and would be unlikely to be impacted by equal or less disturbance during the operational phases.

It is therefore considered that construction/decommissioning and operation related activities of the Proposed Development in combination with other projects would not impact FCS of otter or undermine any of the conservation objectives. Thus, it is considered that an in-combination effect **will not undermine conservation objectives in relation to otters from the River Tay SAC.**

8.3 Effects on Integrity without Mitigation

It has been ascertained that conservation objectives will not be undermined and therefore there will be no adverse effects on integrity from the project alone or in-combination for the assessed South Tayside Goose Roosts, Firth of Tay and Eden Estuary and Loch Leven SPA/ Ramsar sites.

Without mitigation and considering in combination effects, the Proposed Development has the potential to undermine the following conservation objectives for River Tay SAC, and therefore represent an adverse effect on the integrity of the SAC:

1. To ensure that the qualifying feature of the River Tay SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2. To ensure that the integrity of the River Tay is maintained by meeting objectives 2a, 2b and 2c for the qualifying feature.

   2a. Maintain the population of otter as viable components of the site.

   2b. Maintain the distribution of otter throughout the site.

   2c. Maintain the habitats supporting otter within the site, and availability of food.

Potential to undermine Conservation Objectives primarily relates to water quality / pollution issues and potential disturbance to otter, for which mitigation measures are provided in **Section 8.4**.

8.4 Mitigation Measures

For the potential effect pathways undermining Conservation Objectives identified in Step Three, proposed mitigation measures, and the predicted residual effects following the application of the proposed measures, are presented below. The mitigation measures detailed include good practice measures that would reduce or remove effects upon the qualifying features, as well as more tailored mitigation measures that would reduce or remove effects.

8.4.1 General Mitigation Measures

- An emergency procedure would be in place should any previously unrecorded protected species or their resting locations be encountered during the works. All work would cease in the area immediately and the ECoW would be consulted to determine any further mitigation requirements. For example, suitable setbacks or buffer zones, and consultation with statutory bodies or licence applications, if required.
- Any fish kills will be retained, recorded and reported to the relevant body.
- All potentially dangerous substances or materials would be carefully stored to prevent them causing any harm to fauna which may enter the works areas at night.
- A 15-mph speed limit would be in place on all tracks within the Site.
- A logbook of wildlife sightings will be kept during the works and the data will be supplied to the ECoW who can forward to any relevant conservation bodies, local biological records centre etc., as required.
- Any lighting necessary for works to proceed will be directed away from features such as mammal places of shelter, mammal paths, watercourses and treelines to minimise light disturbance on otter, fish and other sensitive fauna.
- An emergency response plan for water pollution events would be produced to provide suitable mitigation strategy measures to respond to worst-case scenarios, e.g. a major oil spill.
- Any areas of bare ground, including dirt/aggregate material on access tracks would be sprayed with water during prolonged dry spells and/or where dust is produced (or other suitable dust suppression method) during construction periods.
- A sensitive lighting scheme during the construction and operational phases that aims to avoid disruption displacement/barrier effects. 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 and commuting habitat on watercourses within the Site; and
- The times during which lighting is on should be limited to provide dark periods.

8.4.2 Invasive Species Mitigation Measures

In order to avoid the introduction or spread of non-native invasive species, biosecurity measures will be included within the CEMP and a non-native invasive species management plan be developed. This will include and be informed by:

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

8.4.3 Otter Mitigation Measures

The following specific mitigation measures for otter would be implemented:

- A Species Protection Plan (SPP) will be produced for otter (and other key target species) and agreed with PKC and NatureScot prior to commencement of construction and implemented as required.
- Prior to works commencing a pre-works check would be conducted on affected watercourses covering 200m upstream and downstream of the limit of deviation. All potential resting locations identified in baseline surveys would be re-visited and checked for signs of activity. Where appropriate further monitoring may be required to establish use of potential features, e.g. for breeding/use by other species.
- If additional otter resting sites or holts are identified during the pre-works checks, appropriate buffers shall be maintained (comprising 30m for a resting site or non-breeding holt, and up to 200 m for a breeding holt). Where these buffers cannot be maintained, an additional licence or licence amendment would be obtained from

NatureScot prior to works within these buffers, which would detail appropriate additional mitigation.

- Should disturbance / destruction of a previously unrecorded place of shelter be suspected, then all reasonable practical steps must be taken to minimise or prevent further damage / disturbance, and those steps documented in the ECoW Log. Consultation with NatureScot may be required through this process in the event of a suspected wildlife conflict event.
- The ECoW will attend Site on a regular basis throughout the construction period to ensure all environmental mitigation relevant to otter is delivered.
- The ECoW will provide a toolbox talk to all contractors on the Site, during which all staff will be informed of the potential issues with regard to otter. All new contractors to the Site would receive a toolbox talk and this would be updated on a need-by-need basis at a minimum frequency of once a month.
- Although pipe systems are not expected to be required, if they are required, then any temporarily exposed pipe systems shall be capped when contractors are off Site to prevent otters (or other animals) from gaining access.
- Any trial pits will only remain open for a few of hours and will be continuously supervised while open. Trial pits will be fully reinstated before the end of each working day. In the unlikely event that any are needed to be left overnight, these will be fitted with ramped edges to enable escape, where possible be covered, or be fitted with mammal ramps to ensure that any animals that enter can safely escape. All excavations would be checked prior to commencement of works to ensure no animals have become trapped overnight. Excavations would be backfilled as soon as possible to minimise the potential for animals to become trapped.
- Update checks will be undertaken by the ECoW prior to works, within 48 hours of clearance activities / the commencement of works. This would include all suitable habitat within 200m of the works areas.
- Work on watercourses or within 50m will avoid working between the hour after dawn and before dusk.

The above mitigation measures would ensure that otters are protected, that there would be no detrimental impact on the contribution to the maintenance of otter at a favourable conservation status, and that relevant legislation is adhered to.

8.4.4 Pollution risk from fuel spill – mitigation measures

Good practice measures in relation to pollution risk would be adopted during the works, and relevant Scottish Environment Protection Agency (SEPA) Guidance for Pollution Prevention (GPP) and Pollution Prevention Guidance Notes (PPG)[58] would be adhered to where relevant. The mitigation would comprise:

- Refuelling would be undertaken under strict guidelines only by authorised operatives following Contractor procedure SENG-OPS-WP-RSP.
- Fuel would be stored in a double-skinned bunded fuel bowser or cube at least 50m from watercourses. These storage containers would be locked when not in use.
- Emergency spill response kits would be maintained during the works. These spill kits would be available at the location of each item of plant being refuelled.

[58] SEPA. (2013). Pollution prevention and control. [Online] Available at: Pollution prevention and control | Scottish Environment Protection Agency (SEPA)

- Drip trays or plant nappies would be placed under machinery that could potentially leak fuel / oils.
- When transferring fuel to the Site via a secondary container (jerry can), only the required amount of fuel to fill the plant would be taken. Refuelling would be undertaken in a controlled manner to ensure no over-filling occurs. Tapered funnels would be employed when using Jerry cans.
- Water for temporary Site welfare facilities will be brought to Site, and foul water will be collected in a tank. This would be collected for offsite disposal at an appropriately licensed facility, and managed in accordance with PPG4.
- Refuelling operations are to be strictly controlled with the minimum fuel required for the day's work taken to the plant at the start of the shift, funnels and drip trays shall be used during refuelling operations.
- Refuelling will be carried out only by trained and authorised operatives.
- Fuel delivery hoses will have handles and triggers for increased control.
- An emergency plan will be in place to deal with spillage and leaks.

The above mitigation measures would ensure that otters are protected, that there would be no detrimental impact on the contribution to the maintenance of otter at a favourable conservation status, and that relevant legislation is adhered to.

8.4.5 Wintering Goose Mitigation Measures

No mitigation measures are required as there is no risk of undermining the conservation objectives of pink-footed and greylag geese qualifying interest of the assessed European/ Ramsar sites.

9.0 Conclusion

Screening

The Stage 1: HRA screening concluded that on the basis of objective evidence and in view of best scientific knowledge, that there will not be any likely significant effects from the construction, operation, or decommissioning activities from the Project alone, or in combination with other plans or projects, on the following European sites:

- Pitkeathly Mires SAC; and
- Methven Moss SAC.

The following European sites and qualifying interests were screened into the SIAA.

- South Tayside Goose Roosts SPA/RAMSAR: all features;
- River Tay SAC: otter;
- Firth of Tay and Eden Estuary SPA/RAMSAR: greylag goose and pink-footed goose;
- Loch Leven SPA/RAMSAR.**;** pink-footed goose.

Appropriate Assessment

South Tayside Goose Roost SPA/RAMSAR, Firth of Tay and Eden Estuary SPA/RAMSAR, Loch Leven SPA/RAMSAR

It has been ascertained that conservation objectives will not be undermined and therefore there will be no adverse effects on integrity from the project alone or in-combination for the assessed European/ Ramsar sites for the following reasons:

- The Site is located outside of the main foraging areas for the pink-footed goose and greylag geese of relevant SPA / Ramsar sites;
- The habitat loss will be insignificant compared to the available suitable foraging habitats within 20 km radius from known roosting sites within each of the SPAs and five km radius from the Site; and
- Any disturbance will be temporal, localised and will not impact local distribution, abundance and ability of these populations to survive.

River Tay SAC

Otter were the sole qualifying interest of the River Tay SAC screened into the SIAA. Although otter presence, including the use of resting locations and/or breeding sites within the Site, was not confirmed, based on the proximity to the East Pow burn (within the catchment of the River Tay SAC) and connecting watercourses they were considered under the precautionary principle.

In the absence of mitigation measures, the following conservation objectives have the potential to be undermined:

1. To ensure that the qualifying feature of the River Tay SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.
2. To ensure that the integrity of the River Tay is maintained by meeting objectives 2a, 2b and 2c for the qualifying feature.

2a. Maintain the population of otter as viable components of the site.

2b. Maintain the distribution of otter throughout the site.

2c. Maintain the habitats supporting otter within the site, and availability of food.

Once mitigation has been applied, no Conservation Objectives would be undermined, either alone or in combination with other plans or projects.

Appendix A Appropriate Assessment Process

Dupplin Solar Farm

Technical Appendix 6.3: shadow Habitats Regulations Appraisal (sHRA)

TRIO Dupplin Solar LLP

SLR Project No.: 405.065787.00003

19 January 2026

Stage 1: Project Description

Stage 1 is an outline description of the Proposed Development, including construction, operation and decommissioning, containing enough sufficient information for potential impact pathways to be understood, and the Site and its surroundings, focussing on the habitats and species that may form part of the qualifying interest of a European site.

Stage 2: Management of the Site

Stage 2 is to ascertain whether the Proposed Development is directly connected with or necessary to the management of a European or Ramsar site. Typically, this applies only to a management plan, or parts thereof, which has the purpose of maintaining or restoring the conservation interest of a European or Ramsar site, and which would not have a negative effect on any other European or Ramsar site.

Stage 3: Likely Significant Effects

Step 1: Sources of Impact

Step 1: identify the aspects of the Proposed Development which have the potential to affect European sites, either alone or in combination with other projects and plans. This may include for example emissions to air and water, noise and increases in recreational activity ('Sources').

Step 2: European Sites

Step 2: identify which (if any) European sites may be affected, considering the potential effects of the Project alone or in combination with other plans or projects, which is subdivided into:

Step 2, Part 1: generate an initial list of European sites to be considered in the screening process, which are those which are potentially connected (via a Pathway) to the Site including:

1. any which overlap with the Site or are close enough to experience increased noise, vibration, light, visible human activity or invasive species;
2. those that may have downstream connectivity via watercourses or groundwater to the Site or transport routes;
3. those that may receive deposition of pollutants as a result of emissions to air from the Project or transport routes;
4. those which may support migratory or mobile species populations which may also use the Site or its environs; and
5. those which may receive additional recreational activity once the Site is inhabited.

Step 2, Part 2: compile basic information on the European sites identified in Part 1, including a list of qualifying interest features/special conservation interest (the Receptors), their conservation objective if known (maintain or restore), the distance and direction from the Site (including transport routes) and how it is or is not connected, using the Source-Pathway-Receptor model, to the Site (including transport routes). Likely significant effects can usually be immediately excluded for any European sites and any qualifying /special conservation interest features which clearly lack a pathway or were it can be demonstrated there is a very weak pathway, such that any effects would not be appreciable, provided there is also no risk of in combination effects.

Step 3: Assess Risks

Step 3: assess whether LSE on all European sites can be ruled out, in view of their conservation objectives, which is sub-divided into:

Step 3, Part 1: assessing LSE for the Project alone, determining whether there is a risk that the Project could undermine the conservation objectives for the qualifying interest features/special conservation interest for those European sites for which a pathway has been identified. This is a scientific determination which considers whether the maintain or restore objective applies and both direct and indirect effects. If there is any uncertainty or detailed investigation or mitigation are required, LSE are assumed.

Step 3, Part 2: assessing LSE for the Project in combination with other projects and plans. Along the same lines as Part 1, this considers whether the effects of the Project, if not capable of undermining the conservation objective(s) on their own, could do so cumulatively with other projects and plans. It also considers whether the risk of undermining conservation objective(s) is elevated when cumulative effects are considered.

Stage 4: Conclusion

Conclusion: stating whether likely significant effects arising from the Proposed Development, alone and in-combination with projects and plans, on European and Ramsar sites can excluded, and if they cannot, which European sites and which qualifying interest features/special conservation interest are at risk from significant effects, and the relevant impact sources and pathways. If the latter, an AA will be required. The conclusion will not consider any mitigation measures designed to avoid likely significant effects on a European site.

Stage 4: Appropriate Assessment

Step 1: Information on the Project and on the European Sites

Step 1, Part 1: information on the Proposed Development and the Site. Whilst the Proposed Development has been described in outline at Stage 1, a more detailed description is provided here at Stage 4 including construction/ decommissioning methods, relevant details of the design and timescales, providing all the details needed by the competent authority to complete its AA.

Step 1, Part 2: information on the European sites, provides further information on the European sites identified at Stage 1 for which LSE cannot be excluded, including a complete list of the qualifying interest features (if not already provided), further investigation into the conservation/feature condition and distribution of qualifying habitats and populations, a description of the Site and further information on the conservation objectives, including the any Site specific advice, and the main threats and pressures.

Step 2: Implications for the European Sites

Step 2: Assessing the implications of the Proposed Development in view the Site's conservation objectives, individually or in combination with other plans or projects.

Step 2, Part 1: Assessment of the Project alone

A scientific assessment of the potential effects of the Proposed Development on the qualifying interest features of the European and Ramsar sites, based on the impact factors and pathways identified at Stage 3. For example, determining whether the effects could result in a population decline or the loss or degradation of a habitat. The effects are considered individually and cumulatively.

Step 2, Part 2: Assessment of Project 'in combination',

This includes the confirmation of the projects and plans (from Stage 3) which could act in combination with the Proposed Development, and could therefore collectively result in effects such as a population decline or the loss or degradation of a habitat, or add to such effects already identified for the Proposed Development alone. Those included are other plans or projects that have been already completed, approved but not yet completed, or submitted for consent, and have likely significant effects on the same European sites as the Proposed Development. All projects and plans are considered together rather than pairwise with the Proposed Development, and assessments already made at the plan level (especially the relevant LPA development plans) are used to inform the assessment.

Step 2, Part 3: Implications for the Conservation Objectives

If site-specific conservation and management advice has not been published it is assumed that the favourable condition is at or above the condition of the feature when the site was designated, and unfavourable condition is below that level. Therefore, the objective is to maintain or restore the feature to that condition. This applies to the area of the qualifying habitat and its quality, the population and distribution of a qualifying species, and the extent and quality of habitat for that species within the designated site. In addition, the species are not significantly disturbed within the designated site. The assessment also considers supporting populations of the same and other species and connected habitats.

Following the assessment at Step 1, identifying whether effects which would undermine the conservation objectives can be excluded for the Proposed Development alone, or if not which conservation objective(s) could be undermined, the level or risk and to what degree. Then, following on from Step 2, considering whether the effects in combination could undermine the conservation objectives, even where the Project does not do so alone, and whether these effects are more/less likely to happen or be worsened/lessened when all plans and projects are considered together.

Low level effects of short duration and from which habitats and species populations would quickly recover may be regarded as not undermining the conservation objectives.

Step 3: Mitigation Measures

Step 4 Identify mitigation measures. For any effect that could have an adverse effect on the integrity of a European site, avoidance and mitigation measures are identified with the aim of removing the risk to the integrity of the identified European sites, including in combination effects with other projects and plans. Measures to compensate for adverse effects must not be considered at this Stage, and neither are actions designed to enhance biodiversity.

Stage 5: Site Integrity

Ascertain the effects of the Proposed Development on the integrity of European sites. Following on from Step 2, and a detailed scientific investigation of the implications of the Project on the conservation objectives, it is determined that where a conservation objective could be undermined, there would be an effect on Site integrity and vice versa, which is based on the published conservation objectives where these exist, or an assumed objective as set above.

Conclusion: Taking into account the mitigation identified at Stage 4, determining whether the risk to the conservation objectives have been reduced or removed such that they will not be undermined, and adverse effects on the integrity of all European sites can be excluded.

Appendix B Case Law

Dupplin Solar Farm

Technical Appendix 6.3: shadow Habitats Regulations Appraisal (sHRA)

TRIO Dupplin Solar LLP

SLR Project No.: 405.065787.00003

19 January 2026

Table B- 1: Case Law of Relevance to the sHRA of the Proposed Development

Case Law	Ruling
People Over Wind and Sweetman v Coillte Teoranta (C-323/17)	The ruling of the CJEU requires that mitigation measures intended to avoid or reduce harmful effects of a project on a European or International site should not be taken into account at when assessing Likely Significant Effects (LSE) at screening stage.
Waddenzee (C-127/02)	This ruling provided clarity on the interpretation of a 'likely significant effect', detailing that a project should be subject to appropriate assessment "if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects". Therefore, 'likely', in this context, should not simply be interpreted as 'probable' or 'more likely than not', but rather whether a significant effect can objectively be ruled out.
Sweetman v An Bord Pleanála (C-258/11)	Request for a preliminary ruling from the Supreme Court (Ireland). Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that a plan or project not directly connected with or necessary to the management of a site will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of sites of Community importance, in accordance with the directive. The precautionary principle should be applied for the purposes of that appraisal.
Holohan and Others v An Bord Pleanála (C-461/17)	Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that an 'appropriate assessment' must, on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site. 1. Article 6(3) of Directive 92/43 must be interpreted as meaning that the competent authority is permitted to grant to a plan or project consent which leaves the developer free to determine subsequently certain parameters relating to the construction phase, such as the location of the construction compound and haul routes, only if that authority is certain that the development consent granted establishes conditions that are strict enough to guarantee that those parameters will not adversely affect the integrity of the site. 2. Article 6(3) of Directive 92/43 must be interpreted as meaning that, where the competent authority rejects the findings in a scientific expert opinion recommending that additional information be obtained, the 'appropriate assessment' must include an explicit and detailed statement of reasons capable of dispelling all reasonable scientific doubt concerning the effects of the work envisaged on the site concerned. 3. Article 5(1) and (3) of, and Annex IV to, Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, must be interpreted as meaning that the developer is obliged to supply information that expressly addresses the significant effects of its

Case Law	Ruling
	project on all species identified in the statement that is supplied pursuant to those provisions. Article 5(3)(d) of Directive 2011/92 must be interpreted as meaning that the developer must supply information in relation to the environmental impact of both the chosen option and of all the main alternatives studied by the developer, together with the reasons for his choice, taking into account at least the environmental effects, even if such an alternative was rejected at an early stage.
T.C. Briels and Others v Minister van Infrastructuur en Milieu (C-521/12).	Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that a plan or project not directly connected with or necessary to the management of a site of Community importance, which has negative implications for a type of natural habitat present thereon and which provides for the creation of an area of equal or greater size of the same natural habitat type within the same site, has an effect on the integrity of that site. Such measures can be categorised as ‘compensatory measures’ within the meaning of Article 6(4) only if the conditions laid down therein are satisfied.

Appendix C Figures

Dupplin Solar Farm

Technical Appendix 6.3: shadow Habitats Regulations Appraisal (sHRA)

TRIO Dupplin Solar LLP

SLR Project No.: 405.065787.00003

19 January 2026

Figures – Volume 3A of the EIA Report

Figure 6.3.1 Site Location and Survey Area
Figure 6.3.2 European Sites within 10km and 20km
Figure 6.3.3 Wintering Goose Survey Results 2025

Appendix D Conservation Advice Package and Citations

Dupplin Solar Farm

Technical Appendix 6.3: shadow Habitats Regulations Appraisal (sHRA)

TRIO Dupplin Solar LLP

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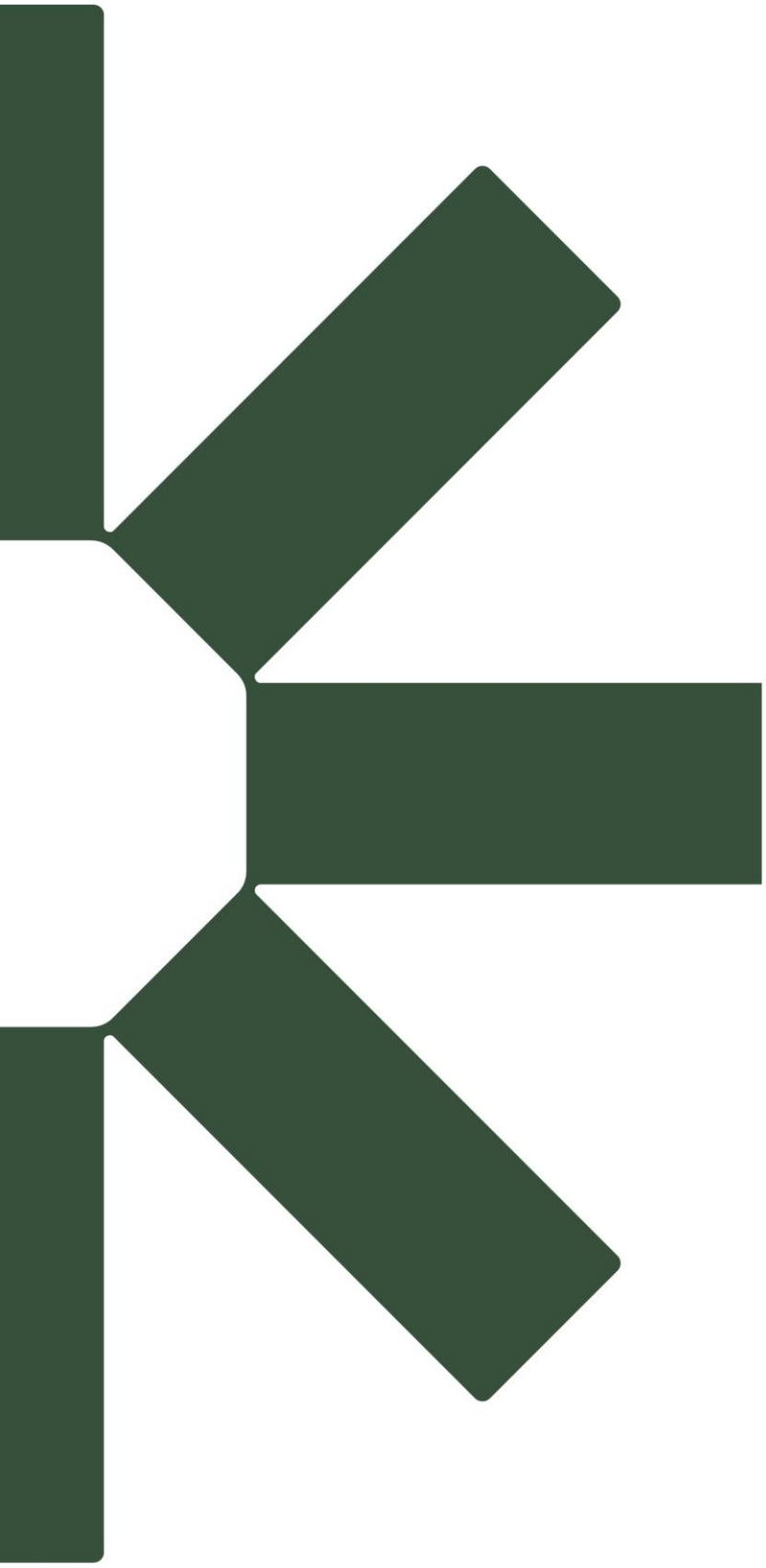
19 January 2026

The following Conservation Advice Packages have been provided:

- River Tay SAC;
- Methven Moss SAC;
- Pitkeathly Moss SAC.

The following SPA Conservation Objectives have been provided:

- South Tayside Goose Roosts SPA/RAMSAR;
- Firth of Tay and Eden Estuary SPA/RAMSAR; and
- Loch Leven SPA/RAMSAR.



Making Sustainability Happen