

# Asland Walks Energy Park

on behalf of The Bretherton Energy Co-Operative and GA Pet Food Partners

## Appendix 1: Ornithology Baseline Report



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|                  |            |   |   |  |

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# CONTENTS

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>INTRODUCTION .....</b>  | <b>1</b>  |
| 1.1      | Background.....  | 1         |
| 1.2      | Site Overview.....   | 1         |
| 1.3      | Legislation.....   | 6         |
| 1.4      | Terminology.....   | 6         |
| <b>2</b> | <b>METHODOLOGY.....</b>  | <b>7</b>  |
| 2.2      | Field Survey Personnel.....  | 7         |
| 2.3      | Target Species.....  | 7         |
| 2.4      | Field Surveys.....   | 8         |
| 2.5      | Limitations .....  | 13        |
| 2.6      | Assessment of Functionally Linked Land .....   | 14        |
| <b>3</b> | <b>YEAR 1 RESULTS.....</b>   | <b>18</b> |
| 3.1      | Habitat Appraisal .....  | 18        |
| 3.2      | Vantage Point Flight Activity Surveys .....  | 18        |
| 3.3      | Non-Breeding Bird Walkover Surveys .....   | 19        |
| 3.4      | Breeding Bird Surveys .....  | 22        |
| <b>4</b> | <b>YEAR 2 RESULTS.....</b>   | <b>24</b> |
| 4.1      | Vantage Point Flight Activity Surveys .....  | 24        |
| 4.2      | Non-Breeding Bird Walkover Surveys .....   | 25        |
| <b>5</b> | <b>SPA AND RAMSAR QUALIFYING SPECIES FUNCTIONALLY LINKED LAND (FLL) ASSESSMENT .....</b> | <b>29</b> |
| 5.1      | Qualifying and Important Component Species.....  | 29        |

|          |   |           |
|----------|---|-----------|
| 5.2      | Waterbird Assemblage.....               | 30        |
| 5.3      | Summary.....                            | 30        |
| <b>6</b> | <b>REGIONAL SPECIES ASSESSMENT.....</b> | <b>31</b> |
| 6.1      | Year 1 and 2 .....                      | 31        |

## **FIGURES**

**Figure 1:** Site Location Plan

**Figure 2:** Statutory Designated Sites With Non-breeding Ornithological Interest

**Figure 3:** VP Flight Activity Survey Plan

**Figure 4:** Non-breeding Walkover Survey Plan

**Figure 5:** Breeding Bird Survey Plan

**Figure 6:** VP Flight Activity Survey Results Plan Year 1 – Geese

**Figure 7:** VP Flight Activity Survey Results Plan Year 1 – Swans

**Figure 8:** VP Flight Activity Survey Results Plan Year 1 – Ducks

**Figure 9:** VP Flight Activity Survey Results Plan Year 1 – Raptors and Owls

**Figure 10:** VP Flight Activity Survey Results Plan Year 1 – Lapwing

**Figure 11:** VP Flight Activity Survey Results Plan Year 1 – Waders and Others (A)

**Figure 12:** VP Flight Activity Survey Results Plan Year 1 – Waders and Others (B)

**Figure 13:** Non-breeding Walkover Survey Results Plan Year 1 – SPA/Ramsar Site Qualifying and Important Assemblage Species

**Figure 14:** Non-breeding Walkover Survey Results Plan Year 1 – Other Target Species (Waterfowl)

**Figure 15:** Non-breeding Walkover Survey Results Plan Year 1 – Other Target Species (Gulls)

**Figure 16:** Breeding Bird Survey Results

**Figure 17:** Confidential Schedule 1 Species Breeding Bird Survey Results (provided separately)

**Figure 18:** VP Flight Activity Survey Results Plan Year 2 – Geese

**Figure 19:** VP Flight Activity Survey Results Plan Year 2 – Swans

**Figure 20:** VP Flight Activity Survey Results Plan Year 2 – Ducks

**Figure 21:** VP Flight Activity Survey Results Plan Year 2 – Raptors and Owls

**Figure 22:** VP Flight Activity Survey Results Plan Year 2 – Lapwing

**Figure 23:** VP Flight Activity Survey Results Plan Year 2 – Waders and Others (A)

**Figure 23:** VP Flight Activity Survey Results Plan Year 2 – Waders and Others (B)

**Figure 24:** Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Listed Qualifying Features (A)

**Figure 26:** Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Listed Qualifying Features (B)

**Figure 27:** Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Waterfowl)

**Figure 28:** Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Gulls)

## **ANNEXES**

**Annex 1:** Species List with Scientific Names and Conservation Status

**Annex 2:** Bird Survey Effort

**Annex 3:** Non-breeding Bird Survey Habitat Appraisal Results

# 1 INTRODUCTION

## 1.1 Background

1.1.1 Avian Ecology Limited (AEL) was commissioned by The Bretherton Energy Co-Operative and GA Pet Food Partners to undertake breeding and non-breeding (wintering and passage) ornithology surveys in relation to the proposed installation of a solar and wind energy park, together with associated infrastructure (the ‘Proposed Development’) on land at Plocks Farm near Bretherton, Lancashire (termed the ‘Site’), as illustrated on **Figure 1**. The main Site central grid reference is located at SD 4607 1933.

1.1.2 Based on NatureScot’s solar farm guidance (NatureScot, 2022<sup>1</sup>) and small-scale wind guidance (NatureScot, 2016<sup>2</sup>), which with regards to bird surveys refers to guidance for onshore wind farms (Scottish Natural Heritage (SNH), 2017<sup>3,4</sup>, as was available at the time of the surveys), the objectives of this report are to:

- provide baseline information on the current breeding and non-breeding ornithological features within the Site and Wider Survey Area (as defined in Sections 1.4 and 2.1 respectively); and,
- identify the presence, abundance and distribution of bird species within the Site and Wider Survey Area (see Section 2.1 for relevant species).

1.1.3 Only common bird species names are referred to within the main text of this report and follow those of the 10<sup>th</sup> Edition of the British Ornithologists’ Union (BOU) official list of species recorded in Great Britain<sup>5</sup>. A summary of all bird species recorded during the surveys or referenced within the text are presented with their scientific names and conservation status in **Annex 1**

## 1.2 Site Overview

1.2.1 The Site, as illustrated by the red-line boundary shown on **Figure 1**, comprises a parcel of arable land bordered by grassland strips with the River Douglas running directly along the eastern Site boundary and the Leeds and Liverpool Canal located along the western Site boundary.

1.2.2 In the wider context, the Site is surrounded by further extensive areas of arable land and scattered areas of woodland which are considered wild bird habitats<sup>6</sup>. Tarleton village is located north-west of the Site (separated by the Leeds and Liverpool Canal), with Bretherton village located along the Proposed Development’s north-eastern cable route.

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<sup>1</sup> NatureScot (2022). General pre-application and scoping advice for solar farms. Available at: <https://www.nature.scot/doc/general-pre-application-and-scoping-advice-solar-farms>.

<sup>2</sup> NatureScot (2016). Assessing the impact of small-scale wind energy proposals on the natural heritage. Available at: <https://www.nature.scot/doc/assessing-impact-small-scale-wind-energy-proposals-natural-heritage#3.+Assessing+the+impact+of+small-scale+wind+energy+developments+>

<sup>3</sup> SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms. March 2017, Version 2. NatureScot, Inverness.

<sup>4</sup> In the absence of English-specific guidance, survey methodologies have made reference to guidance produced by NatureScot (formerly Scottish Natural Heritage, SNH), which is used to inform ornithology surveys for wind farm applications. Note, the surveys were undertaken in accordance with the previous version of the guidance given updated NatureScot guidance has since been published this year (2025), thus after surveys were completed. The updated version of the guidance is NatureScot (2025).

*Recommended bird survey methods to inform impact assessment of onshore windfarms*. Updated: March 2025. Consideration of the previous version of the guidance rather than the 2025 updated version for the approach to surveys is not considered a notable consideration or limitation, with the two versions of the guidance largely comparable.

<sup>5</sup> British Ornithologists’ Union, 2022. The British List: A Checklist of Birds of Britain (10th edition). Ibis 164: 860–910.

<sup>6</sup> Department for Environment, Food & Rural Affairs (DEFRA) and Welsh Government. (2016). *Providing and protecting habitat for wild birds*. Available at: <https://www.gov.uk/guidance/providing-and-protecting-habitat-for-wild-birds#wild-bird-habitat-types> (Accessed: 12<sup>th</sup> May 2025).

1.2.3 On review of the Multi-Agency Geographic Information for the Countryside ('MAGIC')<sup>7</sup> website, the Site's main land parcel is located approximately 4.94 km north-east of Martin Mere Special Protection Area (SPA) and Wetland of International Importance (Ramsar site), as well as 5.08 km south-east of Ribble and Alt Estuaries SPA / SPA Marine Components (GB) and Ramsar site. These sites are designated for a number of qualifying breeding and migratory waterbird species, as well as their broader non-breeding waterbird and/or breeding seabird assemblages. The assemblages themselves comprise a number of Important Component Species which represent substantial proportions of the assemblage(s).

1.2.4 The Site is therefore located within the foraging range for associated SPA goose and swan species (up to 20km and within 5km respectively, based on SNH, 2016<sup>8</sup>) and is considered likely to also be within the foraging ranges of other less widely ranging waterfowl species listed as qualifying features of these SPA and Ramsar sites (see **Table 1.1**). Indeed, Natural England's guidance on functionally linked land (2021)<sup>9</sup>, see further details in Section 2.4, *Criteria for Significance*) identifies that the Site represents suitable foraging habitat for waterbirds whilst Brides *et al.* (2013<sup>10</sup>) also identifies documented pink-footed goose foraging grounds in the vicinity of the Site. Furthermore, a review of Lancashire Environmental Records Network (LERN)<sup>11</sup> data also indicates that the Site is located within a Sensitive Waterbird Area (SWA) and that the Site is situated within a major feeding area for both pink-footed goose and whooper swan.

1.2.5 The only other internationally designated site located within 20 km of the Site is Liverpool Bay / Bae Lerpwel SPA, which is located approximately 13.60 km north-west of the Site. However, as this site is designated for breeding and non-breeding seabirds, the habitats within the Site are considered unsuitable for such species and therefore this SPA is not considered further within the assessment.

1.2.6 Three nationally designated sites listed with ornithological qualifying features are present also within 10 km of the Site.

1.2.7 A summary of the above sites' qualifying features is presented in **Table 1.1**, with their locations illustrated on **Figure 2**.

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<sup>7</sup> <https://magic.defra.gov.uk/> (Accessed 12<sup>th</sup> May 2025)

<sup>8</sup> [www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf](http://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf) (Accessed: 8<sup>th</sup> September 2025)

<sup>9</sup> Bowland Ecology (2021). *Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England. NERC361*. Natural England

<sup>10</sup> Brides, K., Mitchell, C. & Hearn R.D. (2013) *Mapping the distribution of feeding Pink-footed Geese in England*. Wildfowl & Wetlands Trust / Natural England Report, Slimbridge. 43pp.

<sup>11</sup> <https://www.lancashire.gov.uk/lern/> (Accessed: 8th September 2025)

**Table 1.1: Designated sites with avian qualifying interests**

SPA: Special Protection Area; SSSI: Site of Special Scientific Interest; NNR: National Nature Reserve.

| Site Name   | Approximate Distance and Direction from Main Site | Approximate Distance and Direction from Site Cable Routes | Description  |
|---|---|---|--|
| Martin Mere SPA   | 4.94 km south-west                                | 5.87 km south-west  | <p>Qualifying features comprise:</p> <ul style="list-style-type: none"> <li>• Bewick's swan (non-breeding);</li> <li>• Whooper swan (non-breeding);</li> <li>• Pink-footed goose (non-breeding);</li> <li>• Teal (non-breeding);</li> <li>• Pintail (non-breeding); and,</li> <li>• Waterbird assemblage.</li> </ul>   |
| Martin Mere Ramsar site                                   | 4.94 km south-west                                | 5.87 km south-west  | <p>Designated under Ramsar criterion 5 and 6.</p> <p><b>Ramsar criterion 5</b></p> <p>Wintering bird assemblages of international importance.</p> <p><b>Ramsar criterion 6</b></p> <p>Species occurring at international levels of importance:</p> <ul style="list-style-type: none"> <li>• Pink-footed goose (non-breeding);</li> <li>• Bewick's swan (non-breeding);</li> <li>• Whooper swan (non-breeding);</li> <li>• Wigeon (non-breeding); and,</li> <li>• Pintail (non-breeding).</li> </ul>  |
| Ribble and Alt Estuaries SPA / SPA Marine Components (GB) | 5.08 km north-west                                | 4.35 km north-west  | <p>Qualifying features comprise:</p> <ul style="list-style-type: none"> <li>• Bewick's swan (non-breeding);</li> <li>• Whooper swan (non-breeding);</li> <li>• Pink-footed goose (non-breeding);</li> <li>• Shelduck (non-breeding);</li> <li>• Wigeon (non-breeding);</li> <li>• Teal (non-breeding);</li> <li>• Pintail (non-breeding);</li> <li>• Oystercatcher (non-breeding);</li> <li>• Ringed plover (non-breeding);</li> <li>• Golden plover (non-breeding);</li> <li>• Grey plover (non-breeding);</li> <li>• Knot (non-breeding);</li> <li>• Sanderling (non-breeding);</li> <li>• Dunlin (non-breeding);</li> <li>• Ruff (breeding);</li> <li>• Black-tailed godwit (non-breeding);</li> <li>• Bar-tailed godwit (non-breeding);</li> <li>• Redshank (non-breeding);</li> <li>• Lesser black-backed gull (breeding);</li> <li>• Common tern (breeding);</li> <li>• Waterbird assemblage; and,</li> <li>• Seabird assemblage.</li> </ul> |

| Site Name                            | Approximate Distance and Direction from Main Site | Approximate Distance and Direction from Site Cable Routes | Description   |
|--------------------------------------|---|---|---|
| Ribble and Alt Estuaries Ramsar site | 5.08 km north-west                                | 4.35 km north-west  | <p>Designated under Ramsar criterion 2, 4, 5 and 6. Ornithological qualifying species listed under Criterion 5 and 6 comprise:</p> <p><b>Ramsar criterion 5</b></p> <p>Wintering bird assemblages of international importance.</p> <p><b>Ramsar criterion 6</b></p> <p>Species occurring at levels of international importance:</p> <ul style="list-style-type: none"> <li>• Black-tailed godwit (non-breeding);</li> <li>• Redshank (non-breeding);</li> <li>• Dunlin (non-breeding);</li> <li>• Grey plover (non-breeding);</li> <li>• Knot (non-breeding);</li> <li>• Ringed plover (non-breeding);</li> <li>• Sanderling (non-breeding);</li> <li>• Bar-tailed godwit (non-breeding);</li> <li>• Oystercatcher (non-breeding);</li> <li>• Teal (non-breeding);</li> <li>• Wigeon (non-breeding);</li> <li>• Pintail (non-breeding);</li> <li>• Pink-footed goose (non-breeding);</li> <li>• Bewick's swan (non-breeding); and,</li> <li>• Whooper swan (non-breeding).</li> </ul> |
| Ribble Estuary NNR                   | 2.90 km north                                     | 2.08 km north   | A key site in the chain of wetlands which make up the east Atlantic flyway or migration route for wintering wildfowl and waders.  |
| Martin Mere Burscough SSSI           | 4.94 km south-west                                | 5.87 km south-west  | Of international importance are the wintering populations of pink-footed geese, teal and pintail. Supports over 35 species of breeding bird, including important populations of greylag goose, gadwall, mallard and snipe.  |
| Ribble Estuary SSSI                  | 5.08 km north-west                                | 4.35 km north-west  | The estuary is of international importance for the passage and wintering waterfowl it supports.   |
| Newton Marsh SSSI                    | 8.65 km north                                     | 7.80 km north   | Supports spring and winter migrants which use the west coast estuaries of Britain on their route from the breeding grounds in the far north and the wintering grounds further south. The proximity of Newton Marsh to the Ribble Estuary allows an interchange of birds between the two sites. On average Newton Marsh supports in the region of 10,000 birds each winter, but under adverse conditions these numbers can be substantially higher as the marsh provides a valuable source of refuge, protected from high tides and relatively free from disturbance.  |

| Site Name                      | Approximate Distance and Direction from Main Site | Approximate Distance and Direction from Site<br>Cable Routes | Description   |
|--------------------------------|---|--|---|
| Liverpool Bay / Bae Lerpwl SPA | 13.60 km north-west                               | 13.60 north-west   | <p>Qualifying features comprise:</p> <ul style="list-style-type: none"> <li>• Red-throated diver (non-breeding);</li> <li>• Common scoter (non-breeding);</li> <li>• Little gull (non-breeding);</li> <li>• Common tern (breeding);</li> <li>• Little tern (breeding); and,</li> <li>• Waterbird assemblage.</li> </ul> |

## 1.3 Legislation

- 1.3.1 All wild birds, their nests and eggs are, with few exceptions protected under the Wildlife and Countryside Act 1981 (as amended). Birds listed on Schedule 1 of the Wildlife and Countryside Act<sup>12</sup> are afforded further protection making it an offence to disturb, either intentionally or recklessly, any wild bird species listed on Schedule 1 when breeding (including dependant young). This period runs from the commencement of nest building until the young are independent<sup>13</sup>.
- 1.3.2 Additionally, a further 49 bird species are listed as Species of Principal Importance under Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006<sup>14</sup>, and are therefore a material consideration within the planning process.

## 1.4 Terminology

- 1.4.1 The following terminology is used throughout this report and, where applicable, is illustrated in **Figures 3, 4 and 5**:

- Site - the application red line boundary (i.e. the focus of the breeding and winter bird surveys).
- Proposed Development - the physical infrastructure within the Site for the proposed solar and wind energy park, together with associated infrastructure.
- Wider Survey Area - a 600 m 'buffer zone' from the Site (cable routes excluded) incorporated in to the non-breeding bird surveys.
- Wintering Survey Area - the Site (cable routes excluded) and Wider Survey Area incorporated in to the non-breeding walk-over surveys.
- VP Survey Area – areas of the Site (cable routes excluded) and Wider Survey Area incorporated in to the vantage point (VP) flight activity surveys (see limitations for areas not included).
- BBS Survey Area - the Site (cable routes excluded). Additionally extended beyond the Site (500 m buffer) to record the presence of species listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended).
- SPA Qualifying Species – rare and vulnerable species listed under Annex 1 of the EC Wild Birds Directive and migratory species for which SPAs are designated under Article 4.1 and 4.2 respectively of the Directive by virtue of that site regularly supporting a population of European or national importance.
- SPA Waterbird Assemblage – aggregations in excess of 20,000 individual waterbirds for which SPAs are designated under Article 4.2 of the Directive.
- Important Component Species of the SPA Waterfowl Assemblage - species occurring in numbers exceeding 1% of their national populations.

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<sup>12</sup> <https://www.legislation.gov.uk/ukpga/1981/69/schedule/1> (Accessed 12th May 2025)

<sup>13</sup> <https://www.legislation.gov.uk/ukpga/1981/69> (Accessed 8th September 2025)

<sup>14</sup> <https://www.gov.uk/government/publications/habitats-and-species-of-principal-importance-in-england> (Accessed 8th September 2025)

## 2 METHODOLOGY

2.1.1 The following ornithology surveys were completed between September 2022 and July 2023 (Year 1) and September 2023 and May 2024 (Year 2):

- Vantage Point (VP) Flight Activity Surveys;
- Non-breeding Walk-over Surveys; and,
- Breeding Bird Surveys (BBS)s.

## 2.2 Field Survey Personnel

2.2.1 Field surveys were undertaken by experienced ornithologists who have all undertaken similar surveys previously, including several ornithologists who have regularly carried out Common Bird Census (CBC) surveys (as detailed in Gilbert *et al.* (1998)<sup>15</sup>) and Wetland Bird Surveys (WeBS) on behalf of the British Trust for Ornithology (BTO):

- P. Baker (PB);
- Z. Hinchcliffe *MRes* (ZH);
- A. Hulme *BSc (Hons.)* (AH); and,
- K. Love *MSc* (KL).

## 2.3 Target Species

### ***Non-breeding Bird Surveys (VP and Non-breeding Walk-over Surveys)***

2.3.1 Target Species for non-breeding bird surveys consisted of all wetland birds and Annex I<sup>16</sup>/Schedule 1 raptors and owls. Note, non-native species were not considered. Target Species therefore included all those which represent non-breeding qualifying features of designated sites listed in **Table 1.1** (excluding Liverpool Bay / Bae Lerpwl SPA qualifying species).

### ***Breeding Bird Surveys***

2.3.2 Target Species for the breeding bird surveys comprised breeding qualifying features of statutory designated sites (listed in **Table 1.1**; including Liverpool Bay / Bae Lerpwl SPA seabird assemblage species), Red and Amber-listed BoCC (Stanbury *et al.* 2021<sup>17</sup> and Stanbury *et al.* 2024<sup>18</sup>), NERC Act (2006) Section 41 species, Schedule 1 species, Annex I species and species listed in the Lancashire Biodiversity Action Plan (LBAP)<sup>19</sup>.

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<sup>15</sup>Gilbert, G., Gibbons, D.W., & Evans, J. (1998) *Bird Monitoring Methods: A Manual of Techniques for UK Key Species*. The Royal Society for the protection of Birds, Sandy, Bedfordshire, England.

<sup>16</sup> <https://lists.nbnatlas.org/speciesListItem/list/dr2401> (Accessed 12th May 2025)

<sup>17</sup> Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747

<sup>18</sup> Stanbury, A.J., Burns, F., Aebischer, N.J., Baker, H., Balmer, D.E., Brown, A., Dunn, T., Lindley, P., Murphy, M., Noble, D.G. and Owens, R. (2024). The status of the UK's breeding seabirds: an addendum to the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 117: 471-487. <https://britishbirds.co.uk/seabird-bocc5a> (Accessed 12th May 2025)

<sup>19</sup> <https://www.lancashire.gov.uk/lern/services/> (Accessed 29<sup>th</sup> August 2025)

## 2.4 Field Surveys

### ***Vantage Point Flight Activity Surveys***

2.4.1 VP Flight Activity surveys were carried out between September 2022 and May 2023 (Year 1) and October 2023 and May 2024 (Year 2) overlooking the Site to determine the flight activity of Target Species. Such survey periods were designed to incorporate the autumn and spring passage of migrant birds. A single VP, located at SD 46114 18798, gave an extensive area of visibility across the Site (cable routes excluded), as well as areas of the 600 m buffer. The VP location and its viewshed are shown in **Figure 3**.

2.4.2 Survey effort exceeded the minimum recommended survey effort outlined within SNH guidance (2017)<sup>20</sup> i.e. a minimum of 36 hours per VP conducted over the relevant breeding or non-breeding season, as relevant, (or 72 hours over the year).

2.4.3 Each VP Flight Activity survey comprised a 3-hour survey period. Survey times were dispersed throughout the day and were also completed in a range of weather conditions, but always conducive to survey and safe access.

2.4.4 In accordance with SNH guidance (2017), flight lines were mapped for all Target Species passing through the VP Survey Area. Details of species, number of birds, flight height in bands (see below), duration and direction were noted on standardised recording forms and field plans.

2.4.5 The following height bands (HT) were used in the field to record Target Species activity at, below or above collision risk height for subsequent use in the calculation of collision mortality risk (see **Appendix 6**).

- HT1: 0-25m;
- HT2: 25-50m;
- HT3: 50-75m;
- HT4: 75-100m;
- HT5: 100-125m;
- HT6: 125-150m; and,
- HT7: >150m.

2.4.6 The use of multiple survey height bands adopted a precautionary approach to allow for the rotor tip height of potential turbines to range between 100 m to 150 m, thereby aiming to ensure that the upper rotor sweep height of the smallest turbine (100 m tip height) and largest turbine (150 m tip height) was considered. However, since the surveys were conducted, a larger turbine is proposed (see limitations in Section 2.5). The proposed turbine model has a hub height of 110.64 m and a rotor diameter of 138 m (69 m radius). That gives rotor swept heights between approximately 42 m (lowest swept height) to 180 m (highest swept height). Therefore, any flights between HT2 and HT7 are to be regarded as being within the collision risk window and considered 'at-risk'. With the inclusion of birds flying at HT7, the subsequent Collision Risk Modelling (CRM) results can be considered to be over precautionary.

2.4.7 Year 1 survey effort is presented below in **Table 2.1** and Year 2 survey effort is presented in **Table 2.2**. A full breakdown of survey conditions is presented in **Annex 2** and the VP Flight Activity Survey Plan (which includes the viewshed) is presented in **Figure 3**.

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<sup>20</sup> Surveys were based on available guidance at the time, which has since been updated with NatureScot (2025). Recommended bird survey methods to inform impact assessment of onshore windfarms. Available at: <https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms>.

**Table 2.1: Vantage Point survey effort – Year 1**

| Survey Month          | Date       | Surveyor | Start Time (24h) | End Time (24h) | Total VP hours per month |
|-----------------------|------------|----------|------------------|----------------|--------------------------|
| September             | 16/09/2022 | PB       | 11:00            | 14:00          | 12                       |
|                       | 16/09/2022 | PB       | 14:30            | 17:30          |                          |
|                       | 22/09/2022 | PB       | 07:00            | 10:00          |                          |
|                       | 22/09/2022 | PB       | 10:30            | 13:30          |                          |
| October               | 18/10/2022 | PB       | 07:45            | 10:45          | 12                       |
|                       | 18/10/2022 | PB       | 11:15            | 14:15          |                          |
|                       | 26/10/2022 | PB       | 11:30            | 14:30          |                          |
|                       | 26/10/2022 | PB       | 15:00            | 18:00          |                          |
| November              | 10/11/2022 | AH       | 10:40            | 13:40          | 12                       |
|                       | 24/11/2022 | PB       | 09:45            | 12:45          |                          |
|                       | 28/11/2022 | PB       | 10:30            | 13:30          |                          |
|                       | 28/11/2022 | PB       | 14:00            | 17:00          |                          |
| December              | 12/12/2022 | PB       | 08:15            | 11:15          | 9                        |
|                       | 12/12/2022 | PB       | 11:45            | 14:45          |                          |
|                       | 20/12/2022 | PB       | 12:45            | 15:45          |                          |
| January               | 13/01/2023 | PB       | 08:15            | 11:15          | 9                        |
|                       | 31/01/2023 | PB       | 11:00            | 14:00          |                          |
|                       | 31/01/2023 | PB       | 14:30            | 17:30          |                          |
| February              | 16/02/2023 | PB       | 08:15            | 11:15          | 6                        |
|                       | 16/02/2023 | PB       | 11:45            | 14:45          |                          |
| March                 | 23/03/2023 | ZH       | 09:30            | 12:30          | 12                       |
|                       | 23/03/2023 | ZH       | 13:00            | 16:00          |                          |
|                       | 29/03/2023 | KL       | 08:30            | 11:30          |                          |
|                       | 29/03/2023 | KL       | 12:00            | 15:00          |                          |
| April                 | 14/04/2023 | PB       | 08:00            | 11:00          | 12                       |
|                       | 14/04/2023 | PB       | 11:30            | 14:30          |                          |
|                       | 24/04/2023 | ZH       | 08:30            | 11:30          |                          |
|                       | 24/04/2023 | ZH       | 12:15            | 15:15          |                          |
| May                   | 11/05/2023 | ZH       | 09:15            | 12:15          | 12                       |
|                       | 11/05/2023 | ZH       | 12:45            | 15:45          |                          |
|                       | 24/05/2023 | ZH       | 09:20            | 12:20          |                          |
|                       | 24/05/2023 | ZH       | 12:50            | 15:50          |                          |
| <b>Total VP hours</b> |            |          |                  |                | <b>96</b>                |

**Table 2.2: Vantage Point survey effort – Year 2**

| Survey Month          | Date     | Surveyor | Start Time (24h) | End Time (24h) | Total VP hours per month |
|-----------------------|----------|----------|------------------|----------------|--------------------------|
| October               | 18/10/23 | PB       | 11:30            | 14:30          | 6                        |
|                       | 18/10/23 | PB       | 15:00            | 18:00          |                          |
|                       | 25/10/23 | PB       | 08:45            | 11:45          | 6                        |
|                       | 25/10/23 | PB       | 12:15            | 15:15          |                          |
| November              | 07/11/23 | PB       | 07:30            | 10:30          | 6                        |
|                       | 07/11/23 | PB       | 11:00            | 14:00          |                          |
|                       | 22/11/23 | PB       | 08:15            | 11:15          | 6                        |
|                       | 22/11/23 | PB       | 11:45            | 14:45          |                          |
| December              | 14/12/23 | PB       | 08:15            | 11:15          | 6                        |
|                       | 14/12/23 | PB       | 11:45            | 14:45          |                          |
| January               | 23/01/24 | PB       | 08:00            | 11:00          | 6                        |
|                       | 29/01/24 | PB       | 09:00            | 12:00          |                          |
| February              | 19/02/24 | PB       | 08:30            | 11:30          | 6                        |
|                       | 19/02/24 | PB       | 12:00            | 15:00          |                          |
| March                 | 13/03/24 | PB       | 08:45            | 11:45          | 6                        |
|                       | 13/03/24 | PB       | 12:15            | 15:15          |                          |
|                       | 25/03/24 | PB       | 07:45            | 10:45          | 6                        |
|                       | 25/03/24 | PB       | 11:15            | 14:15          |                          |
| April                 | 04/04/24 | PB       | 08:30            | 11:30          | 6                        |
|                       | 04/04/24 | PB       | 12:00            | 15:00          |                          |
|                       | 17/04/24 | PB       | 07:30            | 10:30          | 6                        |
|                       | 17/04/24 | PB       | 11:00            | 14:00          |                          |
| May                   | 20/05/24 | PB       | 09:00            | 12:00          | 6                        |
|                       | 20/05/24 | PB       | 12:30            | 15:30          |                          |
|                       | 31/05/24 | PB       | 07:30            | 10:30          | 6                        |
|                       | 31/05/24 | PB       | 11:00            | 14:00          |                          |
| <b>Total VP hours</b> |          |          |                  |                | <b>78</b>                |

### **Non-breeding Walk-over Surveys**

2.4.8 Non-breeding walk-over surveys were undertaken twice monthly (roughly fortnightly) between September 2022 to March 2023 (Year 1) and September 2023 to March 2024 (Year 2).

2.4.9 The ‘Wintering Survey Area’ comprised of all habitats within the Site (excluding cable routes) and fields within a 600 m buffer surrounding the Site (‘Wider Survey Area’).

2.4.10 The methodology employed comprised ‘walkover’ surveys adopting the ‘look-see’ methodology (Gilbert *et al.* 1998)<sup>28</sup>, with surveyors observing each field within the Wintering Survey Area using

public rights of way (PRoW) and roads where possible, walking the boundaries and stopping at intervals and scanning the fields for Target Species with binoculars.

2.4.11 Suitable habitat comprised open pastoral and arable fields with no or limited disturbance. All fields within the Wintering Survey Area were deemed as potentially suitable habitat. Information relating to habitats (e.g., crops and pasture) and disturbances (e.g., shooting or scarers) was also recorded during each survey visit. Target Species recorded on the adjacent watercourses (Leeds and Liverpool Canal and River Douglas) and beyond the Wintering Survey Area were noted, but excluded from analysis.

2.4.12 Surveys were undertaken during daylight hours and were occasionally started at dawn or ended at dusk to observe the direction taken by any Target Species leaving/arriving at overnight roost sites.

2.4.13 The Site included a single field (Field 1), whilst the Wider Survey Area included Fields 2 to 113 (see **Figure 4**).

2.4.14 **Table 2.3** below presents a summary of the Year 1 survey effort, whilst **Table 2.4** presents the Year 2 survey effort.

**Table 2.3: Walkover survey effort - Year 1**

| Survey Visit | Date       | Surveyor | Sunrise / sunset Time (24h) | Start Time (24h) | End Time (24h) |
|--------------|------------|----------|-----------------------------|------------------|----------------|
| 1            | 14/09/2022 | PB       | 06:43 / 19:28               | 13:00            | 16:00          |
| 2            | 20/09/2022 | PB       | 06:53 / 19:13               | 12:28            | 13:28          |
| 3            | 19/10/2022 | PB       | 07:46 / 18:04               | 11:15            | 14:45          |
| 4            | 27/10/2022 | PB       | 08:01 / 17:47               | 07:40            | 12:40          |
| 5            | 14/11/2022 | PB       | 07:35 / 16:13               | 14:00            | 17:00          |
| 6            | 21/11/2022 | PB       | 07:48 / 16:04               | 07:30            | 11:00          |
| 7            | 07/12/2022 | PB       | 08:13 / 15:50               | 09:50            | 13:15          |
| 8            | 13/12/2022 | PB       | 08:20 / 15:49               | 11:15            | 15:20          |
| 9            | 09/01/2023 | PB       | 08:25 / 16:10               | 08:10            | 12:10          |
| 10           | 23/01/2023 | PB       | 08:11 / 16:34               | 08:00            | 12:10          |
| 11           | 08/02/2023 | PB       | 07:45 / 17:05               | 13:00            | 17:00          |
| 12           | 22/02/2023 | PB       | 07:16 / 17:33               | 08:40            | 13:30          |
| 13           | 06/03/2023 | PB       | 06:48 / 17:56               | 09:00            | 13:15          |
| 14           | 30/03/2023 | PB       | 06:50 / 19:41               | 09:30            | 12:30          |

**Table 2.4: Walkover survey effort - Year 2**

| Survey Visit | Date       | Surveyor | Sunrise / sunset Time (24h) | Start Time (24h) | End Time (24h) |
|--------------|------------|----------|-----------------------------|------------------|----------------|
| 15           | 28/09/2023 | PB       | 07:05 / 18:54               | 07:50            | 12:10          |
| 16           | 17/10/2023 | PB       | 07:40 / 18:09               | 09:00            | 13:25          |
| 17           | 26/10/2023 | PB       | 07:57 / 17:49               | 09:00            | 13:45          |
| 18           | 06/11/2023 | PB       | 07:20 / 16:29               | 10:45            | 14:15          |
| 19           | 16/11/2023 | PB       | 07:39 / 16:12               | 09:25            | 14:40          |
| 20           | 15/12/2023 | PB       | 08:22 / 15:50               | 08:00            | 13:10          |
| 21           | 20/12/2023 | PB       | 08:25 / 15:51               | 08:00            | 12:45          |

| Survey Visit | Date       | Surveyor | Sunrise / sunset Time (24h) | Start Time (24h) | End Time (24h) |
|--------------|------------|----------|-----------------------------|------------------|----------------|
| 22           | 09/01/2024 | PB       | 08:25 / 16:11               | 08:25            | 13:35          |
| 23           | 22/01/2024 | PB       | 08:13 / 16:33               | 08:00            | 13:00          |
| 24           | 12/02/2024 | PB       | 07:37 / 17:14               | 08:00            | 13:50          |
| 25           | 26/02/2024 | PB       | 07:07 / 17:42               | 08:10            | 13:15          |
| 26           | 08/03/2024 | PB       | 06:42 / 18:03               | 07:30            | 13:15          |
| 27           | 21/03/2024 | PB       | 06:10 / 18:27               | 08:00            | 13:20          |

### Breeding Bird Surveys

2.4.15 A programme of breeding bird surveys (BBS) was undertaken between April and July 2023 (inclusive), comprising a series of four staggered survey visits undertaken at least seven days apart. The ‘BBS Survey Area’ comprised all suitable habitats within the Site (cable routes excluded) and extended to include a 500 m buffer to record the presence of species listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) (see **Figure 5**).

2.4.16 The methodology employed was based upon a scaled-down version of the BTO’s CBC technique, as detailed in Gilbert *et al.* (1998)<sup>28</sup>. All bird registrations were recorded on suitably scaled field maps using standard BTO species codes and behaviour notations (such as singing, carrying food, active nest). The approximate locations of bird territories within the Site were determined using standard territory mapping techniques to identify and isolate areas within which birds consistently displayed breeding behaviours (following Gilbert *et al.* 1998)<sup>28</sup>.

2.4.17 All survey visits were carried out between dawn and 11:00hrs and were carried out in conditions conducive for breeding bird surveys (avoiding heavy rain and strong winds).

2.4.18 For the purposes of the assessment, although the estimated number of breeding territories for all species is provided, only the breeding territories of Target Species are mapped, given these are the most relevant species to the assessment.

2.4.19 Records of birds just visiting the Site (e.g. corvids feeding in fields) and birds flying over the Site were also recorded.

2.4.20 A summary of the breeding bird survey effort is presented in **Table 2.5** and detailed survey conditions are presented in **Annex 2**.

**Table 2.5: Breeding Bird Survey Effort**

| Survey visit number | Date       | Start time (24hrs) | End time (24hrs) | Sunrise times (24hrs) |
|---------------------|------------|--------------------|------------------|-----------------------|
| 1                   | 17/04/2023 | 08:10              | 10:20            | 06:06                 |
| 2                   | 09/05/2023 | 07:30              | 10:00            | 05:20                 |
| 3                   | 13/06/2023 | 06:45              | 09:45            | 04:40                 |
| 4                   | 04/07/2023 | 07:50              | 10:25            | 04:47                 |

## 2.5 Limitations

### ***VP Flight Activity Surveys***

- 2.5.1 The flat and low-lying nature of the Site meant that the VP location provided an extensive visual coverage across the Site, including the proposed turbine location and 500 m buffer. However, as can be seen in **Figure 3**, the viewshed did not cover the Wider Survey Area south of the Site, which is not considered to be a substantial limitation.
- 2.5.2 At the time of surveys, the proposed turbine specifications were unconfirmed. As such, surveys were based on a rotor sweep of approximately 35 m (lowest expected rotor swept height) to 150 m (highest expected rotor swept height). However, since the surveys were conducted, a larger turbine is proposed. The proposed turbine has a hub height of 110.64 m and a rotor diameter of 138 m (69 m radius). That gives a rotor sweep of approximately 42 m (lowest swept height) to 180 m (highest swept height). Flights between HT2 and HT7 are therefore regarded as having been within the collision risk window and considered 'at-risk'. Analysis therefore incorporates all flights recorded above 150 m as within the collision risk window, which is an overestimate of birds considered 'at-risk'. The addition of flights above 150 m comprises ten pink-footed goose flights in Year 1 only. Although birds 'at-risk' are not accurately representative of birds flying above 150 m, the data does capture all potential birds within the collision risk window and therefore this is not considered to be a substantial limitation to the assessment.
- 2.5.3 Surveys in Year 1 did not consider lesser black-backed gull, cormorant or mallard to be Target Species, although all three species were treated as Target Species in Year 2. This is not considered to substantially influence the assessment.

### ***Non-breeding Walk-over Surveys***

- 2.5.4 The non-breeding walkover surveys were carried out between September and May in Years 1 and 2 and thus the habitat use and activity of Target Species within the Wintering Survey Area are only considered indicative of that defined period. Although surveys are only a snap-shot, the entire non-breeding period was appropriately covered, so this provides a good indication of activity and usage of the Wintering Survey Area by Target Species.
- 2.5.5 During the non-breeding walkover surveys Fields 59, 61, 62, 64, 65, 67, 90 and 91 within the Wider Survey Area could not be viewed due to limited access in both years. From aerial images many of these fields appeared suitable for waterbirds, comprising arable and pastoral land. These fields only make up a small proportion of the overall suitable fields and so are not considered to be a substantial limitation to the assessment.

### ***Breeding Bird Survey***

- 2.5.6 Surveys in 2023 were conducted in line with current guidance at the time and based on an adapted version of the BTO CBC technique (Gilbert *et al.*, 1998)<sup>28</sup>. Therefore, such surveys only comprised four survey visits, as opposed to six as based on updated Bird Survey & Assessment Steering Group (2023) guidance<sup>21</sup>. As such, surveys also did not include an evening survey and therefore it's possible that the detection probability for potential crepuscular species may have been reduced. However, it is considered that the survey effort is satisfactory in order to determine the breeding species assemblage present within the BBS Survey Area, and that any further potential crepuscular species present would

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<sup>21</sup> Bird Survey & Assessment Steering Group. (2023). Bird Survey Guidelines for assessing ecological impacts, v.1.1.1. <https://birdsurveyguidelines.org> (Accessed: 10<sup>th</sup> September 2025)

likely be associated with field boundary features that are not proposed to be impacted by the Proposed Development.

2.5.7 Updated guidance from the Bird Survey & Assessment Steering Group (2023) also suggests that dawn breeding bird surveys should typically commence within 30 minutes of sunrise and end by 11:00. All visits commenced outside of the recommended start time; however all were concluded prior to 11:00. Although visits did not start within 30 minutes of sunrise, all were conducted during optimal survey times (i.e. between sunrise and 11:00). With the species assemblage for all areas considered to be robustly analysed using data from four visits, it is not considered that the timing of dawn visits will impact the assessment.

2.5.8 Following the 2023 surveys, updated status assessments for 28 species have also been made for breeding seabirds in the UK (Stanbury *et al.* 2024)<sup>31</sup>. This is not considered to be a constraint to the assessment as such species were incorporated into the 2023 survey. Therefore, the survey results comprised no additional species since added that could be considered potentially vulnerable to negative impacts from the Proposed Development.

## 2.6 Assessment of Functionally Linked Land

### Criteria for Significance

2.6.1 For the purposes of this report, the importance of the Wintering Survey Area (the Site and Wider Survey Area) for qualifying species of the nearby Ribble and Alt Estuaries SPA/Ramsar site and Martin Mere SPA/Ramsar site is assessed using functional linkage, based on current Natural England guidance (2021)<sup>9</sup>.

2.6.2 Given the habitats present within the Site and qualifying species present (i.e., seabirds) functional linkage to the Liverpool Bay/ Bae Lerpwl SPA is not assessed.

2.6.3 'Functionally Linked Land' (FLL) is the term used to describe areas of land (or sea) occurring outside a designated site, which are considered important (or necessary) in supporting and/or maintaining the viability of the qualifying features of a European site (i.e. SPA, SAC and/or Ramsar site).

2.6.4 The above report published by Natural England (2021)<sup>9</sup> mapped potential areas of FLL used by waterbirds comprising qualifying features of European sites in the northwest of England, and defined thresholds for the identification of such areas.

2.6.5 The definition of FLL within the report, developed and agreed with Natural England and RSPB, is '*areas of land occurring within 20km<sup>8</sup> of an SPA, that are regularly used by significant number of qualifying bird species*', with:

- a 'significant number' of birds defined as 0.5% of the Great British (GB) population or 1,000 individuals; and,
- 'regular' defined, with reference to Stroud *et al.* (2001)<sup>22</sup>, as when a threshold is met in two thirds of the season for which adequate data is available.

2.6.6 This report determines functional linkage using the same 'regular' definition above; however, a 'significant number' for non-breeding birds is based on a more precautionary count of 1% of the non-breeding SPA or Ramsar site population (based on BTO WeBS data<sup>23</sup>). Therefore, functional linkage for

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<sup>22</sup> Stroud, D.A., Chambers, D., Cook, S., Buxton, N., Fraser, B., Clement, P., Lewis, P., McLean, I., Baker, H. & Whitehead, S. (eds). (2001). *The UK SPA network: its scope and content*. JNCC, Peterborough, p56.

<sup>23</sup> SPA populations estimated from latest 5 year average WeBS counts (2019/20 to 2023/24). Available at: <https://app.bto.org/webs-reporting/numbers.jsp> (Accessed 11th September 2025). The Ribble and Alt Estuaries SPA population combines average 5 year BTO

non-breeding birds is where counts of Component Species (defined below) of the Ribble and Alt Estuaries SPA/Ramsar site and/or Martin Mere SPA/Ramsar site regularly (i.e. over 9 visits in Year 1 and 8 visits in Year 2 per season (66.66%)) exceed 1% of that species' non-breeding SPA population for the Site and/or Wider Survey Area.

2.6.7 Component Species are defined as:

- Non-breeding qualifying species listed on the SPA or Ramsar citation; and,
- Non-breeding waterbird species occurring in numbers exceeding 1% of the national population according to the latest WeBS count (termed Important Component Species).

2.6.8 Component Species are listed in **Table 2.6** below.

**Table 2.6: Non-breeding Qualifying species features and Important Component Species of relevant European Sites**

| European Site(s)                | Qualifying Features   | Important Component Species (excludes qualifying species)   |
|---------------------------------|---|---|
| Martin Mere SPA                 | <ul style="list-style-type: none"> <li>• Bewick's swan (non-breeding);</li> <li>• Whooper swan (non-breeding);</li> <li>• Pink-footed goose (non-breeding);</li> <li>• Teal (non-breeding);</li> <li>• Pintail (non-breeding);</li> </ul>   | None  |
| Martin Mere Ramsar              | <ul style="list-style-type: none"> <li>• Pink-footed goose (non-breeding);</li> <li>• Bewick's swan (non-breeding);</li> <li>• Whooper swan (non-breeding);</li> </ul>  |   |
| Ribble and Alt Estuaries SPA    | <ul style="list-style-type: none"> <li>• Bewick's swan (non-breeding);</li> <li>• Whooper swan (non-breeding);</li> <li>• Pink-footed goose (non-breeding);</li> <li>• Shelduck (non-breeding);</li> <li>• Wigeon (non-breeding);</li> <li>• Teal (non-breeding);</li> <li>• Pintail (non-breeding);</li> <li>• Oystercatcher (non-breeding);</li> <li>• Ringed plover (non-breeding);</li> <li>• Golden plover (non-breeding);</li> <li>• Grey plover (non-breeding);</li> <li>• Knot (non-breeding);</li> <li>• Sanderling (non-breeding);</li> <li>• Dunlin (non-breeding);</li> <li>• Black-tailed godwit (non-breeding);</li> <li>• Bar-tailed godwit (non-breeding);</li> <li>• Redshank (non-breeding);</li> </ul> | <ul style="list-style-type: none"> <li>• Lapwing</li> <li>• Common scoter</li> <li>• Curlew</li> <li>• Cormorant</li> <li>• Shoveler</li> <li>• Avocet</li> <li>• Little egret</li> <li>• Whimbrel</li> </ul> |
| Ribble and Alt Estuaries Ramsar | <ul style="list-style-type: none"> <li>• Black-tailed godwit (non-breeding);</li> <li>• Redshank (non-breeding);</li> <li>• Dunlin (non-breeding);</li> <li>• Grey plover (non-breeding);</li> <li>• Knot (non-breeding);</li> <li>• Ringed plover (non-breeding);</li> <li>• Sanderling (non-breeding);</li> <li>• Bar-tailed godwit (non-breeding);</li> <li>• Oystercatcher (non-breeding);</li> <li>• Teal (non-breeding);</li> </ul>   |   |

data for the Ribble Estuary and Alt Estuary sites, whilst the Martin Mere SPA population is based on 5 year average BTO data at the WWT Martin Mere site.

| European Site(s)               | Qualifying Features  | Important Component Species (excludes qualifying species) |
|--------------------------------|--|---|
|                                | <ul style="list-style-type: none"> <li>• Wigeon (non-breeding);</li> <li>• Pintail (non-breeding);</li> <li>• Pink-footed goose (non-breeding);</li> <li>• Bewick's swan (non-breeding); and,</li> <li>• Whooper swan (non-breeding).</li> </ul> |   |
| Liverpool Bay / Bae Lerpwl SPA | <ul style="list-style-type: none"> <li>• Red-throated diver (non-breeding);</li> <li>• Common scoter (non-breeding);</li> <li>• Little gull (non-breeding);</li> </ul>   | None  |

2.6.9 For the purposes of this report, functional linkage for any of the Important Component Species of the SPA/Ramsar site's waterbird assemblages was determined where at least one of the following thresholds were 'regularly' reached for the Wintering Survey Area as a whole:

- 1%, or more of an Important Component Species' SPA population; or,
- Cumulatively over 2,000 individuals of an Important Component Species.

2.6.10 The assessment of functional linkage was also extended to the broader waterbird assemblages of the Ribble and Alt Estuaries SPA/Ramsar site and Martin Mere SPA/Ramsar site. The threshold for the waterbird assemblage was considered to have been met when over 2,000 individual waterbirds were observed.

2.6.11 The breeding seabird assemblage of the Ribble and Alt Estuaries SPA/Ramsar site, and the individual Important Component Species thereof are not considered here as the surveys undertaken to inform the assessment of functional linkage only covered the non-breeding season.

#### Regional assessment

2.6.12 In addition to the above functional link assessment for SPA and Ramsar site populations, all Target Species were also assessed against regional populations (i.e. Lancashire) in order to provide context at a broader scale. An equivalent threshold was utilised to define a 'significant number' of birds at a regional scale, which was here defined as 1% of the Lancashire population recorded 'regularly' in two thirds of the season. Regional populations for each Target Species were based on BTO data<sup>24</sup>, which included the five year average (2019/20 to 2023/24) of peak counts recorded across all sites within Lancashire.

2.6.13 Where available, additional regional population data available for pink-footed goose and whooper swan was also incorporated into the assessment. Here an evaluation was made in relation to the pink-footed goose population in 'West England' (i.e. 77,659 birds), which was based upon a five year mean of peak counts reported in the latest available annual census' between 2016 and 2020<sup>25</sup>. An assessment in relation to the whooper swan population in Lancashire (i.e. 2,194 birds) was also made

<sup>24</sup> Lancashire populations estimated from latest 5 year average for combined WeBS counts in the region (2019/20 to 2023/24). Available at: <https://app.bto.org/webs-reporting/numbers.jsp> (Accessed 16th October 2025).

<sup>25</sup> The following five annual species accounts for pink-footed goose populations in West England are available at: <https://www.bto.org/get-involved/volunteer/projects/goose-and-swan-monitoring-programme/newsletters-and-reports> (Accessed 16th October 2025).

- I. WWT. 2017. *Goose & Swan Monitoring Programme: survey results 2016/17* Pink-footed Goose *Anser brachyrhynchus*. WWT/JNCC/SNH, Slimbridge.
- II. WWT. 2018. *Goose & Swan Monitoring Programme: survey results 2017/18* Pink-footed Goose *Anser brachyrhynchus*. WWT/JNCC/SNH, Slimbridge.
- III. WWT. 2019. *Goose & Swan Monitoring Programme: survey results 2018/19* Pink-footed Goose *Anser brachyrhynchus*. WWT/JNCC/SNH, Slimbridge.
- IV. WWT. 2020. *Goose & Swan Monitoring Programme: survey results 2019/20* Pink-footed Goose *Anser brachyrhynchus*. WWT/JNCC/NatureScot, Slimbridge.
- V. WWT. 2021. *Goose & Swan Monitoring Programme: survey results 2020/21* Pink-footed Goose *Anser brachyrhynchus*. WWT/JNCC/NatureScot, Slimbridge.

using data reported in Brides *et al.* (2021)<sup>26</sup>. Both assessments used the same threshold criteria to define a ‘significant number’ of birds, which included 1% of the defined regional population in two thirds of the season.

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<sup>26</sup> Brides, K., Wood, K.A., Hall, C., Burke, B., McElwaine, G., Einarsson, O. and Rees, E.C., 2021. *The Icelandic Whooper Swan Cygnus cygnus population: current status and long-term (1986–2020) trends in its numbers and distribution*. Wildfowl, 71(71), pp.29-57. Available at [https://www.bto.org/sites/default/files/brides\\_et\\_al\\_2021\\_icelandic\\_whooper\\_status\\_and\\_trends\\_1986-2020\\_wildfowl\\_71.pdf](https://www.bto.org/sites/default/files/brides_et_al_2021_icelandic_whooper_status_and_trends_1986-2020_wildfowl_71.pdf) (Accessed 16th October 2025).

## 3 YEAR 1 RESULTS

### 3.1 Habitat Appraisal

- 3.1.1 Before surveys commenced the fields in the Site and Wider Survey Area were assessed for their suitability to support Target Species. Habitats within the fields comprised predominantly arable and pastoral farmland with the majority of these comprising the same land use throughout the survey period. With the exception of Field 4 within the Wider Survey Area (a large garden adjacent to a dwelling likely to experience regular disturbance, see **Figure 4**), all fields were assessed as being suitable to support Target Species.
- 3.1.2 Arable fields did change in management practice throughout the survey period; with most going from ploughed/tilled to crop/arable stubble (or vice versa) and thus changing the level of suitability of these fields for different Target Species. Early growth-stage crops and arable stubble are most suitable for geese and swans, with ploughed/tilled fields more suitable for waders and gulls.
- 3.1.3 Results of the habitat appraisal, including changes in land use/management throughout the survey period are presented in **Annex 3**.

### 3.2 Vantage Point Flight Activity Surveys

- 3.2.1 A total of 17 Target Species were recorded during the VP Flight Activity surveys in Year 1. The total number of flights and total number of birds are at all height bands are listed in **Table 3.1**. The total number of flights, birds and duration within the at-risk window is also presented in **Table 3.1**. This includes some flights which were detected outside of the VP Survey Area.
- 3.2.2 Lapwing and pink-footed goose were the most frequently recorded species in Year 1. Lapwing comprised 111 flights comprising 623 birds, whilst pink-footed goose included 92 flights comprising 2,888 birds. Lapwing were found to fly in all directions in all areas of the Site. Pink-footed geese were mostly found to fly south, west and south-east over the Site.
- 3.2.3 Whooper swan (30 flights; 747 birds) was primarily recorded flying over the southern section of the Site and mostly in a north-eastern and south-eastern direction.
- 3.2.4 Teal, oystercatcher, golden plover, little egret and shelduck were recorded flying over the Site in lower numbers. Teal were primarily associated with the River Douglas, whilst shelduck and oystercatcher were recorded in all areas of the Site. Little egret was mostly recorded over the southern area of the Site, whilst golden plover were primarily flying north over the northern section of the Site. Only five flights or less were recorded for all other species.
- 3.2.5 During survey Visit 3 (18/10/2022), flocks of whooper swans (14 flights) comprising 258 birds flew in and landed within the Site. Two flocks of whooper swans (two flights) comprising 66 birds also flew in and landed within the Site during survey Visit 5 (10/11/2023).
- 3.2.6 The VP Flight Activity results for Year 1 are presented in **Figures 6 to 12**.
- 3.2.7 Target Species recorded during the Vantage Point Year 1 survey period associated as non-breeding qualifying species of either the Ribble and Alt Estuaries SPA/Ramsar site or Martin Mere SPA/Ramsar site comprised of pink-footed goose, whooper swan, golden plover, oystercatcher, redshank, shelduck and teal. Lapwing, curlew and little egret are classified as Important Component Species the Ribble and Alt Estuary SPA / Ramsar

**Table 3.1: Target Species flight activity summary (all flights) between September 2022 – May 2023.**

| Species                                 | Total. no. of flights | Total. no. of birds | No. of flights passing within the at-risk window* | Total. no. of birds within at-risk window | Total flight time within at-risk window (secs)† |
|---|-----------------------|---------------------|---|---|---|
| <b>Pink-footed goose</b> <sup>M,R</sup> | <b>92</b>             | <b>2,888</b>        | <b>90</b>   | <b>2,881</b>                              | <b>363,265</b>                                  |
| <b>Whooper swan</b> <sup>M,R</sup>      | <b>30</b>             | <b>747</b>          | <b>21</b>   | <b>262</b>                                | <b>12,800</b>                                   |
| <b>Shelduck</b> <sup>R</sup>            | <b>56</b>             | <b>139</b>          | <b>9</b>  | <b>40</b>                                 | <b>2,707</b>                                    |
| <b>Teal</b> <sup>M,R</sup>              | <b>35</b>             | <b>144</b>          | <b>2</b>  | <b>8</b>                                  | <b>170</b>                                      |
| <b>Golden plover</b> <sup>R</sup>       | <b>7</b>              | <b>26</b>           | <b>3</b>  | <b>18</b>                                 | <b>390</b>                                      |
| <b>Oystercatcher</b> <sup>R</sup>       | <b>55</b>             | <b>95</b>           | <b>2</b>  | <b>6</b>                                  | <b>150</b>                                      |
| <b>Redshank</b> <sup>R</sup>            | <b>5</b>              | <b>8</b>            | <b>2</b>  | <b>4</b>                                  | <b>90</b>                                       |
| <b>Curlew</b> <sup>R</sup>              | <b>1</b>              | <b>1</b>            | <b>0</b>  | <b>0</b>                                  | <b>0</b>  |
| <b>Lapwing</b> <sup>R</sup>             | <b>111</b>            | <b>623</b>          | <b>37</b>   | <b>383</b>                                | <b>1,207</b>                                    |
| <b>Little egret</b> <sup>R</sup>        | <b>11</b>             | <b>14</b>           | <b>1</b>  | <b>1</b>                                  | <b>43</b>                                       |
| Snipe                                   | 5                     | 9                   | 4   | 7   | 239   |
| Mute swan                               | 2                     | 3                   | 0   | 0   | 0   |
| Goosander                               | 2                     | 7                   | 0   | 0   | 0   |
| Grey heron                              | 2                     | 3                   | 1   | 1   | 45  |
| Barn owl                                | 4                     | 4                   | 0   | 0   | 0   |
| Peregrine                               | 2                     | 2                   | 2   | 2   | 25  |
| Hobby                                   | 1                     | 1                   | 0   | 0   | 0   |

Species in **bold** represent qualifying features of either the Ribble and Alt Estuary SPA and Ramsar site and/or Martin Mere SPA and Ramsar site. **Bold italics** are those which are Important Component Species of the qualifying waterbird assemblage of either SPA/Ramsar site.

† Duration of each flight is multiplied by the number of individuals and summed for each species.

\* Rotor sweep of approximately 42 m (lowest tip height) to 180 m (highest tip height) within the whole VP Survey Area (Site and Wider Survey Area).

### 3.3 Non-Breeding Bird Walkover Surveys

3.3.1 Results of Target Species recorded during the non-breeding bird walkover surveys in Year 1 are presented in **Table 3.2** and **3.3**. Those species in **bold** are qualifying features<sup>27</sup> of either the Ribble and Alt Estuary SPA and Ramsar site and / or Martin Mere SPA and Ramsar site. Those species in **bold italics** are those which are Important Component Species of the qualifying waterbird assemblage of either SPA/Ramsar site. ‘-’ means no Target Species were recorded during the survey visit.

3.3.2 A total of 11 Target Species were identified within the Site, which included pink-footed goose, whooper swan, shelduck, mallard, oystercatcher, lapwing, snipe, black-headed gull, herring gull, lesser black-backed gull and little egret. Of these, four Target Species are qualifying features of either the

<sup>27</sup> This includes only species designated with internationally important numbers for the SPA or Ramsar site.

Ribble and Alt Estuaries SPA/Ramsar site and/or Martin Mere SPA/Ramsar site (pink-footed goose, whooper swan, shelduck and oystercatcher). These four qualifying species were recorded relatively infrequently within the Site. Pink-footed goose was identified twice (peak: 11 birds), whilst whooper swan was recorded once (peak: 152 birds). Oystercatcher (peak: 2 birds) and shelduck (peak: 10 birds) were recorded on three and two occasions respectively.

3.3.3 Other Important Component Species of the qualifying waterbird assemblages (that are not specific qualifying species) recorded within the Site comprised lapwing and little egret. Of these, lapwing was the most abundant (peak: 67 birds) and most frequent (7/14 visits). Little egret was recorded in low numbers (peak  $\leq$ 1 bird) and infrequently (4/14 visits).

3.3.4 A total of 15 Target Species were identified within the Wider Survey Area, which included pink-footed goose, whooper swan, shelduck, mallard, teal, moorhen, oystercatcher, lapwing, redshank, snipe, black-headed gull, herring gull, lesser black-backed gull, grey heron and little egret. Of these, six Target Species are qualifying features of either the Ribble and Alt Estuaries SPA/Ramsar site and/or Martin Mere SPA/Ramsar site (pink-footed goose, whooper swan, oystercatcher, redshank, shelduck and teal).

3.3.5 These qualifying species were recorded relatively infrequently within the Wider Survey Area. Pink-footed goose was identified once in Field 17 (peak: 58 birds), whilst whooper swans were recorded on four occasions in Fields 8, 10 and 11 (peak: 138 birds<sup>28</sup>; Field 8). Oystercatcher was recorded on three occasions in Fields 2 and 10 (peak: 3 birds; Field 10), whilst shelduck were recorded on a single visit in Field 2 and 24 (peak: 2). Redshank (peak: 1 bird) and teal (peak: 14 birds) were also each recorded on single occasions in Field 2.

3.3.6 Important Component Species of the Ribble and Alt Estuaries SPA recorded within the Wider Survey Area comprised lapwing and little egret. Both species were recorded in low numbers and infrequently with lapwing recorded at 14 birds on one occasion and little egret with a peak of three birds and recorded on three occasions.

3.3.7 Results of these Target Species, showing overall peak counts across the Site and Wider Survey Area, are presented in **Figures 13** (SPA/Ramsar site qualifying and important assemblage species) and **Figures 14 and 15** (other Target Species (Waterfowl and Gulls respectively)).

**Table 3.2: Target Species recorded in the Site and within the Wider Survey Area during the Year 1 Walkover Surveys.**

\* Exceeds Ribble and Alt Estuary SPA/ Ramsar 1% threshold. + Exceeds Martin Mere SPA/ Ramsar 1% threshold

| Species                                 | Survey Visits |   |                  |   |   |           |   |   |   |          |          |           |          |    |
|---|---------------|---|------------------|---|---|-----------|---|---|---|----------|----------|-----------|----------|----|
|   | 1             | 2 | 3                | 4 | 5 | 6         | 7 | 8 | 9 | 10       | 11       | 12        | 13       | 14 |
| <b>Site</b>                             |               |   |                  |   |   |           |   |   |   |          |          |           |          |    |
| <b>Pink-footed goose</b> <sup>M,R</sup> | -             | - | -                | - | - | <b>11</b> | - | - | - | <b>6</b> | -        | -         | -        | -  |
| <b>Whooper swan</b> <sup>M,R</sup>      | -             | - | <b>152</b><br>** | - | - | -         | - | - | - | -        | -        | -         | -        | -  |
| <b>Shelduck</b> <sup>R</sup>            | -             | - | -                | - | - | -         | - | - | - | -        | <b>4</b> | <b>10</b> | -        | -  |
| <b>Oystercatcher</b> <sup>R</sup>       | -             | - | -                | - | - | -         | - | - | - | -        | <b>2</b> | <b>2</b>  | <b>2</b> | -  |

<sup>28</sup> It should be noted that the flock of 152 whooper swans recorded on-Site (Field 1) flew in the direction of Field 8, however it was not confirmed if the flock landed or flew outside the Wintering Survey Area. The 136 birds recorded in Field 8 and two birds in adjacent Field 10 are therefore considered likely to comprise most of the same individual birds flown from within the Site. As evidence of landing was not confirmed, a precautionary approach has been used to independently record birds in the Wider Survey Area. Consideration of potential count duplication should be noted for the remainder of the assessment.

| Species                                 | Survey Visits |   |                  |           |           |           |           |           |            |           |           |           |           |           |
|---|---------------|---|------------------|-----------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|
|   | 1             | 2 | 3                | 4         | 5         | 6         | 7         | 8         | 9          | 10        | 11        | 12        | 13        | 14        |
| <b>Site</b>                             |               |   |                  |           |           |           |           |           |            |           |           |           |           |           |
| <i>Lapwing</i> <sup>R</sup>             | -             | - | <b>11</b>        | -         | -         | -         | <b>67</b> | -         | <b>26</b>  | -         | <b>23</b> | <b>32</b> | <b>20</b> | <b>12</b> |
| <i>Little egret</i> <sup>R</sup>        | -             | - | -                | -         | -         | -         | <b>1</b>  | <b>1</b>  | -          | -         | <b>1</b>  | -         | <b>1</b>  | -         |
| Mallard                                 | -             | - | -                | <b>4</b>  | -         | -         | -         | -         | -          | -         | -         | -         | -         | <b>2</b>  |
| Snipe                                   | -             | - | -                | -         | -         | -         | -         | <b>2</b>  | -          | <b>3</b>  | -         | -         | -         | -         |
| Black-headed gull                       | <b>63</b>     | - | <b>250</b>       | <b>8</b>  | -         | -         | <b>10</b> | -         | -          | -         | -         | -         | <b>9</b>  | -         |
| Herring gull                            | <b>87</b>     | - | <b>14</b>        | -         | -         | -         | -         | -         | -          | -         | -         | -         | <b>4</b>  | -         |
| Lesser black-backed gull                | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | -         | -         | <b>18</b> | -         |
| <b>Wider Survey Area</b>                |               |   |                  |           |           |           |           |           |            |           |           |           |           |           |
| <i>Pink-footed goose</i> <sup>M,R</sup> | -             | - | -                | -         | <b>58</b> | -         | -         | -         | -          | -         | -         | -         | -         | -         |
| <i>Whooper swan</i> <sup>M,R</sup>      | -             | - | <b>138</b><br>** | -         | <b>7</b>  | -         | -         | <b>8*</b> | <b>9**</b> | -         | -         | -         | -         | -         |
| <i>Shelduck</i> <sup>R</sup>            | -             | - | -                | -         | -         | -         | -         | -         | <b>2</b>   | -         | -         | -         | -         | -         |
| <i>Teal</i> <sup>R</sup>                | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | <b>14</b> | -         | -         | -         |
| <i>Oystercatcher</i> <sup>R</sup>       | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | -         | <b>2</b>  | <b>2</b>  | <b>3</b>  |
| <i>Redshank</i> <sup>R</sup>            | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | -         | <b>1</b>  | -         | -         |
| <i>Lapwing</i> <sup>R</sup>             | -             | - | -                | -         | -         | -         | -         | <b>14</b> | -          | -         | -         | -         | -         | -         |
| <i>Little egret</i> <sup>R</sup>        | -             | - | -                | -         | -         | -         | -         | <b>2</b>  | -          | <b>3*</b> | -         | <b>1</b>  | -         | -         |
| Mallard                                 | -             | - | -                | <b>4</b>  | -         | <b>6</b>  | <b>30</b> | -         | -          | <b>4</b>  | -         | -         | -         | <b>1</b>  |
| Snipe                                   | -             | - | -                | -         | -         | -         | -         | <b>1</b>  | -          | -         | -         | -         | -         | -         |
| Black-headed gull                       | -             | - | -                | -         | -         | <b>60</b> | <b>16</b> | <b>2</b>  | -          | -         | -         | -         | <b>90</b> | -         |
| Herring gull                            | -             | - | -                | -         | -         | <b>3</b>  | -         | -         | -          | -         | -         | -         | -         | -         |
| Lesser black-backed gull                | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | -         | -         | <b>50</b> | -         |
| Grey heron                              | -             | - | -                | -         | <b>1</b>  | -         | -         | -         | <b>2</b>   | -         | -         | -         | -         | <b>1</b>  |
| Moorhen                                 | -             | - | -                | -         | -         | -         | -         | <b>1</b>  | -          | <b>2</b>  | <b>1</b>  | <b>8</b>  | -         | <b>2</b>  |
| <b>Flying Overhead Only</b>             |               |   |                  |           |           |           |           |           |            |           |           |           |           |           |
| <i>Pink-footed goose</i> <sup>M,R</sup> | -             | - | -                | <b>50</b> | -         | -         | -         | <b>93</b> | -          | <b>76</b> | -         | -         | -         | -         |
| <i>Whooper swan</i> <sup>M,R</sup>      | -             | - | -                | -         | -         | <b>3</b>  | -         | -         | -          | -         | -         | -         | -         | -         |
| <i>Teal</i> <sup>R</sup>                | -             | - | -                | -         | -         | <b>4</b>  | <b>8</b>  | -         | -          | -         | -         | -         | -         | -         |
| <i>Cormorant</i> <sup>R</sup>           | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | -         | -         | <b>2</b>  | -         |
| <i>Lapwing</i> <sup>R</sup>             | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | -         | <b>52</b> | -         | -         |
| <i>Little egret</i> <sup>R</sup>        | -             | - | -                | -         | -         | -         | -         | -         | -          | -         | -         | <b>1</b>  | -         | -         |
| Mallard                                 | -             | - | -                | -         | -         | <b>12</b> | -         | -         | -          | -         | -         | -         | -         | -         |

| Species           | Survey Visits |   |     |   |   |   |   |    |    |    |    |    |    |    |
|-------------------|---------------|---|-----|---|---|---|---|----|----|----|----|----|----|----|
|                   | 1             | 2 | 3   | 4 | 5 | 6 | 7 | 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| <b>Site</b>       |               |   |     |   |   |   |   |    |    |    |    |    |    |    |
| Goosander         | -             | - | -   | - | - | - | 2 | -  | -  | -  | -  | -  | -  | -  |
| Black-headed gull | -             | - | 140 | 4 | - | 5 | - | 11 | 20 | -  | -  | -  | -  | -  |
| Herring gull      | -             | - | 100 | - | - | - | - | -  | -  | -  | -  | -  | -  | -  |
| Grey heron        | -             | - | -   | 2 | - | - | - | 1  | -  | -  | 1  | 2  | -  | -  |
| Peregrine         | -             | - | -   | - | - | - | - | -  | -  | -  | -  | 1  | -  | -  |

**Table 3.3: Non-breeding bird walkover survey Target Species summary results – Year 1\***

| Target Species                    | Number of Birds Within the Site |                |                              | Number of Birds Within the Wider Survey Area |                |                              |
|-----------------------------------|---------------------------------|----------------|------------------------------|--|----------------|------------------------------|
|                                   | Visit peak                      | Mean per visit | Visit frequency recorded (%) | Visit Peak                                   | Mean per visit | Visit frequency recorded (%) |
| Pink-footed goose <sup>M, R</sup> | 11                              | 1.3            | 14.3 (2/14)                  | 58   | 4.1            | 7.1 (1/14)                   |
| Whooper swan <sup>M, R</sup>      | 152                             | 10.9           | 7.1 (1/14)                   | 138  | 11.6           | 28.6 (4/14)                  |
| Shelduck <sup>R</sup>             | 10                              | 1.0            | 14.3 (2/14)                  | 2  | 0.1            | 7.1 (1/14)                   |
| Teal <sup>R</sup>                 | -                               | -              | -                            | 14   | 1              | 7.1 (1/14)                   |
| Oystercatcher <sup>R</sup>        | 2                               | 0.4            | 21.4 (3/14)                  | 3  | 0.5            | 21.4 (3/14)                  |
| Redshank <sup>R</sup>             | -                               | -              | -                            | 1  | 0.1            | 7.1 (1/14)                   |
| Lapwing <sup>R</sup>              | 67                              | 13.6           | 50 (7/14)                    | 14   | 1              | 7.1 (1/14)                   |
| Little egret <sup>R</sup>         | 1                               | 0.3            | 28.6 (4/14)                  | 3  | 0.4            | 21.4 (3/14)                  |
| Mallard                           | 4                               | 0.4            | 14.3 (2/14)                  | 30   | 3.2            | 35.7 (5/14)                  |
| Snipe                             | 3                               | 0.4            | 14.3 (2/14)                  | 1  | 0.1            | 7.1 (1/14)                   |
| Black-headed gull                 | 250                             | 24.3           | 35.7 (5/14)                  | 90   | 12             | 28.6 (4/14)                  |
| Herring gull                      | 87                              | 7.5            | 21.4 (3/14)                  | 3  | 0.2            | 7.1 (1/14)                   |
| Lesser black-backed gull          | 18                              | 1.3            | 7.1 (1/14)                   | 50   | 3.6            | 7.1 (1/14)                   |
| Grey heron                        | -                               | -              | -                            | 2  | 0.3            | 21.4 (3/14)                  |
| Moorhen                           | -                               | -              | -                            | 8  | 1              | 35.7 (5/14)                  |

\*Birds recorded only in flight are excluded from the summary results.

### 3.4 Breeding Bird Surveys

3.4.1 The breeding bird assemblage recorded within the Site comprised a range of species typically associated with the farmland, scrub and wetland habitats which make up the Site.

3.4.2 A total of 21 species were recorded as displaying breeding behaviour within or immediately bordering the Site. An additional Schedule 1 species, barn owl was recorded within 500m of the Site. Of these, 14 were Target Species (number of territories are included in **Table 3.4**), including:

- Three Schedule 1 species (barn owl, Cetti's warbler and kingfisher);
- Three BoCC Red list species (lapwing, skylark and greenfinch);
- Eight BoCC Amber list species (moorhen, oystercatcher, wren, dunnock, woodpigeon, whitethroat, sedge warbler and reed bunting); and,
- Four of the above species are also NERC Act (2006) Section 41 species (lapwing, skylark, dunnock and reed bunting) whilst three are also LBAP species (lapwing, skylark and reed bunting).

3.4.3 No breeding qualifying species of the Ribble and Alt Estuaries SPA/Ramsar site were recorded holding territory within the Site.

3.4.4 Schedule 1 species Cetti's warbler and kingfisher were recorded as each holding a territory along the Leeds and Liverpool Canal located along the west boundary of the Site. Additionally, a confirmed barn owl territory was located within c. 500m of the Site, with the associated birds possibly using the Site as a hunting location.

3.4.5 Most species were associated with the watercourses (Leeds and Liverpool Canal and River Douglas) and associated habitats (scrub, reeds, trees) that run adjacent to the east and west boundaries of the Site.

3.4.6 Ground nesting species recorded within the arable field of the Site included skylark (6 territories), lapwing (6 territories) and oystercatcher (2 territories).

3.4.7 All breeding species recorded within the Site along with an estimated number of territories are detailed in **Table 3.4**. Those species in **bold** are identified as Target Species. The indicative locations of the territories of Target Species are provided in **Figure 16**; however, sensitive Schedule 1 species are illustrated separately on **Confidential Figure 17**.

**Table 3.4: Breeding Bird Survey Results**

| Common name            | Estimated number of territories | Comments   |
|------------------------|---------------------------------|--|
| <b>Skylark</b>         | 6                               | Within the large arable fields that make up the majority of the Site.  |
| <b>Lapwing</b>         | 6                               | Within the large arable fields that make up the majority of the Site.  |
| <b>Sedge warbler</b>   | 6                               | Within scrub/reeds along the watercourses that border the Site.  |
| <b>Wren</b>            | 6                               | Within scrub/trees along the watercourses that border the Site.  |
| <b>Reed bunting</b>    | 3                               | Within scrub/reeds along the watercourses that border the Site.  |
| <b>Oystercatcher</b>   | 2                               | Within the large arable fields that make up the majority of the Site.  |
| <b>Greenfinch</b>      | 2                               | Within trees located along the boundaries of the Site.   |
| <b>Dunnock</b>         | 1                               | Within trees located along the boundaries of the Site.   |
| <b>Moorhen</b>         | 1                               | Within the margins of the Leeds and Liverpool canal that runs adjacent to the west boundary, occasionally wandering into the Site to forage. |
| <b>Cetti's warbler</b> | 1                               | Within scrub along the watercourses that border the Site.  |
| <b>Kingfisher</b>      | 1                               | Along the Leeds and Liverpool canal that runs adjacent to the west boundary.   |
| <b>Whitethroat</b>     | 1                               | Within scrub along the watercourses that border the Site.  |

|                     |   |  |
|---------------------|---|--|
| <b>Woodpigeon</b>   | 1 | Within trees located along the boundaries of the Site.                       |
| <b>Barn owl</b>     | 1 | Within woodland c. 500m south of the Site.                                   |
| <b>Goldfinch</b>    | 3 | Within trees located along the boundaries of the Site.                       |
| <b>Blackbird</b>    | 2 | Within trees located along the boundaries of the Site.                       |
| <b>Blue tit</b>     | 2 | Within trees located along the boundaries of the Site.                       |
| <b>Robin</b>        | 2 | Within trees located along the boundaries of the Site.                       |
| <b>Reed warbler</b> | 2 | Within scrub/reeds along the watercourses that border the Site.              |
| <b>Blackcap</b>     | 1 | Within trees located along the boundaries of the Site.                       |
| <b>Great tit</b>    | 1 | Within trees located along the boundaries of the Site.                       |
| <b>Mute swan</b>    | 1 | Nesting on the Leeds and Liverpool Canal adjacent to the west Site boundary. |

3.4.8 A number of bird species were also recorded during the survey but for which breeding was not suspected. This included birds flying over and/or visiting to feed only. These species comprised shelduck, mallard, lesser black-backed gull, buzzard (nesting within 500m of Site), kestrel (nesting within 500m of Site), jay, jackdaw, house martin, wheatear, house sparrow and pied wagtail.

## 4 YEAR 2 RESULTS

### 4.1 Vantage Point Flight Activity Surveys

4.1.1 A total of 21 Target Species were recorded during the VP Flight Activity surveys. The total number of flights, total number of birds and total flight duration recorded (across all height bands) is presented in **Table 4.1**. This includes some flights which were detected outside of the VP Survey Area and which are not at-risk of collision from the proposed turbine (see the final column in **Table 4.1** for the number of at-risk flights recorded across the survey period). Flights of Target Species are shown on **Figures 18 to 24**.

4.1.2 Lapwing and pink-footed goose were the most frequently recorded species in Year 2. Lapwing comprised 164 flights of 1,964 birds, whilst pink-footed goose included 78 flights of 3,644 birds. Lapwing were found to fly in all directions in all areas of the Site. Pink-footed goose was mostly found to fly south, west and south-west over the Site.

4.1.3 Whooper swan, oystercatcher, golden plover, cormorant, mallard, shelduck, lesser black-backed gull, little egret and grey heron were recorded flying over the Site in lower numbers. Whooper swans (7 flights; 32 birds) were primarily recorded flying over in the southern section of the Site and mostly in both western and eastern directions. Mallard was mostly recorded flying in the south and along adjacent watercourses whilst shelduck, cormorant, lesser black-backed gull and oystercatcher were recorded in all areas of the Site. Little egret, grey heron and golden plover were mostly recorded over the southern area of the Site. Only five flights or less were recorded for all other species.

4.1.4 Target Species recorded during the Vantage Point Year 2 survey period listed as non-breeding qualifying species of the Ribble and Alt Estuaries SPA and Ramsar and/or Martin Mere SPA and Ramsar comprised of pink-footed goose, whooper swan, golden plover, oystercatcher, redshank, dunlin, shelduck and teal. Important Component Species of the Ribble and Alt Estuary SPA and Ramsar comprised lapwing, curlew and little egret.

**Table 4.1: Target Species flight activity summary (all flights) between October 2023 – May 2024.**

| Species                                  | Total. no. of flights | Total. no. of birds | No. of flights passing within the at-risk window* | Total. no. of birds within at-risk window | Total flight time within at-risk window (secs)† |
|--|-----------------------|---------------------|---|---|---|
| <b>Pink-footed goose</b> <sup>M, R</sup> | <b>78</b>             | <b>3,644</b>        | <b>78</b>   | <b>3,644</b>                              | <b>290,890</b>                                  |
| <b>Whooper swan</b> <sup>M, R</sup>      | <b>7</b>              | <b>32</b>           | <b>6</b>  | <b>29</b>                                 | <b>379</b>                                      |
| <b>Shelduck</b> <sup>R</sup>             | <b>38</b>             | <b>82</b>           | <b>12</b>   | <b>31</b>                                 | <b>905</b>                                      |
| <b>Teal</b> <sup>R</sup>                 | <b>1</b>              | <b>2</b>            | <b>0</b>  | <b>0</b>                                  | <b>0</b>  |
| <b>Golden plover</b> <sup>R</sup>        | <b>8</b>              | <b>47</b>           | <b>3</b>  | <b>21</b>                                 | <b>1,005</b>                                    |
| <b>Oystercatcher</b> <sup>R</sup>        | <b>44</b>             | <b>69</b>           | <b>6</b>  | <b>12</b>                                 | <b>375</b>                                      |
| <b>Redshank</b> <sup>R</sup>             | <b>1</b>              | <b>4</b>            | <b>0</b>  | <b>0</b>                                  | <b>0</b>  |
| <b>Dunlin</b> <sup>R</sup>               | <b>1</b>              | <b>2</b>            | <b>1</b>  | <b>2</b>                                  | <b>90</b>                                       |
| <b>Lapwing</b> <sup>R</sup>              | <b>164</b>            | <b>1,964</b>        | <b>33</b>   | <b>1,294</b>                              | <b>69,094</b>                                   |
| <b>Curlew</b> <sup>R</sup>               | <b>1</b>              | <b>1</b>            | <b>0</b>  | <b>0</b>                                  | <b>0</b>  |
| <b>Cormorant</b> <sup>R</sup>            | <b>12</b>             | <b>16</b>           | <b>11</b>   | <b>14</b>                                 | <b>668</b>                                      |
| <b>Little egret</b> <sup>R</sup>         | <b>17</b>             | <b>17</b>           | <b>2</b>  | <b>2</b>                                  | <b>87</b>                                       |
| Mallard                                  | 47                    | 125                 | 5   | 17  | 361   |
| Ruff                                     | 1                     | 3                   | 1   | 3   | 270   |
| Snipe                                    | 2                     | 3                   | 1   | 2   | 40  |
| Goosander                                | 1                     | 1                   | 0   | 0   | 0   |
| Lesser black-backed gull                 | 41                    | 101                 | 32  | 70  | 2,758   |
| Grey heron                               | 8                     | 8                   | 1   | 1   | 30  |
| Red kite                                 | 1                     | 1                   | 1   | 1   | 175   |
| Peregrine                                | 1                     | 1                   | 1   | 1   | 78  |
| Merlin                                   | 1                     | 1                   | 0   | 0   | 0   |

Species in **bold** represent qualifying features of either the Ribble and Alt Estuary SPA and Ramsar site and/or Martin Mere SPA and Ramsar site. **Bold italics** are those which are Important Component Species of the qualifying waterbird assemblage of either SPA/Ramsar site.

† Duration of each flight is multiplied by the number of individuals and summed for each species.

\* Rotor sweep of approximately 42 m (lowest tip height) to 180 m (highest tip height) within the whole VP Survey Area (Site and Wider Survey Area).

## 4.2 Non-Breeding Bird Walkover Surveys

4.2.1 Results of Target Species recorded in Year 2 are presented in **Table 4.2 and 4.3**. Those species in **bold** are non-breeding qualifying features<sup>29</sup> of either the Ribble and Alt Estuary SPA and Ramsar site and/or Martin Mere SPA and Ramsar site. Those species in **bold italics** are those which are Important Component Species of the qualifying waterbird assemblage of either SPA/Ramsar site. ‘-’ means no Target Species were recorded during the survey visit.

<sup>29</sup> This includes only species designated with internationally important numbers for the SPA or Ramsar site.

4.2.2 A total of 14 Target Species were identified within the Site, which included barnacle goose, greylag goose, pink-footed goose, shelduck, mallard, oystercatcher, lapwing, golden plover, snipe, black-headed gull, common gull, herring gull, lesser black-backed gull and little egret. Of these, four Target Species are qualifying features of either the Ribble and Alt Estuaries SPA/Ramsar site and/or Martin Mere SPA/Ramsar site (pink-footed goose, shelduck, golden plover and oystercatcher).

4.2.3 These qualifying species were recorded relatively infrequently within the Site. Pink-footed goose (peak: 290 birds) and golden plover (peak: 19) were both identified once, whilst oystercatcher (peak: 4 birds) and shelduck (peak: 4 birds) were recorded on three and five occasions respectively.

4.2.4 Other Important Component Species of the qualifying waterbird assemblages (that are not specific qualifying species) recorded within the Site included lapwing and little egret. Of these, lapwing was the most abundant (peak: 65 birds) and most frequent (9/13 visits). Little egret were instead recorded in low numbers (peak  $\leq 1$  bird) and infrequently (1/13 visits).

4.2.5 A total of 18 Target Species were identified within the Wider Survey Area, which included pink-footed goose, greylag goose, shelduck, mallard, teal, oystercatcher, lapwing, curlew, ruff, dunlin, snipe, green sandpiper, redshank, black-headed gull, herring gull, lesser black-backed gull, grey heron and little egret. Of these, six Target Species are qualifying features of either the Ribble and Alt Estuaries SPA/Ramsar site and/or Martin Mere SPA/Ramsar site (pink-footed goose, shelduck, oystercatcher, teal, dunlin and redshank).

4.2.6 Apart from shelduck, most qualifying species were recorded relatively infrequently within the Wider Survey Area. Shelduck was recorded on nine visits in Fields 18, 20, 23, 24, 34, 89, 95, 103 (peak: 31; Field 18, 20, 23 and 24). Pink-footed goose and dunlin were both identified on a single occasion in Field 111 (peak: 63 birds) and Field 14 (peak: 1), respectively. Oystercatcher was recorded on four visits and distributed throughout Fields 2, 8, 10, 14, 18, 23 and 109 (peak: 6 birds; Fields 8, 10, 23 and 109). Redshank (peak: 4 birds; Fields 2 and 18) and teal (peak: 12 birds; Field 66) were each recorded on two occasions respectively in Fields 2 and 18 (redshank) and Field 66 (teal).

4.2.7 Other Important Component Species of the qualifying waterbird assemblages (that are not specific qualifying species) recorded within the Wider Survey Area included lapwing, curlew and little egret. Of these, lapwing was the most abundant (peak: 183 birds) and most frequent (9/13 visits). Curlew and little egret were recorded in low numbers (peak  $\leq 6$  birds), and infrequently ( $\leq 5/13$  visits).

4.2.8 Peregrine was additionally recorded flying over the Site. No additional Target Species were recorded only flying over the Wider Survey Area.

4.2.9 Results of Target Species are presented in **Figures 25 and 26** (SPA/Ramsar site qualifying and important assemblage species) and **Figures 27 and 28** (other Target Species (Waterfowl and Gulls respectively)).

**Table 4.2: Target Species recorded in within the Site and within the Wider Survey Area during the Year 2 Walkover Surveys**

\* Exceeds Ribble and Alt Estuary SPA/ Ramsar 1% threshold. + Exceeds Martin Mere SPA/ Ramsar 1% threshold

| Species                                  | Survey Visits          |    |    |    |    |          |          |    |          |          |           |    |          |
|--|------------------------|----|----|----|----|----------|----------|----|----------|----------|-----------|----|----------|
|  | 15                     | 16 | 17 | 18 | 19 | 20       | 21       | 22 | 23       | 24       | 25        | 26 | 27       |
| <b>Site</b>                              |                        |    |    |    |    |          |          |    |          |          |           |    |          |
| <b>Pink-footed goose</b> <sup>M, R</sup> | <b>290<sup>+</sup></b> | -  | -  | -  | -  | -        | -        | -  | -        | -        | -         | -  | -        |
| <b>Shelduck</b> <sup>R</sup>             | -                      | -  | -  | -  | -  | <b>2</b> | <b>1</b> | -  | <b>4</b> | <b>2</b> | -         | -  | <b>2</b> |
| <b>Golden plover</b> <sup>R</sup>        | -                      | -  | -  | -  | -  | -        | -        | -  | -        | -        | <b>19</b> | -  | -        |

| Species                                 | Survey Visits |                 |            |            |                 |            |            |           |           |            |            |            |            |           |
|---|---------------|-----------------|------------|------------|-----------------|------------|------------|-----------|-----------|------------|------------|------------|------------|-----------|
|   | 15            | 16              | 17         | 18         | 19              | 20         | 21         | 22        | 23        | 24         | 25         | 26         | 27         |           |
| <b>Site</b>                             |               |                 |            |            |                 |            |            |           |           |            |            |            |            |           |
| <b>Oystercatcher<sup>R</sup></b>        | -             | -               | -          | -          | -               | -          | -          | -         | -         | -          | <b>2</b>   | <b>2</b>   | <b>4</b>   |           |
| <b>Lapwing<sup>R</sup></b>              | -             | -               | <b>14</b>  | <b>14</b>  | <b>24</b>       | <b>12</b>  | <b>11</b>  | -         | -         | <b>22</b>  | <b>65</b>  | <b>18</b>  | <b>22</b>  |           |
| <b>Little egret<sup>R</sup></b>         | -             | -               | -          | -          | -               | <b>1</b>   | -          | -         | -         | -          | -          | -          | -          |           |
| Mallard                                 | -             | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | -          | -          | <b>2</b>  |
| Snipe                                   | -             | <b>3</b>        | <b>5</b>   | <b>2</b>   | <b>3</b>        | <b>1</b>   | -          | <b>2</b>  | <b>2</b>  | <b>2</b>   | -          | -          | -          |           |
| Barnacle goose                          | <b>1</b>      | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | -          | -          |           |
| Greylag goose                           | <b>124</b>    | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | -          | -          |           |
| Black-headed gull                       | <b>52</b>     | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | <b>94</b>  | -          |           |
| Common gull                             | <b>4</b>      | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | -          | -          |           |
| Herring gull                            | <b>430</b>    | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | <b>2</b>   | -          |           |
| Lesser black-backed gull                | <b>58</b>     | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | <b>4</b>   | -          |           |
| <b>Wider Survey Area</b>                |               |                 |            |            |                 |            |            |           |           |            |            |            |            |           |
| <b>Pink-footed goose<sup>M, R</sup></b> | -             | -               | -          | <b>63</b>  | -               | -          | -          | -         | -         | -          | -          | -          | -          |           |
| <b>Shelduck<sup>R</sup></b>             | -             | -               | -          | -          | <b>2</b>        | <b>2</b>   | <b>3</b>   | <b>4</b>  | <b>10</b> | <b>4</b>   | <b>11</b>  | <b>31</b>  | <b>22</b>  |           |
| <b>Teal<sup>M, R</sup></b>              | -             | -               | -          | -          | -               | -          | -          | -         | -         | -          | -          | <b>5</b>   | <b>12</b>  |           |
| <b>Oystercatcher<sup>R</sup></b>        | -             | -               | -          | -          | -               | -          | -          | -         | -         | <b>4</b>   | <b>2</b>   | <b>2</b>   | <b>6</b>   |           |
| <b>Redshank<sup>R</sup></b>             | -             | -               | -          | -          | -               | -          | -          | -         | -         | -          | <b>1</b>   | <b>4</b>   | -          |           |
| <b>Dunlin<sup>R</sup></b>               | -             | <b>1</b>        | -          | -          | -               | -          | -          | -         | -         | -          | -          | -          | -          |           |
| <b>Lapwing<sup>R</sup></b>              | -             | <b>179</b><br>* | <b>89</b>  | <b>14</b>  | <b>183</b><br>* | -          | -          | <b>61</b> | <b>18</b> | -          | <b>108</b> | <b>47</b>  | <b>15</b>  |           |
| <b>Curlew<sup>R</sup></b>               | -             | -               | -          | <b>6</b>   | -               | -          | -          | -         | -         | -          | -          | -          | -          |           |
| <b>Little egret<sup>R</sup></b>         | <b>1</b>      | -               | -          | -          | -               | <b>1</b>   | <b>4</b>   | -         | <b>2</b>  | -          | <b>1</b>   | -          | -          |           |
| Mallard                                 | -             | -               | <b>6</b>   | <b>6</b>   | -               | -          | -          | -         | -         | -          | -          | <b>16</b>  | <b>10</b>  | <b>41</b> |
| Ruff                                    | -             | -               | <b>5</b>   | <b>3</b>   | -               | -          | -          | -         | -         | -          | -          | -          | -          |           |
| Snipe                                   | -             | -               | -          | <b>2</b>   | -               | -          | <b>1</b>   | -         | <b>1</b>  | -          | -          | -          | -          |           |
| Greylag goose                           | -             | -               | -          | -          | -               | -          | <b>2</b>   | -         | -         | -          | -          | -          | -          |           |
| Green sandpiper                         | -             | -               | -          | -          | -               | -          | -          | -         | -         | -          | <b>1</b>   | -          | -          |           |
| Black-headed gull                       | <b>238</b>    | <b>77</b>       | <b>460</b> | <b>462</b> | <b>473</b>      | <b>315</b> | <b>472</b> | <b>22</b> | <b>78</b> | <b>126</b> | <b>362</b> | <b>687</b> | <b>423</b> |           |
| Herring gull                            | -             | <b>265</b>      | <b>92</b>  | <b>81</b>  | <b>6</b>        | <b>5</b>   | <b>2</b>   | -         | -         | -          | -          | -          | -          |           |
| Lesser black-backed gull                | -             | <b>9</b>        | <b>1</b>   | <b>6</b>   | -               | <b>1</b>   | <b>2</b>   | -         | -         | -          | <b>1</b>   | <b>4</b>   | <b>3</b>   |           |
| Grey heron                              | -             | -               | <b>2</b>   | <b>4</b>   | -               | -          | -          | <b>1</b>  | <b>1</b>  | <b>1</b>   | -          | -          | <b>1</b>   |           |

| Species                     | Survey Visits |    |    |    |    |    |    |    |    |    |    |    |          |
|-----------------------------|---------------|----|----|----|----|----|----|----|----|----|----|----|----------|
|                             | 15            | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27       |
| <b>Site</b>                 |               |    |    |    |    |    |    |    |    |    |    |    |          |
| <b>Flying Overhead Only</b> |               |    |    |    |    |    |    |    |    |    |    |    |          |
| <i>Lapwing</i> <sup>R</sup> | -             | -  | -  | -  | -  | -  | -  | -  | -  | -  | -  | -  | <b>4</b> |
| Black-headed gull           | -             | 21 | 4  | -  | 6  | -  | -  | -  | -  | -  | -  | -  | -        |
| Peregrine                   | -             | 1  | -  | -  | -  | -  | -  | -  | -  | -  | 1  | -  | -        |

**Table 4.3: Non-breeding bird walkover survey Target Species summary results-Year 2\***

| Target Species                           | Number of Birds Within the Site |                |                              | Number of Birds Within the Wider Survey Area |                |                              |
|--|---------------------------------|----------------|------------------------------|--|----------------|------------------------------|
|  | Visit peak                      | Mean per visit | Visit frequency recorded (%) | Visit Peak                                   | Mean per visit | Visit frequency recorded (%) |
| <b>Pink-footed goose</b> <sup>M, R</sup> | <b>290</b>                      | <b>22.3</b>    | <b>7.7 (1/13)</b>            | <b>63</b>                                    | <b>5</b>       | <b>7.7 (1/13)</b>            |
| <b>Shelduck</b> <sup>R</sup>             | <b>4</b>                        | <b>0.8</b>     | <b>38.5 (5/13)</b>           | <b>31</b>                                    | <b>7</b>       | <b>69.2 (9/13)</b>           |
| <b>Teal</b> <sup>M,R</sup>               | -                               | -              | -                            | <b>12</b>                                    | <b>1</b>       | <b>15.4 (2/13)</b>           |
| <b>Golden plover</b> <sup>R</sup>        | <b>19</b>                       | <b>1.5</b>     | <b>7.7 (1/13)</b>            | -  | -              | -                            |
| <b>Oystercatcher</b> <sup>R</sup>        | <b>4</b>                        | <b>0.6</b>     | <b>23.1 (3/13)</b>           | <b>6</b>                                     | <b>1</b>       | <b>30.8 (4/13)</b>           |
| <b>Redshank</b> <sup>R</sup>             | -                               | -              | -                            | <b>4</b>                                     | <b>0</b>       | <b>15.4 (2/13)</b>           |
| <b>Dunlin</b> <sup>R</sup>               | -                               | -              | -                            | <b>1</b>                                     | <b>0</b>       | <b>7.7 (1/13)</b>            |
| <b>Curlew</b> <sup>R</sup>               | -                               | -              | -                            | <b>6</b>                                     | <b>0</b>       | <b>7.7 (1/13)</b>            |
| <b>Lapwing</b> <sup>R</sup>              | <b>65</b>                       | <b>15.5</b>    | <b>69.2 (9/13)</b>           | <b>183</b>                                   | <b>55</b>      | <b>69.2 (9/13)</b>           |
| <b>Little egret</b> <sup>R</sup>         | <b>1</b>                        | <b>0.1</b>     | <b>7.7 (1/13)</b>            | <b>4</b>                                     | <b>1</b>       | <b>38.5 (5/13)</b>           |
| Mallard                                  | 2                               | 0.2            | 7.7 (1/13)                   | 41   | 6              | 38.5 (5/13)                  |
| Ruff                                     | -                               | -              | -                            | 5  | 1              | 15.4 (2/13)                  |
| Snipe                                    | 5                               | 1.5            | 61.5 (8/13)                  | 2  | 0              | 23.1 (3/13)                  |
| Barnacle goose                           | 1                               | 0.1            | 7.7 (1/13)                   | -  | -              | -                            |
| Greylag goose                            | 124                             | 9.5            | 7.7 (1/13)                   | 2  | 0              | 7.7 (1/13)                   |
| Green sandpiper                          | -                               | -              | -                            | 1  | 0              | 7.7 (1/13)                   |
| Black-headed gull                        | 94                              | 11.2           | 15.4 (2/13)                  | 687  | 323            | 100 (13/13)                  |
| Herring gull                             | 430                             | 33.2           | 15.4 (2/13)                  | 265  | 35             | 46.2 (6/13)                  |
| Lesser black-backed gull                 | 58                              | 4.8            | 15.4 (2/13)                  | 9  | 2              | 61.5 (8/13)                  |
| Common gull                              | 4                               | 0.3            | 7.7 (1/13)                   | -  | -              | -                            |
| Grey heron                               | -                               | -              | -                            | 4  | 1              | 46.2 (6/13)                  |

\*Birds recorded only in flight are excluded from the summary results.

## 5 SPA AND RAMSAR QUALIFYING SPECIES FUNCTIONALLY LINKED LAND (FLL) ASSESSMENT

### 5.1 Qualifying and Important Component Species

5.1.1 **Table 5.1** below lists the number of surveys in which the 1% significance threshold was exceeded for Qualifying and Important Component Species of the Ribble and Alt Estuaries SPA and Ramsar and the Martin Mere SPA and Ramsar.

#### ***Ribble and Alt Estuary SPA and Ramsar***

5.1.2 The only Qualifying Species found to exceed the 1% threshold for the Ribble and Alt Estuaries SPA was whooper swan. Whooper swan were recorded in significant numbers but only on 3 of 14 (21%) surveys in Year 1 and not recorded in Year 2 and so was not found to occur regularly (i.e., over 66% of surveys)..

5.1.3 Additionally, the Important Component Species of lapwing and little egret were also record in numbers in exceed the 1% threshold for the Ribble and Alt Estuaries SPA. Significant numbers of lapwing were recorded in 2 of 14 surveys in Year 2 and not recorded in Year 1. Significant numbers of little egret were recorded on 1 of 14 (7%) surveys in Year 1 and 1 of 13 (7%) surveys Year 2.

#### ***Martin Mere SPA and Ramsar***

5.1.4 The only Qualifying Species found to exceed the 1% threshold for the Ribble and Alt Estuaries SPA were pink-footed goose and whooper swan. Pink-footed goose were recorded in significant numbers on 1 of 13 (7%) surveys in Year 2 and not in Year 1. Whooper swan were recorded in significant numbers on 2 of 13 (15%) surveys in Year 1 and not recorded in year two. Neither species were found to be regularly occurring (i.e., over 66% of surveys).

***Table 5.1: Number of surveys on which 1% threshold has been exceeded within the Wintering Survey Area (Site and Wider Survey Area combined)***

| Species                           | Ribble and Alt Estuary SPA/<br>Ramsar |                | Martin Mere SPA/ Ramsar |               |
|-----------------------------------|---------------------------------------|----------------|-------------------------|---------------|
|                                   | Yr 1                                  | Yr2            | Yr 1                    | Yr2           |
| Pink-footed goose <sup>M, R</sup> | -                                     | -              | -                       | <b>1 (7%)</b> |
| Whooper swan <sup>M, R</sup>      | <b>3 (21%)</b>                        |                | <b>2 (15%)</b>          | -             |
| Teal <sup>M, R</sup>              | -                                     |                | -                       | -             |
| Shelduck <sup>R</sup>             | -                                     |                | -                       | -             |
| Golden plover <sup>R</sup>        | -                                     |                | -                       | -             |
| Oystercatcher <sup>R</sup>        | -                                     |                | -                       | -             |
| Redshank <sup>R</sup>             | -                                     |                | -                       | -             |
| Dunlin <sup>R</sup>               | -                                     |                | -                       | -             |
| Curlew <sup>R</sup>               | -                                     |                | -                       | -             |
| Lapwing <sup>R</sup>              | -                                     | <b>2 (14%)</b> | -                       | -             |
| Little egret <sup>R</sup>         | <b>1 (7%)</b>                         | <b>1 (7%)</b>  | -                       | -             |

## **5.2 Waterbird Assemblage**

5.2.1 On no occasion did the waterbird assemblage within the wintering Survey Area meet the criteria to be assessed as functionally linked land to either the Ribble and Alt Estuaries SPA/ Ramsar or Martin Mere SPA/ Ramsar. Numbers of water birds remained below the 2,000 bird threshold to meet the importance criteria for the Waterbird Assemblage with numbers peaking at 416 birds (excluding gull species) on survey 15.

## **5.3 Summary**

5.3.1 The Wintering Survey Area is not considered to meet the definition of functionally linked land for any Qualifying Species, Important Component Species or waterbird assemblage of either the Ribble and Alt Estuaries SPA and Ramsar or the Martin Mere SPA and Ramsar.

## 6 REGIONAL SPECIES ASSESSMENT

### 6.1 Year 1 and 2

- 6.1.1 The regional assessment results in relation to Target Species recorded within the Site and Wider Survey Area are detailed respectively in **Table 6.1** and **6.2** for Year 1, whilst those recorded in Year 2 are respectively detailed in **Table 6.3** and **6.4**.
- 6.1.2 Although several species were identified over the survey period with peak numbers occasionally exceeding 1% of their estimated regional populations, no such counts met the assessment's definition of 'regular' and therefore were not considered to be significant at a broad, regional level.
- 6.1.3 Target Species recorded within the Site exceeding 1% of the regional population included only whooper swan (152 birds) on a single occurrence during Year 1. During Year 2, this also included whooper swan (138 birds), barnacle goose (1 bird), herring gull (430 birds) and lesser black-backed gull (58 birds) each all on a single occasion within the Site. During Year 1, the Wider Survey Area was recorded with numbers exceeding 1% of regional populations for whooper (138 birds), moorhen (8 birds) and lesser black-backed gull (50 birds) on a single visit. Year 2 included herring gull (265 birds), grey heron (4 birds) and green sandpiper (1 bird) at exceeded regional numbers in the Wider Survey Area on only one visit, whilst ruff (3 and 5 birds; two visits) and black-headed gull (423 to 687 birds; six visits) were recorded at such numbers on multiple, irregular occasions.

Table 6.1: Regional assessment of bird species recorded within the Site between September 2023 - March 2024 (Year 1).

| Species           | Month    | Visit | Peak count | Regional population <sup>43</sup>     |   | % of regional population <sup>30</sup> |             | Regular significant numbers criteria met? <sup>31</sup> |  |
|-------------------|----------|-------|------------|---------------------------------------|---|--|-------------|---|--|
| Pink-footed goose | November | 6     | 11         | 33,537<br>(Lancashire <sup>45</sup> ) | 77,659<br>(West England <sup>46</sup> ) | 0.03                                   | 0.01        | No  |  |
|                   | January  | 10    | 6          |                                       |   | 0.02                                   | 0.01        |   |  |
| Whooper swan      | October  | 3     | 152        | 1,518<br>(Lancashire <sup>45</sup> )  | 2,194<br>(Lancashire <sup>47</sup> )    | <b>10.01</b>                           | <b>6.93</b> | No  |  |
| Shelduck          | February | 12    | 4          | 10,435                                |   | 0.04                                   |             | No  |  |
|                   | March    | 13    | 10         |                                       |   | 0.10                                   |             |   |  |
| Mallard           | October  | 4     | 4          | 8,140                                 |   | 0.05                                   |             | No  |  |
|                   | March    | 14    | 2          |                                       |   | 0.02                                   |             |   |  |
| Oystercatcher     | February | 12    | 2          | 48,631                                |   | <0.01                                  |             | No  |  |
|                   | March    | 13    | 2          |                                       |   | <0.01                                  |             |   |  |
|                   | March    | 14    | 2          |                                       |   | <0.01                                  |             |   |  |
| Lapwing           | October  | 3     | 11         | 33,651                                |   | 0.03                                   |             | No  |  |
|                   | December | 7     | 67         |                                       |   | 0.20                                   |             |   |  |
|                   | January  | 9     | 26         |                                       |   | 0.08                                   |             |   |  |
|                   | February | 11    | 23         |                                       |   | 0.07                                   |             |   |  |
|                   | February | 12    | 32         |                                       |   | 0.10                                   |             |   |  |
|                   | March    | 13    | 20         |                                       |   | 0.06                                   |             |   |  |
|                   | March    | 14    | 12         |                                       |   | 0.04                                   |             |   |  |
| Snipe             | December | 8     | 2          | 566                                   |   | 0.35                                   |             | No  |  |

<sup>30</sup> Those in bold indicate when 1% of that species' non-breeding regional population is met.

<sup>31</sup> When a 'significant number' (i.e. 1% of that species' non-breeding regional population) is met in two thirds of the season (i.e.  $\geq 9$  visits).

| Species                  | Month     | Visit | Peak count | Regional population <sup>43</sup> | % of regional population <sup>30</sup> | Regular significant numbers criteria met? <sup>31</sup> |
|--------------------------|-----------|-------|------------|-----------------------------------|--|---|
| Black-headed gull        | January   | 10    | 3          | 36,405                            | 0.53                                   | No  |
|                          | September | 1     | 63         |                                   | 0.17                                   |   |
|                          | October   | 3     | 250        |                                   | 0.69                                   |   |
|                          | October   | 4     | 8          |                                   | 0.02                                   |   |
|                          | December  | 7     | 10         |                                   | 0.03                                   |   |
|                          | March     | 13    | 9          |                                   | 0.02                                   |   |
| Herring gull             | September | 1     | 87         | 13,522                            | 0.64                                   | No  |
|                          | October   | 3     | 14         |                                   | 0.10                                   |   |
|                          | March     | 13    | 4          |                                   | 0.03                                   |   |
| Lesser black-backed gull | March     | 13    | 18         | 3,987                             | 0.45                                   | No  |
| Little egret             | December  | 7     | 1          | 760                               | 0.13                                   | No  |
|                          | December  | 8     | 1          |                                   | 0.13                                   |   |
|                          | February  | 11    | 1          |                                   | 0.13                                   |   |
|                          | March     | 13    | 1          |                                   | 0.13                                   |   |

Table 6.2: Regional assessment of bird species recorded within the Wider Survey Area between September 2023 - March 2024 (Year 1).

| Species           | Month    | Visit | Peak count | Regional population <sup>43</sup>    | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>59</sup> |
|-------------------|----------|-------|------------|--------------------------------------|--|---|
| Pink-footed goose | November | 5     | 58         | 33,537 (Lancashire <sup>45</sup> )   | 0.17                                   | No  |
| Whooper swan      | October  | 3     | 138        | 77,659 (West England <sup>46</sup> ) | 0.07                                   | No  |

| Species           | Month    | Visit | Peak count | Regional population <sup>43</sup>    |                                      | % of regional population <sup>58</sup> |      | Regular significant numbers criteria met? <sup>59</sup> |  |
|-------------------|----------|-------|------------|--------------------------------------|--------------------------------------|--|------|---|--|
|                   | November | 5     | 7          | 1,518<br>(Lancashire <sup>45</sup> ) | 2,194<br>(Lancashire <sup>47</sup> ) | 0.46                                   | 0.32 |   |  |
|                   | December | 8     | 8          |                                      |                                      | 0.53                                   | 0.36 |   |  |
|                   | January  | 9     | 9          |                                      |                                      | 0.59                                   | 0.41 |   |  |
| Shelduck          | January  | 9     | 2          | 10,435                               |                                      | 0.02                                   |      | No  |  |
| Mallard           | October  | 4     | 4          | 8,140                                |                                      | 0.05                                   |      | No  |  |
|                   | November | 6     | 6          |                                      |                                      | 0.07                                   |      |   |  |
|                   | December | 7     | 30         |                                      |                                      | 0.37                                   |      |   |  |
|                   | January  | 10    | 4          |                                      |                                      | 0.05                                   |      |   |  |
|                   | March    | 14    | 1          |                                      |                                      | 0.01                                   |      |   |  |
| Teal              |          | 11    | 14         | 13,217                               |                                      | 0.11                                   |      | No  |  |
| Moorhen           | December | 7     | 1          | 689                                  |                                      | 0.15                                   |      | No  |  |
|                   | January  | 9     | 2          |                                      |                                      | 0.29                                   |      |   |  |
|                   | January  | 10    | 1          |                                      |                                      | 0.15                                   |      |   |  |
|                   | February | 11    | 8          |                                      |                                      | <b>1.16</b>                            |      |   |  |
|                   | March    | 14    | 2          |                                      |                                      | 0.29                                   |      |   |  |
| Oystercatcher     | February | 12    | 2          | 48,631                               |                                      | <0.01                                  |      | No  |  |
|                   | March    | 13    | 2          |                                      |                                      | <0.01                                  |      |   |  |
|                   | March    | 14    | 3          |                                      |                                      | 0.01                                   |      |   |  |
| Lapwing           | December | 8     | 14         | 33,651                               |                                      | 0.04                                   |      | No  |  |
| Snipe             | December | 8     | 1          | 566                                  |                                      | 0.18                                   |      | No  |  |
| Redshank          | February | 12    | 1          | 8,052                                |                                      | 0.01                                   |      | No  |  |
| Black-headed gull | November | 6     | 60         | 36,405                               |                                      | 0.16                                   |      | No  |  |

| Species                  | Month    | Visit | Peak count | Regional population <sup>43</sup> | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>59</sup> |
|--------------------------|----------|-------|------------|-----------------------------------|--|---|
|                          | December | 7     | 16         |                                   | 0.04                                   |   |
|                          | December | 8     | 2          |                                   | 0.01                                   |   |
|                          | March    | 13    | 90         |                                   | 0.25                                   |   |
| Herring gull             | November | 6     | 3          | 13,522                            | 0.02                                   | No  |
| Lesser black-backed gull | March    | 13    | 50         | 3,987                             | <b>1.25</b>                            | No  |
| Grey heron               | November | 5     | 1          | 292                               | 0.34                                   | No  |
|                          | January  | 9     | 2          |                                   | 0.68                                   |   |
|                          | March    | 14    | 1          |                                   | 0.34                                   |   |
| Little egret             | December | 8     | 2          | 760                               | 0.26                                   | No  |
|                          | January  | 10    | 3          |                                   | 0.39                                   |   |
|                          | February | 12    | 1          |                                   | 0.13                                   |   |

**Table 6.3: Regional assessment of bird species recorded within the Site between September 2024 - March 2025 (Year 2).**

| Species           | Month     | Visit | Peak count | Regional population <sup>45</sup>  | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>32</sup> |
|-------------------|-----------|-------|------------|------------------------------------|--|---|
| Pink-footed goose | September | 15    | 290        | 33,537 (Lancashire <sup>45</sup> ) | 77,659 (West England <sup>46</sup> )   | 0.86 0.37   |
| Barnacle goose    | September | 15    | 1          | 83                                 |  | <b>1.20</b>   |

<sup>32</sup> When a 'significant number' (i.e. 1% of that species' non-breeding regional population) is met in two thirds of the season (i.e.  $\geq 8$  visits).

| Species       | Month     | Visit | Peak count | Regional population <sup>45</sup> | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>32</sup> |
|---------------|-----------|-------|------------|-----------------------------------|--|---|
| Greylag goose | September | 15    | 124        | 5,708                             | <b>2.17</b>                            | No  |
| Shelduck      | December  | 20    | 2          | 10,435                            | 0.02                                   | No  |
|               | December  | 21    | 1          |                                   | 0.01                                   |   |
|               | January   | 23    | 4          |                                   | 0.04                                   |   |
|               | February  | 24    | 2          |                                   | 0.02                                   |   |
|               | March     | 27    | 2          |                                   | 0.02                                   |   |
| Mallard       | March     | 27    | 2          |                                   | 0.02                                   | No  |
| Oystercatcher | February  | 25    | 2          | 48,631                            | <0.01                                  | No  |
|               | March     | 26    | 2          |                                   | <0.01                                  |   |
|               | March     | 27    | 4          |                                   | 0.01                                   |   |
| Lapwing       | October   | 17    | 14         | 33,651                            | 0.04                                   | No  |
|               | November  | 18    | 14         |                                   | 0.04                                   |   |
|               | November  | 19    | 24         |                                   | 0.07                                   |   |
|               | December  | 20    | 12         |                                   | 0.04                                   |   |
|               | December  | 21    | 11         |                                   | 0.03                                   |   |
|               | February  | 24    | 22         |                                   | 0.07                                   |   |
|               | February  | 25    | 65         |                                   | 0.19                                   |   |
|               | March     | 26    | 18         |                                   | 0.05                                   |   |
|               | March     | 27    | 22         |                                   | 0.07                                   |   |
| Golden plover | February  | 25    | 19         |                                   | 0.19                                   | No  |
| Snipe         | October   | 16    | 3          | 566                               | 0.53                                   | No  |
|               | October   | 17    | 5          |                                   | 0.88                                   |   |

| Species                  | Month     | Visit | Peak count | Regional population <sup>45</sup> | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>32</sup> |
|--------------------------|-----------|-------|------------|-----------------------------------|--|---|
|                          | November  | 18    | 2          |                                   | 0.35                                   |   |
|                          | November  | 19    | 3          |                                   | 0.53                                   |   |
|                          | December  | 20    | 1          |                                   | 0.18                                   |   |
|                          | January   | 22    | 2          |                                   | 0.35                                   |   |
|                          | January   | 23    | 2          |                                   | 0.35                                   |   |
|                          | February  | 24    | 2          |                                   | 0.35                                   |   |
| Black-headed gull        | September | 15    | 52         | 36,405                            | 0.14                                   | No  |
|                          | March     | 26    | 94         |                                   | 0.26                                   |   |
| Common gull              | September | 15    | 4          | 2,431                             | 0.16                                   | No  |
| Herring gull             | September | 15    | 430        | 13,522                            | 3.18                                   | No  |
|                          | March     | 26    | 2          |                                   | 0.01                                   |   |
| Lesser black-backed gull | September | 15    | 58         | 3,987                             | 1.45                                   | No  |
|                          | March     | 26    | 4          |                                   | 0.10                                   |   |
| Little egret             | December  | 20    | 1          | 760                               | 0.13                                   | No  |

**Table 6.4: Regional assessment of bird species recorded within the Wider Survey Area between September 2024 - March 2025 (Year 2).**

| Species           | Month    | Visit | Peak count | Regional population <sup>43</sup>   | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>60</sup> |
|-------------------|----------|-------|------------|---|--|---|
| Pink-footed goose | November | 18    | 63         | 33,537 (Lancashire <sup>45</sup> )   77,659 (West England <sup>46</sup> ) | 0.19   0.08                            | No  |
| Greylag goose     | December | 21    | 2          | 5,708   | 0.04                                   | No  |
| Shelduck          | November | 19    | 2          | 10,435  | 0.02                                   | No  |

| Species       | Month    | Visit | Peak count | Regional population <sup>43</sup> | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>60</sup> |
|---------------|----------|-------|------------|-----------------------------------|--|---|
|               | December | 20    | 2          |                                   | 0.02                                   |   |
|               | December | 21    | 3          |                                   | 0.03                                   |   |
|               | January  | 22    | 4          |                                   | 0.04                                   |   |
|               | January  | 23    | 10         |                                   | 0.10                                   |   |
|               | February | 24    | 4          |                                   | 0.04                                   |   |
|               | February | 25    | 11         |                                   | 0.11                                   |   |
|               | March    | 26    | 31         |                                   | 0.30                                   |   |
|               | March    | 27    | 22         |                                   | 0.21                                   |   |
| Mallard       | October  | 17    | 6          | 8,140                             | 0.07                                   | No  |
|               | November | 18    | 6          |                                   | 0.07                                   |   |
|               | February | 25    | 16         |                                   | 0.20                                   |   |
|               | March    | 26    | 10         |                                   | 0.12                                   |   |
|               | March    | 27    | 41         |                                   | 0.50                                   |   |
| Teal          | March    | 26    | 5          | 13,217                            | 0.04                                   | No  |
|               | March    | 27    | 12         |                                   | 0.09                                   |   |
| Oystercatcher | February | 24    | 4          | 48,631                            | 0.01                                   | No  |
|               | February | 25    | 2          |                                   | <0.01                                  |   |
|               | March    | 26    | 2          |                                   | <0.01                                  |   |
|               | March    | 27    | 6          |                                   | 0.01                                   |   |
| Lapwing       | October  | 16    | 179        | 33,651                            | 0.53                                   | No  |
|               | October  | 17    | 89         |                                   | 0.26                                   |   |
|               | November | 18    | 14         |                                   | 0.04                                   |   |
|               | November | 19    | 183        |                                   | 0.54                                   |   |

| Species           | Month     | Visit | Peak count | Regional population <sup>43</sup> | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>60</sup> |
|-------------------|-----------|-------|------------|-----------------------------------|--|---|
|                   | January   | 22    | 61         |                                   | 0.18                                   |   |
|                   | January   | 23    | 18         |                                   | 0.05                                   |   |
|                   | February  | 25    | 108        |                                   | 0.32                                   |   |
|                   | March     | 26    | 47         |                                   | 0.14                                   |   |
|                   | March     | 27    | 15         |                                   | 0.04                                   |   |
| Curlew            | November  | 18    | 6          | 10,244                            | 0.06                                   | No  |
| Ruff              | October   | 17    | 5          | 82                                | <b>6.10</b>                            | No  |
|                   | November  | 18    | 3          |                                   | <b>3.66</b>                            |   |
| Dunlin            | October   | 16    | 1          | 71,049                            | <0.01                                  | No  |
| Snipe             | November  | 18    | 2          | 566                               | 0.35                                   | No  |
|                   | December  | 21    | 1          |                                   | 0.18                                   |   |
|                   | January   | 23    | 1          |                                   | 0.18                                   |   |
| Green sandpiper   | February  | 25    | 1          | 19                                | <b>5.26</b>                            | No  |
| Redshank          | February  | 25    | 1          | 8,052                             | 0.01                                   | No  |
|                   | March     | 26    | 4          |                                   | 0.05                                   |   |
| Black-headed gull | September | 15    | 238        | 36,405                            | 0.65                                   | No  |
|                   | October   | 16    | 77         |                                   | 0.21                                   |   |
|                   | October   | 17    | 460        |                                   | <b>1.26</b>                            |   |
|                   | November  | 18    | 462        |                                   | <b>1.27</b>                            |   |
|                   | November  | 19    | 473        |                                   | <b>1.30</b>                            |   |
|                   | December  | 20    | 315        |                                   | 0.87                                   |   |

| Species                  | Month    | Visit | Peak count | Regional population <sup>43</sup> | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>60</sup> |
|--------------------------|----------|-------|------------|-----------------------------------|--|---|
| Herring gull             | December | 21    | 472        | 13,522                            | 1.30                                   | No  |
|                          | January  | 22    | 22         |                                   | 0.06                                   |   |
|                          | January  | 23    | 78         |                                   | 0.21                                   |   |
|                          | February | 24    | 126        |                                   | 0.35                                   |   |
|                          | February | 25    | 362        |                                   | 0.99                                   |   |
|                          | March    | 26    | 687        |                                   | 1.89                                   |   |
|                          | March    | 27    | 423        |                                   | 1.16                                   |   |
| Lesser black-backed gull | October  | 16    | 265        | 3,987                             | 1.96                                   | No  |
|                          | October  | 17    | 92         |                                   | 0.68                                   |   |
|                          | November | 18    | 81         |                                   | 0.60                                   |   |
|                          | November | 19    | 6          |                                   | 0.04                                   |   |
|                          | December | 20    | 5          |                                   | 0.04                                   |   |
|                          | December | 21    | 2          |                                   | 0.01                                   |   |
|                          | October  | 16    | 9          |                                   | 0.23                                   |   |
|                          | October  | 17    | 1          |                                   | 0.03                                   |   |

| Species      | Month     | Visit | Peak count | Regional population <sup>43</sup> | % of regional population <sup>58</sup> | Regular significant numbers criteria met? <sup>60</sup> |
|--------------|-----------|-------|------------|-----------------------------------|--|---|
| Grey heron   | October   | 17    | 2          | 292                               | 0.68                                   | No  |
|              | November  | 18    | 4          |                                   | <b>1.37</b>                            |   |
|              | January   | 22    | 1          |                                   | 0.34                                   |   |
|              | January   | 23    | 1          |                                   | 0.34                                   |   |
|              | February  | 24    | 1          |                                   | 0.34                                   |   |
|              | March     | 27    | 1          |                                   | 0.34                                   |   |
| Little egret | September | 15    | 1          | 760                               | 0.13                                   | No  |
|              | December  | 20    | 1          |                                   | 0.13                                   |   |
|              | December  | 21    | 4          |                                   | 0.53                                   |   |
|              | January   | 23    | 2          |                                   | 0.26                                   |   |
|              | February  | 25    | 1          |                                   | 0.13                                   |   |

## **FIGURES**

**Figure 1:** Site Location Plan

**Figure 2:** Statutory Designated Sites With Non-breeding Ornithological Interest

**Figure 3:** VP Flight Activity Survey Plan

**Figure 4:** Non-breeding Walkover Survey Plan

**Figure 5:** Breeding Bird Survey Plan

**Figure 6:** VP Flight Activity Survey Results Plan Year 1 – Geese

**Figure 7:** VP Flight Activity Survey Results Plan Year 1 – Swans

**Figure 8:** VP Flight Activity Survey Results Plan Year 1 – Ducks

**Figure 9:** VP Flight Activity Survey Results Plan Year 1 – Raptors and Owls

**Figure 10:** VP Flight Activity Survey Results Plan Year 1 – Lapwing

**Figure 11:** VP Flight Activity Survey Results Plan Year 1 – Waders and Others (A)

**Figure 12:** VP Flight Activity Survey Results Plan Year 1 – Waders and Others (B)

**Figure 13:** Non-breeding Walkover Survey Results Plan Year 1 – SPA/Ramsar Site Qualifying and Important Assemblage Species

**Figure 14:** Non-breeding Walkover Survey Results Plan Year 1 – Other Target Species (Waterfowl)

**Figure 15:** Non-breeding Walkover Survey Results Plan Year 1 – Other Target Species (Gulls)

**Figure 16:** Breeding Bird Survey Results

**Figure 17:** Confidential Schedule 1 Species Breeding Bird Survey Results (provided separately)

**Figure 18:** VP Flight Activity Survey Results Plan Year 2 – Geese

**Figure 19:** VP Flight Activity Survey Results Plan Year 2 – Swans

**Figure 20:** VP Flight Activity Survey Results Plan Year 2 – Ducks

**Figure 21:** VP Flight Activity Survey Results Plan Year 2 – Raptors and Owls

**Figure 22:** VP Flight Activity Survey Results Plan Year 2 – Lapwing

**Figure 23:** VP Flight Activity Survey Results Plan Year 2 – Waders and Others (A)

**Figure 24:** VP Flight Activity Survey Results Plan Year 2 – Waders and Others (B)

**Figure 25:** Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Listed Qualifying Features (A)

**Figure 26:** Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Listed Qualifying Features (B)

**Figure 27:** Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Waterfowl)

**Figure 28:** Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Gulls)

## **FIGURES**

## Annex 1: Species List with Scientific Names and Conservation Status

**Table A3.1.1** provides a list of bird species recorded during the non-breeding bird surveys. Both common and species names are presented along with a summary of each species conservation status using the following abbreviations:

- Annex 1 – European Birds Directive Annex I species.
- Sch1.1/1.1A/A1/1.2 – Schedule 1 part 1, 1 part 1A, A1 or 1 part 2 of the Wildlife and Countryside Act 1981 (as amended);
- BoCC – Birds of Conservation Concern as listed by leading bird conservation organisations in the UK, including the RSPB and BTO. Red and Amber categories are given (Stanbury *et al.*, 2021; Stanbury *et al.* 2024)<sup>30,31</sup>;
- Sec41 – species listed on Section 41 of the Natural Environment and Rural Communities Act 2006 (Species of principle importance for conserving biodiversity in England); and,
- LBAP – species listed as priority in the Lancashire Biodiversity Action Plan.

**Table A3.1.1: Summary of bird species.**

| Common name            | Species name                       | Conservation status      |
|------------------------|------------------------------------|--------------------------|
| Barnacle goose         | <i>Branta leucopsis</i>            | Amber; Ann1              |
| Greylag goose          | <i>Anser anser</i>                 | Amber                    |
| Pink-footed goose      | <i>Anser brachyrhynchus</i>        | Amber                    |
| Mute swan              | <i>Cygnus olor</i>                 | Green                    |
| Bewick's swan          | <i>Cygnus columbianus bewickii</i> | Red; Sch1.1; Sec41; Ann1 |
| Whooper swan           | <i>Cygnus cygnus</i>               | Amber; Sch1.1; Ann1      |
| Shelduck               | <i>Tadorna tadorna</i>             | Amber                    |
| Shoveler               | <i>Spatula clypeata</i>            | Amber                    |
| Gadwall                | <i>Mareca strepera</i>             | Amber                    |
| Wigeon                 | <i>Mareca penelope</i>             | Amber                    |
| Mallard                | <i>Anas platyrhynchos</i>          | Amber                    |
| Pintail                | <i>Anas acuta</i>                  | Amber; Sch1.2            |
| Teal                   | <i>Anas crecca</i>                 | Amber                    |
| Scaup                  | <i>Aythya marila</i>               | Red; Sch1.1; Sec41       |
| Common scoter          | <i>Melanitta nigra</i>             | Red; Sch1.1; Sec41       |
| Goosander              | <i>Mergus merganser</i>            | Green                    |
| Red-breasted merganser | <i>Mergus serrator</i>             | Amber                    |
| Woodpigeon             | <i>Columba palumbus</i>            | Amber                    |
| Moorhen                | <i>Gallinula chloropus</i>         | Amber                    |
| Oystercatcher          | <i>Haematopus ostralegus</i>       | Amber                    |
| Lapwing                | <i>Vanellus vanellus</i>           | Red; Sec41; LBAP         |
| Golden plover          | <i>Pluvialis apricaria</i>         | Green; Ann1              |
| Grey plover            | <i>Pluvialis squatarola</i>        | Amber                    |
| Ringed plover          | <i>Charadrius hiaticula</i>        | Red                      |
| Whimbrel               | <i>Numenius phaeopus</i>           | Red; Sch1.1              |
| Curlew                 | <i>Numenius arquata</i>            | Red; Sec41               |
| Bar-tailed godwit      | <i>Limosa lapponica</i>            | Amber; Ann1              |

## Annex 1: Species List with Scientific Names and Conservation Status

| Common name              | Species name                      | Conservation status      |
|--------------------------|-----------------------------------|--------------------------|
| Black-tailed godwit      | <i>Limosa limosa</i>              | Red; Sch1.1; Sec41; LBAP |
| Knot                     | <i>Calidris canutus</i>           | Amber                    |
| Ruff                     | <i>Calidris pugnax</i>            | Red; Sch1.1; Ann1        |
| Sanderling               | <i>Calidris alba</i>              | Amber                    |
| Dunlin                   | <i>Calidris alpina</i>            | Red                      |
| Snipe                    | <i>Gallinago gallinago</i>        | Amber                    |
| Common sandpiper         | <i>Actitis hypoleucos</i>         | Amber                    |
| Green sandpiper          | <i>Tringa ochropus</i>            | Amber; Sch1.1            |
| Redshank                 | <i>Tringa totanus</i>             | Amber                    |
| Spotted redshank         | <i>Tringa erythropus</i>          | Amber                    |
| Greenshank               | <i>Tringa nebularia</i>           | Amber; Sch1.1            |
| Black-headed gull        | <i>Chroicocephalus ridibundus</i> | Amber                    |
| Little gull              | <i>Hydrocoleus minutus</i>        | Green; Sch1.1; Ann1      |
| Common gull              | <i>Larus canus</i>                | Red                      |
| Herring gull             | <i>Larus argentatus</i>           | Red; Sec41               |
| Lesser black-backed gull | <i>Larus fuscus</i>               | Amber                    |
| Little tern              | <i>Sternula albifrons</i>         | Amber; Sch1.1; Ann1      |
| Common tern              | <i>Sterna hirundo</i>             | Amber; Ann1              |
| Red-throated diver       | <i>Gavia stellata</i>             | Green; Sch1.1; Ann1      |
| Cormorant                | <i>Phalacrocorax carbo</i>        | Green                    |
| Grey heron               | <i>Ardea cinerea</i>              | Green                    |
| Little egret             | <i>Egretta garzetta</i>           | Green; Ann1              |
| Red kite                 | <i>Milvus milvus</i>              | Green; Sch1.1 & 1A; Ann1 |
| Buzzard                  | <i>Buteo buteo</i>                | Green                    |
| Barn owl                 | <i>Tyto alba</i>                  | Green; Sch1.1            |
| Kingfisher               | <i>Alcedo atthis</i>              | Green; Sch1.1; Ann1      |
| Kestrel                  | <i>Falco tinnunculus</i>          | Amber                    |
| Merlin                   | <i>Falco columbarius</i>          | Red; Sch1.1; Ann1        |
| Hobby                    | <i>Falco subbuteo</i>             | Green; Sch1.1            |
| Peregrine                | <i>Falco peregrinus</i>           | Green; Sch1.1; Ann1      |
| Jay                      | <i>Garrulus glandarius</i>        | Green                    |
| Jackdaw                  | <i>Coloeus monedula</i>           | Green                    |
| Blue tit                 | <i>Cyanistes caeruleus</i>        | Green                    |
| Great tit                | <i>Parus major</i>                | Green                    |
| Skylark                  | <i>Alauda arvensis</i>            | Red; Sec41; LBAP         |
| House martin             | <i>Delichon urbicum</i>           | Red                      |
| Cetti's warbler          | <i>Cettia cetti</i>               | Green; Sch1.1            |
| Sedge warbler            | <i>Acrocephalus schoenobaenus</i> | Amber                    |
| Reed warbler             | <i>Acrocephalus scirpaceus</i>    | Green                    |

## Annex 1: Species List with Scientific Names and Conservation Status

| Common name   | Species name                   | Conservation status |
|---------------|--------------------------------|---------------------|
| Blackcap      | <i>Sylvia atricapilla</i>      | Green               |
| Whitethroat   | <i>Curruca communis</i>        | Amber               |
| Wren          | <i>Troglodytes troglodytes</i> | Amber               |
| Blackbird     | <i>Turdus merula</i>           | Green               |
| Robin         | <i>Erithacus rubecula</i>      | Green               |
| Wheatear      | <i>Oenanthe oenanthe</i>       | Amber               |
| House sparrow | <i>Passer domesticus</i>       | Red; Sec41          |
| Dunnock       | <i>Prunella modularis</i>      | Amber; Sec41        |
| Pied wagtail  | <i>Motacilla alba yarellii</i> | Green               |
| Greenfinch    | <i>Chloris chloris</i>         | Red                 |
| Goldfinch     | <i>Carduelis carduelis</i>     | Green               |
| Reed bunting  | <i>Emberiza schoeniclus</i>    | Amber; Sec41; LBAP  |

## Annex 2: Bird Survey Effort

**Table A2.2.1** provides full survey effort, including weather conditions during each VP survey. **Table A2.2.2** provides full survey effort, including weather conditions during each non-breeding walkover survey at the Site. **Table A2.2.3** provides full survey effort, including weather conditions during each breeding bird survey.

| Wind Speed    |    | W-Direction          | Rain          |            | Cloud Cover            |             | Cloud Height |         |
|---------------|----|----------------------|---------------|------------|------------------------|-------------|--------------|---------|
| Calm          | 0  | Use 16 point Compass | None          | 0          | In eighths e.g.<br>3/8 | <150m       |              | 0       |
| Light air     | 1  |                      | Light showers | 1          |                        | 150-500m    |              | 1       |
| Light breeze  | 2  |                      | Heavy showers | 2          |                        | >500m       |              | 2       |
| Gentle breeze | 3  |                      | Light rain    | 3          |                        |             |              |         |
| Mod. breeze   | 4  |                      | Heavy rain    | 4          |                        |             |              |         |
| Fresh breeze  | 5  |                      | E             |            |                        |             |              |         |
| Strong breeze | 6  |                      | Etc           | Visibility |                        | Snow        |              | Frost   |
| Mod. gale     | 7  |                      |               | Poor       | 0                      | None        | 0            | None    |
| Fresh gale    | 8  |                      |               | < 1km      | 1                      | On site     | 1            | Ground  |
| Strong gale   | 9  |                      |               | >1km       | 2                      | High ground | 2            | All day |
| Whole gale    | 10 |                      |               |            |                        |             |              |         |

**Table A2.2.1: VP survey effort.**

| Date       | Surveyor | Start Time | End time | VP Hours | Wind Speed | Wind Direction | Rain        | Cloud Height | Cloud Cover | Visibility | Frost | Snow |
|------------|----------|------------|----------|----------|------------|----------------|-------------|--------------|-------------|------------|-------|------|
| Year 1     |          |            |          |          |            |                |             |              |             |            |       |      |
| 16/09/2022 | PB       | 11:00      | 14:00    | 3        | 3/3/3      | N/N/N          | 0           | 1/1/3        | 2           | 2          | 0     | 0    |
| 16/09/2022 | PB       | 14:30      | 17:30    | 3        | 3/2/2      | N/N/N          | 0           | 4/4/4        | 2           | 2          | 0     | 0    |
| 22/09/2022 | PB       | 07:00      | 10:00    | 3        | 2/2/2      | SSE/SSW/SSW    | 0           | 4/6/6        | 2           | 2          | 0     | 0    |
| 22/09/2022 | PB       | 10:30      | 13:30    | 3        | 2/2/2      | S/S/S          | 0           | 6/6-8/8      | 2           | 2          | 0     | 0    |
| 18/10/2022 | PB       | 07:45      | 10:45    | 3        | 0/0/0      | ESE/ESE/ESE    | 0           | 1/1/1        | 2           | 2          | 0     | 0    |
| 18/10/2022 | PB       | 11:15      | 14:15    | 3        | 0/0/0      | ESE/ESE/ESE    | 0           | 1-2/2-4/4    | 2           | 2          | 0     | 0    |
| 26/10/2022 | PB       | 11:30      | 14:30    | 3        | 4/4/4      | SSW/SSW/SSW    | 1-0/0-1/0-1 | 6/4/4        | 2           | 2          | 0     | 0    |
| 26/10/2022 | PB       | 15:00      | 18:00    | 3        | 4/3/3      | SSW/SSW/SSW    | 0-1/0-1/1   | 3/4/5        | 2           | 2          | 0     | 0    |
| 10/11/2022 | AH       | 10:40      | 13:40    | 3        | 6/7/5      |                | 0/0/0       | 7/8/8        | 2           | 2          | 0     | 0    |
| 24/11/2022 | PB       | 09:45      | 12:45    | 3        | 4/4/4      | SSE/SSE/SSE    | 0/0/0-1-2   | 6/6/8        | 2           | 2          | 0     | 0    |

## Annex 2: Bird Survey Effort

|            |    |       |       |   |         |             |             |       |   |         |   |   |
|------------|----|-------|-------|---|---------|-------------|-------------|-------|---|---------|---|---|
| 28/11/2022 | PB | 10:30 | 13:30 | 3 | 1/1/1   | SE/SE/SE    | 0/0/0       | 2/2/3 | 2 | 2       | 0 | 0 |
| 28/11/2022 | PB | 14:00 | 17:00 | 3 | 1/1/1   | SE/SE/SE    | 0/0/0       | 3/3/6 | 2 | 2       | 0 | 0 |
| 12/12/2022 | PB | 08:15 | 11:15 | 3 | 1/1/1   | ESE/ESE/ESE | 0/0/0       | 8/8/8 | 2 | 2       | 1 | 0 |
| 12/12/2022 | PB | 11:45 | 14:45 | 3 | 1/1/1   | ESE/ESE/ESE | 0/0/0       | 8/8/8 | 2 | 2       | 1 | 0 |
| 20/12/2022 | PB | 12:45 | 15:45 | 3 | 3/3/3   | SW/SW/SW    | 1/0/0       | 7/5/5 | 2 | 2       | 0 | 0 |
| 13/01/2023 | PB | 08:15 | 11:15 | 3 | 6/6/6   | W/W/W       | 0/0/0-1     | 7/7/7 | 2 | 2       | 0 | 0 |
| 31/01/2023 | PB | 11:00 | 14:00 | 3 | 4/4/4   | NW/NW/NW    | 0/0/0       | 1/1/1 | 2 | 2       | 0 | 0 |
| 31/01/2023 | PB | 14:30 | 17:30 | 3 | 4/4/4   | WNW/WNW/WNW | 0/0/0       | 4/4/6 | 2 | 2       | 0 | 0 |
| 16/02/2023 | PB | 08:15 | 11:15 | 3 | 1/1/1   | SW/SW/SW    | 1/1/1-0     | 8/8/8 | 2 | 2       | 0 | 0 |
| 16/02/2023 | PB | 11:45 | 14:45 | 3 | 1/1/1   | SW/SW/SW    | 1-0/0-1/0-1 | 8/8/8 | 2 | 2       | 2 | 0 |
| 23/03/2023 | ZH | 09:30 | 12:30 | 3 | 4/4/4   | SW/SW/SW    | 3/3/1       | 8/8/5 | 2 | 2       | 2 | 0 |
| 23/03/2023 | ZH | 13:00 | 16:00 | 3 | 3/2/3   | SW/SW/SW    | 1/0/0       | 5/5/4 | 2 | 2       | 0 | 0 |
| 29/03/2023 | KL | 08:30 | 11:30 | 3 | 1/1/2   | S/SE/SE     | 0/0/0       | 8/8/8 | 2 | 2       | 0 | 0 |
| 29/03/2023 | KL | 12:00 | 15:00 | 3 | 3/2/3   | SE/SE/SE    | 0/0/0       | 8/8/8 | 2 | 2       | 0 | 0 |
| 24/04/2023 | ZH | 08:30 | 11:30 | 3 | 2/3/3   | N/N/NW      | 0/0/0       | 2/3/3 | 2 | 2       | 0 | 0 |
| 24/04/2023 | ZH | 12:15 | 15:15 | 3 | 3/4/4   | NW/NW/NW    | 0/0/0       | 4/5/5 | 2 | 2       | 0 | 0 |
| 14/04/2023 | PB | 08:00 | 11:00 | 3 | 2/2/2   | SE/SE/SE    | 0/0-2/2-0   | 5/6/6 | 2 | 2       | 0 | 0 |
| 14/04/2023 | PB | 11:30 | 14:30 | 3 | 2/2/2   | SE/SE/SE    | 0-2/2-0/2/2 | 7/7/7 | 2 | 2       | 0 | 0 |
| 11/05/2023 | ZH | 12:45 | 15:45 | 3 | 1/2/1   | NW/NW/NW    | 0/0/0       | 3/2/6 | 2 | 2       | 0 | 0 |
| 11/05/2023 | ZH | 09:15 | 12:15 | 3 | 2/2/2   | NW/NW/NW    | 0/0/0       | 3/3/3 | 2 | 2       | 0 | 0 |
| 24/05/2023 | ZH | 09:20 | 12:20 | 3 | 2/3/3   | NW/NW/NW    | 0/0/0       | 2/4/4 | 2 | 2       | 0 | 0 |
| 24/05/2023 | ZH | 12:50 | 15:50 | 3 | 3/2/2   | NW/NW/NW    | 0/0/0       | 2/1/1 | 2 | 2       | 0 | 0 |
| Year 2     |    |       |       |   |         |             |             |       |   |         |   |   |
| 18/10/2023 | PB | 11:30 | 14:30 | 3 | 3/3/3   | ESE/ESE/ESE | 0/0/0       | 3/4/4 | 2 | 2       | 0 | 0 |
| 18/10/2023 | PB | 15:00 | 18:00 | 3 | 3/3/3   | ESE/E/E     | 0/0-1-0/0   | 4/5/6 | 2 | 2       | 0 | 0 |
| 25/10/2023 | PB | 08:45 | 11:45 | 3 | 1/1/1   | NNE/NW/NW   | 0/0/0       | 1/1/1 | 2 | 1-2/2/2 | 0 | 0 |
| 25/10/2023 | PB | 12:15 | 15:15 | 3 | 1/1/1   | NW>NNW>NNW  | 0/0/0       | 1/2/2 | 2 | 2       | 0 | 0 |
| 07/11/2023 | PB | 07:30 | 10:30 | 3 | 2/2/2   | WNW/WNW/WNW | 0-1-0       | 6/5/6 | 2 | 2       | 0 | 0 |
| 07/11/2023 | PB | 11:00 | 14:00 | 3 | 2-3/3/3 | W/W/W       | 0/0/0       | 5/5/4 | 2 | 2       | 0 | 0 |
| 22/11/2023 | PB | 08:15 | 11:15 | 3 | 3/3/3   | WSW/WSW/WSW | 1/1-0/0     | 8/8/8 | 2 | 2       | 0 | 0 |

## Annex 2: Bird Survey Effort

|            |    |       |       |   |         |                |               |           |   |   |   |   |
|------------|----|-------|-------|---|---------|----------------|---------------|-----------|---|---|---|---|
| 22/11/2023 | PB | 11:45 | 14:45 | 3 | 3/3/3   | WSW/WSW/WSW    | 1/1-0/0-1     | 8/8/8     | 2 | 2 | 0 | 0 |
| 14/12/2023 | PB | 08:15 | 11:15 | 3 | 2/2/2   | SW/SW/SW       | 1-0/0-1/1-0   | 8/8/8-7   | 2 | 2 | 0 | 0 |
| 14/12/2023 | PB | 11:45 | 14:45 | 3 | 2/2/2   | NW/NW/NW       | 0/0/0         | 6-8/8/8-7 | 2 | 2 | 0 | 0 |
| 23/01/2024 | PB | 08:00 | 11:00 | 3 | 2/2/2-3 | SSE/SSE/SSE    | 2/2/2-4       | 8/8/8     | 2 | 2 | 0 | 0 |
| 29/01/2024 | PB | 09:00 | 12:00 | 3 | 1/1/1   | NNE/NNE/NNE    | 1/1-2/2-0     | 8/8/8     | 2 | 2 | 0 | 0 |
| 19/02/2024 | PB | 08:30 | 11:30 | 3 | 2/2/2   | WNW/WNW/WNW    | 0/0/0         | 1/1/1-5   | 2 | 2 | 0 | 0 |
| 19/02/2024 | PB | 12:00 | 15:00 | 3 | 2/2/2   | WNW/WNW/WNW    | 0/0/0         | 5-7/7-8/8 | 2 | 2 | 0 | 0 |
| 13/03/2024 | PB | 08:45 | 11:45 | 3 | 3/3/3   | SSW/SSW/SSW    | 0/0-1/0/0-1   | 8/8/8     | 2 | 2 | 0 | 0 |
| 13/03/2024 | PB | 12:15 | 15:15 | 3 | 3/3/3   | SSW/SSW/SSW    | 1-2/2-1/1-0-2 | 8/8/8     | 2 | 2 | 0 | 0 |
| 25/03/2024 | PB | 07:45 | 10:45 | 3 | 2/2/2   | ESE/ESE/ESE    | 2/2-1/1-2     | 8/8/8     | 2 | 2 | 0 | 0 |
| 25/03/2024 | PB | 11:15 | 14:15 | 3 | 2/2/2   | SE/SE/SE       | 0/0-1/1       | 8/8/8     | 2 | 2 | 0 | 0 |
| 04/04/2024 | PB | 08:30 | 11:30 | 3 | 1/1/1   | NNW-NW/NW/NW   | 0/0/0         | 8/8/8     | 2 | 2 | 0 | 0 |
| 04/04/2024 | PB | 12:00 | 15:00 | 3 | 1/1/1   | SSE/SSE/SSE    | 0/0/0         | 6/6/6     | 2 | 2 | 0 | 0 |
| 17/04/2024 | PB | 07:30 | 10:30 | 3 | 4/4/4   | NW/NW/NW       | 0/0/0         | 2-3/3/3-5 | 2 | 2 | 0 | 0 |
| 17/04/2024 | PB | 11:00 | 14:00 | 3 | 4/4/4   | NW-NNW/NNW/NNW | 0/0/0         | 5-6/6-4/4 | 2 | 2 | 0 | 0 |
| 20/05/2024 | PB | 09:00 | 12:00 | 3 | 2/2/2   | E/E/E          | 0/0/0         | 7/7/6     | 2 | 2 | 0 | 0 |
| 20/05/2024 | PB | 12:30 | 15:30 | 3 | 2/2/2   | ENE/ENE-E/E    | 0/0/0         | 6/6/6     | 2 | 2 | 0 | 0 |
| 31/05/2024 | PB | 07:30 | 10:30 | 3 | 3/3-4/4 | N/N/N          | 0/0/0         | 1/1-2/2   | 2 | 2 | 0 | 0 |
| 31/05/2024 | PB | 11:00 | 14:00 | 3 | 4-3/3/3 | N-NNW/NNW/NNW  | 0/0/0         | 2-4/4/4   | 2 | 2 | 0 | 0 |

**Table A2.2.2: Walkover survey effort.**

| Date       | Start Time | End time | Wind Speed | Wind Direction   | Rain  | Cloud Height | Cloud Cover | Visibility | Frost | Snow | Temperature (°C) |
|------------|------------|----------|------------|------------------|-------|--------------|-------------|------------|-------|------|------------------|
| Year 1     |            |          |            |                  |       |              |             |            |       |      |                  |
| 14/09/2022 | 13:00      | 16:00    | 2          | North-west       | 0     | 2            | 5/8         | 2          | 0     | 0    | 17               |
| 20/09/2022 | 12:28      | 13:48    | 2          | West             | 0     | 2            | 5/8         | 2          | 0     | 0    | 19-18            |
| 19/10/2022 | 11:15      | 14:45    | 3          | East             | 0     | 2            | 6/8         | 2          | 0     | 0    | 13-16            |
| 27/10/2022 | 07:40      | 12:40    | 1          | South South-east | 1-0-1 | 2            | 8-6/8       | 2          | 0     | 0    | 14-16            |
| 14/11/2022 | 14:00      | 17:00    | 1          | South South-east | 0-1   | 2            | 6/8         | 2          | 0     | 0    | 14-12            |
| 21/11/2022 | 07:30      | 10:30    | 2          | East South-east  | 0-1   | 2            | 3/8         | 2          | 0     | 0    | 5-7              |

## Annex 2: Bird Survey Effort

|            |       |       |   |                  |         |   |     |   |     |   |       |
|------------|-------|-------|---|------------------|---------|---|-----|---|-----|---|-------|
| 07/12/2022 | 09:50 | 13:15 | 1 | North North-west | 0       | 2 | 1/8 | 2 | 0   | 0 | 2-6   |
| 13/12/2022 | 11:15 | 15:20 | 1 | East South-east  | 0       | 2 | 8/8 | 2 | 0   | 0 | 0-1   |
| 09/01/2023 | 08:10 | 12:10 | 3 | West North-west  | 0-1-0   | 2 | 7/8 | 2 | 0   | 0 | 8     |
| 23/01/2023 | 08:00 | 12:10 | 1 | South-east       | 0       | 2 | 4/8 | 2 | 0   | 0 | 3-6   |
| 08/02/2023 | 13:00 | 17:00 | 2 | South South-west | 0       | 2 | 4/8 | 2 | 0   | 0 | 7-6   |
| 14/02/2023 | 11:50 | 14:30 | 3 | North            | 0       | 2 | 3/8 | 2 | 0   | 0 | 2-7   |
| 22/02/2023 | 08:40 | 13:30 | 2 | North-west       | 0-1     | 2 | 6/8 | 2 | 0   | 0 | 7-8   |
| 06/03/2023 | 09:00 | 13:15 | 2 | West North-west  | 1-0-1   | 2 | 7/8 | 2 | 0   | 0 | 7     |
| 30/03/2023 | 09:30 | 12:30 | 1 | North            | 1-2-1   | 2 | 6/8 | 2 | 0   | 0 | 10-12 |
| Year 2     |       |       |   |                  |         |   |     |   |     |   |       |
| 28/09/2023 | 07:50 | 12:10 | 2 | South-west       | 0       | 2 | 7/8 | 2 | 0   | 0 | 15-16 |
| 17/10/2023 | 09:00 | 13:25 | 2 | East             | 0       | 2 | 1/8 | 2 | 0   | 0 | 9-13  |
| 26/10/2023 | 09:00 | 13:45 | 2 | South-east       | 1-0-1-0 | 2 | 8/8 | 2 | 0   | 0 | 10-11 |
| 06/11/2023 | 10:45 | 14:15 | 2 | West             | 1-0     | 2 | 6/8 | 2 | 0   | 0 | 10-11 |
| 16/11/2023 | 09:25 | 14:40 | 2 | South South-east | 0       | 2 | 8/8 | 2 | 0   | 0 | 7-8   |
| 15/12/2023 | 08:00 | 13:10 | 3 | West South-west  | 0       | 2 | 8/8 | 2 | 0   | 0 | 9-10  |
| 20/12/2023 | 08:00 | 12:45 | 3 | West             | 1       | 2 | 8/8 | 2 | 0   | 0 | 10    |
| 09/01/2024 | 08:25 | 13:35 | 2 | East North-east  | 0       | 2 | 1/8 | 2 | 0   | 0 | 3-4   |
| 22/01/2024 | 08:00 | 13:00 | 3 | West South-west  | 0-1-0   | 2 | 7/8 | 2 | 0   | 0 | 8     |
| 12/02/2024 | 08:00 | 13:50 | 3 | West             | 0       | 2 | 6/8 | 2 | 0   | 0 | 7-9   |
| 26/02/2024 | 08:10 | 13:15 | 2 | North            | 0       | 2 | 1/8 | 2 | 1-0 | 0 | 5-8   |
| 08/03/2024 | 07:30 | 13:15 | 3 | East             | 0       | 2 | 7/8 | 2 | 0   | 0 | 6-8   |
| 21/03/2024 | 08:00 | 13:20 | 2 | South South-west | 1-0     | 2 | 8/8 | 2 | 0   | 0 | 8-9   |

**Table A2.2.3: Breeding Bird survey effort**

| Date       | Surveyor | Start Time | End time | Wind Speed | Wind Direction  | Rain | Cloud Height | Cloud Cover | Visibility | Frost | Snow | Temperature (°C) |
|------------|----------|------------|----------|------------|-----------------|------|--------------|-------------|------------|-------|------|------------------|
| 17/04/2023 | PB       | 08:10      | 10:20    | 1          | East            | 0-1  | 2            | 8           | 2          | 0     | 0    | 11               |
| 09/05/2023 | PB       | 07:30      | 10:00    | 1-2        | West            | 0    | 2            | 2           | 2          | 0     | 0    | 10-14            |
| 13/06/2023 | PB       | 06:45      | 09:45    | 1          | East north-east | 0    | 2            | 4           | 2          | 0     | 0    | 12               |

## Annex 2: Bird Survey Effort

|            |    |       |       |   |                 |         |   |   |   |   |   |    |
|------------|----|-------|-------|---|-----------------|---------|---|---|---|---|---|----|
| 04/07/2023 | PB | 07:50 | 10:25 | 2 | West south-west | 0-1-2-0 | 2 | 5 | 2 | 0 | 0 | 16 |
|------------|----|-------|-------|---|-----------------|---------|---|---|---|---|---|----|

## Annex 3: Wintering Bird Surveys Habitat Appraisal Results

Table A2.3.1 provides habitat appraisal results, including any changes in land use/management throughout the survey period.

**Table A2.3.1: Habitat Appraisal Results**

| Field number | Crop type                            |                                     |
|--------------|--------------------------------------|-------------------------------------|
| The Site     |                                      |                                     |
| 1            | Root crop → ploughed                 | 27 Pasture - unstocked/stocked      |
| 2            | Pasture- stocked                     | 28 Pasture - unstocked/stocked      |
| 3            | Pasture- stocked                     | 29 Arable stubble/pasture unstocked |
| 4            | House and garden                     | 30 Arable stubble/pasture unstocked |
| 5            | Pasture - unstocked                  | 31 Pasture - unstocked              |
| 6            | Pasture - unstocked                  | 32 Pasture - unstocked              |
| 7            | Pasture - unstocked/ploughed         | 33 Pasture - unstocked              |
| 8            | Arable stubble → crop                | 34 Arable stubble → crop            |
| 9            | Arable stubble → crop                | 35 Arable stubble → crop            |
| 10           | Arable stubble → crop                | 36 Pasture - unstocked              |
| 11           | Arable stubble → crop                | 37 Crop                             |
| 12           | Arable stubble → crop                | 38 Crop                             |
| 13           | Arable stubble → crop                | 39 Crop                             |
| 14           | Arable stubble → crop                | 40 Pasture unstocked                |
| 15           | Pasture - unstocked                  | 41 Crop → arable stubble/crop       |
| 16           | Tilled → crop                        | 42 Pasture - unstocked              |
| 17           | Crop → arable stubble                | 43 Pasture - unstocked              |
| 18           | Arable stubble → arable stubble/crop | 44 Pasture - unstocked              |
| 19           | Arable Stubble                       | 45 Pasture - unstocked              |
| 20           | Arable stubble/crop → crop           | 46 Pasture - unstocked              |
| 21           | Pasture unstocked                    | 47 Pasture - unstocked              |
| 22           | Arable stubble/crop                  | 48 Pasture - unstocked              |
| 23           | Arable stubble → arable stubble/crop | 49 Pasture - stocked                |
| 24           | Arable stubble → crop                | 50 Pasture - unstocked              |
| 25           | Crop                                 | 51 Pasture - unstocked              |
| 26           | Arable stubble/crop                  | 52 Pasture - unstocked              |
|              |                                      | 53 Pasture - unstocked              |
|              |                                      | 54 Pasture - unstocked/stocked      |
|              |                                      | 55 Pasture - unstocked              |
|              |                                      | 56 Pasture - unstocked              |

### Annex 3: Wintering Bird Surveys Habitat Appraisal Results

|    |                             |     |                                     |
|----|-----------------------------|-----|-------------------------------------|
| 57 | Pasture - unstocked         | 86  | Crop                                |
| 58 | Pasture - unstocked         | 87  | Tilled/pasture - unstocked → tilled |
| 59 | Not viewable                | 88  | Pasture - unstocked                 |
| 60 | Pasture - unstocked/reed    | 89  | Tilled → crop                       |
| 61 | Not viewable                | 90  | Not viewable                        |
| 62 | Not viewable                | 91  | Not viewable                        |
| 63 | Pasture - unstocked         | 92  | Pasture - unstocked                 |
| 64 | Not viewable                | 93  | Pasture - stocked                   |
| 65 | Not viewable                | 94  | Crop                                |
| 66 | Pasture - unstocked/stocked | 95  | Crop                                |
| 67 | Not viewable                | 96  | Pasture - stocked                   |
| 68 | Pasture - stocked           | 97  | Pasture - stocked                   |
| 69 | Pasture - unstocked         | 98  | Ploughed/ley → crop                 |
| 70 | Pasture - unstocked         | 99  | Ley → crop                          |
| 71 | Pasture - unstocked         | 100 | Ley → crop                          |
| 72 | Pasture - unstocked         | 101 | Ley → crop                          |
| 73 | Pasture - unstocked         | 102 | Ley → crop                          |
| 74 | Pasture - unstocked/stocked | 103 | Ploughed/ley → crop                 |
| 75 | Pasture - unstocked         | 104 | Pasture - unstocked/stocked         |
| 76 | Pasture - stocked           | 105 | Arable stubble → ploughed           |
| 77 | Pasture - unstocked         | 106 | Not viewable                        |
| 78 | Pasture - stocked           | 107 | Not viewable                        |
| 79 | Pasture - stocked           | 108 | Arable stubble                      |
| 80 | Pasture - stocked           | 109 | Arable stubble                      |
| 81 | Pasture - stocked           | 110 | Ley/crop → crop/arable stubble      |
| 82 | Pasture - unstocked/stocked | 111 | Crop                                |
| 83 | Pasture - stocked           | 112 | Arable stubble/crop → crop          |
| 84 | Pasture - unstocked         | 113 | Pasture - unstocked                 |
| 85 | Pasture - unstocked/stocked |     |                                     |