

HOUSTON SOLAR PV AND ENERGY STORAGE FACILITY

Ecological Impact Assessment Report

ECO02648
Houston Solar PV and
Energy Storage Facility
2
29 June 2023

REPORT

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1	Draft	Nora Washbourne	Stephen Lockwood & Simon Zisman	Stephen Lockwood	05.12.22
2	Update with connection area	Nora Washbourne	-	-	-

Approval for issue

Stephen Lockwood

5 December 2022

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1 INTRODUCTION

RPS Consulting Services Ltd. (RPS) was commissioned by Elgin Energy Esco Ltd. 'Elgin Energy' to carry out an Ecological Impact Assessment (EclA) of the proposed Houston Solar Photovoltaic (PV) and energy storage facility (hereafter referred to as the Development) near Houston, Renfrewshire (Central Ordnance Survey Grid Reference: NS 43100 67252). The location of the proposed development is shown in Figure 1.

This EclA comprised a desk-based assessment, results from walkover surveys for habitats and terrestrial and aquatic protected species, and an ecological impact assessment. The report identifies potential impacts on ecological receptors located within and immediately adjacent to the Development and provides recommended mitigation and enhancement measures where appropriate.

1.1 Proposed Development

The Development is situated on several land parcels totalling approximately 129 hectares. The northernmost land parcel (Houston North) is located approximately 0.52km northeast of Houston Village, and the two southernmost (Houston South) parcels are located south of the B790 Houston Road, approximately 1km east of Houston Village (Figure 1). Houston North and Houston South are separated by the River Gryfe and an additional land parcel and will be connected by a cable (Connection Area). The current land use within the Development is a combination of arable fields and grazing pasture. Much of the Development site is bordered by other arable fields or pasture, but some areas of woodland border both Houston North and Houston South.

The proposed Development includes the installation of a solar farm with approximate capacity of 75MW, battery energy storage system with approximate capacity of 25MW and associated infrastructure. Connection to the National Grid is not included in the Development. The Development is expected to include the following elements:

- Photovoltaic (PV) solar panels erected on steel frames;
- Battery energy storage facility sited on concrete plinths;
- A primary substation, comprising electrical infrastructure and associated buildings;
- Numerous inverter substation containers on concrete plinths;
- Underground main cables connecting exposed cables from the panels with the inverter substations;
- CCTV security cameras at several locations (approximately 3m high);
- Perimeter post and wire deer fencing (approximately 2.45m high);
- Internal access tracks; and
- Two temporary construction compounds (Houston North and Houston South).

The primary substation will be located within Houston South, a smaller connecting substation will be located in Houston North and an underground cable will connect the two. The final route of the connecting cable is still to be determined but two options are proposed:

1. Cable on the south side of the B790/Houston Road running east for approximately 360m and then being directed southwards across agricultural land for approximately 850m. The cable would cross the River Gryfe by either overhead cable or directional drilling.
2. Cable on the south side of the B790/Houston Road running east for approximately 850m and then proceeding south along the western side of Moss Road for approximately 900m until it reaches Houston South. The cable would cross the River Gryfe via Fulwood Bridge along Moss Road.

Construction is anticipated to be undertaken over a 16-week period and it is anticipated that the Development will have an operating life of 40 years. After operation, all panels and associated infrastructure will be removed and the site reinstated with a scheme agreed with the Planning Authority at that time.

1.2 Report Objectives

The key objectives of the assessment were to:

- Assess any potential impacts the proposed solar farm may have on designated sites, protected or notable habitats or species;
- Identify the broad habitat types and dominant floral communities within the survey area by reporting results from a phase 1 habitat survey;
- Identify habitat capable of supporting protected and notable species of conservation concern;
- Identify confirmed presence of any protected and notable species of conservation concern;
- Identify the presence of invasive non-native species (inns) subject to legal control; and
- Make recommendations for avoidance, mitigation and/or compensation measures that should be addressed in the design, construction and operation of the development.

This report includes details of the methodology used (Section 2), the results obtained (Section 3) and identifies the potential impacts the proposals could have and appropriate mitigation measures where required (Section 4).

1.3 Relevant Legislation

A summary of the legislation relevant to protected species and habitats, or those which may pose a potential constraint to the scheme as identified in this report, are provided in Appendix A and include:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- Conservation of Habitats and Species (Amendment) (EU Exit) regulations 2019;
- The Wildlife and Countryside Act 1981 (as amended); and
- The Protection of Badgers Act 1992.

1.4 Terms

The following definitions are used in this report and are delineated in Figure 1:

- **Site Boundary:** the area of the proposed Development within which all works will be undertaken and is subject to any granted planning consent; and
- **Survey Area:** an area encompassing the Site Boundary plus a defined buffer in which field surveys were undertaken. Survey Areas are shown in Figure 1.

1.5 Conditions

The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for 24 months, notwithstanding any substantial changes to the site conditions.

The desk study data is third party controlled data, purchased for the purposes of this report only. RPS cannot vouch for its accuracy and cannot be held liable for any error(s) in these data.

1.6 Limitations

The terrestrial protected species survey was undertaken outside of the optimal season for water voles *Arvicola amphibius* (optimal period April to October inclusive). However, the low vegetation levels observed during the November field survey allow for better visibility of burrows within the Survey Area, allowing for an assessment of habitat suitability. For the purpose of the assessment, a precautionary approach was used to prevent any potential impacts to this species.

Access was not granted to undertake a bat roost assessment on buildings within the Survey Area. However, the build elements of the Development are all situated at least 30m away from these buildings and therefore no disturbance is anticipated to any bats that may be roosting in these buildings.

Land access was only granted within the boundary of the Estate, and therefore portions of the Survey Area that were outside of the Estate boundary could not be fully surveyed (Figure 1). These areas were limited in area and primarily consisted of arable fields. Areas that could not be fully surveyed were visually assessed from publicly accessible locations (e.g., public roads, Estate-owned land), which was considered a reasonable approach for this site.

2 METHODOLOGY

2.1 Desk Study

A desk study was undertaken to identify designated sites (both statutory and non-statutory) and protected species within the vicinity of the Development. The search area for the desk study was determined based on a combination of factors including the nature of the Development; potential impacts to habitats, species and designated sites; and whether highly mobile species (e.g., bats, birds) are expected to be present and impacted (Chartered Institute of Ecology and Environmental Management (CIEEM), 2017). For this Development, a 2km buffer around the Site Boundary was considered appropriate, unless otherwise stated below.

The desk study consisted of:

- A search for all statutory and non-statutory designated sites within a 2km buffer of the Site Boundary using the Magic Mapping¹ and Scotland's Environment Web² websites, as well as contextual habitat data from the latter (e.g., woodland interests).
- Due to the highly mobile nature of bird species, the search for sites designated for ornithological interests extended to 20km buffer of the Site Boundary, using the above websites.
- A data request was made to the Glasgow Museums Biological Records Centre (GMBRC) for all records of protected and notable species within 2km of the Site Boundary. The request was limited to records from 2012 to the present only.
- A review of records from the Royal Society for the Protection of Birds (RSPB) Swift Mapper website³.
- A search of publications from the Clyde River Foundation was undertaken to identify the use of nearby watercourses by aquatic species of conservation interest.
- An inspection of aerial imagery prior to field surveys to identify any areas of high sensitivity which might require additional survey effort during the site visits.

2.2 Field Surveys

Field surveys were undertaken by experienced ecologists in June 2022 and between October 2022 and April 2023. Surveys were undertaken within the Site Boundary for the Development plus an appropriate survey buffer, where possible. The extent of survey buffers was informed by best practice guidelines (e.g., NatureScot standard advice for planning and development; NatureScot, 2023b), existing knowledge at the Development site, and professional judgement.

The following field surveys were undertaken to support this assessment:

- Phase 1 Habitat Survey undertaken in June 2022 and February 2023 within a 50m buffer of the Site Boundary.
- Terrestrial protected species surveys undertaken in November 2022 and February 2023:
 - Otter *Lutra lutra*: encompassing the Site Boundary plus a 250m buffer;
 - Badger *Meles meles*: encompassing the Site Boundary plus a 100m buffer;

¹ Magic Mapping website: <https://magic.defra.gov.uk/>

² Scotland's Environment Web website: <https://map.environment.gov.scot/sewebmap/>

³ Swift Mapper website: <https://www.rspb.org.uk/swiftmapper>

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- Fish and freshwater pearl mussel *Margaritifera margaritifera* habitat: encompassing the Site Boundary plus a 100m buffer;
- Water vole: habitat assessment encompassing the Site Boundary plus a 30m buffer;
- Preliminary bat roost assessment: encompassing the Site Boundary plus a 30m buffer;
- Wintering goose surveys undertaken once each month from October 2022 to April 2023, inclusive, within the Site Boundary plus a 500m buffer.
- A breeding bird habitat assessment was undertaken for the Site Boundary and immediate adjacent buffer to describe habitat suitability for breeding birds and identify areas of importance.

Detailed field survey methodology is outlined in Appendix B.

3 RESULTS

3.1 Desk Study

3.1.1 Designated Sites

Two statutory designated sites, the Black Cart Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA), were located within 2km of the Development Site Boundary and an additional three SPAs were located within 20km of the boundary (Figures 2a and 2b, Table 1).

Thirty-two non-statutory designated sites were located within 2km of the Development Site Boundary, which includes 13 Local Nature Conservation Sites (LNCS) and 19 Ancient Woodland Inventory (AWI) woodlands (Figure 2b, Table 1). Several of these AWI woodlands and LNCSs bordered both Houston North and Houston South.

Table 1: Statutory and Non-Statutory Designated Sites within 2km (all sites) or 20km (SPAs only) of the Development Site Boundary.

Site Name	Site Type	Area (ha)	Interest Features	Distance to site (km)
Statutory Sites				
Black Cart	SSSI	56.3	Whooper swan <i>Cygnus cygnus</i> , non-breeding	1.9
Black Cart	SPA	56.3	Whooper swan, non-breeding	1.9
Inner Clyde	SPA	1,813.7	Redshank <i>Tringa totanus</i> , non-breeding	4.7
Inner Clyde	Ramsar	1,824.92	Redshank <i>Tringa totanus</i> , non-breeding	4.7
Renfrewshire Heights	SPA	8,940.8	Hen harrier <i>Circus cyaneus</i> , breeding	8.5
Loch Lomond	SPA	508.2	Capercaillie <i>Tetrao urogallus</i> , breeding Greenland white-fronted goose <i>Anser albifrons flavirostris</i> , non-breeding	19.3
Non-Statutory Sites				
Linwood Moss Wood	LNCS	13	Unknown	0
Linwood Moss Wood	LNCS	2	Unknown	0
Barochan Moss	LNCS	72	Unknown	0
Linwoodmoss Wood	AWI	13.7	2b: long-established (of plantation origin)	0
N/S	AWI	7.5	2b: long-established (of plantation origin)	0
Houston Wood	AWI	8.3	1b: long-established (of plantation origin)	0
Fulwood Wood	AWI	8.9	1b: long-established (of plantation origin)	0.03
Houstoun Wood	AWI	5.1	3: other (on Roy map)	0.09
N/S	AWI	8.6	2b: long-established (of plantation origin)	0.1
Houston Wood	AWI	13.7	2b: long-established (of plantation origin)	0.1
N/S	AWI	1.9	2b: long-established (of plantation origin)	0.2
Low Wood	AWI	4.3	2b: long-established (of plantation origin)	0.3
N/S	AWI	2.8	2a: ancient (of semi-natural origin)	0.5
Craigends Estate	LNCS	21	Unknown	0.7
N/S	AWI	7.1	1b: long-established (of plantation origin)	0.7
N/S	AWI	5.4	2b: long-established (of plantation origin)	0.8
N/S	AWI	2.4	2b: long-established (of plantation origin)	0.8
N/S	AWI	4.2	3: other (on Roy map)	0.9
N/S	AWI	3.9	1b: long-established (of plantation origin)	0.9

Site Name	Site Type	Area (ha)	Interest Features	Distance to site (km)
Corsellehill & Swinesglen/Northbrae Woods	LNCS	32	Unknown	1.1
N/S	AWI	2.2	2b: long-established (of plantation origin)	1.1
Dargavel Mosaic	LNCS	12	Unknown	1.1
Gryfe Walkway (Bridge Of Weir to Crosslee)	LNCS	8	Unknown	1.3
N/S	AWI	7.3	2b: long-established (of plantation origin)	1.3
Cleaves Wood	AWI	3.1	2b: long-established (of plantation origin)	1.6
N/S	AWI	2.4	2a: ancient (of semi-natural origin)	1.6
Georgetown Wood (ROF)	LNCS	18	Unknown	1.6
Brierie Hill Marshland	LNCS	1	Unknown	1.6
Black Cart Water Gryfe end	LNCS	10	Unknown	1.7
Candren Pool	LNCS	4	Unknown	1.7
Locher Water Kaim Hill	LNCS	2	Unknown	1.8
East Fulwood Moss	LNCS	1	Unknown	1.9

Abbreviations used in Table 1: AWI = Ancient Woodland Index, ha = hectare, km = kilometre, LNCS = Local Nature Conservation Site, N/S = not supplied, SSSI = Site of Special Scientific Interest, SPA = Special Protection Area.

3.1.2 Protected and Notable Species

The desk study returned the data search detailing the protected and notable species within 2km of the Site Boundary. The key species are noted in Table 2. These included numerous European Protected Species (EPS), birds listed on Annex 1 of the Birds Directive and both Red- and Amber-listed species on the Birds of Conservation Concern (BoCC) 5 list (Stanbury *et. al.*, 2021).

Where records of bird species were returned that were not relevant as the Development site does not provide suitable habitat (e.g., wading birds), these records were excluded from this report. Species that were identified during field surveys for other receptors are displayed in bold in Table 2, but it should be noted that these were only incidental observations as opposed to targeted surveys for birds.

Table 2: Protected and notable species records from 2012-2022. For birds, only species with a conservation designation or listed as Red/Amber on the BoCC 5 are included here. For a full list of bird species identified in the desk study, see Appendix C.

Common Name	Taxon Name	European Protected Species	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Terrestrial Mammals				
Eurasian badger	<i>Meles meles</i>		PBA 1992	
Grey squirrel	<i>Sciurus carolinensis</i>			
Hedgehog	<i>Erinaceus europaeus</i>			
Daubenton's bat	<i>Myotis daubentonii</i>	EPS		
Natterer's bat	<i>Myotis nattereri</i>	EPS		
Myotis bat species	<i>Myotis species</i>	EPS		
Lesser noctule	<i>Nyctalus leisleri</i>	EPS		
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	EPS		
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	EPS		
Pipistrelle bat	<i>Pipistrellus species</i>			
Brown long-eared bat	<i>Plecotus auritus</i>	EPS		

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Common Name	Taxon Name	European Protected Species	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Birds				
Barn owl	<i>Tyto alba</i>		WCA.S1p1, SBL	
Barnacle goose	<i>Branta leucopsis</i>	Annex 1	SBL	Amber
Brambling	<i>Fringilla montifringilla</i>		WCA.S1p1, SBL	
Bullfinch	<i>Pyrrhula pyrrhula</i>		SBL	Amber
Common crossbill	<i>Loxia curvirostra</i>		WCA.S1p1	Amber
Common gull	<i>Larus canus</i>			Amber
Common sandpiper	<i>Actitis hypoleucos</i>			Amber
Cuckoo	<i>Cuculus canorus</i>		UK BAP, SBL	Red
Dipper	<i>Cinclus cinclus</i>			Amber
Dunlin	<i>Calidris alpina</i>		SBL	Red
Dunlin (alpina)	<i>Calidris alpina alpina</i>		SBL	Red
Dunnock	<i>Prunella modularis</i>		SBL	Amber
Fieldfare	<i>Turdus pilaris</i>		WCA.S1p1	Red
Golden plover	<i>Pluvialis apricaria</i>	Annex 1	SBL	
Goldeneye	<i>Bucephala clangula</i>		WCA.S1p1	Red
Grasshopper warbler	<i>Locustella naevia</i>		UK BAP, SBL	Red
Great spotted woodpecker	<i>Dendrocopos major</i>	Annex 1		
Greenfinch	<i>Chloris chloris</i>			Red
Grey wagtail	<i>Motacilla cinerea</i>			Amber
Greylag goose	<i>Anser anser</i>		WCA.S1p1	Amber
Hen harrier	<i>Circus cyaneus</i>	Annex 1	WCA.S1p1, SBL	Red
House martin	<i>Delichon urbicum</i>			Red
House sparrow	<i>Passer domesticus</i>		UK BAP, SBL	Red
Kestrel	<i>Falco tinnunculus</i>		SBL	Amber
Kingfisher	<i>Alcedo atthis</i>	Annex 1	WCA.S1p1, SBL	
Lapwing	<i>Vanellus vanellus</i>		UK BAP, SBL	Red
Lesser redpoll	<i>Acanthis cabaret</i>		UK BAP, SBL	
Linnet	<i>Linaria cannabina</i>		SBL	Red
Marsh harrier	<i>Circus aeruginosus</i>		WCA.S1p1, SBL	Amber
Meadow pipit	<i>Anthus pratensis</i>			Amber
Merlin	<i>Falco columbarius</i>	Annex 1	WCA.S1p1, SBL	Red
Mistle thrush	<i>Turdus viscivorus</i>			Red
Osprey	<i>Pandion haliaetus</i>	Annex 1	WCA.S1p1, SBL	Amber
Peregrine	<i>Falco peregrinus</i>	Annex 1	WCA.S1p1, SBL	
Pink-footed goose	<i>Anser brachyrhynchus</i>			Amber
Pintail	<i>Anas acuta</i>			Amber
Red kite	<i>Milvus milvus</i>	Annex 1	WCA.S1p1, SBL	
Redwing	<i>Turdus iliacus</i>		WCA.S1p1	Amber
Reed bunting	<i>Emberiza schoeniclus</i>		UK BAP, SBL	Amber
Reed warbler	<i>Acrocephalus scirpaceus</i>		SBL	
Ringed plover	<i>Charadrius hiaticula</i>			Red
Rook	<i>Corvus frugilegus</i>			Amber
Sedge warbler	<i>Acrocephalus schoenobaenus</i>			Amber

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Common Name	Taxon Name	European Protected Species	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Short-eared owl	<i>Asio flammeus</i>	Annex 1	SBL	Amber
Siskin	<i>Spinus spinus</i>		SBL	
Skylark	<i>Alauda arvensis</i>		SBL	Red
Snipe	<i>Gallinago gallinago</i>			Amber
Song thrush	<i>Turdus philomelos</i>			Amber
Sparrowhawk	<i>Accipiter nisus</i>	Annex 1		Amber
Spotted flycatcher	<i>Muscicapa striata</i>		UK BAP, SBL	Red
Starling	<i>Sturnus vulgaris</i>		SBL	Red
Starling (vulgaris)	<i>Sturnus vulgaris vulgaris</i>		SBL	
Stock dove	<i>Columba oenas</i>			Amber
Swift	<i>Apus apus</i>		SBL	Red
Taiga/Tundra bean goose	<i>Anser fabalis/serrirostris</i>		SBL	Amber
Tawny owl	<i>Strix aluco</i>			Amber
Tree pipit	<i>Anthus trivialis</i>		UK BAP, SBL	Red
Tree sparrow	<i>Passer montanus</i>		SBL	Red
Twite	<i>Linaria flavirostris</i>		UK BAP, SBL	Red
Wheatear	<i>Oenanthe oenanthe</i>			Amber
Whinchat	<i>Saxicola rubetra</i>			Red
White-fronted goose	<i>Anser albifrons</i>			Red
Whitethroat	<i>Curruca communis</i>			Amber
Whooper swan	<i>Cygnus cygnus</i>	Annex 1	WCA.S1p1, SBL	Amber
Wigeon	<i>Mareca penelope</i>			Amber
Willow warbler	<i>Phylloscopus trochilus</i>			Amber
Wood warbler	<i>Phylloscopus sibilatrix</i>		UK BAP, SBL	Red
Woodcock	<i>Scolopax rusticola</i>		SBL	Red
Woodpigeon	<i>Columba palumbus</i>			Amber
Wren	<i>Troglodytes troglodytes</i>			Amber
Yellow-browed warbler	<i>Phylloscopus inornatus</i>			Amber
Yellowhammer	<i>Emberiza citrinella</i>		UK BAP, SBL	Red
Invertebrates				
Beet carrion beetle	<i>Aclypea opaca</i>			
Small heath butterfly	<i>Coenonympha pamphilus</i>			
Variable damselfly	<i>Coenagrion pulchellum</i>			
Plants				
Lesser tussock-sedge	<i>Carex diandra</i>			

Abbreviations used in Table 2: Amber = Birds of Conservation Concern 5 amber-listed species, Annex 1 = Annex 1 of the Birds Directive, EPS = European Protected Species, PBA1992 = The Protection of Badgers Act 1992, Red = Birds of Conservation Concern 5 red-listed species, SBL = Scottish Biodiversity List, UK BAP = UK Biodiversity Action Plan, WCA.S1p1 = The Wildlife and Countryside Act 1981 (as amended) Schedule 1 part 1.

The watercourses in the Survey Area are within the catchment for the River Gryfe, and the River Gryfe itself flows within the Connection Area between the two site locations. During fish population surveys undertaken by the Clyde River Foundation, brown/sea trout *Salmo trutta* were found to be widely distributed in the River Gryfe catchment (McColl *et. al.*, 2009).

No barriers to fish migration were identified in the River Gryfe or its tributaries within or downstream of the Survey Area, and therefore it is considered that the watercourses within the Survey Area are accessible to

migratory fish species such as Atlantic salmon *Salmo salar*, river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus*, and European eel *Anguilla anguilla*.

3.2 Phase 1 Habitat Survey

A Phase 1 Habitat Survey was undertaken in June 2022 in Houston North and Houston South. An additional Phase 1 Habitat survey was undertaken in February 2023 in the Connection Area.

A majority of Houston North was composed of arable land and improved grassland, whereas Houston South was predominantly composed of marsh/marshy grassland and semi-improved neutral grassland (Figure 3, Table 3). Hedgerows lined some of the fields around both Houston North and Houston South and woodlands were only present outside of the Site Boundaries.

The Connection Area is approximately 13ha and was predominantly arable land north of the River Gryfe and semi-improved and marshy grassland or semi-improved neutral grassland to the south of the River Gryfe (Figure 3). Hedgerows and scattered trees were present around the boundary of some of the fields. A swamp with some standing water was observed but is likely that this area only holds standing water during wet times of year.

Table 3: Phase 1 habitats recorded within the Site Boundary for Houston North, Houston South and the Connection Area and the Survey Area for Houston North and Houston South. The most abundant habitat types (by area) are highlighted in green.

Phase 1 Habitat	Survey Area (ha)	Site Boundary (ha)	% of Site Boundary	Conservation Designations
A1.1.2: Broadleaved woodland – plantation	6.85	2.34	1.8	
A1.3.2: Mixed woodland – plantation	4.18	0.25	0.2	
A2.1: Dense/continuous scrub	1.92	0.19	0.2	
B2.2: Neutral grassland – semi-improved	8.32	7.29	4.5	
B4: Improved grassland	38.77	30.02	25.7	
B5: Marsh/marshy grassland	20.60	20.46	14.8	
C3.1: Other tall herb and fern – ruderal	0.22	0.17	0.1	
F1: Swamp	-	0.19		
G1: Standing water	-	0.06		
G2: Running water	P	P	-	UK BAP, SBL
J1.1: Cultivated/disturbed land – arable	98.83	64.70	51.8	
J2.1.1: Intact hedge – native, species-rich	P	P	-	UK BAP, SBL
J2.5: Drystone wall	P	P	-	
J4: Bare ground	0.15	-	-	
Existing track	0.83	3.07	0.7	
Total	180.7	129.0	-	

Abbreviations used in Table 3: ha = hectare, P = present, LBAP = Renfrewshire LBAP, SBL = Scottish Biodiversity List, UK BAP = UK Biodiversity Action Plan habitat.

Broadleaved woodland – plantation (A1.1.2)

Several areas of the Development Site Boundary are bordered by areas of broadleaved plantation woodland (Figure 3). The canopies of these areas were dominated by silver birch *Betula pendula* with frequent sycamore *Acer pseudoplatanus* and beech *Fagus sylvatica* (TN1, TN5, TN7, TN8, TN11, TN12; Appendix D). There was also occasional holly *Ilex aquifolium* and rowan *Sorbus aucuparia*. The shrub layer was dominated by rhododendron *Rhododendron* spp. and field layer dominated by ferns *Polypodiopsida*

spp.. There was also frequent wood sorrell *Oxalis acetosella* and brambles *Rubus fruticosus* throughout the woodland and occasional ground elder *Aegopodium podagraria*.

Mixed woodland – plantation (A1.3.2)

There are three areas of mixed plantation woodland, two of which bordered Houston North and one small area bordered Houston South (Figure 3). These were mostly dominated by oak *Quercus robur* with Scots pine *Pinus sylvestris* abundant and frequent sycamore also throughout (TN3, Appendix D). The shrub layers of these woodlands were dominated by rhododendron and the field layers within these woodlands were dominated by bracken *Pteridium aquilinum*.

Dense/continuous scrub (A2.1)

At the western boundary of Houston North lies a large patch of scrub, composed mostly of rhododendron (Figure 3).

Neutral grassland – semi-improved (B2.2)

Most of this habitat type was located in Houston South and the Connection Area (Figure 3). These areas were dominated by false oat grass *Arrhenatherum elatius*; Yorkshire fog *Holcus lanatus*, *Festuca* species and nettles *Urtica dioica* with numerous other species occasionally or rarely present (TN2, TN4, TN16, TN18; Appendix D). Bordering this habitat in Houston South are stands of Himalayan balsam *Impatiens glandulifera*, an invasive, non-native species.

Three small areas of semi-improved neutral grassland were present in Houston North, which were composed of creeping buttercup, meadow buttercup *Ranunculus acris*, white clover *Trifolium repens*, Yorkshire fog, ribwort plantain *Plantago lanceolata*, dock *Rumex crispus*, ragwort *Jacobaea vulgaris* and hazel *Corylus* species (TN9, Appendix D).

Within the Connection Area, semi-improved neutral grassland was present in the fields to the north and south of the River Gryfe. To the north of the River Gryfe, the grassland was primarily composed of *Festuca* species, reed canary grass *Phalaris arundinacea* and bitter dock *Rumex obtusifolius* with rare common rush *Juncus effusus* (TN16, Appendix D) whereas the grassland to the south of the river was composed of crested dogs tail *Cynosurus cristatus*, frequent common rush and moss species (TN18, Appendix D).

Improved grassland (B4)

A majority of Houston North is improved grassland (Figure 3). These are mainly grazing pastures for sheep and cows as well as fields being cultivated for silage. The vegetation community in this habitat type is dominated by Yorkshire fog with occasional thistle *Cirsium* spp. and meadow buttercup throughout (TN10, Appendix D).

Marsh/marshy grassland (B5)

A majority of Houston South and the southern field within the Connection Area is marsh/marshy grassland (Figure 3). This habitat was composed of rush *Juncus* species, Yorkshire fog, nettle, horsetail *Equisetum sylvaticum*, canary grass *Phalaris canariensis* meadowsweet *Filipendula ulmaria*, red clover *Trifolium pratense*, thistle species, meadow buttercup, sticky willow, purple leaved willowherb *Epilobium* species, bitter dock, ribwort plantain, tufted hairgrass *Deschampsia cespitosa*, dog rose and foxglove (TN6, TN19 Appendix D). In Houston South, these fields are also bordered by large patches of Japanese knotweed *Reynoutria japonica* which is an invasive species (Figure 4).

A small area of marshy grassland was present in the southwestern extent of Houston North and was composed of rushes, Yorkshire fog and dock (Figure 3, TN13, Appendix D).

Most of the field to the south of the River Gryfe within the Connection Area was marsh/marshy grassland which was dominated by common rush with infrequent tufted hairgrass and ribwort plantain (TN19, Appendix D). Frequent small depressions with standing water were observed in this field.

Other tall herb and fern – ruderal (C3.1)

There are small patches of tall ruderal habitat running down the field margins of Houston North (Figure 3). These patches are dominated by brambles with frequent docks, nettles and sticky willow. There are also thistle species occasionally throughout.

Swamp (F1) and Standing Water (G1)

Within one of the arable fields in the Connection Area is an area of swamp with some standing water in its centre (TN15, Figure 3, Appendix D). Emergent vegetation was present within and surrounding the standing water, dominated by soft rush. Submerged grasses within the open standing water suggest that this pond is ephemeral.

Running water (G2)

Several watercourses and drainage channels cross the Development Site Boundary (Figure 3). The Barochan Burn, flows through the centre of Houston North and Peter's Burn also crosses this Site Boundary. The River Gryfe also flows through the Connection Area. Several drainage channels cross Houston South.

Cultivated/disturbed land – arable (J1.1)

A majority of the habitat in Houston North and the Connection Area is arable land, consisting mostly of fields of barley *Hordeum vulgare* in Houston North and non-cereal crops, including turf, in the Connection Area (TN14, TN20; Figure 3, Appendix D). A small amount of arable land borders the north eastern corner of Houston South.

Drystone wall (J2.5)

A drystone wall runs between two of the fields in Houston North (Figure 3).

Intact hedge – native, species-rich (J2.1.1)

Several of the fields in both Houston North, Houston South and the Connection Area are bordered by native, species-rich intact hedges. Within Houston North and Houston South, these mainly consist of hawthorn *Crataegus monogyna* bushes. Within the Connection Area, these hedges consist of hawthorn, blackthorn *Prunus spinosa*, *Roas* spp., and beech *Fagus* spp. (TN21, Figure 3, Appendix D).

Intact hedge – species-poor (J2.1.2)

Species-poor hedges bordered several of the fields in the Connection Area (Figure 3). The longer of the two hedges was a single-species hedge composed of beech (TN23, Appendix D) and the other was a short, newly planted hedge consisting of hawthorn, blackthorn and beech (TN22, Appendix D).

Scattered broadleaved trees

Scattered trees were observed in several areas within the Connection Area (Figure 3). On the south bank of the River Gryfe these consisted of semi-mature beech, ash *Fraxinus excelsior* and hawthorn (TN17, Appendix D).

Bare ground (J4)

A very small area of bare ground is present in the north eastern area of the Survey Buffer for Houston North (Figure 3). This is used as storage for containers.

3.3 Invasive, Non-Native Species

Three invasive, non-native species (INNS); rhododendron, Japanese knotweed and Himalayan balsam; were recorded within the Survey Area (Figure 4). Rhododendron was the most common and widespread INNS and was present in many of the woodlands surrounding the Development Site Boundary. Himalayan balsam was recorded in the woodland separating the marshy grassland and semi-improved grassland in Houston South and Japanese knotweed was identified along the edge of the marshy grassland in Houston South.

3.4 Terrestrial and Aquatic Protected Species

3.4.1 Otter

The larger watercourses in the Survey Area (Barochan Burn, Peter's Burn, Houston Burn, Locher Water and River Gryfe) all provided suitable habitat for otter foraging, commuting and resting, and several signs were recorded during field surveys (Figure 4, PSN8-PSN12, Appendix E). The drainage channels within the Site Boundary provide suitable commuting routes for otters moving within the Site Boundary and wider area. Overall, the Development Site is considered to provide **good** potential to support otters.

3.4.2 Water vole

Overall, the watercourses within the Site Boundary were found to provide **good** potential to support water voles. Barochan Burn, Peter's Burn and Houston Burn were generally slow flowing with soft embankments and a vegetated riparian area that would be suitable for burrowing. The drainage channels also had soft embankments, although many were considered likely to be ephemeral. Although no field signs for water vole were recorded, burrows were noted on WC2b and Barochan Burn which were of a suitable size and shape to have been created by water voles.

3.4.3 Badger

Numerous field signs for badgers were recorded during field surveys, including multiple outlier setts and possible latrines (Figure 5, PSN1-PSN6, Appendix E). The woodland habitats within and adjacent to the Development Site Boundary provided suitable sett building opportunities for badgers and the field boundaries and woodland to field interfaces provide suitable foraging habitat. Based on the results of the field surveys, the Development Site is considered to provide **good** potential to support foraging and commuting badgers and sett building.

3.4.4 Bats

Forty-eight trees were identified during the field surveys with potential to support roosting bats, including two trees with high potential, twenty trees with moderate potential and twenty-six trees with low potential (Figure 6, Appendix F). These trees were predominantly associated with field borders both within the Development Site Boundary and along its outside edge. The trees with roosting potential were primarily oak, birch and ash with features including rot holes, broken limbs, tears and flaking bark (Appendix F). The results of the field survey indicate that the Development provides **good** potential to support roosting bats in trees.

Six buildings were identified within a 30m buffer of the Site Boundary (Figure 6). No access was granted to survey these buildings, and therefore their potential to support roosting bats is unknown. Although these

buildings are located within 30m of the Site Boundary, no built elements for the Development (e.g., access tracks, solar PV panels) are proposed within 30m of them.

The grassland habitats which compose a majority of the habitat within the Site Boundary are considered to provide poor foraging habitat for bats. However, many of the fields are bordered by trees, woodlands, drainage channels and watercourses, which provide linear features for bats to use for commuting. Several ponds are also present in the wider area, which will provide foraging opportunities for bats. Therefore, it is considered that the Development provides **good** potential for commuting and foraging bats.

3.4.5 Amphibians

Three ponds were identified in the Survey Area, but outside of the Site Boundary, which were assessed for suitability for amphibians, including great crested newts *Triturus cristatus* (Figure 4). A fourth pond was identified on OS mapping (NS 42204 67582), but during field surveys was found to not be present and a pile of rubble was in its place.

The three ponds identified within the Survey Area provided suitable habitat for amphibians, although Pond 1 and Pond 3 were expected to dry on an annual basis (PSN12, PSN13, PSN14, Appendix E). Pond 2 is a permanent pond which would provide suitable habitat for all life stages of amphibians but is located outside of the Development Site Boundary. The results of the HSI survey for the three ponds indicated that all provided poor habitat suitability for great crested newts (Table 4).

Given the results of the field surveys, the Development Site Boundary is considered to provide **low** potential to support amphibians, including great crested newts.

Table 4: Great crested newt habitat suitability index survey results

Index	Pond 1		Pond 2		Pond 3	
	Result	Score	Result	Score	Result	Score
Grid reference	NS 42827 67162		NS 41565 66952		NS 44061 66701	
1 – Geographic location	B	0.5	B	0.5	B	0.5
2 – Pond area (m ²)	60	0.05	10,570	Omitted*	30	0.05
3 – Pond permanence	Dries annually	0.1	Never dries	0.9	Dries annually	0.1
4 – Water quality	Good	1	Moderate	0.67	Moderate	0.67
5 – Pond shading	5%	1	20%	1	95%	0.3
6 – Waterfowl	Minor	0.67	Major	0.01	Minor	0.67
7 – Fish	Absent	1	Major	0.01	Absent	1
8 – Pond count within 1km	0	0.1	1 (0.318 ponds/km ²)	0.39	0	0.1
9 – Terrestrial habitat	Good	1	Good	1	Good	1
10 – Macrophytes	20%	0.5	10%	0.4	None	0.3
HSI score	0.39		0.26		0.32	
Habitat suitability	Poor		Poor		Poor	

*For ponds larger than 2,000m², pond area should be omitted from the HSI calculation.

3.4.6 Reptiles

The semi-improved neutral grassland habitats and areas alongside open-canopy woodlands provide suitable foraging and commuting habitat for reptile species, although none were observed during field surveys. A dry-stone wall and pile of stones and vegetation in Houston North provide suitable refugia and hibernation habitat for reptiles (Figure 4, PSN15, PSN16, Appendix E). The results of the field survey indicate that the Development Site Boundary provides **moderate** potential to support reptile species.

3.4.7 Freshwater fish

Multiple watercourses flow through the Survey Area ranging from ephemeral drainage channels to the River Gryfe, a major watercourse. The drainage channels were generally narrow, many were overgrown with terrestrial vegetation and some were dry at the time of survey. These channels provided **negligible** or no suitable habitat for freshwater fish individuals or populations.

Barochan Burn and Peter's Burn are minor watercourses that flow through the Site Boundary. Both watercourses are 1-2m in width but have been straightened and showed little habitat heterogeneity for freshwater fish. Both watercourses are considered to provide **low** potential to support populations of freshwater fish such as European eel, brown trout and brook lamprey, although individual fish from larger watercourses (e.g., Houston Burn) may be present.

3.4.8 Freshwater pearl mussel

In the Site Boundary, Barochan Burn and Peter's Burn are straightened, narrow watercourses that act as field drainage channels and are considered to have low potential to support brown trout, one of the host species for freshwater pearl mussel. The other watercourses in the Site Boundary are drainage channels that are mostly ephemeral. Given these conditions, it is concluded that the watercourses within the Site Boundary provide **no** potential to support freshwater pearl mussels.

3.4.9 Birds

Suitable nesting habitat for both ground-nesting and woodland species was recorded within the Development Site Boundary. The grassy boundaries around the fields and at the base of the hedgerows provide suitable nesting habitat for ground-nesting species and the hedges, trees and woodland that border many of the fields are suitable for tree-nesting birds.

Targeted breeding bird surveys were not undertaken, but surveyors noted bird species during surveys in June 2022 to support the PEA (Table 5).

Given the habitat available and species observed it is considered that the Development Site Boundary provides **good** potential to support breeding birds, but with populations of no greater than local value.

Table 5: Incidental records of bird species observed during the field survey in June 2022 and the wintering goose surveys (October 2022 – March 2023)

Common Name	Taxon Name	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Blackbird	<i>Turdus merula</i>		
Blue tit	<i>Cyanistes caeruleus</i>		
Buzzard	<i>Buteo buteo</i>		
Carrion crow	<i>Corvus corone</i>		
Chaffinch	<i>Fringilla coelebs</i>		
Chiffchaff	<i>Phylloscopus collybita</i>		
Coal tit	<i>Parus ater</i>		
Goldfinch	<i>Carduelis carduelis</i>		
Great tit	<i>Parus major</i>		
Grey heron	<i>Ardea cinerea</i>		
Herring gull	<i>Larus argentatus</i>	UK BAP, SBL	Red
House sparrow	<i>Passer domesticus</i>	UK BAP, SBL	Red
Jackdaw	<i>Coloeus monedula</i>		
Lesser black-backed gull	<i>Larus fuscus</i>	UK BAP, SBL	Amber
Magpie	<i>Pica pica</i>		

Common Name	Taxon Name	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Mallard	<i>Anas platyrhynchos</i>		Amber
Mistle thrush	<i>Turdus viscivorus</i>		Red
Northern lapwing	<i>Vanellus vanellus</i>	UK BAP, SBL	Red
Robin	<i>Erithacus rubecula</i>		
Shelduck	<i>Tadorna tadorna</i>		Amber
Snipe	<i>Gallinago gallinago</i>		Amber
Song thrush	<i>Turdus philomelos</i>	SBL	Amber
Starling	<i>Sturnus vulgaris</i>	UK BAP, SBL	Red
Swift	<i>Apus apus</i>	SBL	Red
Teal	<i>Anas crecca</i>		Amber
Woodcock	<i>Scolopax rusticola</i>	SBL	Red
Woodpigeon	<i>Columba palumbus</i>		Amber
Wren	<i>Troglodytes troglodytes</i>		Amber

Abbreviations used in Table 5: Amber/Red = Birds of Conservation Concern 5 amber- or red-listed species, SBL = Scottish Biodiversity List, UK BAP = UK Biodiversity Action Plan.

3.4.10 Barn owl

A barn owl box was recorded in a woodland adjacent to Houston South but was found to be unused during field surveys in autumn 2022 with no signs of recent occupation (Figure 4, PSN7, Appendix E). Most of the habitat within the Houston South Site Boundary was considered suitable for foraging barn owl. No roosting areas for barn owl were identified in Houston North or the areas immediately adjacent to it, and only small areas of suitable foraging habitat were identified during the field surveys (Figure 4, PSN17 and PSN18, Appendix E).

Based on the results of the field surveys, the Development Site Boundary is considered to provide moderate potential to support foraging and roosting barn owl but currently of negligible importance to the local population.

3.4.11 Wintering geese and swans

In order to confirm whether or not the Site was of value for wintering wildfowl, field surveys for wintering geese and swans were completed between October 2022 and April 2023, inclusive (Table 6). Pink-footed geese and whooper swan were observed to be feeding within the Site Boundary for Houston North and the Connection Area and groups of both species plus Canada goose were observed flying over the Survey Area. Whooper swans were observed during the surveys in January, February, March and April 2023, but in small numbers (≤6 individuals) only.

Table 6: Results from wintering goose and swan surveys

Survey Date	Species	Total Count	Location of observation	Notes
27/10/2022	Canada goose	6	Survey Buffer (Houston South)	Observed in a field near the extent of the Survey Buffer.
	Canada goose	6	Houston South	Observed flying over Houston South.
	Pink-footed goose	75	Houston South	Observed flying over Houston South.
	Greylag goose	13	Houston South	Observed flying over Houston South.
17/11/2022	Greylag goose	-	Houston North	Feathers and droppings in a field in Houston North.
	Pink-footed goose	2	Survey Buffer (Houston South)	Two geese flew over and beyond Survey Buffer.

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Survey Date	Species	Total Count	Location of observation	Notes
09/12/2022	Pink-footed goose	>250	Houston North & Survey Buffer	Four separate skeins of geese flying over the site.
11/01/2023	Goose species	-	Houston North	Fresh and old goose dung in a field in Houston North.
	Pink-footed goose	10	Houston North	Observed feeding in a field in Houston North.
	Pink-footed goose	315	Houston North & Survey Buffer	Several groups of geese observed feeding in a field in Houston North. Geese were flushed by surveyor and split into several groups, including one which landed in an adjacent field.
	Pink-footed goose	15	Survey Buffer (Houston South)	Observed flying over the survey buffer near Houston South.
	Canada goose	5	Houston North	Observed flying away from a field in Houston North.
	Whooper swan	2	Connection Area	Observed feeding in a field between Houston North and Houston South.
	Mute swan	1	Houston North & Survey Buffer	Flew overhead into the site and back out into the Survey Buffer.
09/02/2023	Goose species	-	Houston North	Fresh and old goose dung in several fields.
	Whooper swan	4	Houston North	Observed within a field and flying over fields.
	Pink-footed goose	63	Houston North & Survey Buffer	Observed flying over fields east of Houston North and into the Houston North boundary.
	Greylag goose	12	Survey Buffer (Houston South)	Observed flying over fields east of Houston North.
	Whooper swan	2	Connection Area	Observed feeding in a field.
	Whooper swan	6	Survey Buffer (Houston South)	Observed feeding in a field.
02/03/2023	Pink-footed goose	193	Houston North & Survey Buffer	Three different groups flying southeast over the fields in Houston North.
	Pink-footed goose	55	Survey Buffer (Houston North)	Flying south and then east in the Survey Buffer.
	Greylag goose	4	Houston North & Survey Buffer	Flying east over fields towards the Survey Buffer.
	Whooper swan	2	Connection Area	Observed feeding in a field to the south of the River Gryfe.
13/03/2023	Greylag goose	4	Survey Buffer (Houston North)	Observed flying southeast within the Survey Buffer.
05/04/2023	Greylag goose	3	Houston North & Survey Buffer	1 greylag goose in a field in Houston North and two greylag geese in a field just east of Houston North.
	Whooper swan	5	Survey Buffer (Houston South)	Five whooper swans observed in the Survey Buffer to the west of Houston South.

4 IMPACT ASSESSMENT

4.1 Assessment of Impacts

Section 3 above presents the baseline results from field surveys for habitats and protected species. This section presents an assessment of the potential impacts of the Development on habitats and protected species. The impact assessment is a staged process, and the assessment below follows guidance from the Chartered Institute for Ecology and Environmental Management's (CIEEM) 2018 guidance (CIEEM, 2018).

4.1.1 Conservation Value of Ecological Features of Interest

Determining the conservation importance of ecological features of interest within the Development is the first step in the assessment process and is undertaken in a systematic way using criteria that determine whether it is of international, national, regional, local or negligible conservation value. The term for the ecological features which may be affected by the Development is 'Important Ecological Features' (or IEFs).

The conservation status of a species or habitat is based primarily on its status within the UK, taking into account its regional status. The conservation status of species and habitats in the UK can be divided into six categories; these are:

- Species on the International Union for Conservation of Nature's (IUCN's) Red List of threatened species (IUCN, 2022);
- Species and habitats given special protection under EU legislation listed on the EU Habitats Directive;
- Species and habitats given special protection under UK legislation;
- Species and habitats of serious conservation concern; Scottish Biodiversity List (SBL) Priority species (NatureScot, 2020);
- Species and habitats of some conservation concern listed on the Local Biodiversity Action Plan (LBAP) for Renfrewshire (Renfrewshire Council, 2018); and
- Species and habitats for which there is little or no conservation concern; species common and widespread throughout the UK.

The regional conservation status of IEFs can be divided into three categories:

- Rare in the region and/or LBAP Priority Species; species for which a Species Action Plan recommends safeguarding of all sites and species with a need to protect all populations above a certain size;
- Uncommon or patchily distributed in the region; and
- Common and/or widespread in the region.

The resultant conservation value of a species or habitats for the Development depends on the interaction between its UK conservation status and its conservation status in Scotland (Table 7). Note that the categories shown may be modified according to the national or regional circumstances of a particular species. In Table 7, "National" refers to the whole of the UK; "Regional" refers to Renfrewshire in Scotland; and "Local" refers to the Site and immediate environs.

Table 7: Resultant conservation value for species and habitats

National Conservation Status	Regional Conservation Status		
	Rare	Uncommon	Common
IUCN Red List	International	International	International
EU Legislative Protection	International / National	National	Regional
UK Legislative Protection	National	National	Regional
SBL Listed	National	National / Regional	Regional / Local
LBAP Listed	Regional	Regional	Local
Common/widespread	Regional	Local	Local

4.1.2 Magnitude of Impact

The potential impacts on each IEF are determined through understanding how each of these responds to the proposed scope of works. The elements used to define the magnitude of the effect include:

- The potential duration, which is defined in relation to the ecological characteristics of the IEF (e.g., an impact of 5 years could be interpreted as a permanent impact for some species with short life spans);
- Timing and frequency, whether the impacts will take place during a sensitive period, or the frequency will alter the impacts;
- Reversibility, whether the impacts will be reversible in the short- (<5 years) to medium-term (5-15 years);
- Confidence in predictions, whether the predicted impact is certain/near certain (>95%), probable (50% – 95%), unlikely (5% – 50%), or extremely unlikely (<5%) to occur;
- Whether the impact will potentially affect the long-term viability of the species’ population; and
- Whether there are any cumulative impacts that may affect the long-term integrity of the ecosystem(s) at the development site.

After considering the above factors, the magnitudes that can be assigned to IEFs are:

- **High:** Impact that would cause major loss of habitat/population on the Development site and have a sufficient effect to alter the nature of the habitat/population in the short to long-term affecting the long-term viability. For example, more than 20% habitat loss or long-term damage, or more than 20% loss of a species’ population.
- **Medium:** Impact that is detectable in the short to medium term, but which should not alter the long-term viability of the feature/population. For example, between 10-20% habitat loss or 10-20% reduction of a species population.
- **Low:** Impact of small scale or short duration that results in no long-term harm to the habitat/populations viability. For example, a loss or damage of under 10% of the habitat.
- **Negligible:** No loss or alteration of characteristics, features or elements; no observable impact in either direction.

The duration of an impact is difficult to quantify across all IEFs due to inherent differences in life histories and responses to impacts. Therefore, the duration of each impact on receptors will be assessed on an individual basis considering the ecological characteristics of the species and/or habitat.

Any potential cumulative impacts arising from other proposals within a distance that may affect the ecological resources associated with the Development site or multi-faceted impacts on any single ecological feature are also considered.

4.1.3 Significance of Effect

The overall effect and significance on each IEF is determined by considering their conservation value and the magnitude of the impact by the proposed scope of works (Table 8). These are described as Major, Moderate, Minor and Negligible.

Effects can be either adverse or beneficial. The two extremes are:

- Major adverse effects on a feature of at least national nature conservation value. In this case, mitigation measures to offset the impact would be required; and
- Major benefits for a feature or population.

Effects or residual effects are considered to be significant under the Environmental Impact Assessment (Scotland) Regulations 2000 (EIA Regulations) if they are at a level of Moderate or Major (i.e., “a likely significant effect”). Effects that are neutral, negligible or minor are not considered significant with respect to the EIA Regulations. Although this is not taken to be an EIA project, the EIA Regulations and requirements therein are referred to as a guide to inform a robust assessment.

Table 8: Assessment matrix. Effects in bold are considered significant under the EIA Regulations.

Conservation Value	Magnitude of Impact			
	Negligible	Low	Medium	High
Local	Negligible	Negligible or minor	Negligible or minor	Minor
Regional	Negligible or minor	Negligible or minor	Minor	Minor or moderate
National	Negligible or minor	Minor	Moderate	Moderate or major
International	Minor	Minor or moderate	Moderate or major	Major

Using the above matrix, further consideration is then given to the following overall effects:

- **Major:** effects are likely to be important considerations at a regional or district scale but which, if adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision-making process.
- **Moderate:** effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
- **Minor:** effects may be raised as local issues, but which are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in the detailed design of the project.
- **Negligible:** no effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

The final assessment of whether a significant effect is likely is completed by taking the mitigation measures that are adopted as part of the Project into account, including both the mitigation incorporated into the design of the Project and mitigation required to address residual impacts. This requires an assessment on the likelihood of successful mitigation being achieved and the mitigation proposed needs to be qualified in terms of the probability of success. The assessment of the likely success of any mitigation and hence the significance of any effects is based on both professional judgement and experience of other mitigation schemes. In general, a precautionary approach is advisable in determining the outcome, however a realistic rather than worst-case scenario assessment is used. In relation to determining likely significant effects on protected sites a precautionary approach is always adopted.

4.1.4 Cumulative Effects

An ecological impact assessment must consider impacts both alone and in-combination with other plans and/or projects, as the cumulative effect of these other plans and/or projects may result in an impact when one was not detected for the Development alone (CIEEM, 2018).

4.1.5 Likely Impacts

The construction, operation and decommissioning phases of the proposed Development have the potential to impact ecological receptors across the Development site and in neighbouring areas. Such impacts may include:

- Where new areas of permanent hardstanding and building are to be constructed, habitats would be permanently lost through direct impact of the construction works and infrastructure. Under the footprint of the solar PV panels, there will be some change to habitats due to shading from the panels.
- Construction disturbance, such as noise and visual, would occur across the Development site which may affect how ecological receptors use the Development site. To a lesser extent, maintenance activities during operation may also cause similar disturbance, although maintenance visits and activities are expected to be occasional and short in duration and are expected to cause less disturbance than the current farming activities at the site.
- Increased traffic during construction and operation may result in injury and/or mortality to individuals. During operation, traffic levels across the site are expected to decrease when compared to the current farming practice.
- Water pollution (both chemical and fine sediment) could occur during the construction period, degrading habitats and causing injury and/or mortality in extreme cases. There is also a risk of water pollution during operation, although this is expected to be restricted to vehicle and/or equipment failure. The risk of operational water pollution is expected to decrease from current levels, as traffic movement across the site during operation will be lower than the current farming practice.

Collision with solar panels by bat and/or bird species causing injury or death is not considered to be a potential impact as the overall risk has been considered by NatureScot to be low (NatureScot, 2023a). Therefore, collision with solar panels is not considered in this assessment.

4.1.6 Identification of Important Ecological Features

Potential ecological receptors that were identified during the desk and field studies comprise designated sites, habitats, otters, badgers, water vole, bats, reptiles, great crested newts, freshwater fish, freshwater pearl mussel, breeding birds and wintering geese.

Of these potential ecological receptors, the following were excluded from further assessment for the reasons outlined below:

- Redshank from the Inner Clyde SPA: Redshank is a wading bird which feeds in shallow water habitats, particularly along the Inner Clyde. The Development Site Boundary does not provide suitable habitat for redshank and therefore no direct impacts are anticipated.
- Renfrewshire Heights SPA: The Development Site Boundary is 8.5km away from the SPA, which is outside of the core range for hen harrier and close to the maximum range for the species (NatureScot, 2016), and therefore direct or indirect impacts to breeding hen harriers or their supporting habitat are not anticipated.
- Loch Lomond SPA: Neither capercaillie nor Greenland white-fronted goose were identified during the desk study and the Development is outside of the core range for Greenland white-fronted geese (core range 5-8km; NatureScot, 2016). Given the distance between these sites and the Development Site

Boundary (19.3km, Table 1), no direct or indirect impacts to the species or habitats within the site are anticipated.

- AWI woodlands and LNCS: No AWI woodlands or LNCS were located within the Development Site Boundary, although some do border it. Construction and operation of the Development will be restricted to the Development Site Boundary, minimising the risk to adjacent sites.
- Water voles: No field signs for water voles were identified during the field survey, although the watercourses were considered to provide good habitat for water voles and several burrows that could be used by water voles were identified. However, the design of the Development includes a buffer of 10m around all watercourses, which is the standard buffer distance for construction works that could affect water voles (NatureScot, 2023b).
- Amphibians, including great crested newts: All three ponds were located outside of the Site Boundary. Ponds 1 and 3 are likely not permanent, limiting their suitability for all life stages of amphibians.
- Reptiles: No reptiles were observed during field surveys and no records were returned during the desk-based assessment.
- Freshwater fish: The watercourses within the Site Boundary provided no or low potential to support freshwater fish individuals and populations.
- Freshwater pearl mussel: the habitat within the watercourses in the Site Boundary was not suitable for FWPM and no records of FWPM were returned in the desk-based assessment.

The following IEFs have been identified for the Development site and are considered further in this assessment:

- Habitats, including habitat within the Black Cart SPA/SSSI and Inner Clyde SPA;
- Otter;
- Badger;
- Bats;
- Nesting birds;
- Barn owl;
- Wintering geese; and
- Whooper swan from the Black Cart SPA/SSSI.

4.1.7 Development Design Mitigation

The following measures have been incorporated into the design of the Development, to minimise impacts on ecological receptors:

- The Development Site Boundary avoids woodland around the field edges to avoid any loss and/or change to these habitats.
- The existing woodlands within the Development Site Boundary will be maintained and no panels or other built elements (e.g., access tracks, inverter containers) are located within these habitats. Proposed security fencing will separate the boundaries of these woodlands from the main operational site.
- A 5-10m buffer around all trees and watercourses.
- A 30m buffer around all trees with potential to support roosting bats.
- Concrete for the BESS will be limited to the extent of the upstands and not the entirety of the battery storage area.

- Concrete for the inverter stations across the site will be limited to the extent of the upstands and not the entirety of the inverter footprints.
- Deer fencing (2.45m high) will surround the site but will be raised 100mm off the ground to permit movement of small mammals (e.g., fox, badger).
- Where hedgerows exist in the location of the proposed security fencing, the hedgerows will be retained and fencing situated on the internal side of the hedgerow.
- CCTV cameras within the site will utilise infra-red technology.
- No permanent lighting is proposed at the Development Site Boundary. Temporary lighting will be available so that emergency works during hours of darkness can occur.
- Existing agricultural tracks within the Development Site Boundary will be utilised where possible, minimising the extent of new access tracks. Any new tracks will be created using permeable stone.

4.1.8 Limitations to the Assessment

As with any environmental assessment there will be elements of uncertainty; these are identified and reported on along with the measures taken to reduce these. However, no gaps were identified in the baseline survey data that would prevent the ecological impact assessment to be undertaken. Although this is not taken to be an EIA project, the Regulations and requirements therein are referred to as a guide to inform a robust assessment.

Any assumptions made include commentary as to the likely extent that such difficulties affect the conclusions.

The level of certainty of the magnitude of impact predictions varies depending upon a range of parameters. For some elements (e.g., habitat loss), it is relatively straightforward to assess and quantify the impact (i.e., area of habitat that will likely be lost within the Development site), but this not always the case for all IEFs. The current assessment approach is based on 'likely' effects, as opposed to the worst-case scenario. A worst case scenario approach is not advocated by the Scottish Government in their advice note regarding Environmental Impact Assessment, as the worst case scenario is not necessarily the most likely outcome (Scottish Government, 2017).

The main limitations in this assessment are common to most ecological assessments. Firstly, the results of the field surveys are limited in their temporal scope as many of the field signs used to identify species presence are only visible for short periods of time. Additionally, species occurrences change over time, both within one year and across multiple years. Therefore, the results presented in this report are limited to the current use of the Development site. Where possible, commentary on habitat suitability is provided, to indicate how species could use areas of the Development site.

Secondly, putting survey results into a wider geographical context is difficult because most species have not been systematically surveyed beyond the Development site. Thus, defining a population as locally or regionally important is difficult because local or regional population estimates do not exist for most taxa and habitats. Wherever such uncertainty exists, professional judgement and published evidence has been used to assign a conservation value.

4.2 Evaluation of Effects to IEFs

There is a potential for the Development to impact IEFs during construction, operation and decommissioning. Decommissioning will involve the dismantling and removal of the built elements of the Development, and as such it is considered that effects on IEFs will be similar to those during construction. Therefore, construction and decommissioning are assessed together below.

4.2.1 Habitats

The vast majority of the Development Site Boundary was composed of improved grassland and arable land (Table 3). The design of the Development has deliberately avoided woodland habitats and watercourses to avoid any loss to these habitat types, although there is a potential for impacts to these habitats as a result of pollution incidents.

The grassland and arable habitats within the Development Site Boundary have no conservation designations and are of low ecological value, as they generally support fewer species and provide less habitat heterogeneity than other habitat types, such as semi-natural woodlands or hedgerows. Plantation woodland is of a higher ecological value than the grassland or arable habitats within the Development Site Boundary, but this habitat type make up a small proportion of the total area within the Site Boundary. As these habitats have no conservation designations and are common in the region, they are considered to be of **local** conservation value, with respect to the Development.

Rivers and hedgerows are identified on the UK BAP and SBL, and are considered to be of **regional** conservation value, with respect to the Development.

The Black Cart SPA/SSSI provides key roosting and feeding habitats for whooper swans, including refuge areas and abundant aquatic vegetation that whooper swans use in severe weather conditions (NatureScot, 2010). As this site is protected at the EU-level and provides important refuge habitat and food resources, it is considered to be of **national** conservation value, with respect to the Development.

Construction and Decommissioning Effects

The construction and decommissioning of the Development have the potential to impact habitats directly or indirectly through:

- Temporary, direct loss or change in habitats beneath construction compounds and general construction footprint; and
- Temporary, direct degradation of habitats as a result of pollution incidents.

Temporary loss and/or change of up to 1.12ha is anticipated beneath the construction compounds. The area of the Houston North compound footprint will be 0.56ha, and the footprint of the Houston South compound will likely be smaller. Following the completion of construction works, all hardcore will be removed off site and the habitat will be reinstated. The exact location of the compounds is not currently known, but they will both be situated within the Site Boundaries for Houston North and Houston South. As the habitats within the Site Boundary are considered to be of local conservation value, in the absence of mitigation, the impact on grassland/arable habitats will be short in duration and low in magnitude, resulting in a **minor adverse** (not significant) effect.

There is a potential for pollution incidents, both of chemicals and fine sediments, to degrade nearby habitats within the Development Site Boundary. As the design of the Development includes buffers around watercourses and most hedgerows, it is expected that the effect to these habitats will be **negligible**. In the absence of mitigation, it is expected that the impact of habitat degradation as a result of pollution incidents during construction/decommissioning on other habitat types within the Development Site Boundary will be short in duration and low in magnitude, resulting in a **minor adverse** (not significant) effect.

The Black Cart SPA/SSSI is hydrologically connected to both Houston North and Houston South, and therefore there is a potential for pollution incidents to degrade habitats within the designated site. However, the design of the Development deliberately buffers around watercourses, minimising the risk of pollution entering watercourses. Given this buffer, the fluvial distance between the Site Boundary and the Black Cart SPA/SSSI (≥ 4.7 km), and in the absence of mitigation measures, it is considered that the impact will be short in duration and negligible in magnitude, resulting in a **negligible** effect.

Operational Effects

The operation of the Development has the potential to impact habitats directly or indirectly through:

- Long-term, direct loss or change in habitats beneath security fencing, access tracks, inverter containers, solar panels and the battery energy storage system (BESS); and
- Temporary degradation of habitats through pollution.

Long-term loss of 32.63ha of arable land, improved grassland, semi-improved neutral grassland and marshy grassland of Habitat Types is predicted beneath security fencing, access tracks, inverter containers, solar panels and the BESS (Table 9). Although these habitats will be lost for the 40 year operational lifespan of the Development, these habitat types are not limited in the wider landscape and therefore the magnitude of long-term habitat loss is considered to be of low magnitude, resulting in a **minor adverse** (not significant) effect.

Table 9: Predicted habitat loss and change in Houston North and Houston South

Phase 1 Habitat Type	Area within Site (ha)	Long-term loss		No change	
		ha	% hab. within site*	ha	% hab. within site*
A1.1.2: Broadleaved woodland – plantation	2.14	-	-	-	-
A1.3.1: Mixed woodland – semi-natural	0.25	-	-	-	-
A2.1: Dense/continuous scrub	0.19	-	-	-	-
B2.2: Neutral grassland – semi-improved	5.25	2.30	2.0	2.96	2.6
B4: Improved grassland	29.92	9.49	8.2	20.44	17.6
B5: Marsh/marshy grassland	17.25	3.30	2.8	13.94	12.0
C3.1: Other tall herb and fern – ruderal	0.17	-	-	0.17	0.2
J1.1 – Cultivated/disturbed land – arable	60.30	17.54	15.1	42.77	36.8
Existing Track	0.83	-	-	0.83	0.7
Total	116.30	32.63	28.1	83.69	72.0

*percentage is of total area of site

During operation of the Development, there is a potential for temporary degradation of habitats as a result of pollution during routine maintenance. Maintenance activities are expected to be infrequent and primarily consist of one or a few vehicles accessing the site. These activities are expected to be less frequent than current vehicular access to the site (due to the farming practice), reducing the risk of pollution incidents at the site. As watercourses and hedgerows will be buffered by at least 5m and most access tracks do not run adjacent to these habitats, it is considered that the effect of habitat degradation on these habitats and on habitats within the Black Cart SPA/SSSI (through its hydrologic connection to the Development) is **negligible**.

The access tracks within the Development Site Boundary run alongside improved grassland, arable land, semi-improved neutral grassland and marshy grassland, and therefore there is a potential for degradation to these habitats through pollution events. However, as maintenance activities are expected to be infrequent and consist of one or a few vehicles accessing the site, the magnitude of the impact is considered to be negligible, resulting in a **negligible** effect.

4.2.2 Otter

The Development site was considered to provide good potential to support otters for foraging, commuting and resting. Otters are a European Protected Species but are considered common in Renfrewshire. As a result, otters are considered to be of **regional** conservation status, with respect to the Development.

Construction and Decommissioning Effects

The construction/decommissioning of the Development has the potential to impact otters directly or indirectly through:

- Injury and/or mortality to individuals from construction traffic or plant;
- Habitat degradation and loss of prey (i.e., fish) due to pollution incidents (chemical and fine sediment); and
- Disturbance due to noise and lighting.

Otters primarily use habitat within and alongside watercourses and are mainly active at night (Chanin, 2003). As the design of the Development includes buffers around watercourses and drainage channels in the Development Site Boundary, the magnitude of the impact of injury/mortality on otters is low, resulting in a **minor adverse** (not significant) effect.

There is a potential for pollution events to occur during construction and decommissioning that could result in degradation of otter habitat and/or a loss of prey (i.e., fish). However, the footprint of the Development and construction/decommissioning activities deliberately avoid watercourses and riparian habitats where possible, limiting the potential for these habitats to be degraded through any pollution events that may occur during construction. Therefore, it is expected that temporary habitat degradation and loss of prey as a result of pollution events will be short in duration and low in magnitude, resulting in a **negligible** (not significant) effect.

Suitable areas for otter resting places were identified within the Site Boundary, and therefore there is the potential for disturbance to otters as a result of construction noise and/or lighting. In the absence of mitigation, it is considered that impact of disturbance to otters will be short in duration and medium in magnitude, resulting in a **minor adverse** (not significant) effect.

Operational Effects

The operation of the Development has the potential to impact otters directly or indirectly through:

- Injury and/or mortality to individuals from maintenance traffic; and
- Habitat degradation and loss of prey (i.e., fish) due to chemical pollution incidents; and
- Disturbance due to noise and lighting during maintenance activities.

Maintenance activities are expected to consist of one or several vehicles accessing the site during the day and will be less frequent than the current vehicular access at the site. The access tracks do not cross any of the larger watercourses within the Site Boundary, although there are crossings over several drainage channels in the southern site. Given this, it is considered that the magnitude of the above operational impacts on otters, their habitat and prey will be negligible, resulting in **negligible** (not significant) effects.

4.2.3 Badger

The results of the field survey and desk-based assessment indicate that badgers are using the Development Site Boundary for sett building and likely foraging and commuting.

Badgers are protected at the UK level and are common in Renfrewshire, and therefore are considered to be of **regional** conservation value, with respect to the Development.

Construction and Decommissioning Effects

The construction of the Development has the potential to impact badgers directly or indirectly through:

- Injury and/or mortality to individuals from construction traffic or plant;

- Temporary loss of foraging and/or dispersing habitat;
- Habitat degradation due to pollution incidents (chemical and fine sediment); and
- Disturbance due to noise and lighting.

Badgers are primarily active at night, and often forage and disperse along field boundaries. Most construction/decommissioning will occur during the day, minimising the risk of badgers interacting with moving plant or site traffic. Therefore, although injury/mortality will result in a permanent impact, it is considered to be low in magnitude, resulting in an overall effect of **minor adverse** (not significant).

Construction/decommissioning activities will result in temporary loss of habitats that could be used by badgers for foraging or degradation of these habitats through pollution incidents. However, the design of the Development avoids many of the habitats that badgers can use for foraging and dispersing (e.g., woodlands and field boundaries), minimising the impacts to these habitats. Therefore, it is expected that the impact of both temporary habitat loss and habitat degradation through pollution events will be short in duration and low in magnitude, resulting in **minor adverse** (not significant) effects.

There is a potential for disturbance to badgers, particularly if badgers are occupying the existing outlier sett in the Development Site Boundary or if any new setts are created. However, the design of the Development avoids the woodland habitats that provide sett building habitat. Therefore, it is considered that the magnitude of the impact of disturbance to badgers will be low, resulting in a **minor adverse** (not significant) effect.

Operational Effects

The operation of the Development has the potential to impact badgers directly or indirectly through:

- Permanent loss of foraging habitat;
- Injury and/or mortality to individuals from maintenance traffic;
- Habitat degradation due to chemical pollution incidents; and
- Disturbance due to noise and lighting during maintenance activities.

Some field boundaries that badgers could use for foraging will be permanently lost to access tracks for the proposed Development. However, suitable foraging habitat is not limited in the Site Boundary or wider area and badgers would still be able to forage on the grass verges alongside these tracks. Therefore, although habitat loss will be a permanent impact, the magnitude is considered to be low, resulting in a **minor adverse** (not significant) effect.

Maintenance activities are expected to be infrequent and primarily consist of one or several vehicles accessing the site during the day and primarily remaining on existing access tracks. Therefore, the potential to cause harm/injury to badgers is considered to be negligible, as badgers are mainly active at night, and the potential to impact surrounding habitats is also considered to be negligible. Given this, it is considered that the magnitude of the above operational impacts on badgers or their habitat will be negligible, resulting in **negligible** (not significant) effects.

4.2.4 Bats

The Development Site Boundary provided suitable habitat for commuting and foraging bats, and many of the trees on the site have the potential to support roosting bats.

All bat species are EPS and the status of individual species in Scotland varies from common (e.g., common pipistrelle and soprano pipistrelle bats) to uncommon (Daubenton's, brown long-eared, Natterer's, whiskered *Myotis mystacinus*, Brandt's *M. brandti*, Nathusius' pipistrelle *Pipistrellus nathusii*, noctule *Nyctalus noctula*, natterer's and Leisler's/lesser noctule bats) (NatureScot, 2021). Therefore, all bats are given a conservation status of **national**, with respect to the Development.

Construction and Decommissioning Effects

The construction/decommissioning of the Development has the potential to impact bats directly or indirectly through:

- Temporary degradation of foraging habitat (i.e., watercourses) or loss of prey due to pollution events; and
- Temporary barrier effects along commuting routes due to noise and/or lighting disturbance.

Bats may use the watercourses within the Development Site Boundary for foraging, and significant pollution events could degrade watercourses or suppress invertebrate prey. However, the design of the Development deliberately avoids watercourses, minimising the risk of pollution impacts to these habitats. Therefore, in the absence of mitigation, the effect of habitat degradation or loss of prey due to pollution events is considered to be short in duration and negligible in magnitude, resulting in a **minor adverse** (not significant) effect.

Noise and/or lighting during construction/decommissioning could discourage bats from using commuting routes within the Development Site Boundary, creating a barrier to dispersal. However, most construction/decommissioning activities will occur during the day, minimising the potential impact on commuting bats, which are nocturnal. Additionally, a 30m buffer will be maintained around all trees with potential to support a bat roost, further minimising the risk of disturbance. Therefore, the impact of disturbance on bats is considered to be short in duration and low in magnitude, resulting in a **minor adverse** (not significant) effect.

Operational Effects

The operation of the Development has the potential to impact bats directly or indirectly through:

- Temporary degradation of foraging habitat (i.e., watercourses) or loss of prey due to pollution events; and
- Temporary barrier effects along commuting routes due to noise and/or lighting disturbance.

Maintenance activities are expected to be infrequent and primarily consist of one or several vehicles accessing the site during the day. Vehicles are expected to remain on the access tracks, minimising the potential impact to surrounding habitats. Given this, it is considered that the magnitude of the above operational impacts on bats, their habitat and/or prey will be negligible, resulting in **negligible** (not significant) effects.

4.2.5 Nesting birds

The Development Site Boundary provided suitable habitat for nesting birds and several species were recorded during surveys that are of notable interest within the UK (Table 2). In addition, records of several species of European importance were returned in the desk-based assessment. As a result, nesting birds are considered to be of **local** conservation value.

Construction and Decommissioning Effects

The construction/decommissioning of the Development has the potential to impact nesting birds directly or indirectly through:

- Temporary loss of breeding habitats (field margins);
- Temporary habitat loss and/or degradation due to pollution events;
- Displacement and/or disturbance due to construction noise and/or lighting.

Birds may use the grassy field margins and trees within the Development Site Boundary for nesting, and therefore construction/decommissioning activities during the breeding bird season (season defined as March

to August inclusive) could impact breeding birds or their habitats. The design of the Development includes a 5-10m buffer around all tree canopies, hedgerows and watercourses and it is expected that these buffers will include many of the habitats that birds will use for nesting. Additionally, the habitat beneath the solar panels is of a lower quality for breeding birds than the habitats that will be retained within the buffers. Therefore, it is considered that the impact of temporary and permanent loss of breeding habitats will be short in duration and low in magnitude, resulting in a **minor adverse** (not significant) impact.

Construction/decommissioning activities could result in degradation of foraging and nesting habitats through pollution incidents. However, the design of the Development avoids woodland and many field boundaries, minimising the risk of impacts to these habitats. Therefore, it is expected that the impact of habitat degradation through pollution events will be short in duration and low in magnitude, resulting in a **minor adverse** (not significant) effect.

Construction/decommissioning activities do have the potential to result in displacement or disturbance to nesting birds, if undertaken during the breeding bird season. In the absence of mitigation measures, it is considered that these effects will be short in duration and medium in magnitude, resulting in a **minor adverse** (not significant impact).

Operational Effects

The operation of the Development has the potential to impact breeding birds directly or indirectly through:

- Permanent loss of/change in breeding habitats;
- Temporary loss and/or degradation of habitats as a result of pollution; and
- Disturbance during maintenance activities.

The habitat beneath the solar panels, access tracks and inverter containers will be permanently lost or changed. However, this habitat is of a lower quality for breeding than the woodland and marginal habitats that are retained within the buffers. Therefore, the impact of permanent habitat loss is expected to be low in magnitude, resulting in a **minor adverse** (not significant) effect.

Maintenance activities are expected to be infrequent in duration and primarily consist of one or several vehicles accessing the site during the day. Vehicles are expected to remain on the access tracks, minimising the potential impact to surrounding habitats from habitat degradation and disturbance. Therefore, the impact of both temporary loss and/or degradation of habitats and disturbance on breeding birds are expected to be short in duration and negligible in magnitude, resulting in **negligible** effects.

4.2.6 Barn owl

The results of the field survey and desk-based assessment indicate that the Development provides good roosting and foraging habitat for barn owls. Barn owls are protected at the UK level and are considered to be of **local** conservation value, with respect to the Development.

Construction and Decommissioning Effects

The construction/decommissioning of the Development has the potential to impact barn owls directly or indirectly through:

- Temporary loss of foraging habitat;
- Temporary degradation of habitats due to pollution events; and
- Displacement and/or disturbance to roosting barn owls due to construction noise and/or lighting.

Barn owls will use open fields and margins for foraging, and construction of the Development will result in a temporary loss of this habitat. However, it is considered that this impact will be short in duration and low in magnitude, resulting in a **minor adverse** (not significant) effect.

Construction/decommissioning activities could temporarily degrade foraging habitat for barn owl as a result of pollution events. However, the design of the Development avoids woodland and many field boundaries, minimising the risk of impacts to these habitats. Therefore, it is expected that the impact of habitat degradation through pollution events will be short in duration and low in magnitude, resulting in a **minor adverse** (not significant) effect.

There is a potential for disturbance or displacement of roosting or nesting barn owls during construction/decommissioning works, particularly if the barn owl box becomes occupied. In the absence of mitigation, this impact is considered to be short in duration and medium in magnitude, resulting in a **minor adverse** (not significant) effect.

Operational Effects

The operation of the Development has the potential to impact barn owls directly or indirectly through:

- Permanent loss of foraging habitat;
- Temporary habitat degradation due to pollution events; and
- Disturbance during maintenance activities.

The operation of the Development will result in a loss of 5.6ha of semi-improved neutral grassland and marshy grassland, which barn owls can use for foraging. This habitat is predominantly within Houston South near the location of the unoccupied barn owl box, although one field identified as marshy grassland within Houston South will be retained during operation of the Development. Improved grassland and arable land are not optimal foraging habitats for barn owls (Scottish Raptor Monitoring Group, 2014), and open areas for hunting are not limited within the wider area around the Development Site Boundary. Additionally, the design of the Development avoids rougher grasslands at field margins, which is higher quality foraging habitat for barn owls. Therefore, in the absence of mitigation, the impact of permanent habitat loss is expected to be low in magnitude, resulting in a **minor adverse** (not significant) effect.

Maintenance activities are expected to be infrequent in duration and primarily consist of one or several vehicles accessing the site during the day. Vehicles are expected to remain on the access tracks, minimising the potential impact to surrounding habitats. Therefore, the impact of habitat degradation from pollution events or disturbance to barn owls is expected to be short in duration and negligible in magnitude, resulting in a **negligible** effect.

4.2.7 Wintering geese (non-designated populations) & Whooper swan (Black Cart SPA/SSSI population)

Wintering geese (non-designated populations)

The wintering geese within the area are not considered to be a part of a protected population associated with any designated sites and thus are not afforded any specific protection. Pink-footed geese and greylag geese are both BoCC amber-listed (Stanbury *et. al.*, 2021) and Canada geese are an introduced species from North America that is now widespread across the UK⁴. All three species were identified during the desk study as present within a 2km buffer of the Development Site Boundary.

Geese were observed during all of wintering goose surveys but were only observed to be feeding in the January 2023 survey (Table 6). An inspection of aerial imagery indicates that agricultural fields, which geese use for winter foraging, are not limited in the wider area surrounding the Development Site Boundary. Given these results, it is considered that wintering geese are of **local** importance, with regards to the Development.

⁴ <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/canada-goose>

Whooper swan (Black Cart SPA/SSSI population)

Whooper swans from the Black Cart SPA/SSSI feed both within the SPA/SSSI boundary and on agricultural land in the Black Cart floodplain from Linwood east to the confluence of the Black Cart and White Cart waters (Robinson *et. al.*, 2004). The Development Site Boundary is located at least 1km north of Linwood and therefore is outside of the core feeding area for whooper swan from the SPA, although the boundary is still within the 5km published foraging range for whooper swan (NatureScot, 2016).

Whooper swans were identified as present within a 2km buffer of the Development during the desk-based assessment. A total of 15 total whooper swans were observed to be feeding within fields in the Survey Area during the January, February, March and April 2023 surveys. Although this indicates that whooper swans do use the fields within the Survey Area for foraging, these swans only make up small proportion of the published population that uses the SPA/SSSI (7%, based on 207 individuals; NatureScot, 2010). Given that the Development is located outside of the core feeding range for whooper swans from the SPA/SSSI and the small number of individuals observed to be using the Survey Area, it is considered that the site does not provide an important foraging resource for whooper swans from the Black Cart SPA/SSSI.

Whooper swans are protected at the European-level and considering the results of the field surveys and location of the Development with respect to the Black Cart SPA/SSSI, this species is considered to be of **national** importance, with regards to the Development.

Construction and Decommissioning Effects

The construction/decommissioning of the Development has the potential to impact wintering geese and whooper swans directly or indirectly through:

- Temporary loss of foraging habitats beneath the construction compounds;
- Temporary habitat loss and/or degradation due to pollution events;
- Displacement and/or disturbance to due to construction noise and/or lighting.

Wintering geese and whooper swans could use the fields within the Development Site Boundary for foraging, and construction/decommissioning of the Development will result in a temporary loss of this habitat type (e.g., beneath construction compounds) or could result in a degradation of habitat due to pollution events or displacement/disturbance to wintering geese and whooper swans. Geese were only observed to be foraging in the Survey Area in January 2023 and only small numbers of whooper swans were observed foraging in the Survey Area in January and February 2023 (Table 6), suggesting that the fields within the Survey Area do not provide an important foraging resource for wintering geese or whooper swans. Therefore, the magnitude of these short term impacts is considered to be low in magnitude, resulting in a **minor adverse** (not significant) effect for both wintering geese and whooper swans.

Operational Effects

The operation of the Development has the potential to impact wintering geese and whooper swans directly or indirectly through:

- Permanent loss of foraging habitat beneath the Development; and
- Temporary habitat degradation during maintenance activities.
- Disturbance during maintenance activities.

The Development is expected to result in a loss of 17.5ha arable land (Table 9), which provides suitable foraging habitat for wintering geese and whooper swans. Geese were only observed to be foraging with the Survey Area during one of the five surveys and only eight total whooper swans were observed foraging in fields within the Site Boundary, suggesting that the Development Site Boundary does not provide an important foraging resource for wintering geese or whooper swans. As a result, it is considered that the

magnitude of this permanent impact will be low, resulting in a **minor adverse** (not significant) effect for both wintering geese and whooper swans.

Maintenance activities are expected to be infrequent in duration and primarily consist of one or several vehicles accessing the site during the day. Vehicles are expected to remain on the access tracks, minimising the potential impact to surrounding habitats. Therefore, the impact of habitat degradation from pollution events or disturbance to wintering geese, whooper swans or their supporting habitat is expected to be short in duration and negligible in magnitude, resulting in a **negligible** effect.

4.3 Proposed Mitigation and Enhancement

The following mitigation measures are proposed to minimise the potential effects of the Development on the IEFs assessed above.

4.3.1 Mitigation During Construction

- Species protection plans should be produced. These should incorporate all survey information (including results from pre-construction surveys and checks) and mitigation should consider how the construction methodology could result in impacts. Particular attention should be paid to any works expected to produce excessive noise and/or vibration (e.g., during construction of the solar PV panel frame table posts).
- Where construction activities that have the potential to result in excessive noise and/or vibration are located near trees with the potential to support roosting bats or buildings, a sound barrier should be used to avoid disturbance to roosting bats. A disturbance buffer of up to 50m should also be put into place.
- The construction programme is anticipated to last for 16 weeks. Works will be undertaken 8am – 6pm Monday to Friday and 8am – 1pm Saturday.
- Targeted pre-construction surveys will be undertaken no more than three months in advance of construction to identify any changes in the baseline conditions and confirm the activity status of any protected features likely to be affected. The results of these surveys will be incorporated into species protection plans for the Development and inform the need for any licences.
 - Surveys will specifically seek to re-identify the otter holt and badger sett identified in Figure 5 and determine whether they are in current use. Camera monitoring should be undertaken at the otter holt to determine its use (i.e., breeding/non-breeding) and camera monitoring may be required at any badger setts identified during pre-construction surveys.
 - If pre-construction surveys identify potential refugia and/or hibernacula features for reptiles which are in the immediate works area, these will be dismantled under supervision of a suitably experienced ecologist, relocated and recreated in an appropriate area in the vicinity of suitable habitat, following the guidance in Edgar *et. al.*, 2010.
- If construction works are undertaken during the breeding bird season (season defined as March to August inclusive), nesting bird checks will be undertaken in advance of any vegetation clearance or other works that could disturb nesting birds. These checks will include breeding barn owl.
- An Ecological Clerk of Works (ECoW) will be appointed to ensure that all ecological mitigation measures are correctly implemented.
- Should any person on site identify a burrow, resting site, nest or sighting of what they believe to be a protected species (i.e., otter, water vole, badger, bat, great crested newt, reptile, bird) within the designated working area, they shall notify the ECoW immediately. If signs are identified within an active working area, works shall cease immediately until further information can be gathered by the ECoW.

- Standard pollution prevention measures (e.g., SEPA Pollution Prevention Guidelines/Guidelines for Pollution Prevention) will be put into place to minimise the risk of pollution impacts to watercourses. Measures will include, but not be limited to:
 - A minimum 10m buffer will be maintained around all watercourses;
 - Spill kits will be available for use by all vehicles/plant/machinery during construction;
 - Silt fencing will be installed around all excavations near watercourses, to prevent silt from entering the channel;
 - An emergency response plan will be developed which will outline the steps to be undertaken in the event of a pollution incident;
 - Fuel, oil and other chemicals will be stored at least 50m away from watercourses;
 - The proposed fuel storage container will be surrounded by a bund wall to contain any spills and minimise contamination;
 - Toilets for the temporary construction compounds will be self-contained and placed within a bunded area to contain any spills. Disposal will be off-site.
- The topsoil removed for trenches dug to install underground cabling will be reinstated (excluding the first 150mm which will be infilled with sand) and re-seeded;
- Two temporary construction compounds will be established (Houston North and Houston South). Following completion of construction works, the compound areas will be reinstated and all hardcore will be removed and the former habitat will be reinstated.
- All existing trees will be retained and buffered from construction and the layout by 5-10m;
- Open excavations will be covered at the end of each working day. A method of escape (e.g., plank) will be placed in all excavations or trenches so animals can vacate the area overnight. Should any animals be trapped in an excavation, the ECoW shall be immediately notified.
- Open pipes will be capped at the end of each day to prevent animals from accessing them and potentially becoming trapped.
- All machinery and plant will be checked each morning for the presence of animals in the unlikely event that an individual is using them for resting.
- A maximum speed limit will be established on the site to reduce the likelihood of injury and/or mortality to individuals.
- No works will be undertaken during hours of darkness unless necessary. Should working during darkness be required, the use of artificial lighting will be minimised where possible and directional lighting and/or screening will be used to avoid illuminating watercourses or other sensitive areas (e.g., otter holts or badger setts).
- In the unlikely event that a protected species is injured or killed, or a burrow is damaged, the ECoW will be notified immediately. The ECoW will attend the Site and make a written and photographic record, including details of the time, location and personnel involved in the incident. This information will be communicated to NatureScot within 24 hours.
- An INNS management plan should be adopted which will outline measures to be undertaken that will minimise the risk of spreading INNS further around the Site.

4.3.2 Mitigation During Operation

- Panels will be cleaned using de-ionised water only, and/or no harmful chemicals;
- All vehicles accessing the site will remain on access tracks, where possible, to minimise impacts to habitats and minimise the risk of injury/mortality to individuals; and

- All vehicles will have spill kits within them in the event of a pollution spill (e.g., oils, fuel).

4.3.3 Mitigation During Decommissioning

- A decommissioning programme and reinstatement scheme will be agreed with the relevant authorities. This requirement is likely to form a Condition attached to any emerging Energy Consents Unit consent and will include the requirement for appropriate ecological assessment, likely through an EclA.
- The Development Site will be fully decommissioned and all built elements will be dismantled and properly removed from the site and recycled where possible.
- The upper parts of the substations' concrete bases will be broken up and subsoil and topsoil will be reinstated. The lower parts of the concrete bases will remain in situ.
- A grass sward will be reinstated at the site, in accordance with an agreement made in writing with the local Planning Authority.
- All landscaping will remain in situ. It is expected that mature hedgerows and shrubbery will have developed over the lifespan of the Development, and these will be retained after decommissioning.
- The site will be restored such that it leaves no permanent visible trace.

4.3.4 Enhancement

The following enhancement measures are recommended for the Development:

- Seed the area beneath the solar panels and between the panels and the Site Boundary with a species-rich wildflower and grass mix to increase floral diversity and create habitat diversity for invertebrates and small mammals. A thick sward should be encouraged where possible, to benefit foraging barn owl.
- Adopt a grassland management plan that is specifically intended to benefit biodiversity at the site. An ecologist should be involved in the development of the plan.
- Woodland screening (2m wide and 5m wide) is proposed around some of the boundaries of the Development Site Boundary, which will provide additional habitat.
- The operational lifespan of the Development is 40 years and any planting associated with the Development will be allowed to establish and grow to form a mature community (e.g., hedgerows, grasslands).

4.4 Cumulative Effects

A search was undertaken which identified three other projects that have the potential to also impact IEFs assessed in this EclA (Table 10). The Inchinnan Solar Farm is located approximately 2.8km away from the Development and would result in a small loss of habitat of generally poor ecological quality (arable land; Brindley Associated, 2022). The Walkinshaw Solar farm is located approximately 3.7km away from the Development and would result in a loss of a small amount of habitat, including land that whooper swans from the Black Cart SPA may use for foraging. The Erskine to Devol Moor Overhead Line (OHL) replacement is located approximately 3.5km north of the Development at its closest.

All three of these developments will result in some habitat loss, but given their distance from the Development, it is considered that the only IEF that may be impacted by cumulative effects with these other projects is whooper swans from the Black Cart SPA. The two solar farms both concluded no adverse effects on the integrity of the Black Cart SPA and the Erskine to Devol Moor (OHL) replacement concluded there would be no potential to impact whooper swans from the Black Cart SPA.

In combination, the proposed Development, the Inchinnan Solar Farm and the Walkinshaw Gardens Solar Farm would result in a potential permanent loss of 152ha of functionally linked land that could be used by foraging whooper swans, which is approximately 2.4% of the total core foraging range of whooper swans

from the Black Cart SPA (based on a core foraging range of 6,361ha, which equates to a 4.5km radius around the SPA). It is concluded that this combined habitat loss would not result in a significant effect on whooper swans from the Black Cart SPA.

Table 10: Projects assessed for cumulative impacts

Project Name (planning reference)	Development	Decision and date	Comments on impacts to whooper swan from the Black Cart SPA	Approximate distance from Development (km)
Inchinnan Solar Farm (22/0582/PP)	Erection of 14.3 MW solar park and associated infrastructure.	Approved 24th Jan 2023	No adverse effects identified, but construction should take place between May and September.	2.8km
Walkinshaw Gardens, Barnsford Road Solar farm (22/0746/PP)	Erection of 19.9 MW solar park and battery storage facility.	Approved 6th April 2023	No adverse effects identified, but construction should take place between May and September.	3.7km
Erskine to Devol Moor 132kV Overhead Line Replacement (ECU00002085)	Installation of a new 16.9km 132kV overhead line between Erskine and Devol Moor.	Yet to be decided	No potential impact on the SPA.	3.5km

4.5 Residual Effects

Residual effects have been assessed for all IEFs which take into account the mitigation measures outlined in Section 4.3 above. In the absence of mitigation, adverse effects were identified for habitats, otters, badgers, bats, nesting birds, barn owls (nesting and non-breeding) and whooper swans (wintering), but all of these effects were identified as not significant (minor adverse or negligible). The implementation of the mitigation measures above will further reduce the impact of the Development on the IEFs, and therefore no significant residual effects are anticipated for the construction or operation of the Development.

REFERENCES

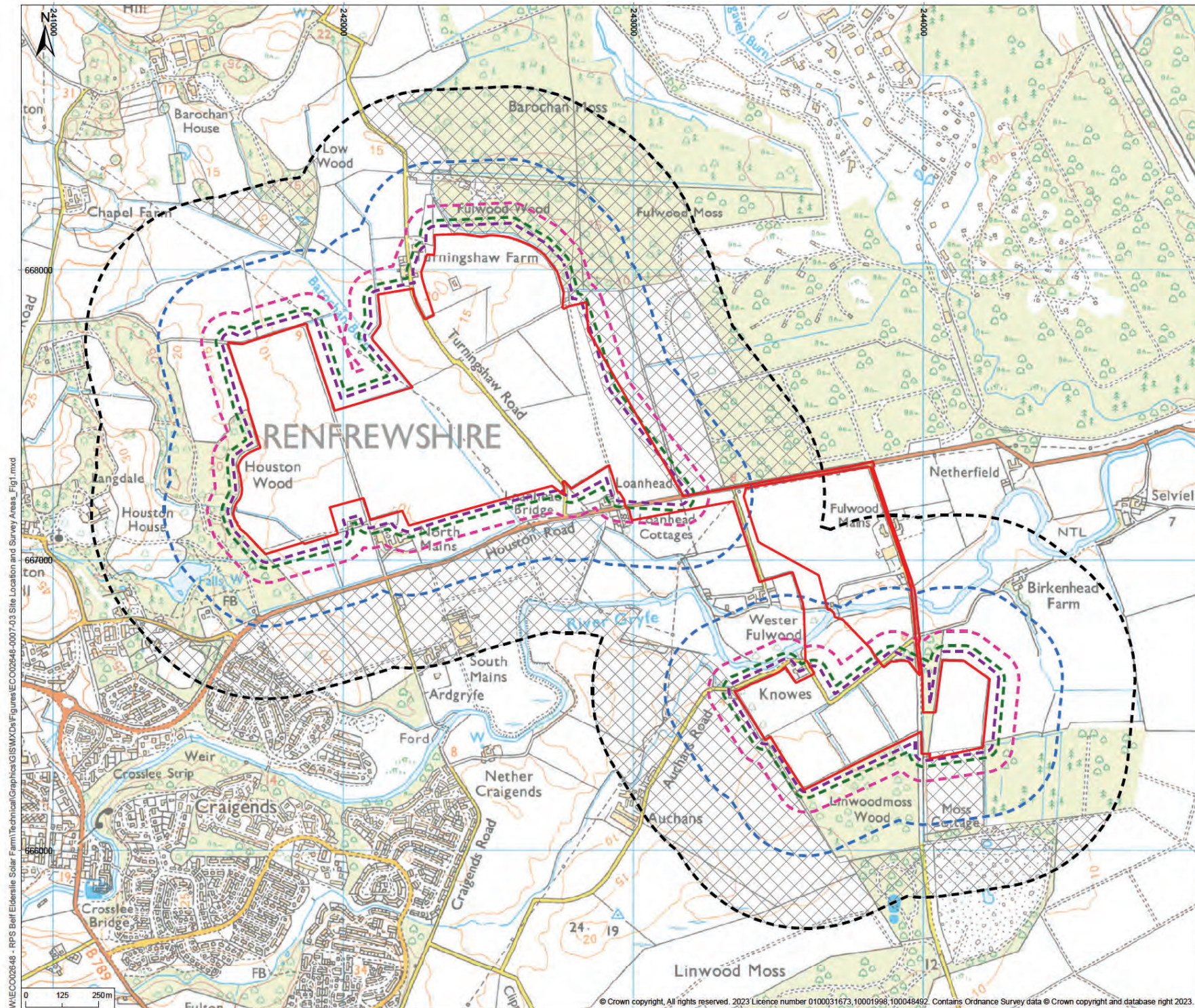
- ARG UK (2010). Great crested newt habitat suitability index.
- Bang, P & Dahlstrøm, P (2001). *Animal Tracks and Signs*. Oxford University Press, Oxford.
- Chanin, P. (2003). Ecology of the European otter. *Conserving Natura 2000 Rivers Ecology Series No. 10*.
- CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal. Second Edition*.
- CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. Version 1.2*.
- Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.
- Edgar, P., Foster, J., and Baker, J. (2010). *Reptile habitat management handbook*.
- IUCN (2022). *The IUCN Red List of Threatened Species. Version 2022-2*. Available online at <https://www.iucnredlist.org/> [Accessed May 2023].
- McColl, D., Yoemans, W.E., McGillivray, C. and Olszewska, J. (2009). *The River Clyde Fishery Management Plan 2009-2015*.
- Natural England (2023). *Badgers: advice for making planning decisions*. Available online at: <https://www.gov.uk/guidance/badgers-advice-for-making-planning-decisions> [Accessed May 2023].
- NatureScot (formerly Scottish Natural Heritage) (2010). *Black Cart Site of Special Scientific Interest Site Management Statement*.
- NatureScot (formerly Scottish Natural Heritage) (2016). *Assessing connectivity with Special Protection Areas (SPAs) Guidance Version 3*.
- NatureScot (formerly Scottish Natural Heritage) (2017). *Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2*.
- NatureScot (2020). *Scottish Biodiversity List*. Available online at <https://www.nature.scot/doc/scottish-biodiversity-list> [Accessed May 2023].
- NatureScot (2021). *Bats and onshore wind turbines – survey, assessment and mitigation*.
- NatureScot (2023a). *General pre-application and scoping advice for solar farms*. Available online at: <https://www.nature.scot/doc/general-pre-application-and-scoping-advice-solar-farms> [Accessed May 2023].
- NatureScot (2023b). *Planning and development: standing advice and guidance documents*. Available online at: <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-standing-advice-and-guidance-documents> [Accessed May 2023].
- Renfrewshire Council (2018). *Renfrewshire Biodiversity Action Plan*.
- Robinson, J. A., Colhoun, K., McElwaine, J. G. and Rees, E.C. (2004). *Waterbird Review Series: Whooper swan *Cygnus cygnus* (Iceland population) in Britain and Ireland 1960/61 – 1999/2000*.
- Roper, T. (2010). *Badger*. Harper Collins, London.
- Scottish Government (2017). *Planning Advice Note 1/2013: Environmental Impact Assessment. Revision 1*. Available online at <https://www.gov.scot/publications/planning-advice-note-1-2013-environmental-impact-assessment/> [Accessed May 2023].
- Scottish Raptor Monitoring Group (2014). *Raptors: a field guide for surveys and monitoring*.
- Sellars, C. 2010. *Habitat Suitability Index Scores as an Indicator of the Presence of Great Crested Newts*. In *In Practice, Bulletin of the Institute of Ecology and Environmental Management (IEEM)*, Number 69, September 2010.

REPORT

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., MuCulloch, N., Noble, D., and Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain.

Strachan and Moorhouse (2011). Water Vole Conservation Handbook (3rd Edition). The Wildlife Conservation Research Unit, 2011.

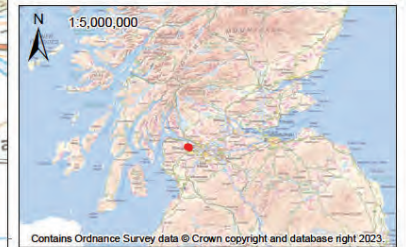
FIGURES



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- Legend**
- Site boundary
 - Survey Areas**
 - Bats and water vole (30m buffer)
 - Phase 1 Habitat (50m buffer)
 - Badger, amphibians, reptiles, freshwater fish and freshwater pearl mussel (100m buffer)
 - Otter (250m buffer)
 - Great crested newt and wintering geese (500m buffer)
 - No access



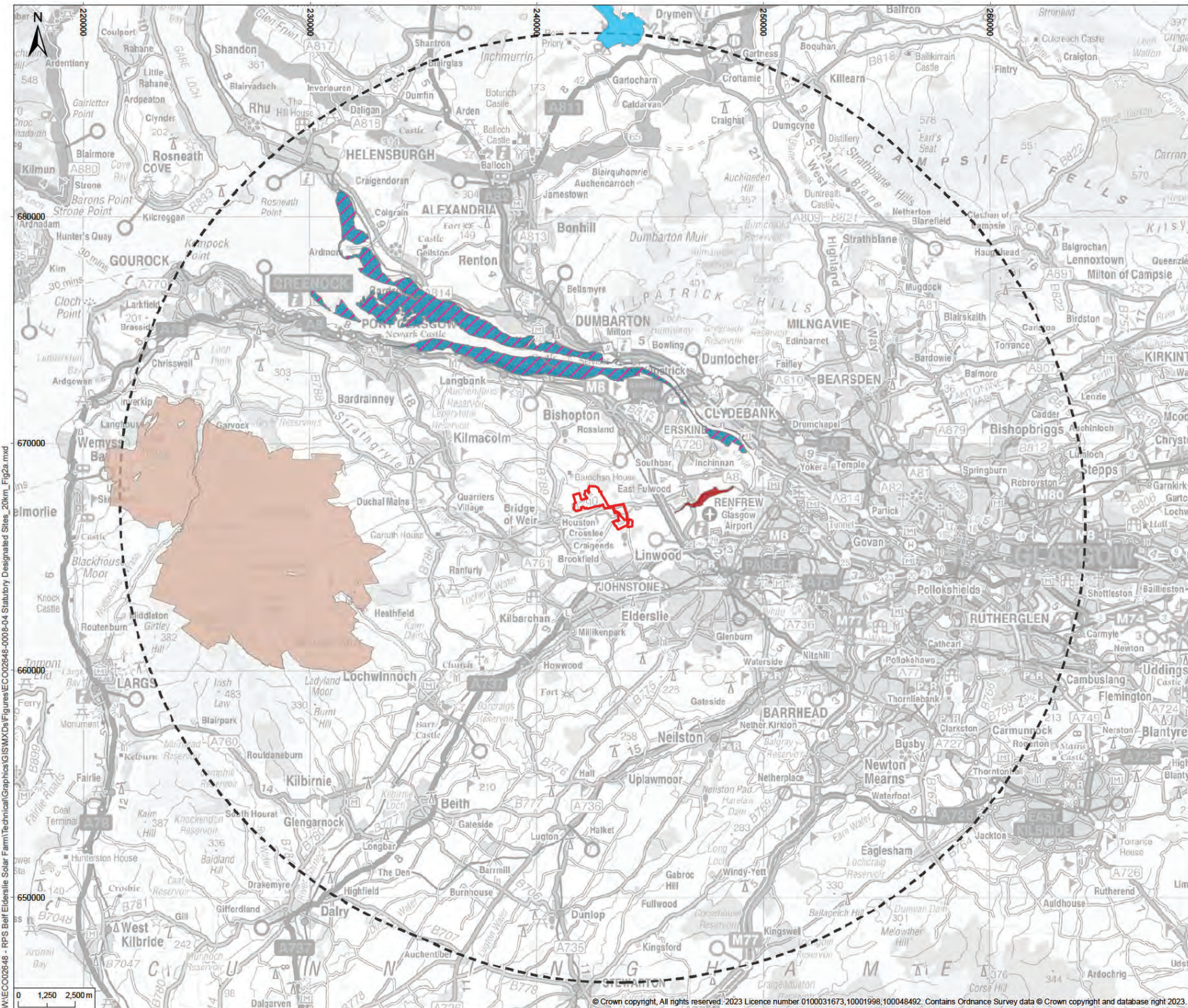
Rev	Description	By	CB	Date

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Client **ELGIN ENERGY**
 Project **Houston Solar Farm**
 Title **Site Location and Survey Areas**

Status	Drawn By	PM/Checked By
FINAL	KAG	NW
Project Number	Scale @ A3	Date Created
ECO02648	1:12,500	MAY 2023
Figure Number		Rev
1		-

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- Legend**
- Site boundary
 - Search area (20km buffer)
 - Inner Clyde Ramsar Site
 - Special Protection Areas (SPA)**
 - Black Cart
 - Inner Clyde
 - Loch Lomond
 - Renfrewshire Heights

Rev	Description	By	CB	Date



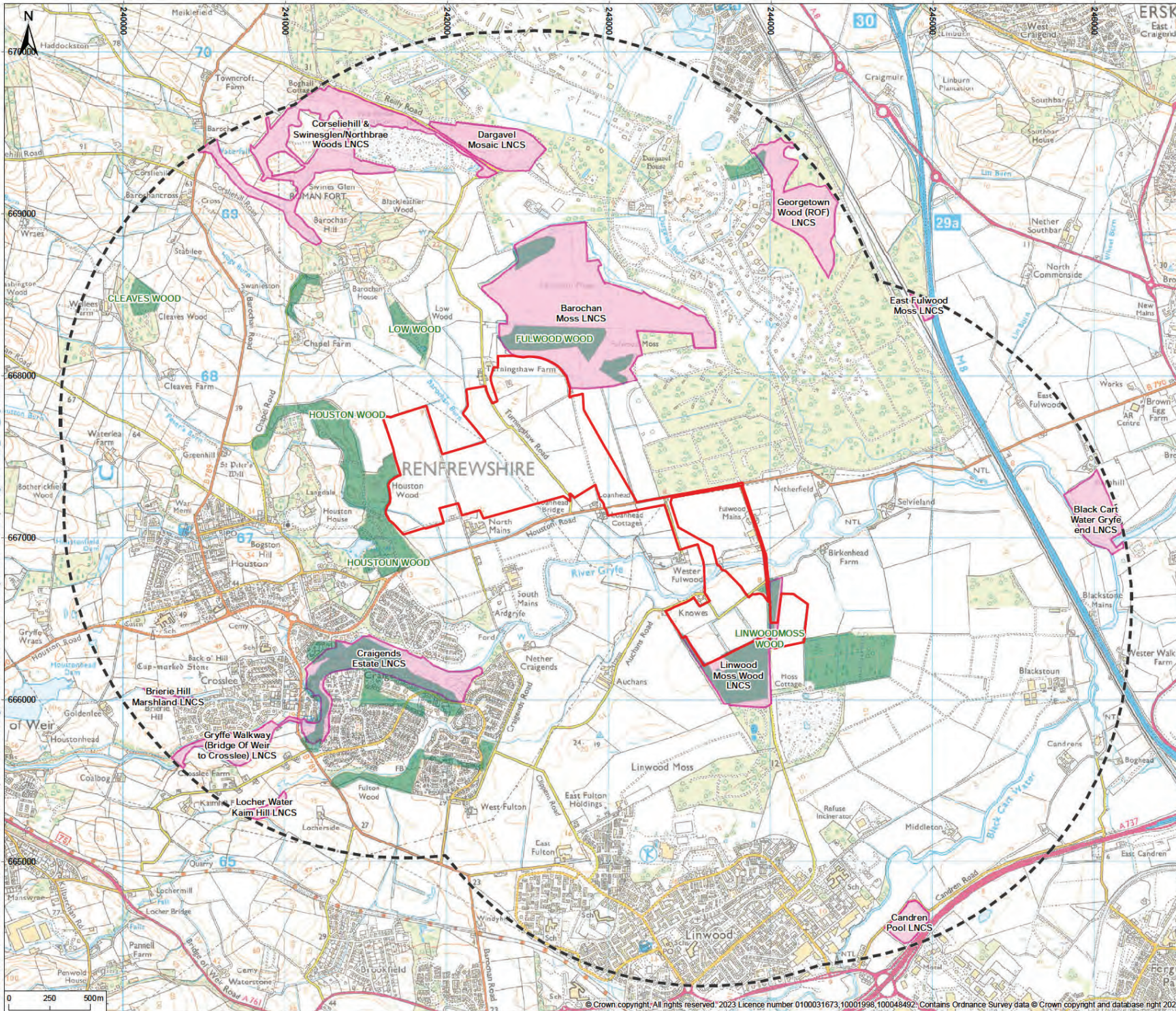
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Client		
Project	Houston Solar Farm	
Title	Statutory Designated Sites within 20km	
Status	Drawn By	PM/Checked By
FINAL	KAG	NW
Project Number	Scale @ A3	Date Created
ECO02648	1:160,000	JUN 2023
Figure Number		Rev
2a		-

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W:\ECO02648 - RPS Belf Elderslie Solar Farm\Technical\Graphics\GISMX\Figures\ECO02648-0009-02 Statutory and Non-Statutory Designated Sites_2km_Fig2b.mxd



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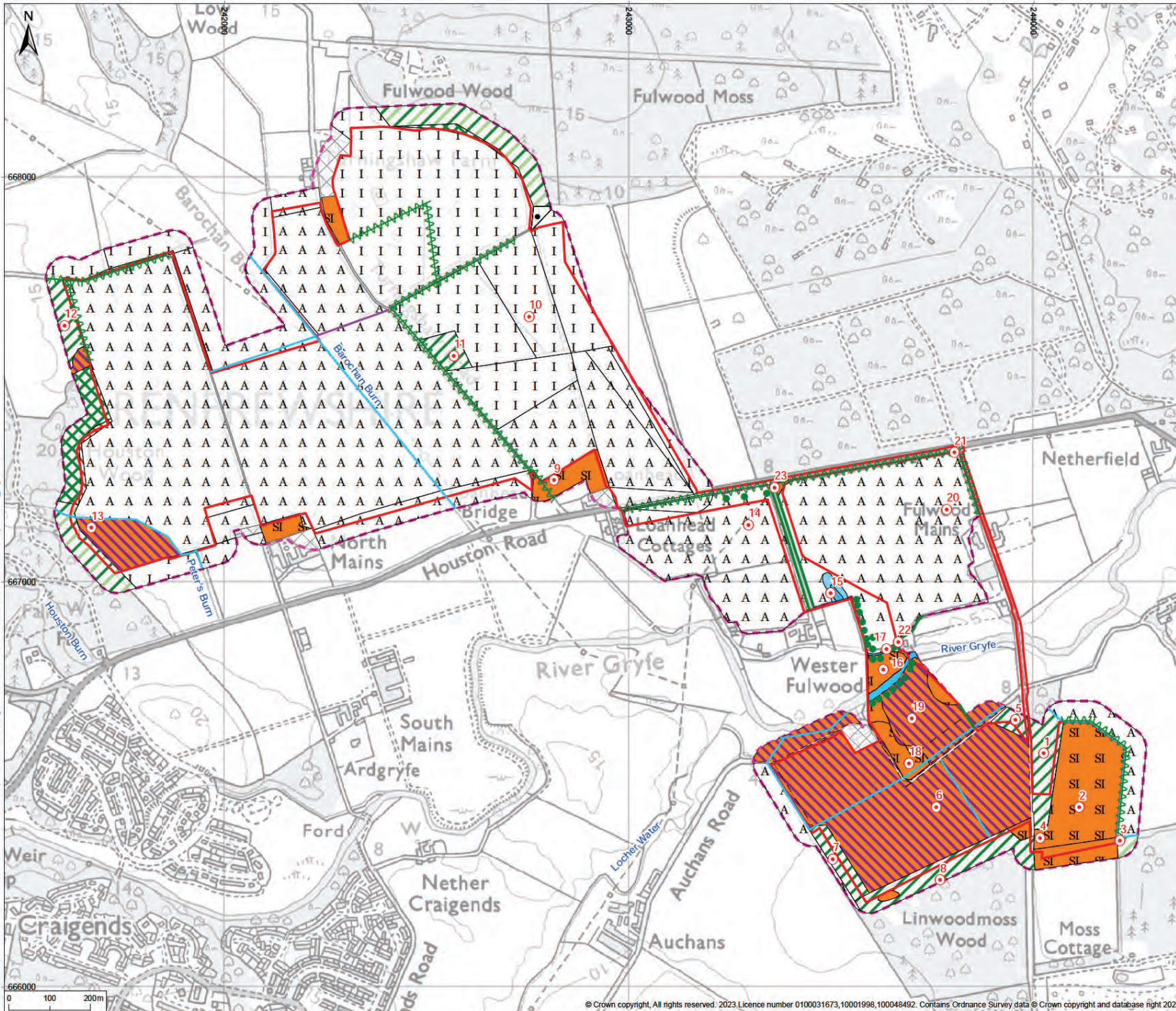
- Legend**
- Site boundary
 - Search area (2km buffer)
 - Local Nature Conservation Sites
 - Ancient and Long-established Woodland Sites

Rev	Description	By	CB	Date

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Client **ELGIN ENERGY**
 Project **Houston Solar Farm**
 Title **Statutory and Non-Statutory Designated Sites within 2km**
 Status **FINAL** Drawn By **KAG** PM/Checked By **NW**
 Project Number **ECO02648** Scale @ **A3** Date Created **MAY 2023**
 Figure Number **2b** Rev **-**

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- Legend**
- Site boundary
 - Phase 1 Habitat Survey Area (50m buffer)
 - A1.1.2 - Broadleaved woodland - plantation
 - A1.3.2 - Mixed woodland - plantation
 - A2.1 - Scrub - dense/continuous
 - B2.2 - Neutral grassland - semi-improved
 - B5 - Marsh/marshy grassland
 - C3.1 - Other tall herb and fern - ruderal
 - F1 - Swamp
 - G1 - Standing water
 - G2 - Running water
 - J1.1 - Cultivated/disturbed land - arable
 - J4 - Bare ground
 - Existing track
 - Not assessed
 - G2 - Running water
 - J2.1.1 - Intact hedge - native species-rich
 - J2.1.2 - Intact hedge - species-poor
 - J2.5 - Wall
 - Broadleaved scattered trees
 - Target Notes

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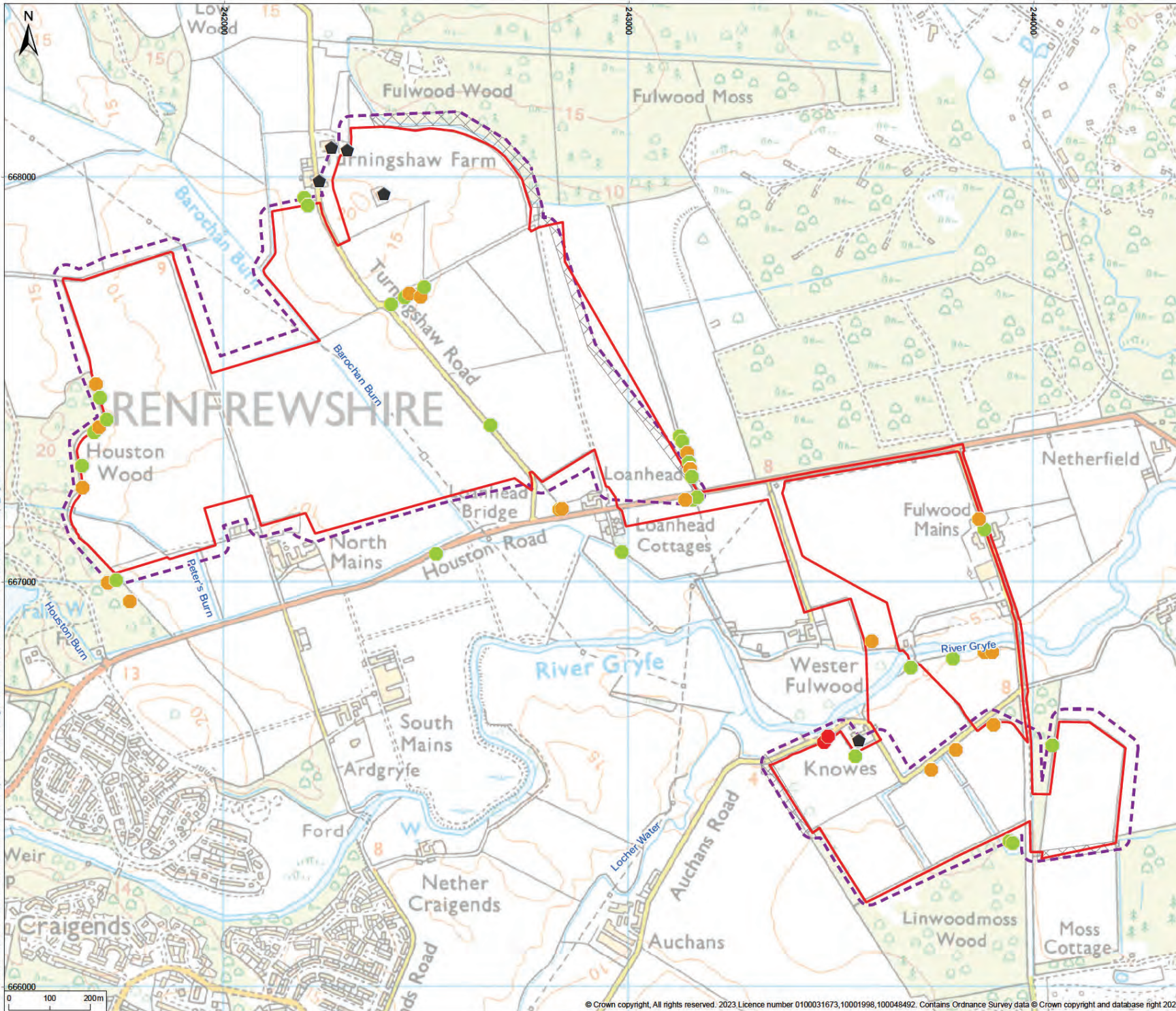
Project: **Houston Solar Farm**

Title: **Phase 1 Habitat Survey Results**

Status Issue	Drawn By KAG	PM/Checked By NW
Project Number ECO02648	Scale @ A3 1:9,000	Date Created MAY 2023
Figure Number 3		Rev -

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- Legend**
- Site boundary
 - Bats (30m buffer)
 - No access
- Survey Results**
- Bat tree roost potential - High (2)
 - Bat tree roost potential - Moderate (20)
 - Bat tree roost potential - Low (26)
 - ⬠ Building: Not surveyed – no access (6)

Rev	Description	By	CB	Date

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Client **ELGIN ENERGY**

Project **Houston Solar Farm**

Title **Bat Roost Assessment Survey Results**

Status Issue	Drawn By KAG	PM/Checked By NW
Project Number ECO02648	Scale @ A3 1:9,000	Date Created MAY 2023
Figure Number 6		Rev -

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APPENDICES

European Protected Species

European Protected Species are defined under the European Commission (EC) Habitats and Species Directive 92/43/EEC (the 'Habitats Directive') and include species such as otter, and all species of bat. The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the 'Habitats Regulations') translates this European legislation into UK law. This was updated to the Conservation of Habitats and Species (Amendment) (EU Exit) regulations 2019 following the UK's exit from the European Union. European Protected Species are identified in Schedule 2 and Schedule 4 of the Habitats Regulations.

The Habitats Regulations makes it an offence to deliberately or recklessly kill, injure or disturb European Protected Species. Their places of shelter are fully protected, and it is an offence to damage, destroy or obstruct access to or otherwise deny the animal use of a breeding site or resting site, whether deliberately or not. It is also an offence to disturb in a manner that is, or in circumstances which are likely to significantly affect the local distribution or abundance of the species, disturb in a manner or circumstances which are likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young. Any activity which is likely to affect such a species requires prior consultation with the relevant statutory nature conservation organisation. In Scotland, the relevant statutory consultee is NatureScot.

A licence from the NatureScot is required in cases of potential disturbance of European Protected Species or damage or destruction of a resting site as a result of work activities. Under the Habitats Regulations, licences may be granted for:

- Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.

Importantly, in order for a licence application to be successful, two tests must be satisfied, namely:

- There is no satisfactory alternative (including retaining the status quo); and
- The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in its natural range.

The Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (WCA) provides protection to a range of species and habitats. The Nature Conservation (Scotland) Act 2004 and Wildlife and Natural Environment (Scotland) Act 2011 then amend the Wildlife and Countryside Act in Scotland.

Section 9 of the WCA provides protection to certain animal species. Enhanced protection is provided for species listed in Schedule 5 which includes water voles and red squirrels. It is an offence to intentionally or recklessly kill, injure or take animals listed in Schedule 5, with the exception of water voles, which are protected in respect of Section 9(4) only, meaning that water vole habitat is protected, although the animals themselves are not. It is also an offence to recklessly damage, destroy or obstruct access to any place used for shelter or breeding by species listed under Schedule 5. Any works which may potentially cause disturbance to such a species requires prior consultation with NatureScot.

The Wildlife and Countryside Act 1981 (as amended) also protects against the spread of invasive non-native plant and animal species (INNS). Specifically, in relation to plants, it is an offence under this legislation to plant or otherwise cause a plant to grow in the wild at a place out with its native range and includes species such as Japanese knotweed *Fallopia japonica* giant hogweed *Heracleum mantegazzianum* and rhododendron *Rhododendron ponticum* and hybrids.

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In addition to the above, all wild birds, their nests and their eggs are protected under the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to intentionally or recklessly:

- Kill, injure, or take any wild bird (excluding certain specified game and other licence-controlled species);
- Take, damage, destroy or otherwise interfere with the nest of any wild bird while it is in use or being built;
- Obstruct or prevent any wild bird from using its nest; or
- Take or destroy the egg of any wild bird.

In addition, there are some rare breeding species, such as golden eagle, barn owl or kingfisher, which are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), which receive extra protection, making it an offence to intentionally or recklessly:

- Disturb any species listed under Schedule 1 of the Act whilst at the nest site, or while building a nest;
- Disturb the dependent young of any species listed under Schedule 1;
- Disturb any species listed under Schedule 1 which leks while it is doing so;
- Harass any wild bird included in Schedule 1A; or
- Take, damage, destroy or otherwise interfere with any nest habitually used by any wild bird included in Schedule A1, even when that nest is not in use.

The Protection of Badgers Act 1992

Badgers are protected under the Protection of Badgers Act 1992. In Scotland, this legislation was updated by the Nature Conservation (Scotland) Act 2004, which makes it an offence to recklessly take, injure or kill a badger, or destroy, disturb, or interfere with its sett. In addition, badgers are afforded protection from cruel ill-treatment. This has been defined to include preventing a badger access to its sett, as well as causing the loss of significant foraging resources within a badger territory.

A licence from NatureScot is required in cases of potential disturbance of badgers or damage or destruction of a badger sett as a result of work activities.

Detailed Field Survey Methodology

Otter

All areas of potentially suitable otter habitat (as detailed below) were inspected for field signs indicating the presence of the species as well as features which may be used as resting sites. Otter field signs are described in Bang and Dahlstrøm (2001) and NatureScot (2023b) and include resting sites (e.g., holts and couches), spraints, prints and feeding remains. Descriptions of these and other field evidence terms are provided below.

- **Holts** - these are underground features where otters live. They can be tunnels within bank-sides, underneath root-plates or boulder piles, and even man-made structures such as disused drains. Holts are used by otters to rest up during the day due to the crepuscular nature of their foraging activities and may be used as natal or breeding sites. Otters may use holts permanently or temporarily.
- **Couches** - these are above ground resting sites. Couches can be very difficult to identify, sometimes consisting of no more than an area of flattened grass or earth and are best identified by the presence of other field signs (e.g., spraints).
- **Prints** - otters have characteristic footprints that can be found in soft ground and muddy areas.
- **Spraints** - otter faeces can be used to mark territories, often on in-stream boulders. They can be present within or outside the entrances of holts and couches. Spraints have a characteristic smell and often contain fish remains.
- **Feeding signs** - the remains of prey items may be found at preferred feeding stations. Remains of fish, crabs or skinned amphibians can indicate the presence of otter.
- **Paths** - these are terrestrial routes that otters take when moving between resting-up sites and watercourses, or at high flow conditions when they will travel along bank sides in preference to swimming.
- **Slides and play areas** - slides are typically worn areas on steep slopes where otters slide on their bellies, often found between holts/couches and watercourses.

Any of these field signs are diagnostic of the presence of otters although spraints are the most reliably identifiable evidence of the species' presence. Otters are active all year and so there is no optimal time of year in which to undertake otter surveys. However, otter surveys should be timed to avoid periods of heavy rain or high water (following period of prolonged heavy rain), which might wash away field signs, thus potentially leading to under-recording or failing to confirm the species presence.

Water vole

The water vole survey was carried out in conjunction with the otter survey. As the assessment was undertaken outside of the optimal survey season for water voles, an assessment of habitat suitability was made on the watercourses. Water vole field signs are described in Strachan and Moorhouse (2011) and include:

- **Faeces** - recognisable by their size, shape, and content. If not too dried-out these faeces are also distinguishable from rat droppings by their smell.
- **Latrines** - faeces, often deposited at discrete locations known as latrines.
- **Feeding stations** - food items are often brought to feeding stations along pathways and hauled onto platforms. Recognisable as neat piles of chewed vegetation up to 10cm long.
- **Burrows** - appear as a series of holes along the water's edge distinguishable from rat burrows by size and position.
- **Lawns** - may appear as grazed areas around land holes.

- **Nests** - where the water table is high. Above ground woven nests may be found.
- **Footprints** - tracks may occur at the water's edge and lead into bank side vegetation. May be distinguishable from rat footprints by size.
- **Runways in vegetation** - low tunnels pushed through vegetation near the water's edge, less obvious than rat runs.

Consideration of the species preferred habitat conditions was also taken into account, including:

- Slow flowing water;
- Low water level fluctuation;
- Banks suitable for burrowing;
- Lush bankside vegetation to provide food and shelter; and
- The absence of American mink *Neovison vison*, the main predator of water vole.

Badger

The badger survey was undertaken in all areas of potentially suitable badger habitat within the Site and a surrounding buffer of 100m. Badger field signs are described in Natural England (2023), Roper (2010), Bang and Dahlstrøm (2001) and NatureScot (2023b) and include:

- **Setts** - used by badgers which can be sub-categorised into the following;
 - **Main setts:** several holes (sometimes up to 30) with large spoil heaps and obvious paths emanating from and between sett entrances;
 - **Annex setts:** normally less than 150m from the main sett, comprising several holes and usually with well-defined runs connecting it to the main sett;
 - **Subsidiary setts:** normally fairly close to the main sett (at least 50m away), typically comprising 3-5 entrances, generally with no tracks connecting them to other setts and only signs of occasional use; and
 - **Outlier setts:** typically consisting of just one or two entrances with little spoil outside the entrance holes, often with no obvious paths connecting them to other setts.
- **Latrines** - dung pits used as territorial markers;
- **Prints** - distinctive in shape;
- **Guard hairs** - these are distinctive in shape and colour and are often found snagged on wire fencing; and
- **Foraging signs** - snuffle holes and excavated wasp/bee nests.

Any of the above signs (with the exception of foraging signs) can be taken as diagnostic evidence of the presence of badger.

Badgers are active all year, but the optimal time to conduct surveys is early spring or autumn when badger territory marking is more prominent and when vegetation is in senescence and has died back, thus making badger field signs more detectable.

Great crested newts

A Habitat Suitability Index (HSI) survey was undertaken on ponds within a 500m buffer of the Development site boundary to describe suitability for great crested newts (GCN). The HSI survey and index calculation were completed as described in Amphibian and Reptile Groups of the United Kingdom (ARG UK) Advice Note 10 (ARG UK, 2010).

The HSI takes into account ten key habitat criteria which influence the presence or likely absence of GCN, including factors such the size, water quality, permanence, shading, and macrophyte cover of potential breeding ponds. The assessment also includes the quality of the surrounding terrestrial habitat which should

ideally comprise a mosaic of rough grassland, scrub, and woodland, with opportunities for shelter and hibernation, as well as other potential breeding ponds. Ponds which support high densities of fish and/or waterfowl and those which are very shallow, dry-up regularly, or are polluted are generally considered to be unsuitable.

Each criterion is scored according to its suitability and the resulting HSI scores provide an indication as to the likelihood of a pond’s potential to support GCN. In general, ponds with high scores are more likely to support GCN than those with low scores, although just because a pond achieves a poor HSI score does not necessarily mean that GCN will not be present (Sellars, 2010).

The HSI score bands presented in Table B.1 have been developed to provide a rough guide as to the likelihood of ponds supporting GCN based on their HSI scores.

Table B.1: GCN HSI score interpretation

HSI Score	Pond Suitability
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Reptiles

Areas of suitable reptile habitat were identified within the 100m of the Site. Reptiles require dry habitats with areas of refugia and basking such as rock piles, crags, scree, and drystone walls. Any features such as these were assessed for their potential to support reptile species (e.g., adder *Vipera berus*, slow worm *Anguis fragilis* and common lizard *Zootoca vivipara*).

Bats

A preliminary ground level bat roost assessment (PBRA) of trees located within the Site and a surrounding buffer of 30m was conducted in line with Bat Conservation Trust’s (BCT) good practice survey guidelines (Collins, 2016). The survey involved a detailed inspection of trees from ground level to identify potential roosting features which may be used by bats. These include:

- Woodpecker holes;
- Rot holes;
- Vertical or horizontal cracks or splits;
- Partially detached flaking bark; and
- Other hollows or cavities.

Trees were classified for their potential to support roosting bats (Table B.2). The suitability for the immediately adjacent habitat to support foraging/commuting bats and connectivity to the wider area was also assessed.

Table B.2: Bat habitat suitability criteria (taken from Collins, 2016)

Suitability	Roosting habitat	Commuting and foraging habitat
Negligible	Negligible habitat features on Site not likely to be used by roosting bats.	Negligible habitat features on Site not likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable	Habitat that could be used by small numbers of commuting bats such as gappy hedgerows or unvegetated streams, but isolated, i.e., not very well connected to the surrounding landscape by other habitat.

Suitability	Roosting habitat	Commuting and foraging habitat
	<p>surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation).</p> <p>A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.</p>	<p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	<p>A structure or tree with one or more potential roost sites that could be used by bats due to its size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).</p>	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	<p>A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.</p>	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site close to and connected to known roosts.</p>

Wintering goose surveys

Field surveys followed guidance set out in NatureScot’s survey guidance for onshore wind farms (NatureScot, 2017). Eight surveys are proposed from October to April, inclusive, to detect the presence of wintering waterfowl foraging within 500m of the development Site. The surveys will focus on wintering geese and swans, particularly whooper swan.

All waterfowl species present within this area during the survey visits were recorded, as well the presence of any goose droppings indicative of recent foraging activity. The Survey Area was divided up by existing field boundaries. Each group of wintering wildfowl recorded within the Survey Area was thus assigned into the appropriate field number to show foraging distribution across the Survey Area.

Breeding bird habitat assessment

A detailed habitat assessment was undertaken to describe habitat suitability for breeding birds across the Site Boundary. The field survey will also identify any areas of particular interest for breeding birds, such as woodlands and hedgerows.

Barn owl habitat assessment

A detailed habitat assessment for barn owls was undertaken in December 2022. The purpose of this survey was to identify key areas for barn owl foraging and roosting.

Bird species identified during the desk study

Table C.1: Full list of bird species identified within 2km of the Development Site Boundary from the data search

Common Name	Taxon Name	European Protected Species	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Barn owl	<i>Tyto alba</i>		WCA.S1p1, SBL	
Barnacle goose	<i>Branta leucopsis</i>	Annex 1	SBL	Amber
Blackbird	<i>Turdus merula</i>			
Blackcap	<i>Sylvia atricapilla</i>			
Black-headed gull	<i>Chroicocephalus ridibundus</i>		SBL	Amber
Black-tailed godwit	<i>Limosa limosa</i>		WCA.S1p1, UK BAP	Red
Blue tit	<i>Cyanistes caeruleus</i>			
Brambling	<i>Fringilla montifringilla</i>		WCA.S1p1, SBL	
Bullfinch	<i>Pyrrhula pyrrhula</i>		SBL	Amber
Buzzard	<i>Buteo buteo</i>			
Canada goose	<i>Branta canadensis</i>			
Carrion crow	<i>Corvus corone</i>			
Carrion x hooded crow	<i>Corvus corone x cornix</i>			
Cattle egret	<i>Bubulcus ibis</i>			Amber
Chaffinch	<i>Fringilla coelebs</i>			
Chiffchaff	<i>Phylloscopus collybita</i>			
Coal tit	<i>Periparus ater</i>			
Collared dove	<i>Streptopelia decaocto</i>			
Common crossbill	<i>Loxia curvirostra</i>		WCA.S1p1	Amber
Common gull	<i>Larus canus</i>			Amber
Common sandpiper	<i>Actitis hypoleucos</i>			Amber
Common tern	<i>Sterna hirundo</i>	Annex 1	SBL	Amber
Common/lesser redpoll	<i>Acanthis flammea/cabaret</i>			
Coot	<i>Fulica atra</i>			
Cormorant	<i>Phalacrocorax carbo</i>			
Cuckoo	<i>Cuculus canorus</i>		UK BAP, SBL	Red
Curlew	<i>Numenius arquata</i>		UK BAP, SBL	Red
Dipper	<i>Cinclus cinclus</i>			Amber
Dunlin	<i>Calidris alpina</i>		SBL	Red
Dunlin (alpina)	<i>Calidris alpina alpina</i>		SBL	Red
Dunnock	<i>Prunella modularis</i>		SBL	Amber
Eider	<i>Somateria mollissima</i>			Amber
Feral pigeon	<i>Columba livia f. domestica</i>			
Fieldfare	<i>Turdus pilaris</i>		WCA.S1p1	Red
Gadwall	<i>Mareca strepera</i>			Amber
Gannet	<i>Morus bassanus</i>			Amber
Garden warbler	<i>Sylvia borin</i>			
Goldcrest	<i>Regulus regulus</i>			
Golden plover	<i>Pluvialis apricaria</i>	Annex 1	SBL	

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Common Name	Taxon Name	European Protected Species	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Goldeneye	<i>Bucephala clangula</i>		WCA.S1p1	Red
Goldfinch	<i>Carduelis carduelis</i>			
Goosander	<i>Mergus merganser</i>			
Goshawk	<i>Accipiter gentilis</i>			
Grasshopper warbler	<i>Locustella naevia</i>		UK BAP, SBL	Red
Great black-backed gull	<i>Larus marinus</i>			Amber
Great crested grebe	<i>Podiceps cristatus</i>			
Great spotted woodpecker	<i>Dendrocopos major</i>	Annex 1		
Great spotted woodpecker (anglicus)	<i>Dendrocopos major anglicus</i>			
Great tit	<i>Parus major</i>			
Green sandpiper	<i>Tringa ochropus</i>		WCA.S1p1, SBL	Amber
Green woodpecker	<i>Picus viridis</i>			
Greenfinch	<i>Chloris chloris</i>			Red
Greenshank	<i>Tringa nebularia</i>		WCA.S1p1	Amber
Grey heron	<i>Ardea cinerea</i>			
Grey wagtail	<i>Motacilla cinerea</i>			Amber
Greylag goose	<i>Anser anser</i>		WCA.S1p1	Amber
Hen harrier	<i>Circus cyaneus</i>	Annex 1	WCA.S1p1, SBL	Red
Herring gull	<i>Larus argentatus</i>			Red
Herring gull (argentatus)	<i>Larus argentatus argentatus</i>		UK BAP, SBL	Red
House martin	<i>Delichon urbicum</i>			Red
House sparrow	<i>Passer domesticus</i>		UK BAP, SBL	Red
Iceland gull	<i>Larus glaucoides</i>			Amber
Iceland gull (glaucoides)	<i>Larus glaucoides glaucoides</i>			Amber
Jack snipe	<i>Lymnocyptes minimus</i>			
Jackdaw	<i>Coloeus monedula</i>			
Jay	<i>Garrulus glandarius</i>			
Kestrel	<i>Falco tinnunculus</i>		SBL	Amber
Kingfisher	<i>Alcedo atthis</i>	Annex 1	WCA.S1p1, SBL	
Lapwing	<i>Vanellus vanellus</i>		UK BAP, SBL	Red
Lesser black-backed gull	<i>Larus fuscus</i>			Amber
Lesser redpoll	<i>Acanthis cabaret</i>		UK BAP, SBL	
Linnet	<i>Linaria cannabina</i>		SBL	Red
Little auk	<i>Alle alle</i>			
Little egret	<i>Egretta garzetta</i>	Annex 1		
Little grebe	<i>Tachybaptus ruficollis</i>			
Little ringed plover	<i>Charadrius dubius</i>			
Long-eared owl	<i>Asio otus</i>			
Long-tailed tit	<i>Aegithalos caudatus</i>			
Magpie	<i>Pica pica</i>			
Mallard	<i>Anas platyrhynchos</i>			Amber
Manx shearwater	<i>Puffinus puffinus</i>		SBL	Amber
Marsh harrier	<i>Circus aeruginosus</i>		WCA.S1p1, SBL	Amber

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Common Name	Taxon Name	European Protected Species	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Meadow pipit	<i>Anthus pratensis</i>			Amber
Mediterranean gull	<i>Ichthyaetus melanocephalus</i>	Annex 1	WCA.S1p1	Amber
Merlin	<i>Falco columbarius</i>	Annex 1	WCA.S1p1, SBL	Red
Mistle thrush	<i>Turdus viscivorus</i>			Red
Moorhen	<i>Gallinula chloropus</i>			Amber
Mute swan	<i>Cygnus olor</i>			
Nuthatch	<i>Sitta europaea</i>			
Osprey	<i>Pandion haliaetus</i>	Annex 1	WCA.S1p1, SBL	Amber
Oystercatcher	<i>Haematopus ostralegus</i>			Amber
Peregrine	<i>Falco peregrinus</i>	Annex 1	WCA.S1p1, SBL	
Pheasant	<i>Phasianus colchicus</i>			
Pied wagtail	<i>Motacilla alba</i>			
Pied wagtail (yarrellii)	<i>Motacilla alba yarrellii</i>			
Pied/white wagtail	<i>Motacilla alba</i>			
Pink-footed goose	<i>Anser brachyrhynchus</i>			Amber
Pintail	<i>Anas acuta</i>			Amber
Raven	<i>Corvus corax</i>			
Red kite	<i>Milvus milvus</i>	Annex 1	WCA.S1p1, SBL	
Red-breasted merganser	<i>Mergus serrator</i>			Amber
Redshank	<i>Tringa totanus</i>			Amber
Redstart	<i>Phoenicurus phoenicurus</i>			
Red-throated diver	<i>Gavia stellata</i>		WCA.S1p1, SBL	
Redwing	<i>Turdus iliacus</i>		WCA.S1p1	Amber
Reed bunting	<i>Emberiza schoeniclus</i>		UK BAP, SBL	Amber
Reed warbler	<i>Acrocephalus scirpaceus</i>		SBL	
Ringed plover	<i>Charadrius hiaticula</i>			Red
Ring-necked parakeet	<i>Psittacula krameri</i>			
Robin	<i>Erithacus rubecula</i>			
Rock dove	<i>Columba livia</i>			
Rook	<i>Corvus frugilegus</i>			Amber
Sand martin	<i>Riparia riparia</i>			
Sandwich tern	<i>Thalasseus sandvicensis</i>	Annex 1	SBL	Amber
Scaup	<i>Aythya marila</i>		WCA.S1p1, UK BAP, SBL	Red
Sedge warbler	<i>Acrocephalus schoenobaenus</i>			Amber
Shelduck	<i>Tadorna tadorna</i>			Amber
Short-eared owl	<i>Asio flammeus</i>	Annex 1	SBL	Amber
Shoveler	<i>Spatula clypeata</i>			Amber
Siskin	<i>Spinus spinus</i>		SBL	
Skylark	<i>Alauda arvensis</i>		SBL	Red
Snipe	<i>Gallinago gallinago</i>			Amber
Song thrush	<i>Turdus philomelos</i>			Amber
Sparrowhawk	<i>Accipiter nisus</i>	Annex 1		Amber
Spotted flycatcher	<i>Muscicapa striata</i>		UK BAP, SBL	Red

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Common Name	Taxon Name	European Protected Species	UK / Scotland Protected / Notable Species	Birds of Conservation Concern 5
Spotted redshank	<i>Tringa erythropus</i>			Amber
Starling	<i>Sturnus vulgaris</i>		SBL	Red
Starling (vulgaris)	<i>Sturnus vulgaris vulgaris</i>		SBL	
Stock dove	<i>Columba oenas</i>			Amber
Stonechat	<i>Saxicola rubicola</i>			
Swallow	<i>Hirundo rustica</i>			
Swift	<i>Apus apus</i>		SBL	Red
Taiga/Tundra bean goose	<i>Anser fabalis/serrirostris</i>		SBL	Amber
Tawny owl	<i>Strix aluco</i>			Amber
Teal	<i>Anas crecca</i>			Amber
Tree pipit	<i>Anthus trivialis</i>		UK BAP, SBL	Red
Tree sparrow	<i>Passer montanus</i>		SBL	Red
Treecreeper	<i>Certhia familiaris</i>			
Tufted duck	<i>Aythya fuligula</i>			
Twite	<i>Linaria flavirostris</i>		UK BAP, SBL	Red
Water rail	<i>Rallus aquaticus</i>			
Waxwing	<i>Bombycilla garrulus</i>			
Wheatear	<i>Oenanthe oenanthe</i>			Amber
Whinchat	<i>Saxicola rubetra</i>			Red
White stork	<i>Ciconia ciconia</i>	Annex 1		
White wagtail	<i>Motacilla alba alba</i>			
White-fronted goose	<i>Anser albifrons</i>			Red
White-fronted goose (European - albifrons)	<i>Anser albifrons albifrons</i>			Red
Whitethroat	<i>Curruca communis</i>			Amber
Whooper swan	<i>Cygnus cygnus</i>	Annex 1	WCA.S1p1, SBL	Amber
Wigeon	<i>Mareca penelope</i>			Amber
Willow warbler	<i>Phylloscopus trochilus</i>			Amber
Wood Warbler	<i>Phylloscopus sibilatrix</i>		UK BAP, SBL	Red
Woodcock	<i>Scolopax rusticola</i>		SBL	Red
Woodpigeon	<i>Columba palumbus</i>			Amber
Wren	<i>Troglodytes troglodytes</i>			Amber
Yellow-browed warbler	<i>Phylloscopus inornatus</i>			Amber
Yellowhammer	<i>Emberiza citrinella</i>		UK BAP, SBL	Red
Yellow-legged gull	<i>Larus michahellis</i>			Amber

Abbreviations used in Table C.12 Table 2: Annex 1 = Annex 1 of the Birds Directive, Amber = Birds of Conservation Concern 5 amber-listed species, Red = Birds of Conservation Concern 5 red-listed species, WCA.S1p1 = The Wildlife and Countryside Act 1981 (as amended) Schedule 1 part 1, SBL = Scottish Biodiversity List, UK BAP = UK Biodiversity Action Plan.

Phase 1 Survey Target Notes

Table D.1: Phase 1 habitat survey target notes

Target Note	Grid Reference	Note
1	NS 44025 66577	Broadleaved woodland – plantation. Canopy: silver birch <i>Betula pendula</i> , holly <i>Ilex aquifolium</i> . Shrubs: ash <i>Fraxinus excelsior</i> , honeysuckle <i>Lonicera periclymenum</i> . Field: Ferns <i>Polypodiopsida</i> , Wood sorrell <i>Oxalis acetosella</i> , nettles <i>Urtica dioica</i> , bramble <i>Rubus fruticosus</i> , Himalayan balsam <i>Impatiens glandulifera</i> .
2	NS 44113 66443	Semi-improved neutral grassland. Nettles, sticky willow <i>Galium aparine</i> , cow parsley <i>Anthriscus sylvestris</i> , <i>Juncus</i> species, foxglove <i>Digitalis species</i> , tall oat grass <i>Arrhenatherum elatius</i> , dock <i>Rumex crispus</i> , hogweed <i>Heracleum sphondylium</i> , thistle <i>Cirsium</i> species, dog rose <i>Rosa canina</i> , red campion <i>Silene dioica</i> , Yorkshire fog <i>Holcus lanatus</i> , creeping buttercup <i>Ranunculus repens</i> , bramble, meadow buttercup <i>R. acris</i> .
3	NS 44214 66361	Mixed woodland plantation. Canopy: oak <i>Quercus robur</i> , Scots pine <i>Pinus sylvestris</i> . Shrub: rhododendron, silver birch. Field: bracken <i>Pteridium aquilinum</i> .
4	NS 44016 66368	Semi-improved neutral grassland. Bracken dominated.
5	NS 43955 66659	Broadleaved woodland – plantation. Canopy: silver birch, sycamore <i>Acer pseudoplatanus</i> , beech <i>Fagus sylvatica</i> Shrub: holly. Field: ferns, bracken, ground ivy <i>Glechoma hederacea</i> , foxglove <i>Digitalis purpurea</i> .
6	NS 43759 66444	Marshy grassland. <i>Juncus</i> species, Yorkshire fog, nettle, horsetail <i>Equisetum species</i> , canary grass <i>Phalaris canariensis</i> meadowsweet <i>Filipendula ulmaria</i> , red clover <i>Trifolium pratense</i> , thistle species, meadow buttercup, sticky willow, purple leaved willowherb <i>Epilobium</i> sp, dog rose, foxglove.
7	NS 43504 66316	Broadleaved woodland – plantation. Canopy: silver birch. Field: Yorkshire fog, ferns.
8	NS 43769 66264	Broadleaved woodland – plantation. Canopy: birch, rowan <i>Sorbus aucuparia</i> . Shrub: holly, rhododendron. Field: ferns, bracken, honeysuckle.
9	NS 42815 67251	Semi-improved neutral grassland. Creeping buttercup, meadow buttercup, white clover <i>Trifolium repens</i> , Yorkshire fog, ribwort plantain <i>Plantago lanceolata</i> , dock, ragwort <i>Jacobaea vulgaris</i> , hazel <i>Corylus species</i> .
10	NS 42753 67655	Improved neutral grassland. Yorkshire fog, thistle species, meadow buttercup.
11	NS 42567 67559	Broadleaved woodland – plantation. Shrub: Eucalyptus species. Field: meadow buttercup, <i>Juncus</i> species, thistle species, Yorkshire fog, dock, meadowsweet, meadowgrass <i>Poa species</i> , daisy <i>Bellis perennis</i> .
12	NS 41605 67633	Broadleaved woodland – plantation. Shrub: Eucalyptus species. Field: Yorkshire fog, dock, horsetail.
13	NS 41671 67134	Marshy Grassland <i>Juncus</i> species, Yorkshire fog, dock.
14	NS 43295 67141	Arable field. Planted with dominantly <i>Festuca</i> spp. for turf production. Appears heavily managed with fertiliser, targeted herbicides and heavy mowing management.

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Target Note	Grid Reference	Note
15	NS 43499 66972	Swamp/Marshy grassland. Standing water with emergent vegetation surrounding. Dominant <i>Juncus effusus</i> . Submerged grasses suggest this is an ephemeral pond. Within <i>J. effusus</i> is occasional broad-leaved dock <i>Rumex obtusifolius</i> and other grasses.
16	NS 43629 66783	Semi-improved neutral grassland. Common <i>Festuca spp.</i> , occasional reed canary grass <i>Phalaris arundinacea</i> & broad-leaved dock with rare <i>Juncus effusus</i> .
17	NS 43637 66835	Scattered trees. Including beech, ash <i>Fraxinus excelsior</i> , and hawthorn - semi mature trees.
18	NS 43692 66552	Semi-improved neutral grassland. Occasional crested dogs tail <i>Cynosurus cristatus</i> , <i>Juncus effusus</i> , frequent moss sp.
19	NS 43699 66663	Marshy grassland. <i>Juncus effusus</i> dominant. Occasional broad-leaved dock. Rare tufted hairgrass, ribwort plantain. Lots of small depressions with standing water.
20	NS 43785 67179	Arable field. Non-cereal crop with strips of bare ground between grasses. Dominantly <i>Festuca spp.</i> grown for turf production. Heavily managed including herbicide and fertiliser addition with intensive mowing regime. On eastern boundary c. 1m width frequent <i>Deschampsia cespitosa</i> and <i>Poa spp.</i> Rare <i>Rubus fruticosus</i> on and wild raspberry.
21	NS 43804 67320	Hedgerow. Species include hawthorn, blackthorn, <i>Rosa spp.</i> (possibly <i>Rosa canina</i>) and beech. C. 1.5m in height, C. 0.8m in width along entire length. Few gaps with biggest being c. 3m in length.
22	NS 43666 66852	Newly planted hedge. Hawthorn blackthorn, beech.
23	NS 43360 67233	Single species hedge. Beech c. 1.5m in height, 1m. width, c. 0.2m gap between ground and main leafy foliage.

Bat Roost Assessment in Trees

Table F.1: Results from bat roost assessment of trees

Grid Reference	Tree Species	Tree Bat Roost Potential	Roost Assessment
NS4282967181	Dead	Moderate	Rot holes on all limbs along with flaking bark
NS4283567182	Unconfirmed	Moderate	Tree with large tear out on eastern side at 10m
NS4314267206	Ash	Moderate	Rot holes running up eastern branch, tear out at 6m on south eastern side
NS4315867204	Ash	Low	Broken limbs at crown, tear out at 4m on south eastern limb, flaking bark, tear out at 6m on south western limb
NS4316967210	Sycamore	Low	Butt rot on south east face with small hole going up
NS4315667261	Sycamore	Low	4 rot holes going up south eastern side
NS4315267281	Ash	Moderate	2 rot holes on south eastern limb, 2 rot holes on western limb
NS4314967296	Ash	Low	2 tear outs on south eastern side, rot hole on south side at 6m
NS4314467320	Dead	Moderate	Numerous tear outs on all limbs with possible rot holes, flaking bark
NS4313267348	Sycamore	Low	Tear out in canopy, branch fallen but still hanging in tree with tear out section, rot hole on south west side at 4m
NS4312667361	Sycamore	Low	Loose bark, dead limbs and tear outs all over
NS4265867388	Sycamore	Low	Rot hole going down at 2m on eastern side, birds nest present.
NS4241367686	Ash	Low	Rot holes south side at 8m, tear out south side at 6m, flaking bark on trunk at 9m, large butt rot hole at base
NS4244667704	Ash	Low	Butt rot on south east side of trunk
NS4248667706	2x Ash	Moderate	2 trees with tear outs on south eastern sides
NS4245867714	Ash	Moderate	Tear out and rot hole up south side, large tear out on eastern side near base, tear out north side at 6m
NS4249467730	Unconfirmed	Low	Loose bark on limbs, rot hole south side at 5m
NS4220767931	Beech	Low	Butt rot going up south west from base
NS4219867951	Unconfirmed	Low	Rot holes and tear out North side at 4m
NS4252467071	Alder	Low	Rot holes running up trunk on south side, possible hollow branch on western side
NS4168367490	Oak	Moderate	Rot hole at 4m on eastern side, tear outs near top
NS4169367457	Oak	Low	Branch tear out at 6m on eastern side, stripped bark on main stem at 6m
NS4171067402	Dead	Low	Flaking bark, Tear outs on western side at 5m and in canopy
NS4169167383	Oak	Moderate	Tear out / dead limbs on south side, rot hole on south side of eastern limb
NS4167967370	Oak	Low	Small tear out on south eastern limb at 8m
NS4164867288	Oak	Low	Tear out at 5m on western side, dead branches at 8m on south and western sides
NS4165067234	Oak	Moderate	Rot holes and tear outs at 8m on south eastern side
NS4171266999	Unconfirmed	Moderate	Tear out on southern side at 4m, South eastern side at 8m
NS4173367005	Unconfirmed	Low	Tear out north eastern side at 5m, flaking bark
NS4176766954	Unconfirmed	Moderate	Butt rot on western side

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Grid Reference	Tree Species	Tree Bat Roost Potential	Roost Assessment
NS4394966356	Silver Birch	Low	Butt rot on Eastern side at 1.5m, 1 sealed, 1 hole
NS4394166361	Silver Birch	Low	Flaking bark on Eastern side at 1m
NS4348366606	Unconfirmed	High	Large tree with butt rot/ tear out on Eastern side at 8m, rot hole under Eastern tear out, 3 rot holes on western limbs at 8m, 2 rot holes on Southern limb at 6m
NS4349366619	Unconfirmed	High	2 rot holes on Northern Side at 5m, rot hole on South Eastern side at 6m
NS4356066571	Oak	Low	Hole on limb on Southern side at 8m
NS4374866538	Unconfirmed	Moderate	Rot holes on all sides and most limbs
NS4380966587	Ash	Moderate	Butt rot leads right up inside of tree and out top, hole on northern side at 4m
NS4390266648	Dead	Moderate	Hollow dead tree, rot holes bottom and top, possibly also suitable for bird nesting.
NS4404766598	Silver Birch	Low	Broken limb on northern side at 2m, hole going down.
NS4388066828	Oak	Moderate	Veteran Quercus sp. tree rot hole in split limb. One hole possibly goes up into branch (cannot be confirmed from the ground) c. 20cm wide going up into branch. Hole within trunk leading up into tree c 20cm width leading up into trunk. Crevice under bark on eastern side of tree.
NS4298367076	Ash	Low	Ash tree c. 20m in height. Ivy coverage - not very dense.
NS4360166855	Lime	Moderate	Three small knot/rot holes in trunk going c. 20cm diameter up into trunk on southern side.
NS4389966828	Ash	Moderate	Ash tree c. 15m in height. Rotten limb with holes.
NS4380166812	Ash	Low	Ash tree, mature c 15m height, split and crevice in broken limb.
NS4369766790	Ash	Low	Veteran ash tree c. 15m in height split in branch with rot, but potentially not always a watertight space.
NS4387967131	Unknown	Low	Potential roost features include heavy ivy coverage. Five trees of unknown species in stand, all low potential.
NS4386667156	Ash	Moderate	Ash tree with lifted bark suitable for a small number of bats.