

APPENDIX 9.2
PRELIMINARY ECOLOGICAL APPRAISAL

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(PRELIMINARY ECOLOGICAL APPRAISAL)
TO
CHAPTER 9 OF THE ENVIRONMENTAL STATEMENT

ALLESTON SOLAR FARM, PEMBROKESHIRE

carried out by



commissioned by

ALLESTON CLEAN ENERGY LIMITED

JULY 2024



Preliminary Ecological Appraisal & Ecological Constraints and Opportunities Plan

Alleston Farm, Pembroke (Central OS Grid Reference: SN 0055000)

PEA reports are aimed at quickly and concisely communicating the findings of initial ecological survey work completed on sites so that key ecological opportunities and constraints to the planning process are appropriately considered within the design and planning process. The constraints identified may have an influence over the time required to complete the baseline ecological surveys to inform a planning application and may also inform the site layout and requirements for ecological mitigation within the site. Opportunities for incorporating mitigation habitat and ecological enhancement measures within the design are also most easily achieved when considered at an early stage. This document is not prepared for direct submission to the local authority but rather for circulation amongst key members of the design team so that ecological requirements might be adequately considered.

A Preliminary Ecological Appraisal (PEA) report for the Site was previously prepared by BSG Ecology in February / March 2021 (Appendix B refers). This document has been produced by Clarkson and Woods Ltd. on behalf of Statkraft to provide an update to the initial PEA report and to outline the ecological constraints and opportunities for incorporating biodiversity enhancements into future development proposals identified at Alleston Farm. Note that this document aims to provide design and planning advice, and it is not intended to be submitted with a planning application to develop the Site. However, recommendations have been provided below with a view to support and enhance any future applications. This report should be read alongside the PEA report prepared by BSG Ecology (2021).

Site Survey

Clarkson and Woods Ltd. were commissioned by Statkraft to complete a UK Habitats Survey which was completed on 26th July 2023. **Figure 1** below shows the survey area and **Figure 2** identifies key constraints as well as opportunities to avoid, mitigate and enhance key ecological features. **Table 3** following the Figure provides more detail of issues for consideration.

An updated desk-based assessment has also been completed, which collates information from various sources including Aderyn (local environmental records centre in Wales), MAGIC.gov.uk, National Biodiversity Network and other resources, including Clarkson and Woods' own in-house database. Any records local to the Site which might have a bearing upon the future development identified during this search are also highlighted within this short report.

The survey completed identified a number of further species survey requirements. The details of these, together with the associated time constraints is set out below.



Further Ecological Survey Work

The timeline below shows the further ecological survey work that would be expected to accompany a planning application and to inform suitable mitigation. Many of these surveys are seasonally constrained. Consultation with the LPA's ecologist is advised to agree the survey scope.

Tasks coloured yellow indicate that they have already been undertaken, while those in green are planned for the future.

YEAR	TASK	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023	LPA Consultation (complete)							Yellow	Yellow				
2023	Baseline UKHab Survey and PEA Walkover							Yellow	Yellow				
2023	Bat Static Surveys (complete)							Yellow	Yellow	Yellow	Yellow		
2024	Bat Static Surveys				Green	Green	Green						
2023	Breeding Bird Scoping Surveys					Yellow	Yellow						
2024	Breeding Bird Surveys (x2 additional)			Green	Green								
2023-24	Wintering Bird Scoping Surveys (complete)	Yellow	Yellow									Yellow	Yellow
2024	Wintering Bird Surveys (x2 additional, complete)		Yellow	Yellow									
2024	Otter and Water Vole Survey(s)		Green	Green	Green	Green							
2024	MoRPh Survey of watercourses for BNG		Green	Green	Green	Green	Green						
2023	PEA Report											Green	Green
2024	ES Chapter					Green	Green						



Basemap © Google Earth, 2023

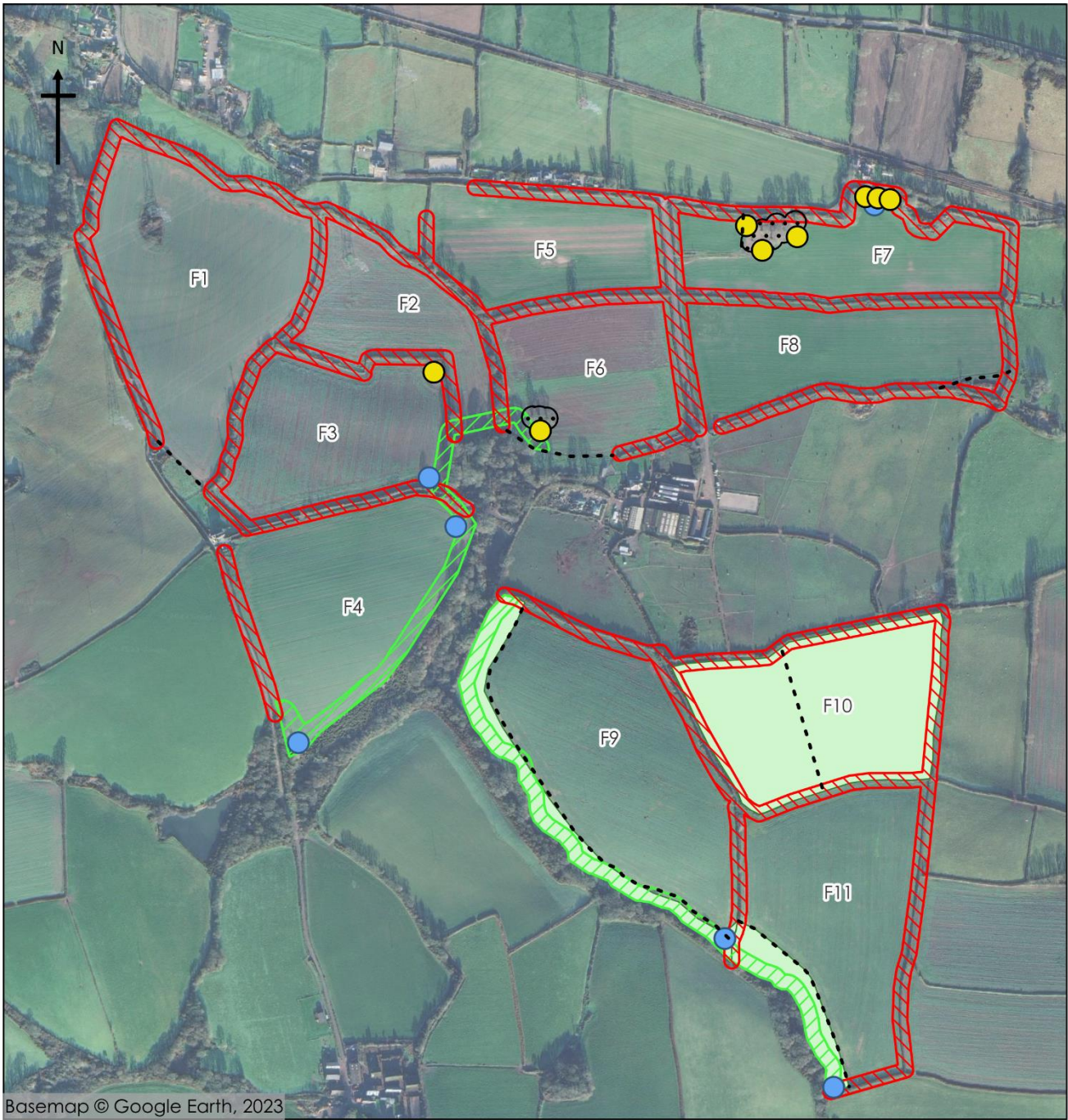
Key: Target Note Existing Large Rural Tree Line of trees Native hedgerow Native hedgerow - associated with bank or ditch Native hedgerow with trees Native hedgerow with trees - associated with bank or ditch Cereal crops Modified grassland Non-cereal crops Bare ground Red Line Boundary			 CLARKSON & WOODS ECOLOGICAL CONSULTANTS
Project Alleston Farm Solar		Title UK Habitats Plan	
Date November 2023		Scale 0 100 200 m 	

Figure 1:UK Habitats Plan



Target Note	Description
1	Green lane comprising bare ground, MG, ruderals and scattered scrub
2	Badger latrine
3	Rubble pile (potential shelter for widespread wildlife, i.e. amphibians & reptiles)
4	Uncropped area on field edge dominated by ruderal species
5	Muck heap & scattered mature ash

Table 1: Target Note Description (Figure 1 refers)



Basemap © Google Earth, 2023

Key: Seek to Retain and Enhance Existing Grassland Habitat Minimum 20m Woodland Buffer Minimum 10m Buffer of Existing Hedgerows / Ditches RPA of Trees (indicative) Potential New Hedge Planting Potential new Tree / Woodland / Orchard Planting Potential New Pond Creation Opportunity	 CLARKSON & WOODS ECOLOGICAL CONSULTANTS	
	Project Alleston Farm Solar	
	Title Ecological Constraints & Opportunities	
	Date November 2023	
	Scale 0 100 200 m 	

Figure 2: ECOP



Desk Study

An updated data search was purchased, pertaining to 2km from the Site boundary, which comprised protected species, Species of Conservation Concern (SoCC) and details of any identified sites of local ecological importance. The desk study presents recent results of relevance to the Site, recorded within the last 20 years.

The designated sites were identified within proximity of the Site are as follows:

- Pembrokeshire Marine Special Area of Conservation (SAC) (1.7km southeast), designated for habitats and species associated with marine environments and not considered further in this report.
- Bristol Channel Approaches SAC (1.9km southeast), designated for population of harbour porpoise *Phocoena phocoena* and not considered further in this report.
- Freshwater East Cliffs to Shrinkle Haven Site of Special Scientific Interest (SSSI) (1.7km southeast), designated for geological features and coastal cliff habitats and species that it supports.
- Stackpole Quay to Trewent Point SSSI (1.9km southeast), designated for geological features and coastal cliff habitats and species that it supports.
- Freshwater East Local Nature Reserve (LNR) (1.2km south), designated for habitats including dune grassland, woodland and reed marsh, which support a good diversity of species.
- Pembroke Mill Ponds LNR and Wildlife Trust Reserve (WTR) (1.0km northwest) designated as priority ponds with developing reed bed and carr, and adjoining woodland, formerly part of a tidal creek.

Further, the Pembrokeshire Bat Sites and Bosherton Lake SAC covers multiple associated SSSI sites that fall within 5km of Alleston Farm, including:

- Stackpole SSSI; 3.9km southwest
- Stackpole Courtyard Flats and Walled Garden SSSI; 3.9km southwest
- Carew Castle SSSI; 4.8km northeast
- Orielson Stable Block and Cellars SSSI; 4.3km west
- Park House Outbuildings SSSI; 3.9km southwest

Clarkson & Woods does not hold any in-house species records within at least 2km of the Site.

Local BAP

The Pembrokeshire Local Biodiversity Action Plan (LBAP) provides a framework within which action plans are coordinated to conserve and enhance biodiversity in Pembrokeshire. The following LBAP habitats and species have been identified as relevant to the Site:

Habitats

- Grassland
- Lowland Farmland
- Woodland
- Freshwater

Species

- Bats
- Farmland Birds
- Reptiles and Amphibians
- Otter
- Brown hairstreak
- Kestrel
- Dormouse
- Invasive Non-native Species



Habitats

A search of priority habitats using the Natural Resources Wales Map Viewer identified areas of broadleaved woodland, as included within the National Forest Inventory and Ancient Woodland Inventory (notably Alleston Wood and adjoining habitat) adjacent to the Site. None fell within the boundary of the Site, however, this is also not exhaustive, and it is noted that hedgerows are listed as a UK BAP Priority Habitat and were recorded within the Site during the initial walkover survey.

Species of Conservation Concern

Badger

Appendix 9.8 to Chapter 9 of the ES chapter refers.

Bats

In excess of 140 field records returned by Aderyn identified common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, Noctule Bat *Nyctalus noctula*, greater horseshoe bat *Rhinolophus ferrumequinum*, lesser horseshoe bat *R. hipposideros*, brown long-eared bat *Plecotus auritus*, myotis species *Myotis spp.* including Natterer's and Daubenton's bats, barbastelle bat *Barbastella barbastellus*, and further unidentified bat species within 2km of the Site. Records comprised animals in flight and roosting in the local area.

The nearest records to the Site originated 0.09km from the Site in 2018 and comprised records of common and soprano pipistrelle and lesser horseshoe bats. It is not indicated whether or not these were roosting bats. The nearest record of confirmed roosts were returned as part of a monitoring project between 1985 and 2010, originating approximately 0.18km (although only to a 4-figure grid ref) from the Site and comprised records of common and soprano pipistrelle and noctule bat roosts. Two records of barbastelle roosting within beech trees were returned as part of licence returns in 2016, both between 0.35-0.37km from the Site.

Birds

Aderyn returned recent records pertaining to 63 species within 1km of the Site, listed in Table 2. A further 20 species were recorded between 1-2km of the Site. Those species listed under Section 7 of the Environment (Wales) Act 2016 are highlighted in **bold**, those protected from disturbance when nesting under Schedule 1 of the Wildlife & Countryside Act (WCA) are underlined, and those recognised as Red or Amber listed species of conservation concern by the British Trust for Ornithology are also highlighted by colour.

Clarkson & Woods holds records for blue tit *Cyanistes caeruleus*, bullfinch, buzzard *Buteo buteo*, goldfinch *Carduelis carduelis*, reed bunting, swift, swallow, robin *Erithacus rubecula*, and wren *Troglodytes troglodytes* originating in 2021 1.9km northwest of the Site.

Table 2: Bird Species Records Returned within 1km of the Site

Species	No. of Records	Distance of Nearest Record	Year of Most Recent Record
Arctic Skua <i>Stercorarius parasiticus</i>	2	2.0km	2013
Barn owl <i>Tyto alba</i>	<u>5</u>	<u>0.4km</u>	<u>2009</u>
Bar-tailed Godwit <i>Limosa lapponica</i>	1	1.5km	2012
<u>Bittern <i>Botaurus stellaris</i></u>	<u>2</u>	<u>0.8km</u>	<u>2012</u>
Black-headed gull <i>Chroicocephalus ridibundus</i>	8	0.5km	2021
Black Redstart <i>Phoenicurus ochruros</i>	<u>1</u>	<u>1.5km</u>	<u>2019</u>
<u>Black-tailed godwit</u>	<u>10+</u>	<u>0.8km</u>	<u>2021</u>
Black Tern <i>Chlidonias niger</i>	<u>2</u>	<u>1.5km</u>	<u>2010</u>
Black-throated Diver <i>Gavia arctica</i>	1	2.0km	2013
Bullfinch <i>Pyrrhula pyrrhula</i>	10+	0.1km	2018
<u>Cetti's warbler <i>Cettia cetti</i></u>	<u>10+</u>	<u>0.8km</u>	<u>2021</u>
<u>Chough <i>Pyrrhacorax pyrrhacorax</i></u>	<u>5</u>	<u>0.4km</u>	<u>2021</u>
Common Gull <i>Larus canus</i>	10+	0.8km	2021
Common Sandpiper <i>Actitis hypoleucos</i>	7	0.8km	2018
Coot <i>Fulica atra</i>	10+	0.8km	2021



Species	No. of Records	Distance of Nearest Record	Year of Most Recent Record
Cormorant <i>Phalacrocorax carbo</i>	10+	0.8km	2021
Crossbill <i>Loxia curvirostra</i>	<u>1</u>	<u>1.2km</u>	<u>2005</u>
Curlew <i>Numenius arquata</i>	5	0.8km	2020
Curlew Sandpiper <i>Calidris ferruginea</i>	1	0.9km	2010
Dunnock <i>Prunella modularis</i>	10+	0.4km	2021
Dunlin <i>Calidris alpina</i>	7	0.5km	2020
Fieldfare <i>Turdus pilaris</i>	<u>10+</u>	<u>0.5km</u>	<u>2021</u>
Firecrest <i>Regulus ignicapilla</i>	<u>8</u>	<u>0.5km</u>	<u>2018</u>
Grasshopper Warbler <i>Locustella naevia</i>	2	0.8km	2004
Great Black-backed Gull <i>Larus marinus</i>	5	0.8km	2021
Great Northern Diver <i>Gavia immer</i>	<u>1</u>	<u>2.0km</u>	<u>2019</u>
Greenfinch <i>Chloris chloris</i>	10+	0.4km	2021
Green Sandpiper <i>Tringa ochropus</i>	<u>10+</u>	<u>1.0km</u>	<u>2012</u>
Greenshank <i>Tringa nebularia</i>	<u>10+</u>	<u>0.8km</u>	<u>2021</u>
Grey Heron <i>Ardea cinerea</i>	10+	0.7km	2021
Grey Wagtail <i>Motacilla cinerea</i>	10+	0.4km	2021
Goldcrest <i>Regulus regulus</i>	10+	0.4km	2020
Goldeneye <i>Bucephala clangula</i>	10+	0.8km	2018
Goshawk <i>Accipiter gentilis</i>	<u>2</u>	<u>1.2km</u>	<u>2021</u>
Herring Gull <i>Larus argentatus</i>	10+	0.4km	2021
House Sparrow <i>Passer domesticus</i>	10+	0.4km	2021
Kestrel <i>Falco tinnunculus</i>	5	2.0km	2020
Kingfisher <i>Alcedo atthis</i>	10+	0.8km	2021
Knot <i>Calidris canutus</i>	2	0.8km	2018
Lapwing <i>Vanellus vanellus</i>	6	0.8km	2020
Lesser Black-backed Gull <i>Larus fuscus</i>	10+	0.4km	2021
Lesser Spotted Woodpecker <i>Dryobates minor</i>	1	0.5km	2007
Linnet <i>Linaria cannabina</i>	10+	0.4km	2019
Long-tailed Duck <i>Clangula hyemalis</i>	<u>4</u>	<u>1.5km</u>	<u>2019</u>
Long-tailed Tit <i>Aegithalos caudatus</i>	10+	0.4km	2021
Mallard <i>Anas platyrhynchos</i>	10+	0.4km	2021
Marsh Tit <i>Poecile palustris</i>	7	0.8km	2018
Meadow Pipit <i>Anthus pratensis</i>	10+	0.4km	2019
Mediterranean Gull	<u>4</u>	<u>1.1km</u>	<u>2013</u>
Mistle Thrush <i>Turdus viscivorus</i>	10+	0.4km	2021
Oystercatcher <i>Haematopus ostralegus</i>	2	0.8km	2018
Peregrine <i>Falco peregrinus</i>	<u>5</u>	<u>1.4km</u>	<u>2018</u>
Pochard <i>Aythya ferina</i>	10+	0.8km	2019
Red-breasted Merganser <i>Mergus serrator</i>	3	0.8km	2011
Red Kite <i>Milvus milvus</i>	<u>4</u>	<u>0.5km</u>	<u>2021</u>
Redshank <i>Tringa totanus</i>	10+	0.8km	2021
Redwing <i>Turdus iliacus</i>	<u>10+</u>	<u>0.4km</u>	<u>2021</u>
Reed Bunting <i>Emberiza schoeniclus</i>	10+	0.8km	2017
Sanderling <i>Calidris alba</i>	2	2.0km	2013
Sand Martin <i>Riparia riparia</i>	10+	0.9km	2019
Sandwich Tern <i>Thalasseus sandvicensis</i>	2	2.0km	2013
Scaup <i>Aythya marila</i>	<u>10+</u>	<u>0.8km</u>	<u>2016</u>
Shag <i>Gulosus aristotelis</i>	4	1.1km	2021
Shelduck <i>Tadorna tadorna</i>	10	0.8km	2019
Shoveler <i>Spatula clypeata</i>	10+	0.8km	2021
Skylark <i>Alauda arvensis</i>	10+	0.4km	2018
Snipe <i>Gallinago gallinago</i>	3	0.8km	2021
Song Thrush <i>Turdus philomelos</i>	10+	0.5km	2021
Spotted Flycatcher <i>Muscicapa striata</i>	4	0.4km	2009
Spotted Redshank <i>Tringa erythropus</i>	10	1.5km	2019
Starling <i>Sturnus vulgaris</i>	10+	0.4km	2021



Species	No. of Records	Distance of Nearest Record	Year of Most Recent Record
Song Sparrow <i>Saxicola rubicola</i>	2	1.7km	2020
Swallow <i>Hirundo rustica</i>	10+	0.1km	2021
Swift <i>Apus apus</i>	10+	0.8km	2021
Teal <i>Anas crecca</i>	10+	0.8km	2021
Tree Pipit <i>Anthus trivialis</i>	2	1.9km	2019
Tufted Duck <i>Aythya fuligula</i>	10+	0.8km	2020
Whimbrel <i>Numenius phaeopus</i>	5	1.1km	2018
Whitethroat <i>Curruca communis</i>	10+	0.4km	2019
Wigeon <i>Mareca penelope</i>	3	0.8km	2021
Willow Warbler <i>Phylloscopus trochilus</i>	10	0.4km	2019
Woodcock <i>Scolopax rusticola</i>	10	0.4km	2021
Yellowhammer <i>Emberiza citrinella</i>	10+	0.4km	2021

Amphibians & Reptiles

Thirty records of reptiles within 2km of the Site were returned during the desk study, comprising common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, and grass snake *Natrix helvetica*. Adder *Vipera berus*, were also present within the data (8 records), although it should be noted that these were all generally associated with the nearby beach and dune system at Freshwater East.

Twenty-two records of amphibians were returned from Aderyn, which comprised common frog *Rana temporaria*, common toad *Bufo bufo*, and palmate newt *Lissotriton helveticus* were returned within 2km of the Site.

Dormouse

No records of dormice *Muscardinus avellanarius* were returned within 2km of the Site and the species is sparsely distributed within West Wales; they may nonetheless be present in the Site's hedgerow network.

Otter & Water Vole

No records of water vole were returned within 2km of the Site and, although the species is present in the wider area, records are sparsely distributed.

Twenty-six records of otter were returned within 2km of the Site.

Invertebrates

The following notable invertebrate species (with distance of nearest record and year of most recent record) were returned by Aderyn within the past 20 years and within 1km of the Site:

- Buff ermine *Spilosoma luteum* (UK BAP, Sect.7 Environment (Wales) Act, LBAP); 0.45km 2021
- Blood-vein *Timandra comae* (UK BAP, Sect.7, LBAP); 0.45km 2021
- Beaded Chestnut *Agrochola lychnidis* (Sect.7, LBAP); 0.45km 2021
- Crescent *Helotropha leucostigma* (Sect.7); 0.45km 2021
- Dusky brocade *Apamea remissa* (Sect.7, LBAP); 0.45km 2021
- Dusky thorn *Ennomos fuscantaria* (Sect.7, LBAP); 0.45km 2021
- Green-brindled crescent *Allophyes oxyacanthae* (Sect.7, LBAP); 0.45km 2021
- Rosy rustic *Hydraecia micacea* (Sect.7, LBAP); 0.45km 2021
- Rustic *Hoplodrina blanda* (Sect.7, LBAP); 0.45km 2021
- Sallow *Cirrhia icteritia* (Sect.7, LBAP); 0.45km 2021
- Small phoenix *Ecliptopera silaceata* (Sect.7, LBAP); 0.45km 2021
- Spinach *Eulithis mellinata* (Sect.7, LBAP); 0.45km 2021
- White ermine *Spilosoma lubricipeda* (Sect.7, UK BAP, LBAP); 0.56km 2006
- Small square-spot *Diarsia rubi* (Sect.7, LBAP); 0.71km 2018
- August thorn *Ennomos quercinaria* (Sect.7, LBAP); 0.73km 2020
- Autumnal rustic *Eugnorisma glareosa* (Sect.7, LBAP); 0.73km 2016
- Broom *Ceramica pisi* (Sect.7, LBAP); 0.73km 2010
- Centre-barred sallow *Atethmia centrargo* (Sect.7, LBAP); 0.73km 2004
- Lackey *Malacosoma neustria* (Sect.7, UK BAP, LBAP); 0.73km 2013



- Minor Shoulder-knot *Brachylomia viminalis* (Sect.7, LBAP); 0.73km 2005
- Sword-grass *Xylena exsoleta* (UK BAP); 0.73km 2008
- Oak Hook-tip *Watsonalla binaria* (UK BAP, Sect.7, LBAP); 0.73km 2011
- Ghost Moth *Hepialus humuli* (Sect.7, UK BAP, LBAP); 0.73km 2013
- Garden Tiger *Arctia caja* (Priority Species); 0.73km 2011
- Dot moth *Melanchnra persicariae* (Sect.7, UK BAP, LBAP); 0.73km 2021
- Knot Grass *Acronicta rumicis* (Sect.7, LBAP); 0.73km 2013
- Grass Rivulet *Perizoma albulata* (UK BAP); 0.73km 2004
- Mottled rustic *Caradrina Morpheus* (Sect.7, LBAP); 0.73km 2019
- Cinnabar *Tyria jacobaeae* (UK BAP, Sect.7, LBAP); 0.73km 2013
- Wall brown *Lasiommata megera* (UK BAP, Sect.7, LBAP), 0.74km 2005
- Garden tiger *Arctia caja* (Sect.7, UK BAP); 0.74km 2013
- Small emerald *Hemistola chrysoprasaria* (Sect.7, UK BAP, LBAP); 0.87km 2011
- Flounced Chestnut *Anchoscelis helvola* (Sect.7, LBAP); 0.87km 2011
- White-line dart *Euxoa tritici* (Sect.7, LBAP); 0.87km 2011
- White-letter hairstreak *Satyrion w-album* (UK BAP, Sect.7, LBAP), 0.9km 2011
- Small heath *Coenonympha pamphilus* (UK BAP, Sect.7), 0.74km 2007

Flowering Plants

Four records of Bluebell *Hyacinthoides non-scripta* were returned within approx. 2km of the Site and are considered potentially relevant given the proximity of mature woodland to the Site, although the nearest record originated 1.2km from the Site. None were recorded during the survey.

Other Species of Conservation Concern

Twenty-two records of hedgehog *Erinaceus europaeus* were returned within the search area and habitats on site may support foraging for this species and movement around the wider landscape with the nearest approximately 0.5km from the Site and most recent record occurring in 2022.

Two records of polecat *Mustela putorius* were returned, originating in 2013 (0.9km from Site) and 2018 (1.9km).

The following WCA Schedule 9 species records were returned within 2km and may potentially occur within the Site:

- Himalayan Balsam *Impatiens glandulifera* (approximately 1km from site, most recently in 2020)
- Japanese Knotweed *Fallopia japonica* (approximately 0.7km from site, most recently in 2017)

Clarkson & Woods holds a record for Japanese knotweed, originating in 2021 1.9km northwest of the Site.



Table 3: Potential Constraints and Opportunities Related to Development of Site

Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Designated Sites		
Freshwater East Cliffs to Shrinkle Haven SSSI; Stackpole Quay to Trewent Point SSSI; Freshwater East LNR; Pembroke Mill Ponds LNR & WTR	<ul style="list-style-type: none"> Unlikely to cause constraint to development given a lack of functionally connected habitat to the Site. 	<ul style="list-style-type: none"> Ensure no impacts arise during construction through lighting, dust, noise etc. (e.g. through Construction Environmental Management Plan (CEMP)).
Pembrokeshire Bat Sites and Bosherton Lake Special Area of Conservation (SAC) and North Pembrokeshire Woodlands SAC	<ul style="list-style-type: none"> The Pembrokeshire Bat Sites and Bosherton Lake SAC management plan lists Greater horseshoe and Lesser horseshoe bats as qualifying features. Both species have been recorded within site during initial bat surveys undertaken by C&W, with significant numbers of passes attributable to greater horseshoe bats. Barbastelle also recorded during C&W surveys to date, for which North Pembrokeshire Woodlands SAC is partially designated (>30km north of site). Site provides habitats which may support otter (a qualifying feature of the Pembrokeshire Bat Sites and Bosherton Lake SAC designation). It is likely that an HRA Test of Likely Significant Effect will be required by the LPA to examine the possibility of impacts on the designated bat and otter populations owing to the site's proximity.; it may be necessary to complete a draft or shadow HRA document on their behalf. This should be determined via consultation. It is considered highly unlikely that the North Pembrokeshire Woodlands SAC would attract an HRA since it is located >30km from the development site and as such is unlikely to represent functionally linked land even for mobile bat species. 	<ul style="list-style-type: none"> Avoid addition of artificial nighttime lighting. Retain and enhance habitats and features of value to bats, such as hedgerows, waterbodies and grassland. Valuable features would be identified through bat survey work (see below). <u>Ensure large, undeveloped buffers (at least 10m of hedgerows and ditches, 20m of ponds and woodland), managed to develop a rough sward, are retained to ensure sufficient commuting corridors are.</u> <u>Landscaping and management to be detailed within a Landscape Ecological Management Plan (LEMP).</u> Create new habitat features where feasible, e.g. hedgerows with trees with large grassland buffers, ponds, and diverse grassland managed for moths and other night-flying insects. <u>Continue undertaking bat activity surveys to ensure a full season (April – October) of data.</u>



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Three SSSI sites within 2km: <ul style="list-style-type: none"> • Freshwater East Cliffs to Skrinkle Haven • Stackpole Quay to Trewent Point • Milford Haven Waterway 	<ul style="list-style-type: none"> • Unlikely to cause constraint to development, although the design will need to ensure no adverse impacts result from proposals. 	<ul style="list-style-type: none"> • Ensure no impacts arise during construction through lighting, dust, noise etc. (e.g. through Construction Environmental Management Plan (CEMP)).
Habitats		
Woodland (Alleston Wood adjacent to redline boundary)	<ul style="list-style-type: none"> • Priority habitat. • Likely to provide important roosting opportunity, flight corridor and foraging habitat for bats, particularly those associated with the SAC. • Potential to damage trees / roots adjacent to Site through construction activities. 	<ul style="list-style-type: none"> • The design will need to take into account root protection zones in accordance with BS 5837: Trees in relation to design, demolition and construction. • <u>Apply undeveloped buffer of at least 20m to priority woodland edge throughout construction.</u> • Ensure no impacts on adjacent habitats arise during construction through implementation of CEMP.
Trees	<ul style="list-style-type: none"> • Mature trees likely to be important landscape and ecology features and contribute to green corridors. Some potential veteran / ancient trees present within boundary features. • TPO trees known around Site. • Trees / roots may be damaged during construction activities. 	<ul style="list-style-type: none"> • Retain mature trees. • The design will need to take into account root protection zones in accordance with BS 5837: Trees in relation to design, demolition and construction. • Further survey required for roosting bats where impacts on mature trees cannot be avoided (see 'Bats').



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Hedgerows	<ul style="list-style-type: none"> Hedgerows are a Habitat of Principal Importance and important ecological feature. Potential for direct and accidental damage during construction and operation. 	<ul style="list-style-type: none"> Existing access gaps should be used for access where possible. Creation of any new gaps for should be minimised. Replace any losses with equivalent or greater length. Enhance scheme through new hedgerow planting connecting into existing features. Protect retained hedgerows through construction phase. <u>Hedgerows to be retained and a buffer of at least 10m provided adjacent to the outer edge of the hedgerow.</u> Use directional drilling to pass cabling beneath hedgerows to reduce losses, where possible.
Scrub	<ul style="list-style-type: none"> Discrete areas of dense / scattered scrub observed around site, often associated with boundary features. Likely to provide suitable habitat for range of wildlife, including nesting birds, badger, and widespread amphibians and / or reptiles. Potential for direct and accidental damage during construction. 	<ul style="list-style-type: none"> Retain where possible; replace any losses with equivalent or greater area. Enhance scheme through new scrub planting. Protect retained scrub through construction phase.
Waterbodies	<ul style="list-style-type: none"> Two off-site ponds associated with Alleston Wood immediately adjacent to the site boundary. These ponds are outside the known range of great crested newt. Stream and ditches associated with field boundaries. Potential for direct and indirect impacts during construction as a result of physical damage or run-off and pollution. 	<ul style="list-style-type: none"> <u>Protect all ponds and watercourses through retention of buffer of at least 10m throughout construction and operation.</u> Landscaping should seek to enhance buffer habitat adjacent to waterbodies by ensuring rough grassland and diverse marginal vegetation. Potential to create new waterbodies within scheme design. <u>Modular River Physical (MoRPh) survey required of watercourses within 10m of development boundary to inform BNG assessment.</u>



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Arable / Crops	<ul style="list-style-type: none"> • Lowland Farmland is local priority habitat, which includes traditional field boundaries, arable field margins and traditional orchards. • Arable land (sown with potatoes / maize at time of survey) of low ecological value and direct loss of this habitat likely insignificant. • Used by low numbers of ground nesting birds, including skylark, in spring (see birds below). • Occasional rare arable species including corn spurrey <i>Spergula arvensis</i> recorded within field margins. 	<ul style="list-style-type: none"> • Retain and protect field boundaries and arable margins, some of which contain rare arable species, throughout development. Further botanical survey may be required where margins cannot be retained to confirm absence of rare flora or inform mitigation. • Potential to create valuable priority habitat such as traditional field boundaries (i.e. new hedgerow planting and hedgerow restoration through coppicing or laying, restoration, orchard and woodland creation, earth bank and drystone wall restoration/creation) within development proposals. • Recommend retaining area within redline boundary but outside of array to cultivate annually focusing on spring (preferably) or autumn cultivation for rare arable weeds.
Modified Grassland	<ul style="list-style-type: none"> • F10 comprised pony-grazed pasture, while southern margin of F9 & F11 comprised uncropped MG. • No major constraints, although pasture and tussocky margin may form foraging habitat for horseshoe bats. 	<ul style="list-style-type: none"> • Ensure no impacts to retained habitats, including those outside the Site, by implementing good practice during construction. • Scope to enhance Site with grassland creation/enhancements, for example creation of species-rich grassland buffers adjacent to hedgerows and implementation of sensitive management plan. Potential to retain existing MG field (F10) as mitigation habitat for ground nesting birds (if required), and enhance to achieve ONG. • Ideally, retain steep MG strip within F9 & F11 as rough grass margin (also as buffer for woodland & watercourse).



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Fauna and Flora		
Badger	<ul style="list-style-type: none">• Appendix 9.8 to Chapter 9 of the ES chapter refers.	



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Bats	<ul style="list-style-type: none"> • European Protected Species. At least 8 species recorded within Site following surveys undertaken to date, including nationally rare and light-sensitive species. • Site boundaries (trees, watercourses and hedgerows) likely important commuting / foraging routes, including for bats associated with the SAC. • Horse-grazed pasture likely utilised as grazing habitat for horseshoe bats. • A number of mature trees have potential for bat roosts (Low to High potential). • Any habitat removal or addition of artificial nighttime lighting will be scrutinised by the LPA. 	<ul style="list-style-type: none"> • Bat activity surveys required to understand species assemblage and inform development. This will comprise 10 activity surveys (static detectors only), once per month April – October. Survey scope agreed with LPA Ecologist. • <u>Retain and enhance 'corridors' e.g. hedgerows, tree lines, streams and ditches by providing sufficient buffers (i.e. at least 10m).</u> Create new hedgerow(s), enhance field margins to provide overall benefit for species and mitigate for loss of foraging habitat. • Minimise any gaps created; utilise existing field access routes. • Identify any other key areas for bats, especially those associated with the SAC and ensure adequate mitigation is designed into the scheme, potentially including the retention or removal of any key areas of habitat from the proposed scheme, such as the grazing pasture where high numbers of horseshoe bats are recorded. • Avoid lighting of key areas during construction and operation, this includes internal light spill. • Avoid removal of mature trees wherever possible. Undertake bat roost survey prior to works, if unavoidable, to inform need for EPS licence. • Enhance site with additional roosting opportunities e.g. installation of bat boxes on trees.



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Breeding birds	<ul style="list-style-type: none"> Protected under Wildlife and Countryside Act (WCA) 1981. Potential for offence to be committed by damaging/destroying active birds' nests. Time vegetation clearance to avoid bird breeding season (March – August inclusive) or with a check for active birds' nests prior to vegetation clearance. Site provides a range of habitats suitable for nesting birds within the fields and boundary habitats. 2x scoping surveys undertaken by C&W in 2023; species recorded to date include low numbers of linnet, snipe, greylag goose, whitethroat, bullfinch and other species largely associated with the site's boundary features. 	<ul style="list-style-type: none"> 2x further surveys planned for spring 2024. Retain habitats that provide nesting habitat for birds, including hedgerows, trees and scrub. Applying conservation grazing to unpannelled areas of the Site will allow for foraging opportunities for birds. Provide new nesting opportunities e.g. place nest boxes on retained mature trees. This could include two barn owl boxes (a Local BAP species) as well as boxes for starling and other general bird boxes. Provision of large, grassy buffer strips and beetle banks will boost insect abundance and provide good cover for chicks.
Wintering birds	<ul style="list-style-type: none"> Arable may provide opportunity for wintering birds. Potential for loss of suitable wintering bird habitat as result of proposed development. Scoping surveys were undertaken in Nov/Dec 2023, with 2x further surveys undertaken in Feb 2024. Notable flocks of snipe recorded. Meadow pipit, skylark fieldfare and redwing also recorded. 	<ul style="list-style-type: none"> Four survey visits completed. No further survey is recommended. Mitigation is recommended for displaced snipe which were recorded in moderate numbers within the southernmost two fields. This could involve the maintenance of suitable foraging habitat in undeveloped fields within the estate during the winter. Provision of large grassy buffer strips and beetle banks will boost insect abundance and provide good cover for chicks. Enhancement opportunity to create small, wet features in open, undeveloped grassland, such as wader scrapes, which dry seasonally.



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Widespread Amphibians and Reptiles	<ul style="list-style-type: none"> Protected under WCA 1981; risk of offence being committed (killing / injury of individual animals) during vegetation clearance and groundworks. Data search records comprised multiple records of common frog <i>Rana rana</i>, toad <i>Bufo bufo</i>, palmate newt <i>Lissotriton helveticus</i>, common lizard <i>Zootica vivipara</i>, grass snake <i>Natrix helvetica</i> and slow-worm <i>Anguis fragilis</i>. Habitats largely unsuitable for adder <i>Vipera berus</i>, despite data search records (likely associated with Stackpole SSSI), although presence within boundary features cannot be ruled out. Hedgerow and ditch network may be used for shelter and commuting. Areas of long grass and scrub may be used for shelter and foraging. Ponds likely to provide key habitat. Outside of known range for great crested newt; species considered absent from Site. 	<ul style="list-style-type: none"> Utilise woodland buffer to create habitat for reptiles. Fence areas during construction as receptor area for reptiles. Enhance boundaries of site to increase the value for reptiles e.g. habitat enhancement such as rough grassland adjacent to hedgerows, ponds and log piles. Landscaping should aim to provide suitable replacement habitats for any losses, this could include ponds and rough grassland. Recommend working under a Risk Avoidance Method Statement to avoid impacts on widespread amphibians and reptiles.
Hazel Dormouse	<ul style="list-style-type: none"> European Protected Species. No records within data search, although species is generally under recorded. Likely to be present within mature woodland, trees and hedgerow network, which offer good suitability. Offence may be committed where vegetation removed without licence or working under precautionary methodology. 	<ul style="list-style-type: none"> Retain and protect habitats suitable for dormouse, i.e. trees and hedgerows. It has been assumed that the development will avoid impacts on this species and, therefore avoid the need for an EPS licence from NRW and associated surveys. This approach has been agreed with LPA Ecologist. NB. Surveys will be required to inform EPS mitigation licence where tree and hedgerow removal is not minimised. Likely, a cumulative loss of c.30m could be justified under non-licensed RAMS approach. Employ sensitive working methodology with licensed ecologist present where small areas of vegetation removal required. Hazel planting should be included to benefit this species.



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Otter and Water Vole	<ul style="list-style-type: none"> • Otter and Water vole are protected under the WCA. • Sparse records of water vole in locality, although numerous records of otter within 2km. • The stream running north-south through the centre of the site and adjacent to the southern site boundary offers suitability for otter, although banks appeared generally too shallow for water vole. Ditches running east-west through northern section of the Site were largely unsuitable for otter, and sub-optimal for water vole. 	<ul style="list-style-type: none"> • Ensure no impacts to offsite watercourses, which may support these species, by implementing good practice during construction. • Further survey to assess presence / absence of water vole; ideally, spring 2024. This report will provide further detail on the layout of watercourses, their individual suitability for these species and any records of evidence of presence gathered. • Otter likely to be present within the landscape; any works impacting watercourse must be kept to a minimum and under guidance of ECoW, where unavoidable.
Invertebrates	<ul style="list-style-type: none"> • The Site itself offers limited suitability for invertebrate diversity, however, adjacent habitat is likely to support a greater assemblage. • Initial survey recorded common species including blue-tailed damselfly <i>Ischnura elegans</i> and red-tailed bumblebee <i>Bombus lapidaries</i>. • The removal of intensely managed arable is likely to benefit invertebrates as a result of the development. 	<ul style="list-style-type: none"> • The creation of less intensively grazed grassland on the lower slopes will benefit a range of invertebrates. • Organic sheep could be employed for grazing of the solar farm to increase the population of dung beetles on the site (also of benefit to horseshoe bats). • Planting should target priority species, such as wych elm, blackthorn, fine grasses, and short perennial vegetation, for example. • Future monitoring of the site could encompass specific surveys of invertebrates.



Ecological Feature	Constraints and Likely Impacts During Construction and Operation.	Recommended Mitigation, Opportunities and Enhancements. Requirements for further survey and <u>recommended buffers</u> are highlighted.
Other Species of Conservation Concern (SoCC)	<ul style="list-style-type: none"> Records of hedgehog and polecat returned, although hedgehog generally associated with nearby residential areas. Species are highly mobile and likely to be present within grassland and hedgerow network on site, and adjacent habitats including the watercourse (polecat). Hedgehog & polecat protected under WCA (1981) and are priority species under Post-2010 Biodiversity Framework. Hedgehog tend to be associated with edges of urban habitats, so may not be found within the site. No invasive non-native species were recorded within the red line boundary, although Japanese knotweed (near TN3 on Fig.1), monbretia and buddleia were recorded adjacent to track within Alleston Wood. 	<ul style="list-style-type: none"> Hedgehog and polecat are unlikely to be negatively impacted by the proposals and the removal of arable may encourage more invertebrates and small mammals as a feeding resource for these species. Any removal of scrub should be undertaken outside of hibernation or under an ecological watching brief to ensure that hedgehog are not present. Future monitoring of the site could encompass specific surveys of these species. It is possible that construction activities will cause the spread on non-native species; caution should be exercised when working near knotweed stands. <i>Ideally engage specialist to treat and manage existing knotweed as an enhancement.</i>

Summary / Conclusion

Results of the desk-based assessment and initial ecological surveys of the Sites have identified a number of sensitivities and ecological considerations relating to the Site. Careful design and implementation of appropriate working methods following the guidance set out in Table 2 will ensure that potential adverse impacts to important ecological features are avoided as far as possible, or suitably mitigated.

Whilst the majority of the Site comprised arable fields of relatively low value for biodiversity, a range of habitats of higher ecological value were recorded, including grassland in the form of grazing pasture, arable field margins, mature trees, and a well-established network of hedgerows and occasional watercourse. Also of relevance to Site design and ecological mitigation are the off-site habitats identified during the desk study, located immediately adjacent the red line boundary, including pond, stream and a broadleaved woodland providing connectivity within the wider landscape.

The habitats within the Site are likely to support a range of protected species, of which several have already been confirmed as present as a result of ecological surveys completed to-date, including badger, bats associated with the nearby SAC and birds (including skylark). Particular consideration during the design process should be given to the maintenance of suitable buffers from key habitats for a number of protected species, particularly for foraging and commuting bats. Depending upon the findings of the surveys, consideration may need to be given to retention or avoidance of habitats of significant importance.



Further species-specific surveys are required to inform the application and provide a more detailed understanding of the use of the Site by protected species. The provision of mitigation habitat for ground-nesting species such as skylark, and for wintering birds will be dependent on further survey. The recommendations within this report have been made with input from the LPA ecologist.

Detailed results of all surveys completed to-date and a full impact assessment, including habitats and species associated with proposed cable routes for the scheme, will be provided in a subsequent ecological report. The findings of the bat activity survey work will also inform the preparation of a Habitats Regulation Assessment on the effects of the development on the integrity of the Pembrokeshire Bat Sites and Bosherton Lake SAC. Consultation will be required with both the local authority and Natural England in the preparation of this assessment.

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Appendix A: Summary of Species Recorded during Wintering Bird Surveys

(excluding birds recorded flying overhead)

Species	No. of Individuals Recorded Across 4 Surveys
Blackbird <i>Turdus merula</i>	101
Blue Tit <i>Cyanistes caeruleus</i>	93
Bullfinch <i>Pyrrhula pyrrhula</i>	15
Buzzard <i>Buteo buteo</i>	3
Carrion Crow <i>Corvus corone</i>	294
Chaffinch <i>Fringilla coelebs</i>	194
Chiffchaff <i>Phyloscopus collybita</i>	1
Collared Dove <i>Streptopelia decaocto</i>	21
Dunnock <i>Prunella modularis</i>	135
Fieldfare <i>Turdus pilaris</i>	43
Goldcrest <i>Regulus regulus</i>	10
Goldfinch <i>Carduelis carduelis</i>	50
Great Black-backed Gull <i>Larus marinus</i>	2
Great-spotted Woodpecker <i>Dendrocopus major</i>	5
Great Tit <i>Parus major</i>	31
Herring Gull <i>Larus argentatus</i>	125
House Sparrow <i>Passer domesticus</i>	55
Jackdaw <i>Corvus monedula</i>	650
Jay <i>Garrulus glandarius</i>	3
Linnet <i>Linaria cannabina</i>	26
Long-tailed Tit <i>Aegithalos caudatus</i>	35
Magpie <i>Pica pica</i>	36
Mallard <i>Anas platyrhynchos</i>	12
Marsh Tit <i>Poecile palustris</i>	4
Meadow Pipit <i>Anthus pratensis</i>	42
Mistle Thrush <i>Turdus viscivorus</i>	4
Nuthatch <i>Sitta europaea</i>	1
Peregrine <i>Falco peregrinus</i>	1
Pheasant <i>Phasianus colchicus</i>	4
Pied Wagtail <i>Motacilla alba</i>	36
Raven <i>Corvus corax</i>	1
Red-legged Partridge <i>Alectorius rufa</i>	2
Redwing <i>Turdus iliacus</i>	176
Reed Warbler <i>Acrocephalus scirpaceus</i>	5
Robin <i>Erithacus rubecula</i>	90
Rook <i>Corvus frugilegus</i>	194
Skylark <i>Alauda arvensis</i>	140
Snipe <i>Gallinago gallinago</i>	60
Song Thrush <i>Turdus philomelos</i>	64
Starling <i>Sturnus vulgaris</i>	157
Teal <i>Anas crecca</i>	10
Treecreeper <i>Certhia familiaris</i>	1
Water Rail <i>Rallus aquaticus</i>	1
Willow Warbler <i>Phylloscopus trochilus</i>	1
Woodpigeon <i>Columba palumbus</i>	120
Wren <i>Troglodytes troglodytes</i>	82
Yellowhammer <i>Emberiza citrinella</i>	6



Appendix B: Alleston Farm PEA (BSG Ecology, 2021)