
Asland Walks Energy Park

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

Appendix 2: Ornithology Baseline Report



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CONTENTS

1 INTRODUCTION 1

1.1 Background 1

1.2 Site Overview 1

1.3 Legislation 7

1.4 Terminology 7

2 METHODOLOGY..... 8

2.2 Field Survey Personnel 8

2.3 Target Species 8

2.4 Field Surveys 9

2.5 Limitations 16

3 YEAR 1 RESULTS..... 18

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

4 YEAR 2 RESULTS..... 24

4.1 Vantage Point Flight Activity Surveys 24

4.2 Non-Breeding Bird Walkover Surveys 25

5 SPA AND RAMSAR QUALIFYING SPECIES FUNCTIONALLY LINKED LAND (FLL) ASSESSMENT 28

5.1 Year 1..... 28

5.2 Year 2..... 36

6 REGIONAL SPECIES ASSESSMENT 44

6.1 Year 1 and 244

FIGURES

Figure 2.1: Site Location Plan

Figure 2.2: Statutory Designated Sites With Non-breeding Ornithological Interest

Figure 2.3: VP Flight Activity Survey Plan

Figure 2.4: Non-breeding Walkover Survey Plan

Figure 2.5: Breeding Bird Survey Plan

Figure 2.6: VP Flight Activity Survey Results Plan Year 1 – Geese

Figure 2.7: VP Flight Activity Survey Results Plan Year 1 – Swans

Figure 2.8: VP Flight Activity Survey Results Plan Year 1 – Ducks

Figure 2.9: VP Flight Activity Survey Results Plan Year 1 – Raptors and Owls

Figure 2.10: VP Flight Activity Survey Results Plan Year 1 – Lapwing

Figure 2.11: VP Flight Activity Survey Results Plan Year 1 – Waders and Others (A)

Figure 2.12: VP Flight Activity Survey Results Plan Year 1 – Waders and Others (B)

Figure 2.13: Non-breeding Walkover Survey Results Plan Year 1 – SPA/Ramsar Site Qualifying and Important Assemblage Species

Figure 2.14: Non-breeding Walkover Survey Results Plan Year 1 – Other Target Species

Figure 2.15: Breeding Bird Survey Results

Figure 2.16: Confidential Schedule 1 Species Breeding Bird Survey Results (provided separately)

Figure 2.17: VP Flight Activity Survey Results Plan Year 2 – Geese

Figure 2.18: VP Flight Activity Survey Results Plan Year 2 – Swans

Figure 2.19: VP Flight Activity Survey Results Plan Year 2 – Ducks

Figure 2.20: VP Flight Activity Survey Results Plan Year 2 – Raptors and Owls

Figure 2.21: VP Flight Activity Survey Results Plan Year 2 – Lapwing

Figure 2.22: VP Flight Activity Survey Results Plan Year 2 – Waders and Others (A)

Figure 2.23: VP Flight Activity Survey Results Plan Year 2 – Waders and Others (B)

Figure 2.24: Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Listed Qualifying Features (A)

Figure 2.25: Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Listed Qualifying Features (B)

Figure 2.26: Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Waterfowl)

Figure 2.27: Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Gulls)

APPENDICES

Annex 2.1: Species List with Scientific Names and Conservation Status

Annex 2.2: Bird Survey Effort

Annex 2.3: 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 2.1**. The main Site central grid reference is located at SD 4607 1933.
- 1.1.2 Based on NatureScot's solar farm guidance (NatureScot, 2022¹) and small-scale wind guidance (NatureScot, 2016²), which with regards to bird surveys refers to guidance for onshore wind farms (Scottish Natural Heritage (SNH), 2017^{3,4}, 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 10th Edition of the British Ornithologists' Union (BOU) official list of species recorded in Great Britain⁵. 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 2.1**

1.2 Site Overview

- 1.2.1 The Site, as illustrated by the red-line boundary shown on **Figure 2.1**, 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 habitats⁶. 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.

¹ 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>.

² 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+>

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

⁴ 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.

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

⁶ 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: 12th May 2025).

- 1.2.3 On review of the Multi-Agency Geographic Information for the Countryside ('MAGIC')⁷ 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, 2016⁸) 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)⁹, 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)¹⁰ also identifies documented pink-footed goose foraging grounds in the vicinity of the Site. Furthermore, a review of Lancashire Environmental Records Network (LERN)¹¹ 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 Lerpwl 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 designed 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 2.2**.

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

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

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

¹⁰ 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.

¹¹ <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 include:</p> <ul style="list-style-type: none"> • Bewick's swan (non-breeding); • Whooper swan (non-breeding); • Pink-footed goose (non-breeding); <ul style="list-style-type: none"> • Teal (non-breeding); • Pintail (non-breeding); and, • Waterbird assemblage^{12,13}.
Martin Mere Ramsar site	4.94 km south-west	5.87 km south-west	<p>Species occurring at international levels of importance:</p> <ul style="list-style-type: none"> • Pink-footed goose (non-breeding); • Bewick's swan (non-breeding); • Whooper swan (non-breeding); <p>Species occurring at national levels of importance:</p> <ul style="list-style-type: none"> • Teal (passage); • Shelduck (non-breeding); • Pochard (non-breeding); <ul style="list-style-type: none"> • Wigeon (non-breeding); and, • Pintail (non-breeding). • Ruff (non-breeding); and, • Spotted redshank (non-breeding)¹⁴.
Ribble and Alt Estuaries SPA / SPA Marine Components (GB)	5.08 km north-west	4.35 km north-west	<p>Qualifying features include:</p> <ul style="list-style-type: none"> • Bewick's swan (non-breeding); • Whooper swan (non-breeding); • Pink-footed goose (non-breeding); • Shelduck (non-breeding); • Wigeon (non-breeding); • Teal (non-breeding); <ul style="list-style-type: none"> • Knot (non-breeding); • Sanderling (non-breeding); • Dunlin (non-breeding); • Ruff (breeding); • Black-tailed godwit (non-breeding); • Bar-tailed godwit (non-breeding);

¹² Although not definitively specified in SPA citation, waterbird species that make up the assemblage likely to include Bewick's swan, whooper swan, pink-footed goose, teal, pintail, gadwall, mallard, shoveler, snipe, lapwing, black-tailed godwit and ruff.

¹³ <https://publications.naturalengland.org.uk/publication/4833056372293632> (Accessed: 1st September 2025)

¹⁴ <https://rsis.ramsar.org/ris/324> (Accessed: 1st September 2025)

Site Name	Approximate Distance and Direction from Main Site	Approximate Distance and Direction from Site Cable Routes	Description
			<ul style="list-style-type: none"> • Pintail (non-breeding); • Oystercatcher (non-breeding); • Ringed plover (non-breeding); • Golden plover (non-breeding); • Grey plover (non-breeding); <p>Non-qualifying species of interest:</p> <ul style="list-style-type: none"> • Hen harrier (non-breeding); • Merlin (non-breeding); <ul style="list-style-type: none"> • Redshank (non-breeding); • Lesser black-backed gull (breeding); • Common tern (breeding); • Waterbird assemblage¹⁵; and, • Seabird assemblage¹⁶. • Peregrine (non-breeding); and, • Short-eared owl (non-breeding)¹⁷.
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. Qualifying species listed as part of qualification under Ramsar Criterion 5 and 6 include:</p> <p>Ramsar criterion 5</p> <p>Wintering bird assemblages of international importance.</p> <p>Ramsar criterion 6</p> <p>Species occurring at levels of international importance:</p> <ul style="list-style-type: none"> • Black-tailed godwit (non-breeding); • Redshank (non-breeding); • Dunlin (non-breeding); • Grey plover (non-breeding); • Knot (non-breeding); • Ringed plover (non-breeding); • Oystercatcher (non-breeding); • Teal (non-breeding); • Wigeon (non-breeding); • Pintail (non-breeding); • Pink-footed goose (non-breeding); • Bewick's swan (non-breeding); and,

¹⁵ The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season. The non-breeding waterbird assemblage includes cormorant, Bewick's swan, whooper swan, pink-footed goose, shelduck, wigeon, teal, pintail, scaup, common scoter, oystercatcher, ringed plover, golden plover, grey plover, lapwing, knot, sanderling, dunlin, black-tailed godwit, bar-tailed godwit, whimbrel, curlew and redshank.

¹⁶ The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 seabirds in any season: The breeding seabird assemblage includes black-headed gull, lesser black-backed gull and common tern.

¹⁷ <https://publications.naturalengland.org.uk/publication/4868920422957056> (Accessed: 1st September 2025)

Site Name	Approximate Distance and Direction from Main Site	Approximate Distance and Direction from Site Cable Routes	Description
			<ul style="list-style-type: none"> Sanderling (non-breeding); Bar-tailed godwit (non-breeding); <p>Species occurring at levels of national importance:</p> <ul style="list-style-type: none"> Black-headed gull (non-breeding); Common tern (non-breeding); Greenshank (non-breeding); Curlew (non-breeding); Ruff (non-breeding); Common scoter (non-breeding); Whooper swan (non-breeding). Golden plover (non-breeding); Cormorant (non-breeding); Shoveler (non-breeding); Red-throated diver (non-breeding); and, Spotted redshank (non-breeding)¹⁸.
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 ¹⁹ .
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 ²⁰ .
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 ²¹ .
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 ²² .

¹⁸ <https://rsis.ramsar.org/ris/325> (Accessed: 1st September 2025)

¹⁹ <https://www.gov.uk/government/publications/lancashires-national-nature-reserves/lancashires-national-nature-reserves#ribble-estuary> (Accessed: 1st September 2025)

²⁰ <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1001769.pdf> (Accessed: 1st September 2025)

²¹ <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1004299.pdf> (Accessed: 1st September 2025)

²² <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1001819> (Accessed 8th September 2025)

Site Name	Approximate Distance and Direction from Main Site	Approximate Distance and Direction from Site Cable Routes	Description
Liverpool Bay / Bae Lerpwl SPA	13.60 km north-west	13.60 north-west	<p>Qualifying features include:</p> <ul style="list-style-type: none"> • Red-throated diver (non-breeding); • Common scoter (non-breeding); • Little gull (non-breeding); • Common tern (breeding); • Little tern (breeding); and, • Waterbird assemblage^{23,24}.

²³ The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season. The non-breeding waterbird assemblage includes cormorant, red-breasted merganser, red throated diver, little gull and common scoter.

²⁴ <https://publications.naturalengland.org.uk/publication/5089733892898816> (Accessed 8th September 2025)

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 Act²⁵ 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 independent²⁶.
- 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 2006²⁷, 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 illustrated in **Figures 2.3, 2.4 and 2.5**:

- 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).

²⁵ <https://www.legislation.gov.uk/ukpga/1981/69/schedule/1> (Accessed 12th May 2025)

²⁶ <https://www.legislation.gov.uk/ukpga/1981/69> (Accessed 8th September 2025)

²⁷ <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)²⁸) 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 1²⁹/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.* 2021³⁰ and Stanbury *et al.* 2024³¹), NERC Act (2006) Section 41 species, Schedule 1 species, Annex 1 species and species listed in the Lancashire Biodiversity Action Plan (LBAP)³².

²⁸Gilbert, 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.

²⁹ <https://lists.nbnatlas.org/speciesListItem/list/dr2401> (Accessed 12th May 2025)

³⁰ 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

³¹ 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)

³² <https://www.lancashire.gov.uk/learn/services/> (Accessed 29th 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 2.3**.
- 2.4.2 Survey effort exceeded the minimum recommended survey effort outlined within SNH guidance (2017)³³ 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 2.2** and the VP Flight Activity Survey Plan (which includes the viewshed) is presented in **Figure 2.3**.

³³ 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	
Total VP hours					96

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	
Total VP hours					78

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)²⁸, 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 2.4**).
- 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

Criteria for Significance

- 2.4.15 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)⁹.
- 2.4.16 '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 the qualifying features of a European site (i.e. SPA, SAC and/or Ramsar site).
- 2.4.17 The above report published by Natural England (2021)⁹ 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.
- 2.4.18 The definition of FLL within the report, developed and agreed with Natural England and RSPB, is '*areas of land occurring within 20km³⁴ 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)³⁵, as when a threshold is met in two thirds of the season for which adequate data is available.
- 2.4.19 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 data³⁶). Therefore, functional linkage for non-breeding birds is where counts of qualifying species 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

³⁴ With reference to pink-footed goose and graylag goose, which are known to commute such distances daily between foraging and roosting sites - <https://www.nature.scot/sites/default/files/2022-12/Assessing%20connectivity%20with%20special%20protection%20areas.pdf> .

³⁵ 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.

³⁶ 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 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.

season (66.66%)) exceed 1% of that species' non-breeding SPA population for the Site and/or Wider Survey Area.

- 2.4.20 The non-breeding qualifying features of the Ribble and Alt Estuaries SPA/Ramsar site and Martin Mere SPA/Ramsar site are identified as those listed in **Table 1.1**. This includes species individually listed with international importance and not those comprising Important Component Species³⁷ of the waterbird assemblages. The criteria for functional linkage described above was therefore utilised for these qualifying species independently within both the Site and Wider Survey Area.
- 2.4.21 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 and the Important Component Species thereof, as listed on each designated site's respective citation.
- 2.4.22 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^{38,39};
 - 1%, or more, of an Important Component Species' GB population⁴⁰; and,
 - Cumulatively over 2,000 individuals of an Important Component Species.
- 2.4.23 Additionally, the entire Wintering Survey Area was considered to represent FLL if the cumulative total number of waterbird Target Species in each survey visit regularly (i.e. 2/3 of the survey effort) exceeded 1% of either SPA/Ramsar site's entire non-breeding waterbird assemblage population (based on BTO data^{41,42}).
- 2.4.24 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

- 2.4.25 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 data⁴³, which included the five year average (2019/20 to 2023/24) of peak counts recorded across all sites within Lancashire.

Commented [JS1]: This doesn't make sense, 1% of the SPA population would always be a lower threshold than the GB - otherwise there's an inference that the SPA would hold more than whole GB pop?

³⁷ i.e. Species represented by at least 1% of their national population (Stroud et al. 2001).

³⁸ Ribble and Alt SPA Important Component Species: cormorant, Bewick's swan, whooper swan, pink-footed goose, shelduck, wigeon, teal, pintail, scaup, common scoter, oystercatcher, ringed plover, golden plover, grey plover, lapwing, knot, sanderling, dunlin, black-tailed godwit, bar-tailed godwit, whimbrel, curlew and redshank.

³⁹ Martin Mere SPA Important Component Species: Bewick's swan, whooper swan, pink-footed goose, teal, pintail, gadwall, mallard, shoveler, snipe, lapwing, black-tailed godwit and ruff.

⁴⁰ Calbrade, N.A., Birtles, G.A., Woodward, I.D., Feather, A., Hiza, B.M., Caulfield, E.B., Balmer, D.E., Peck, K., Wotton, S.R., Shaw, J.M. & Frost, T.M. (2025). Waterbirds in the UK 2023/24. BTO/RSPB/JNCC/NatureScot Available at: <https://www.bto.org/our-work/science/publications/reports/waterbirds-uk/2023-24> (Accessed 1st October 2025).

⁴¹ Combined Ribble Estuary and Alt Estuary: i.e. 2,806 birds, based on the five-year winter peak mean of 280,634 (Ribble Estuary: 59,063; Alt Estuary: 221,571) individual waterfowl over the period 2019/20 to 2023/24, taken from recent BTO data available at: <https://app.bto.org/webs-reporting/numbers.jsp> (Accessed 28th October 2025).

⁴² WWT Martin Mere: i.e. 149 birds, based on the five-year winter peak mean of 14,931 individual waterfowl over the period 2019/20 to 2023/24, taken from recent BTO data available at: <https://app.bto.org/webs-reporting/numbers.jsp> (Accessed 28th October 2025).

⁴³ 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).

2.4.26 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 2020⁴⁴. An assessment in relation to the whooper swan population in Lancashire (i.e. 2,194 birds) was also made using data reported in Brides *et al.* (2021)⁴⁵. 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.

Breeding Bird Surveys

- 2.4.27 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 2.5**).
- 2.4.28 The methodology employed was based upon a scaled-down version of the BTO's CBC technique, as detailed in Gilbert *et al.* (1998)²⁸. 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)²⁸.
- 2.4.29 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).
- 2.4.30 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.
- 2.4.31 Records of birds just visiting the Site (e.g. corvids feeding in fields) and birds flying over the Site were also recorded.
- 2.4.32 A summary of the breeding bird survey effort is presented in **Table 2.5** and detailed survey conditions are presented in **Annex 2.2**.

⁴⁴ 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.

⁴⁵ 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 (Accessed 16th October 2025).

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 2.3**, 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)²⁸. Therefore, such surveys only comprised four

survey visits, as opposed to six as based on updated Bird Survey & Assessment Steering Group (2023) guidance⁴⁶. 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 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)³¹. 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.

⁴⁶ Bird Survey & Assessment Steering Group. (2023). Bird Survey Guidelines for assessing ecological impacts, v.1.1.1. <https://birdsurveyguidelines.org> (Accessed: 10th September 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 2.4**), 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 2.3**.

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 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 2.6 to 2.12**.
- 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 and Martin Mere SPA/Ramsar site comprised of pink-footed goose, whooper swan, golden plover, oystercatcher, redshank, shelduck and teal. Lapwing, curlew and snipe are further listed as non-breeding waterbird assemblage species of these designated sites.

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)†
Pink-footed goose	92	2,888	90	2,881	363,265
Whooper swan	30	747	21	262	12,800
Shelduck	56	139	9	40	2,707
Teal	35	144	2	8	170
Golden plover	7	26	3	18	390
Oystercatcher	55	95	2	6	150
Redshank	5	8	2	4	90
Curlew	1	1	0	0	0
Lapwing	111	623	37	383	1,207
Snipe	5	9	4	7	239
Mute swan	2	3	0	0	0
Goosander	2	7	0	0	0
Little egret	11	14	1	1	43
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 features⁴⁷ 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 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

⁴⁷ This includes only species designated with internationally important numbers for the SPA or Ramsar site.

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 included mallard, lapwing and snipe. Of these, lapwing was the most abundant (peak: 67 birds) and most frequent (7/14 visits). Mallard and snipe were instead recorded in low numbers (peak ≤ 4 birds) and infrequently (2/14 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 birds⁴⁸; 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 Other Important Component Species of the qualifying waterbird assemblages (that are not specific qualifying species) recorded within the Wider Survey Area included mallard, lapwing and snipe. Of these, mallard was the most abundant (peak: 30 birds) and most frequent (5/14 visits). Lapwing and snipe were instead recorded in low numbers (respective peaks: 14 and 1 bird) and infrequently (1/14 visits).
- 3.3.7 Results of these Target Species, showing overall peak counts across the Site and Wider Survey Area, are presented in **Figures 2.13** (SPA/Ramsar site qualifying and important assemblage species) and **2.14** (other Target Species).

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

Species	Survey Visits													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Site														
Pink-footed goose	-	-	-	-	-	11	-	-	-	6	-	-	-	-
Whooper swan	-	-	152	-	-	-	-	-	-	-	-	-	-	-
Shelduck	-	-	-	-	-	-	-	-	-	-	4	10	-	-
Oystercatcher	-	-	-	-	-	-	-	-	-	-	2	2	2	-
Mallard	-	-	-	4	-	-	-	-	-	-	-	-	-	2
Lapwing	-	-	11	-	-	-	67	-	26	-	23	32	20	12
Snipe	-	-	-	-	-	-	-	2	-	3	-	-	-	-

⁴⁸ 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
Site														
Black-headed gull	63	-	250	8	-	-	10	-	-	-	-	-	9	-
Herring gull	87	-	14	-	-	-	-	-	-	-	-	-	4	-
Lesser black-backed gull	-	-	-	-	-	-	-	-	-	-	-	-	18	-
Little egret	-	-	-	-	-	-	1	1	-	-	1	-	1	-
Wider Survey Area														
Pink-footed goose	-	-	-	-	58	-	-	-	-	-	-	-	-	-
Whooper swan	-	-	138	-	7	-	-	8	9	-	-	-	-	-
Shelduck	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Teal	-	-	-	-	-	-	-	-	-	-	14	-	-	-
Oystercatcher	-	-	-	-	-	-	-	-	-	-	-	2	2	3
Redshank	-	-	-	-	-	-	-	-	-	-	-	1	-	-
<i>Mallard</i>	-	-	-	4	-	6	30	-	-	4	-	-	-	1
<i>Lapwing</i>	-	-	-	-	-	-	-	14	-	-	-	-	-	-
<i>Snipe</i>	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Black-headed gull	-	-	-	-	-	60	16	2	-	-	-	-	90	-
Herring gull	-	-	-	-	-	3	-	-	-	-	-	-	-	-
Lesser black-backed gull	-	-	-	-	-	-	-	-	-	-	-	-	50	-
Grey heron	-	-	-	-	1	-	-	-	2	-	-	-	-	1
Little egret	-	-	-	-	-	-	-	2	-	3	-	1	-	-
Moorhen	-	-	-	-	-	-	1	-	2	1	8	-	-	2
Flying Overhead Only														
Pink-footed goose	-	-	-	50	-	-	-	93	-	76	-	-	-	-
Whooper swan	-	-	-	-	-	3	-	-	-	-	-	-	-	-
Teal	-	-	-	-	-	4	8	-	-	-	-	-	-	-
Cormorant	-	-	-	-	-	-	-	-	-	-	-	-	2	-
<i>Mallard</i>	-	-	-	-	-	12	-	-	-	-	-	-	-	-
<i>Lapwing</i>	-	-	-	-	-	-	-	-	-	-	-	52	-	-
Goosander	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Black-headed gull	-	-	140	4	-	5	-	11	20	-	-	-	-	-
Herring gull	-	-	100	-	-	-	-	-	-	-	-	-	-	-
Grey heron	-	-	-	2	-	-	-	1	-	-	1	2	-	-

Species	Survey Visits													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Site														
Little egret	-	-	-	-	-	-	-	-	-	-	-	-	1	-
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	11	1.3	14.3 (2/14)	58	4.1	7.1 (1/14)
Whooper swan	152	10.9	7.1 (1/14)	138	11.6	28.6 (4/14)
Shelduck	10	1.0	14.3 (2/14)	2	0.1	7.1 (1/14)
Teal	0	0.0	0 (0/14)	14	1	7.1 (1/14)
Oystercatcher	2	0.4	21.4 (3/14)	3	0.5	21.4 (3/14)
Redshank	0	0.0	0 (0/14)	1	0.1	7.1 (1/14)
Mallard	4	0.4	14.3 (2/14)	30	3.2	35.7 (5/14)
Lapwing	67	13.6	50 (7/14)	14	1	7.1 (1/14)
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	0	0.0	0 (0/14)	2	0.3	21.4 (3/14)
Little egret	1	0.3	28.6 (4/14)	3	0.4	21.4 (3/14)
Moorhen	0	0	0 (0/14)	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, dunnoek, woodpigeon, whitethroat, sedge warbler and reed bunting); and,
 - Four of the above species are also NERC Act (2006) Section 41 species (lapwing, skylark, dunnoek 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 2.15**; however, sensitive Schedule 1 species are illustrated separately on **Confidential Figure 2.16**.

Table 3.4: Breeding Bird Survey Results

Common name	Estimated number of territories	Comments
Skylark	6	Within the large arable fields that make up the majority of the Site.
Lapwing	6	Within the large arable fields that make up the majority of the Site.
Sedge warbler	6	Within scrub/reeds along the watercourses that border the Site.
Wren	6	Within scrub/trees along the watercourses that border the Site.
Reed bunting	3	Within scrub/reeds along the watercourses that border the Site.
Oystercatcher	2	Within the large arable fields that make up the majority of the Site.
Greenfinch	2	Within trees located along the boundaries of the Site.
Dunnoek	1	Within trees located along the boundaries of the Site.
Moorhen	1	Within the margins of the Leeds and Liverpool canal that runs adjacent to the west boundary, occasionally wondering into the Site to forage.
Cetti's warbler	1	Within scrub along the watercourses that border the Site.
Kingfisher	1	Along the Leeds and Liverpool canal that runs adjacent to the west boundary.
Whitethroat	1	Within scrub along the watercourses that border the Site.
Woodpigeon	1	Within trees located along the boundaries of the Site.
Barn owl	1	Within woodland c. 500m south of the Site.
Goldfinch	3	Within trees located along the boundaries of the Site.
Blackbird	2	Within trees located along the boundaries of the Site.
Blue tit	2	Within trees located along the boundaries of the Site.

Robin	2	Within trees located along the boundaries of the Site.
Reed warbler	2	Within scrub/reeds along the watercourses that border the Site.
Blackcap	1	Within trees located along the boundaries of the Site.
Great tit	1	Within trees located along the boundaries of the Site.
Mute swan	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 2.17 to 2.23**.
- 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 associated as non-breeding species with the Ribble and Alt Estuaries SPA and Ramsar and Martin Mere SPA and Ramsar comprised of pink-footed goose, cormorant, whooper swan, golden plover, lapwing, oystercatcher, redshank, ruff, dunlin, curlew, shelduck, teal and mallard.

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)†
Pink-footed goose	78	3,644	78	3,644	290,890
Whooper swan	7	32	6	29	379
Shelduck	38	82	12	31	905
Teal	1	2	0	0	0

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)†
Golden plover	8	47	3	21	1,005
Oystercatcher	44	69	6	12	375
Redshank	1	4	0	0	0
Ruff	1	3	1	3	270
Dunlin	1	2	1	2	90
Cormorant	12	16	11	14	668
<i>Mallard</i>	47	125	5	17	361
<i>Curlew</i>	1	1	0	0	0
<i>Lapwing</i>	164	1,964	33	1,294	69,094
<i>Snipe</i>	2	3	1	2	40
Goosander	1	1	0	0	0
Lesser black-backed gull	41	101	32	70	2,758
Little egret	17	17	2	2	87
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. <i>Bold italics</i> 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 features⁴⁹ 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.
- 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, oystercatcher and snipe).

⁴⁹ This includes only species designated with internationally important numbers for the SPA or Ramsar site.

- 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 mallard, lapwing and snipe. Of these, lapwing was the most abundant (peak: 65 birds) and most frequent (9/13 visits). Mallard and snipe were instead recorded in low numbers (peak ≤5 birds), with snipe being frequently recorded (8/13) whilst mallard was infrequent (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, seven 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, ruff, 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), whilst ruff was recorded only in Field 14 on two occasions (peak: 5 birds). 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 mallard, lapwing, curlew and snipe. Of these, lapwing was the most abundant (peak: 183 birds) and most frequent (9/13 visits). Mallard was also recorded in larger numbers (peak: 41 birds) and more frequently (5/13 visits) than other Important Component Species. Curlew and snipe were instead recorded in low numbers (peak ≤6 birds), and infrequently (≤3/13 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 2.24** and **2.25** (SPA/Ramsar site qualifying and important assemblage species), **2.26** (other Target Species (waterfowl)) and **2.27** (other Target Species (gulls)).

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

Species	Survey Visits												
	15	16	17	18	19	20	21	22	23	24	25	26	27
Site													
Pink-footed goose	290	-	-	-	-	-	-	-	-	-	-	-	-
Shelduck	-	-	-	-	-	2	1	-	4	2	-	-	2
Golden plover	-	-	-	-	-	-	-	-	-	-	19	-	-
Oystercatcher	-	-	-	-	-	-	-	-	-	-	2	2	4
Mallard	-	-	-	-	-	-	-	-	-	-	-	-	2
Lapwing	-	-	14	14	24	12	11	-	-	22	65	18	22

Species	Survey Visits												
	15	16	17	18	19	20	21	22	23	24	25	26	27
Site													
Snipe	-	3	5	2	3	1	-	2	2	2	-	-	-
Barnacle goose	1	-	-	-	-	-	-	-	-	-	-	-	-
Greylag goose	124	-	-	-	-	-	-	-	-	-	-	-	-
Black-headed gull	52	-	-	-	-	-	-	-	-	-	-	94	-
Common gull	4	-	-	-	-	-	-	-	-	-	-	-	-
Herring gull	430	-	-	-	-	-	-	-	-	-	-	2	-
Lesser black-backed gull	58	-	-	-	-	-	-	-	-	-	-	4	-
Little egret	-	-	-	-	-	1	-	-	-	-	-	-	-
Wider Survey Area													
Pink-footed goose	-	-	-	63	-	-	-	-	-	-	-	-	-
Shelduck	-	-	-	-	2	2	3	4	10	4	11	31	22
Teal	-	-	-	-	-	-	-	-	-	-	-	5	12
Oystercatcher	-	-	-	-	-	-	-	-	-	4	2	2	6
Redshank	-	-	-	-	-	-	-	-	-	-	1	4	-
Ruff	-	-	5	3	-	-	-	-	-	-	-	-	-
Dunlin	-	1	-	-	-	-	-	-	-	-	-	-	-
Mallard	-	-	6	6	-	-	-	-	-	-	16	10	41
Lapwing	-	179	89	14	183	-	-	61	18	-	108	47	15
Curlew	-	-	-	6	-	-	-	-	-	-	-	-	-
Snipe	-	-	-	2	-	-	1	-	1	-	-	-	-
Greylag goose	-	-	-	-	-	-	2	-	-	-	-	-	-
Green sandpiper	-	-	-	-	-	-	-	-	-	-	1	-	-
Black-headed gull	238	77	460	462	473	315	472	22	78	126	362	687	423
Herring gull	-	265	92	81	6	5	2	-	-	-	-	-	-
Lesser black-backed gull	-	9	1	6	-	1	2	-	-	-	1	4	3
Grey heron	-	-	2	4	-	-	-	1	1	1	-	-	1
Little egret	1	-	-	-	-	1	4	-	2	-	1	-	-
Flying Overhead Only													
Lapwing	-	-	-	-	-	-	-	-	-	-	-	-	4
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 (%)
Pink-footed goose	290	22.3	7.7 (1/13)	63	5	7.7 (1/13)
Shelduck	4	0.8	38.5 (5/13)	31	7	69.2 (9/13)
Teal	0	0.0	0 (0/13)	12	1	15.4 (2/13)
Golden plover	19	1.5	7.7 (1/13)	0	0	0 (0/13)
Oystercatcher	4	0.6	23.1 (3/13)	6	1	30.8 (4/13)
Redshank	0	0.0	0 (0/13)	4	0	15.4 (2/13)
Ruff	0	0.0	0 (0/13)	5	1	15.4 (2/13)
Dunlin	0	0.0	0 (0/13)	1	0	7.7 (1/13)
<i>Mallard</i>	2	0.2	7.7 (1/13)	41	6	38.5 (5/13)
<i>Curlew</i>	0	0.0	0 (0/13)	6	0	7.7 (1/13)
<i>Lapwing</i>	65	15.5	69.2 (9/13)	183	55	69.2 (9/13)
<i>Snipe</i>	5	1.5	61.5 (8/13)	2	0	23.1 (3/13)
Barnacle goose	1	0.1	7.7 (1/13)	0	0	0 (0/13)
Greylag goose	124	9.5	7.7 (1/13)	2	0	7.7 (1/13)
Green sandpiper	0	0.0	0 (0/13)	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)	0	0	0 (0/13)
Grey heron	0	0.0	0 (0/13)	4	1	46.2 (6/13)
Little egret	1	0.1	7.7 (1/13)	4	1	38.5 (5/13)

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

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

5.1 Year 1

5.1.1 During Year 1, a total of four Target Species (pink-footed goose, whooper swan, shelduck and oystercatcher) listed as qualifying species of nearby Ribble and Alt Estuaries SPA/Ramsar site and/or Martin Mere SPA/Ramsar site were recorded within the Site during the non-breeding bird walkover surveys. The same species, plus redshank and teal were also recorded within the Wider Survey Area.

5.1.2 One Target Species (whooper swan) was recorded within the Site in numbers exceeding 1.0% of both SPA/Ramsar site's populations. However, the species was not recorded in significant numbers

regularly, with numbers exceeding the threshold on only one visit in October (i.e. 1/14 visits; 7.1%). The Site is therefore infrequently utilised by significant numbers of this species.

- 5.1.3 Whooper swan and teal were also recorded within the Wider Survey Area in significant numbers during Year 1. Whooper swan was recorded in numbers exceeding 1.0% of both SPA populations (three occasions for Ribble and Alt Estuaries SPA/Ramsar site and two occasions for Martin Mere SPA/Ramsar site), whilst teal was recorded in numbers exceeding 1.0% of the Martin Mere SPA population on a single visit. Neither species was therefore regularly recorded in significant numbers.
- 5.1.4 Peak counts of each non-breeding qualifying species recorded within the Site and Wider Survey Area are shown below in **Tables 5.1 and 5.2**, respectively.
- 5.1.5 Similarly, the data collected in Year 1 showed that the Wintering Survey Area as a whole does not qualify as FLL for the broader Ribble and Alt Estuaries SPA/Ramsar site or Martin Mere SPA/Ramsar site overwintering waterbird assemblages for Important Component Species (see **Table 5.3**). Whooper swan was the only Important Component Species that exceeded 1% of its national population, however this was only on a single visit (7% visits) and therefore was not regular.
- 5.1.6 No Important Component Species were found to regularly meet 1% of their SPA/Ramsar site populations (**Table 5.3**). The 1% threshold for the Ribble and Alt Estuaries SPA/Ramsar site populations was only recorded for whooper swan on three visits (21%). Meanwhile, the 1% threshold for the Martin Mere SPA/Ramsar site whooper swan population was only met on two visits (14%), teal population on one visit (7%), lapwing on seven visits (50%), mallard on one visit (7%) and snipe on two visits (14%).
- 5.1.7 As shown on **Table 5.4**, cumulative counts of Important Component Species also did not exceed 2,000 individuals on any one survey visit for the entire Wintering Survey Area.
- 5.1.8 Additionally, cumulative counts of all wetland bird Target Species did not regularly exceed 1% of the cumulative non-breeding waterbird assemblage populations of either the Ribble and Alt Estuaries SPA/Ramsar site or the Martin Mere SPA/Ramsar site (Ribble and Alt Estuaries SPA population: 280,634 birds; Martin Mere SPA population: 14,931 birds), only doing so on three visits (September, October and March) for the Martin Mere SPA 1% assemblage threshold.

Table 5.1: SPA Qualifying Species recorded within the Site between September 2022 - March 2023 (Year 1).

'NA' indicates a species that is not designated as a qualifying feature of either the Ribble and Alt Estuaries or Martin Mere SPA/Ramsar site.

Species	Month	Visit	Peak count	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵¹	Martin mere SPA population	% of Martin mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵¹
Pink-footed goose	November	6	11	35,316	0.03	No	9,918	0.11	No
	January	10	6		0.02			0.06	
Whooper swan	October	3	152	759	20.03	No	889	17.10	No
Shelduck	February	12	4	5,571	0.07	No	NA	NA	NA
	March	13	10		0.18			NA	
Oystercatcher	February	12	2	16,270	0.01	No	NA	NA	NA
	March	13	2		0.01			NA	
	March	14	2		0.01			NA	

Table 5.2: SPA Qualifying Species recorded within the Wider Survey Area between September 2022 and March 2023 (Year 1).

'NA' indicates a species that is not designated as a qualifying feature of either the Ribble and Alt Estuaries or Martin Mere SPA/Ramsar site.

Species	Month	Visit	Peak count	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵¹	Martin Mere SPA population	% of Martin Mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵¹
Pink-footed goose	November	5	58	35,316	0.16	No	9,918	0.58	No
Whooper swan	October	3	138	759	18.18	No	889	15.52	No
	November	5	7		0.92			0.79	
	December	8	8		1.05			0.90	

⁵⁰ Those in bold indicate when 1% of that species' non-breeding SPA population is met.

⁵¹ When a 'significant number' (i.e. 1% of that species' non-breeding SPA population) is met in two thirds of the season (i.e. ≥9 visits).

Species	Month	Visit	Peak count	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵¹	Martin Mere SPA population	% of Martin Mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵¹
	January	9	9		1.19			1.01	
Teal	February	11	14	7,427	0.19	No	1,342	1.04	No
Shelduck	January	9	2	5,571	0.04	No	NA	NA	NA
Oystercatcher	February	12	2	16,270	0.01	No	NA	NA	NA
	March	13	2		0.01			NA	
	March	14	3		0.02			NA	
Redshank	February	12	1	2,490	0.04	No	NA	NA	NA

Table 5.3: SPA/Ramsar site Waterfowl Assemblage Important Component Species recorded within the Wintering Survey Area between September 2022 and March 2023 (Year 1).

'NA' indicates a species that is not an Important Component Species of the waterfowl assemblage of either the Ribble and Alt Estuaries or Martin Mere SPA/Ramsar site.

Species	Month	Visit	Peak count	National population ⁴⁰	% of national population ⁵²	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵³	Martin Mere SPA population	% of Martin Mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵³
Pink-footed goose	November	5	58	466,400	0.01	35,316	0.16	No	9,918	0.58	No

⁵² Those in bold indicate when 1% of that species' non-breeding GB population is met.

⁵³ For important component species of waterbird assemblages only. This when any of the thresholds per criteria in Section 2.4.22 are met (i.e., 1% of each species' SPA/Ramsar site population, 1%, or more of the designated species' GB population and, cumulatively over 2,000 birds of those species) in two thirds of the season (i.e. ≥9 visits).

Species	Month	Visit	Peak count	National population ⁴⁰	% of national population ⁵²	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵³	Martin Mere SPA population	% of Martin Mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵³
	November	6	11		<0.01		0.03			0.11	
Whooper swan	October	3	290	10,980	2.64	759	38.21	No	889	32.62	No
	November	5	7		0.06		0.92			0.79	
	December	8	8		0.07		1.05			0.90	
	January	9	9		0.08		1.19			1.01	
Teal	February	11	14	204,783	0.01	7,427	0.19	No	1,342	1.04	No
Shelduck	January	9	2	44,445	<0.01	5,571	0.04	No	NA	NA	NA
	February	12	4		0.01		0.07			NA	
	March	13	10		0.02		0.18			NA	
Oystercatcher	February	12	4	290,000	<0.01	16,270	0.02	No	NA	NA	NA
	March	13	4		<0.01		0.02			NA	
	March	14	5		<0.01		0.03			NA	
Redshank	February	12	1	78,246	<0.01	2,490	0.04	No	NA	NA	NA
Lapwing	October	3	11	255,460	<0.01	15,804	0.07	No	1,200	0.92	No
	December	7	67		0.03		0.42			5.58	
	December	8	14		0.01		0.09			1.17	

Species	Month	Visit	Peak count	National population ⁴⁰	% of national population ⁵²	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵³	Martin Mere SPA population	% of Martin Mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵³
	January	9	26		0.01		0.16			2.17	
	February	11	23		0.01		0.15			1.92	
	February	12	32		0.01		0.20			2.67	
	March	13	20		0.01		0.13			1.67	
	March	14	12		<0.01		0.08			1.00	
Mallard	October	4	8	118,026	0.01	NA	NA	NA	848	0.94	No
	November	6	6		0.01		NA			0.71	
	December	7	30		0.03		NA			3.54	
	January	10	4		<0.01		NA			0.47	
	March	14	3		<0.01		NA			0.35	
Snipe	December	8	3	7,862	0.04	NA	NA	NA	25	12.00	No
	January	10	3		0.04		NA			12.00	

Table 5.4: Cumulative count of Important Component Species, and cumulative count of all wetland bird Target Species relative to the Ribble and Alt Estuaries SPA/Ramsar site and Martin Mere SPA/Ramsar site entire waterfowl assemblage recorded within the Wintering Survey Area between September 2022 and March 2023 (Year 1)*

Visit number	Date	Cumulative count of Important Component Species for the Ribble and Alt Estuaries SPA/Ramsar site waterfowl assemblage	Cumulative wetland bird count and percentage relative to Ribble and Alt Estuaries SPA/Ramsar site waterfowl assemblage population	Regular significant numbers criteria met? ⁵⁴	Cumulative count of Important Component Species for the Martin Mere SPA/Ramsar site waterfowl assemblage	Cumulative wetland bird count and percentage relative to Martin Mere SPA/Ramsar site waterfowl assemblage population	Regular significant numbers criteria met? ⁵⁵
1	14/09/2022	0	150 (0.05%)	No	0	150 (1.00%)	No
2	20/09/2022	0	0 (0.0%)		0	0 (0.00%)	
3	19/10/2022	301	413 (0.15%)		301	413 (2.77%)	
4	27/10/2022	0	16 (0.01%)		8	16 (0.11%)	
5	14/11/2022	65	66 (0.02%)		65	66 (0.44%)	
6	21/11/2022	11	80 (0.03%)		17	80 (0.54%)	
7	07/12/2022	67	125 (0.04%)		97	125 (0.84%)	
8	13/12/2022	22	30 (0.01%)		25	30 (0.20%)	
9	09/01/2023	37	41 (0.01%)		35	41 (0.27%)	
10	23/01/2023	0	17 (0.01%)		7	17 (0.11%)	
11	08/02/2023	37	46 (0.02%)		37	46 (0.31%)	
12	22/02/2023	41	42 (0.01%)		32	42 (0.28%)	

⁵⁴ Whether the threshold per the criteria in Section 2.4.22 or 2.4.23 is met (i.e. if the cumulative total number of Important Component Species for the Ribble and Alt SPA/Ramsar site waterbird assemblage in each survey visit regularly exceeds 2000 birds, or, if the cumulative total number of all wetland Target Species in each survey visit regularly exceeds 1% of the Ribble and Alt SPA/Ramsar site non-breeding waterfowl assemblage population (i.e. >2,806 birds for over 2/3 of the survey effort)).

⁵⁵ Whether the threshold per the criteria in Section 2.4.22 or 2.4.23 is met (i.e. if the cumulative total number of Important Component Species for the Martin Mere SPA/Ramsar site waterbird assemblage in each survey visit regularly exceeds 2000 birds, or, if the cumulative total number of wetland bird species in each survey visit regularly exceeds 1% of the Martin Mere SPA/Ramsar site non-breeding waterfowl assemblage population (i.e. >149 birds for over 2/3 of the survey effort)).

Visit number	Date	Cumulative count of Important Component Species for the Ribble and Alt Estuaries SPA/Ramsar site waterfowl assemblage	Cumulative wetland bird count and percentage relative to Ribble and Alt Estuaries SPA/Ramsar site waterfowl assemblage population	Regular significant numbers criteria met? ⁵⁴	Cumulative count of Important Component Species for the Martin Mere SPA/Ramsar site waterfowl assemblage	Cumulative wetland bird count and percentage relative to Martin Mere SPA/Ramsar site waterfowl assemblage population	Regular significant numbers criteria met? ⁵⁵
13	06/03/2023	34	206 (0.07%)		20	206 (1.38%)	
14	30/03/2023	17	23 (0.01%)		15	23 (0.15%)	

*Those in bold indicate when a single threshold per criteria in Section 2.4.22 and 2.4.23 is met

5.2 Year 2

- 5.2.1 During Year 2, a total of four Target Species (pink-footed goose, golden plover, shelduck and oystercatcher) listed as qualifying species of nearby SPA/Ramsar sites were recorded within the Site during the non-breeding bird walkover survey. The same species, plus teal, dunlin and redshank were also recorded within the Wider Survey Area.
- 5.2.2 One Target Species (pink-footed goose) was recorded within the Site in numbers exceeding 1.0% of the Martin Mere SPA population (**Table 5.5**). However, the species was not recorded in significant numbers regularly, with Site numbers exceeding the threshold on only one visit in September (i.e. 1/13 visits; 7.7%). The Site is therefore infrequently utilised by significant numbers of this species.
- 5.2.3 No Target Species were recorded within the Wider Survey Area in numbers exceeding the threshold criteria for significant numbers.
- 5.2.4 Peak counts of each non-breeding qualifying species recorded within the Site and Wider Survey Area are shown below in **Table 5.5** and **Table 5.6**, respectively.
- 5.2.5 Similarly, the data collected in Year 2 showed that the Wintering Survey Area as a whole does not qualify as FLL for the broader Ribble and Alt Estuaries SPA/Ramsar site overwintering waterbird assemblage or any of its Important Component Species (see **Table 5.7**). Here no Important Component Species of the waterbird assemblage exceeded 1% of their national populations and whilst lapwing exceeded 1% of its SPA/Ramsar site populations it only did so on three visits (23%) and so not regularly enough for the Wintering Survey Area to represent FLL.
- 5.2.6 However, lapwing and snipe were found to regularly meet 1% of their Important Component Species' SPA/Ramsar site populations for Martin Mere (see **Table 5.7**). The Martin Mere SPA/Ramsar site population 1% threshold was exceeded for pink-footed goose (one visit (8%)), lapwing (11 visits (85%)), mallard (three visits (23%)), ruff (two visits (15%)) and snipe (nine visits (69%)). As only lapwing and snipe were recorded to regularly exceed 1% of their corresponding Important Component Species populations at the SPA/Ramsar site, the Wintering Survey Area is only considered to represent FLL for these species based on the Year 2 survey data. When assessed over the entire survey period however, (i.e. Year 1 and 2) only lapwing was identified to regularly exceed the 1% threshold of the Martin Mere SPA/Ramsar site population (lapwing: 18 visits (66.7%); snipe: 11 visits (40.7%)). As such, the Wintering Survey Area is only considered to represent FLL for lapwing related to Martin Mere SPA/Ramsar site over the entire survey period.
- 5.2.7 As shown in **Table 5.7**, cumulative counts of Important Component Species did not exceed 2,000 individuals on any one survey visit for the entire Wintering Survey Area.
- 5.2.8 Additionally, cumulative counts of all wetland bird Target Species did not regularly exceed 1% of the cumulative non-breeding Ribble and Alt Estuaries SPA/Ramsar site waterbird assemblage population (SPA/Ramsar site population: 280,634 birds). However, the cumulative count of all wetland bird Target Species did regularly exceed 1% of the cumulative non-breeding waterbird assemblage population of Martin Mere SPA/Ramsar site (SPA/Ramsar site population: 14,931 birds) in Year 2. Here the 1% threshold was met on 11 visits (84.6%) during Year 2. Yet when further assessed over the collective two seasons (i.e. Year 1 and 2) the 1% threshold was not regularly achieved for either SPA/Ramsar site (Ribble and Alt Estuaries SPA/Ramsar site: 0/27 visits (0%); Martin Mere SPA/Ramsar site: 14/27 visits (51.9%)). The Wintering Survey Area is therefore not considered to represent FLL for the waterbird assemblage of either SPA/Ramsar site when considering the entire survey period.

Table 5.5: SPA Qualifying Species recorded within the Site between September 2023 - March 2024 (Year 2).

'NA' indicates a species that is not designated as a qualifying feature of either the Ribble and Alt Estuaries or Martin Mere SPA/Ramsar site.

Species	Month	Visit	Peak count	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁶	Martin mere SPA population	% of Martin mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁶
Pink-footed goose	September	15	290	35,316	0.82	No	9,918	2.92	No
Golden plover	February	25	19	5,472	0.35	No	NA	NA	NA
Shelduck	December	20	2	5,571	0.04	No	NA	NA	NA
	December	21	1		0.02			NA	
	January	23	4		0.07			NA	
	February	25	2		0.04			NA	
	March	27	2		0.04			NA	
Oystercatcher	February	25	2	16,270	0.01	No	NA	NA	NA
	March	26	2		0.01			NA	
	March	27	4		0.02			NA	

Table 5.6: SPA Qualifying Species recorded within the Wider Survey Area between September 2023 and March 2024 (Year 2).

'NA' indicates a species that is not designated as a qualifying feature of either the Ribble and Alt Estuaries or Martin Mere SPA/Ramsar site.

Species	Month	Visit	Peak count	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁶	Martin mere SPA population	% of Martin mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁶
Pink-footed goose	September	18	63	35,316	0.18	No	9,918	0.64	No
Teal	March	26	5	7,427	0.07	No	1,342	0.37	No

⁵⁶ When a 'significant number' (i.e. 1% of that species' non-breeding SPA/Ramsar site population) is met in two thirds of the season (i.e. ≥8 visits).

Species	Month	Visit	Peak count	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁶	Martin mere SPA population	% of Martin mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁶
	March	27	12		0.16			0.89	No
Shelduck	November	19	2	5,571	0.04	No	NA	NA	NA
	December	20	2		0.04			NA	
	December	21	3		0.05			NA	
	January	22	4		0.07			NA	
	January	23	10		0.18			NA	
	February	24	4		0.07			NA	
	February	25	11		0.20			NA	
	March	26	31		0.56			NA	
	March	27	22		0.39			NA	
Oystercatcher	February	24	4	16,270	0.02	No	NA	NA	NA
	February	25	2		0.01			NA	
	March	26	2		0.01			NA	
	March	27	6		0.04			NA	
Dunlin	October	16	1	63,464	<0.01	No	NA	NA	NA
Redshank	February	25	1	2,490	0.04	No	NA	NA	NA
	March	26	4		0.16	No		NA	

Table 5.7: SPA Waterfowl Assemblage Important Component Species recorded within the Wintering Survey Area between September 2023 and March 2024 (Year 2).

'NA' indicates a species that is not an Important Component Species of the waterfowl assemblage of either the Ribble and Alt Estuaries or Martin Mere SPA/Ramsar site .

Species	Month	Visit	Peak count	National population ⁴⁰	% of national population ⁵²	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁷	Martin Mere SPA population	% of Martin Mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁷
Pink-footed goose	September	15	290	466,400	0.06	35,316	0.82	No	9,918	2.92	No
	November	18	63		0.01		0.18			0.64	
Teal	March	26	5	204,783	<0.01	7,427	0.07	No	1,342	0.37	No
	March	27	12		0.01		0.16			0.89	
Shelduck	November	19	2	44,445	<0.01	5,571	0.04	No	NA	NA	NA
	December	20	4		0.01		0.07			NA	
	December	21	4		0.01		0.07			NA	
	January	22	4		0.01		0.07			NA	

⁵⁷ For Important Component Species of waterbird assemblages only. This when any of the thresholds per criteria in Section 2.4.22 are met (i.e., 1% of each species' SPA/Ramsar site population, 1%, or more of the designated species' GB population and, cumulatively over 2,000 birds of those species listed on the waterbird assemblage) in two thirds of the season (i.e. ≥8 visits).

Species	Month	Visit	Peak count	National population ₄₀	% of national population ₅₂	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ₅₀	Regular significant numbers criteria met? ⁵⁷	Martin Mere SPA population	% of Martin Mere SPA population ₅₀	Regular significant numbers criteria met? ⁵⁷
	January	23	14		0.03		0.25			NA	
	February	24	6		0.01		0.11			NA	
	February	25	11		0.02		0.20			NA	
	March	26	31		0.07		0.56			NA	
	March	27	24		0.05		0.43			NA	
Oystercatcher	February	24	4	290,000	<0.01	16,270	0.02	No	NA	NA	NA
	February	25	4		<0.01		0.02			NA	
	March	26	4		<0.01		0.02			NA	
	March	27	10		<0.01		0.06			NA	
Redshank	February	25	1	78,246	<0.01	2,490	0.04	No	NA	NA	NA
	March	26	4		0.01		0.16			NA	
Golden plover	February	25	19	113,042	0.02	5,472	0.35	No	NA	NA	NA
Curlew	November	18	6	57,164	0.01	2,788	0.22	No	NA	NA	NA
Dunlin	October	16	1	343,707	<0.01	63,464	<0.01	No	NA	NA	NA
Lapwing	October	16	179	255,460	0.07	15,804	1.13	No	1,200	14.92	Yes
	October	17	103		0.04		0.65			8.58	

Species	Month	Visit	Peak count	National population ₄₀	% of national population ₅₂	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ₅₀	Regular significant numbers criteria met? ⁵⁷	Martin Mere SPA population	% of Martin Mere SPA population ₅₀	Regular significant numbers criteria met? ⁵⁷
	November	18	28		0.01		0.18			2.33	
	November	19	207		0.08		1.31			17.25	
	December	20	12		<0.01		0.08			1.00	
	December	21	11		<0.01		0.07			0.92	
	January	22	61		0.02		0.39			5.08	
	January	23	18		0.01		0.11			1.50	
	February	24	22		0.01		0.14			1.83	
	February	25	173		0.07		1.09			14.42	
	March	26	65		0.03		0.41			5.42	
	March	27	37		0.01		0.23			3.08	
Mallard	October	17	6	118,026	0.01	NA	NA	NA	848	0.71	No
	November	18	6		0.01		NA			0.71	
	February	25	16		0.01		NA			1.89	
	March	26	10		0.01		NA			1.18	
	March	27	43		0.04		NA			5.07	

Species	Month	Visit	Peak count	National population ⁴⁰	% of national population ⁵²	Ribble and Alt Estuaries SPA population	% of Ribble and Alt Estuaries SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁷	Martin Mere SPA population	% of Martin Mere SPA population ⁵⁰	Regular significant numbers criteria met? ⁵⁷
Ruff	October	17	5	586	0.85	NA	NA	NA	39	12.82	No
	November	18	3		0.51		NA			7.69	
Snipe	October	16	3	7,862	0.04	NA	NA	NA	25	12.00	Yes
	October	17	5		0.06		NA			20.00	
	November	18	4		0.05		NA			16.00	
	November	19	3		0.04		NA			12.00	
	December	20	1		0.01		NA			4.00	
	December	21	1		0.01		NA			4.00	
	January	22	2		0.03		NA			8.00	
	January	23	3		0.04		NA			12.00	
	February	24	2		0.03		NA			8.00	

Table 5.8: Cumulative count of Important Component Species, and cumulative count of all wetland bird Target Species relative to the Ribble and Alt Estuaries SPA/Ramsar site and Martin Mere SPA/Ramsar site entire waterfowl assemblage recorded within the Wintering Survey Area between September 2023 and March 2024 (Year 2)*

Visit number	Date	Cumulative count of Important Component Species for the Ribble and Alt Estuaries SPA/Ramsar site waterfowl assemblage	Cumulative wetland bird count and percentage relative to Ribble and Alt Estuaries SPA/Ramsar site waterfowl assemblage population	Regular significant numbers criteria met? ⁵⁴	Cumulative count of Important Component Species for the Martin Mere SPA/Ramsar site waterfowl assemblage	Cumulative wetland bird count and percentage relative to Martin Mere SPA/Ramsar site waterfowl assemblage population	Regular significant numbers criteria met? ⁵⁵
15	28/09/2023	290	1,198 (0.43%)	No	290	1,198 (8.02%)	Yes
16	17/10/2023	180	534 (0.19%)		182	534 (3.58%)	
17	26/10/2023	103	674 (0.24%)		119	674 (4.51%)	
18	06/11/2023	97	663 (0.24%)		104	663 (4.44%)	
19	16/11/2023	209	691 (0.25%)		210	691 (4.63%)	
20	15/12/2023	16	340 (0.12%)		13	340 (2.28%)	
21	20/12/2023	15	498 (0.18%)		12	498 (3.34%)	
22	09/01/2024	65	90 (0.03%)		63	90 (0.60%)	
23	22/01/2024	32	116 (0.04%)		21	116 (0.78%)	
24	12/02/2024	32	161 (0.06%)		24	161 (1.08%)	
25	26/02/2024	208	589 (0.21%)		189	589 (3.94%)	
26	08/03/2024	109	910 (0.32%)		80	910 (6.09%)	
27	21/03/2024	83	553 (0.20%)		92	553 (3.70%)	

*Those in bold indicate when a single threshold per criteria in Section 2.4.22 or 2.4.23 is met.

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 ⁴³		% of regional population ⁵⁸		Regular significant numbers criteria met? ⁵⁹
Pink-footed goose	November	6	11	33,537 (Lancashire ⁴⁵)	77,659 (West England ⁴⁶)	0.03	0.01	No
	January	10	6			0.02	0.01	
Whooper swan	October	3	152	1,518 (Lancashire ⁴⁵)	2,194 (Lancashire ⁴⁷)	10.01	6.93	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	

⁵⁸ Those in bold indicate when 1% of that species' non-breeding regional population is met.

⁵⁹ When a 'significant number' (i.e. 1% of that species' non-breeding regional population) is met in two thirds of the season (i.e. ≥9 visits).

Species	Month	Visit	Peak count	Regional population ⁴³	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁵⁹
	January	10	3		0.53	
Black-headed gull	September	1	63	36,405	0.17	No
	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 ⁴³		% of regional population ⁵⁸		Regular significant numbers criteria met? ⁵⁹
Pink-footed goose	November	5	58	33,537 (Lancashire ⁴⁵)	77,659 (West England ⁴⁶)	0.17	0.07	No

Species	Month	Visit	Peak count	Regional population ⁴³		% of regional population ⁵⁸		Regular significant numbers criteria met? ⁵⁹
Whooper swan	October	3	138	1,518 (Lancashire ⁴⁵)	2,194 (Lancashire ⁴⁷)	9.09	6.29	No
	November	5	7			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			1.16		
	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 ⁴³	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁵⁹
	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	1.25	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 ⁴⁵		% of regional population ⁵⁸		Regular significant numbers criteria met? ⁶⁰
Pink-footed goose	September	15	290	33,537 (Lancashire ⁴⁵)	77,659 (West England ⁴⁶)	0.86	0.37	No
Barnacle goose	September	15	1	83		1.20		No

⁶⁰ When a ‘significant number’ (i.e. 1% of that species’ non-breeding regional population) is met in two thirds of the season (i.e. ≥8 visits).

Species	Month	Visit	Peak count	Regional population ⁴⁵	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁶⁰
Greylag goose	September	15	124	5,708	2.17	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	8,140	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	9,966	0.19	No
Snipe	October	16	3	566	0.53	No
	October	17	5		0.88	

Species	Month	Visit	Peak count	Regional population ⁴⁵	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁶⁰
	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 ⁴³		% of regional population ⁵⁸		Regular significant numbers criteria met? ⁶⁰
Pink-footed goose	November	18	63	33,537 (Lancashire ⁴⁵)	77,659 (West England ⁴⁶)	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 ⁴³	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁶⁰
	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 ⁴³	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁶⁰
	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	6.10	No
	November	18	3		3.66	
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	5.26	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		1.26	
	November	18	462		1.27	
	November	19	473		1.30	
	December	20	315		0.87	

Species	Month	Visit	Peak count	Regional population ⁴³	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁶⁰
	December	21	472		1.30	
	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	
Herring gull	October	16	265	13,522	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	
Lesser black-backed gull	October	16	9	3,987	0.23	No
	October	17	1		0.03	
	November	18	6		0.15	
	December	20	1		0.03	
	December	21	2		0.05	
	February	25	1		0.03	
	March	26	4		0.10	
	March	27	3		0.08	

Species	Month	Visit	Peak count	Regional population ⁴³	% of regional population ⁵⁸	Regular significant numbers criteria met? ⁶⁰
Grey heron	October	17	2	292	0.68	No
	November	18	4		1.37	
	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	

Figure 2.1: Site Location Plan

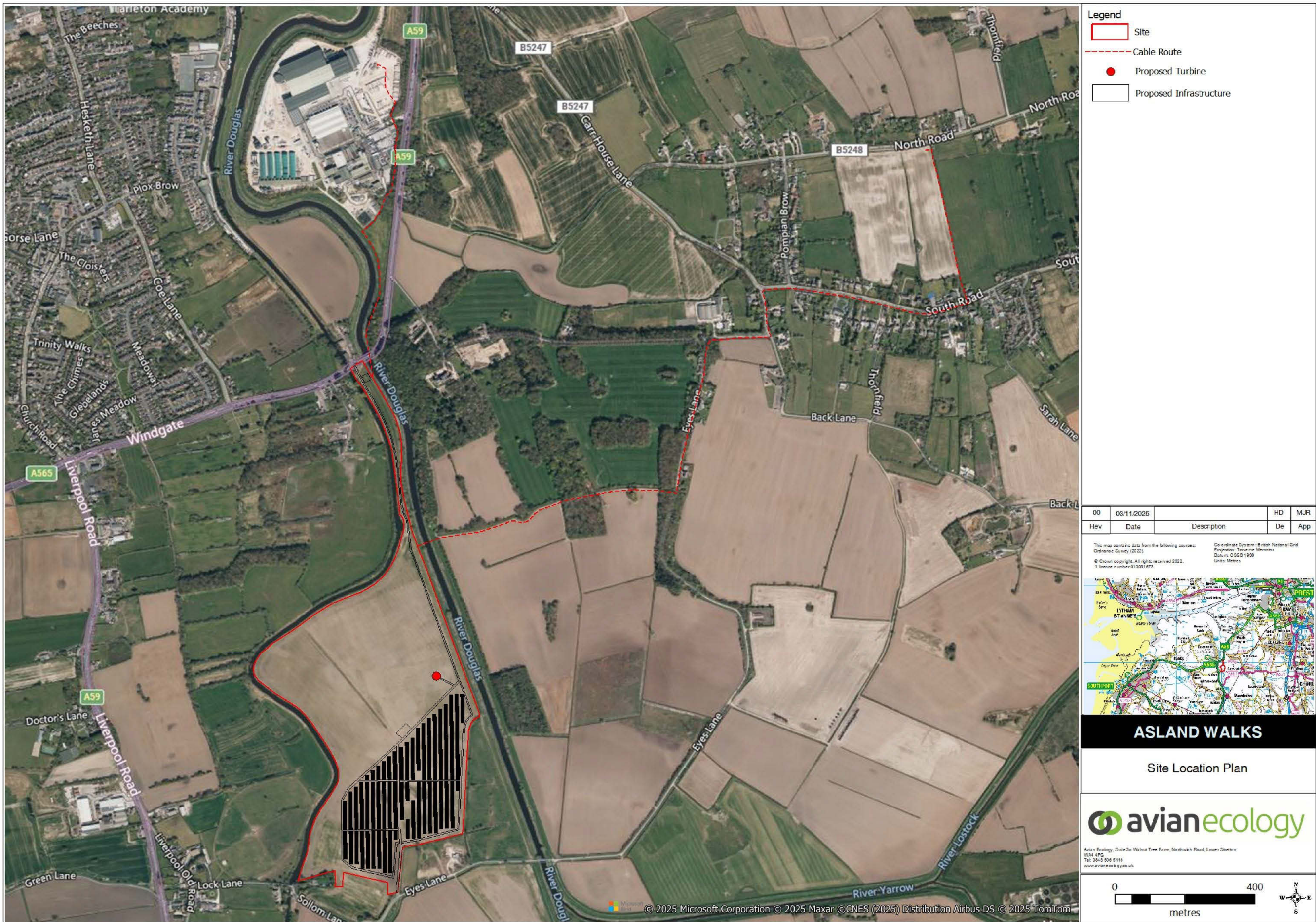


Figure 2.2: Statutory Designated Sites With Non-breeding Ornithological Interest

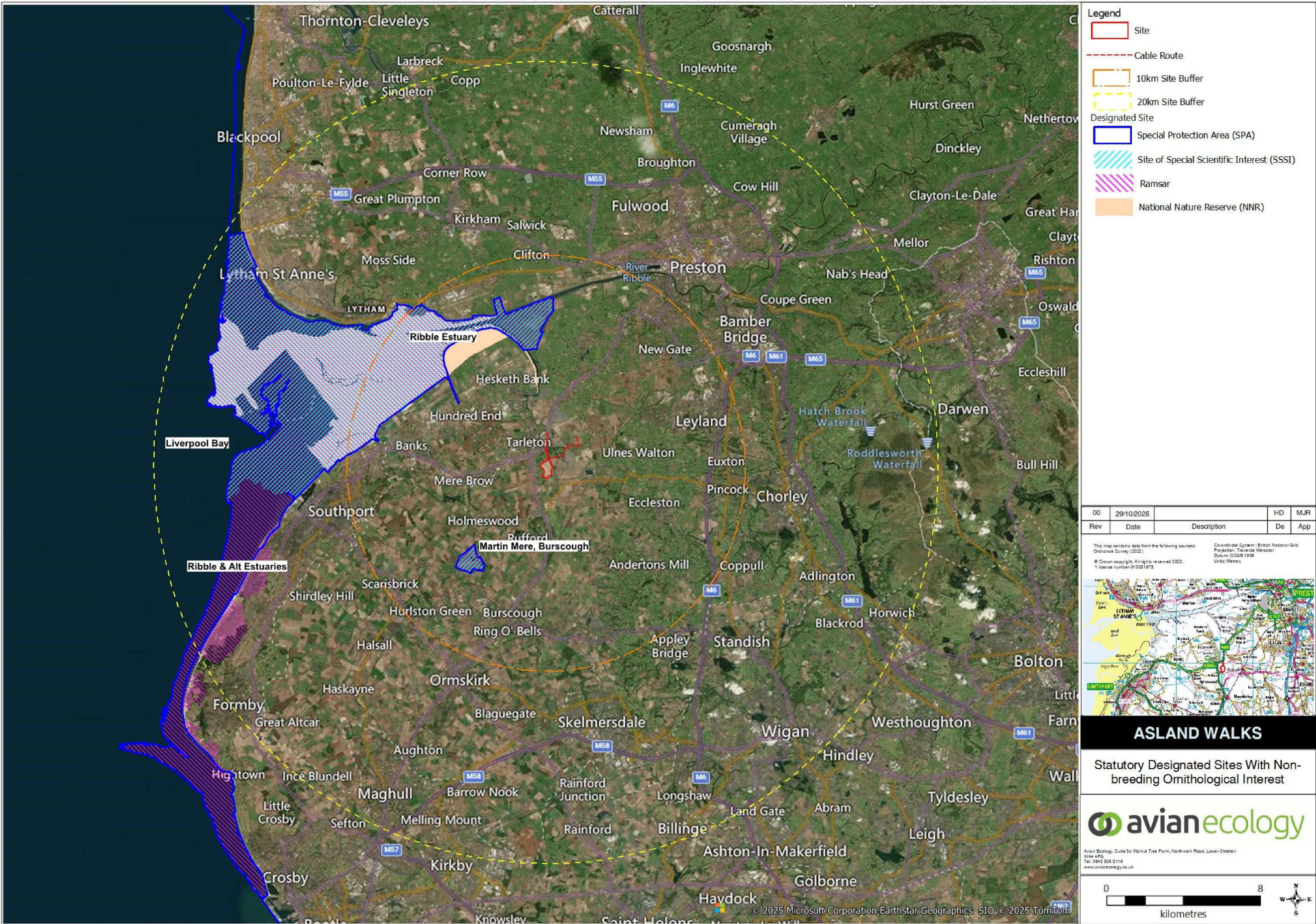


Figure 2.3: VP Flight Activity Survey Plan

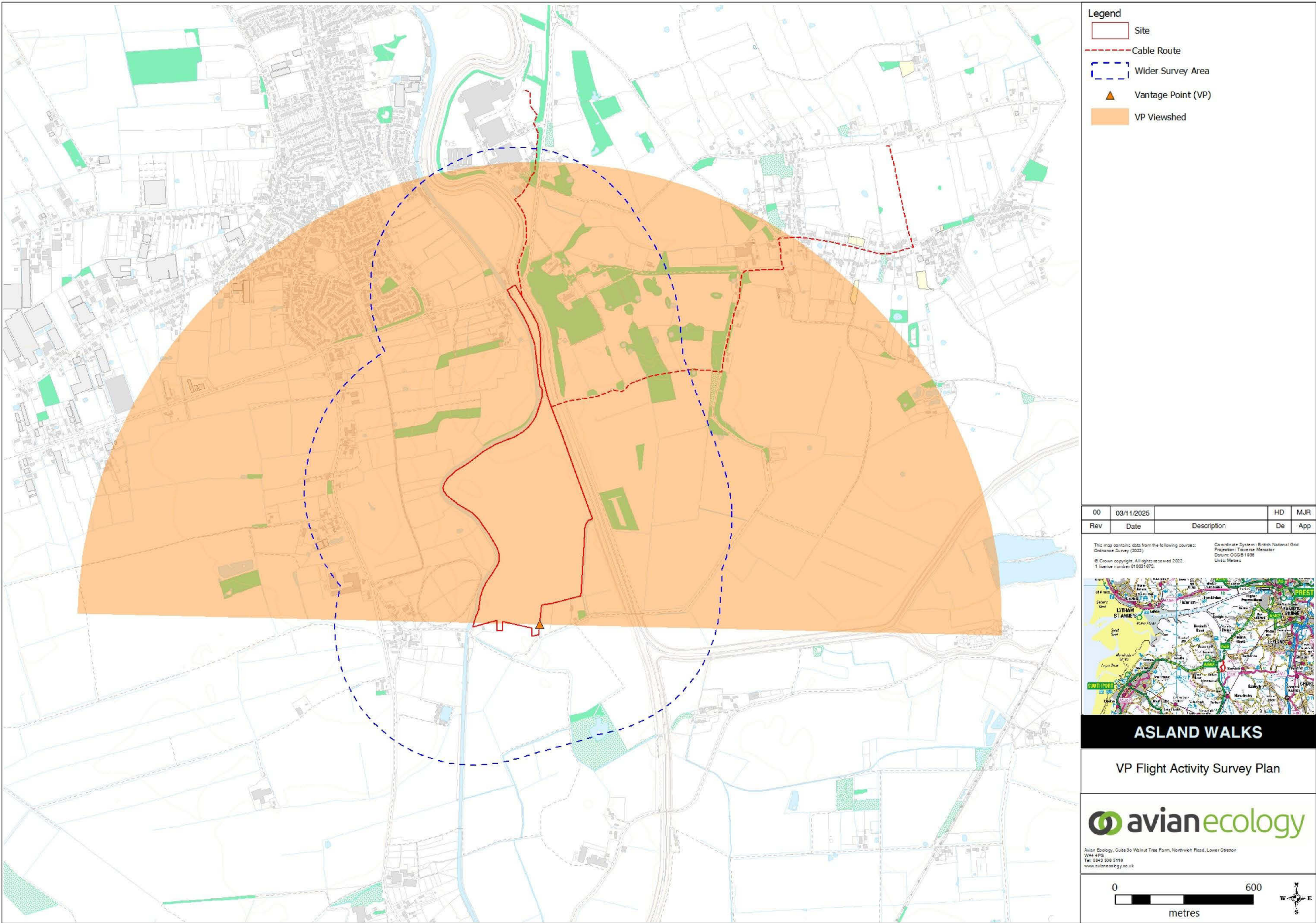


Figure 2.4: Non-breeding Walkover Survey Plan

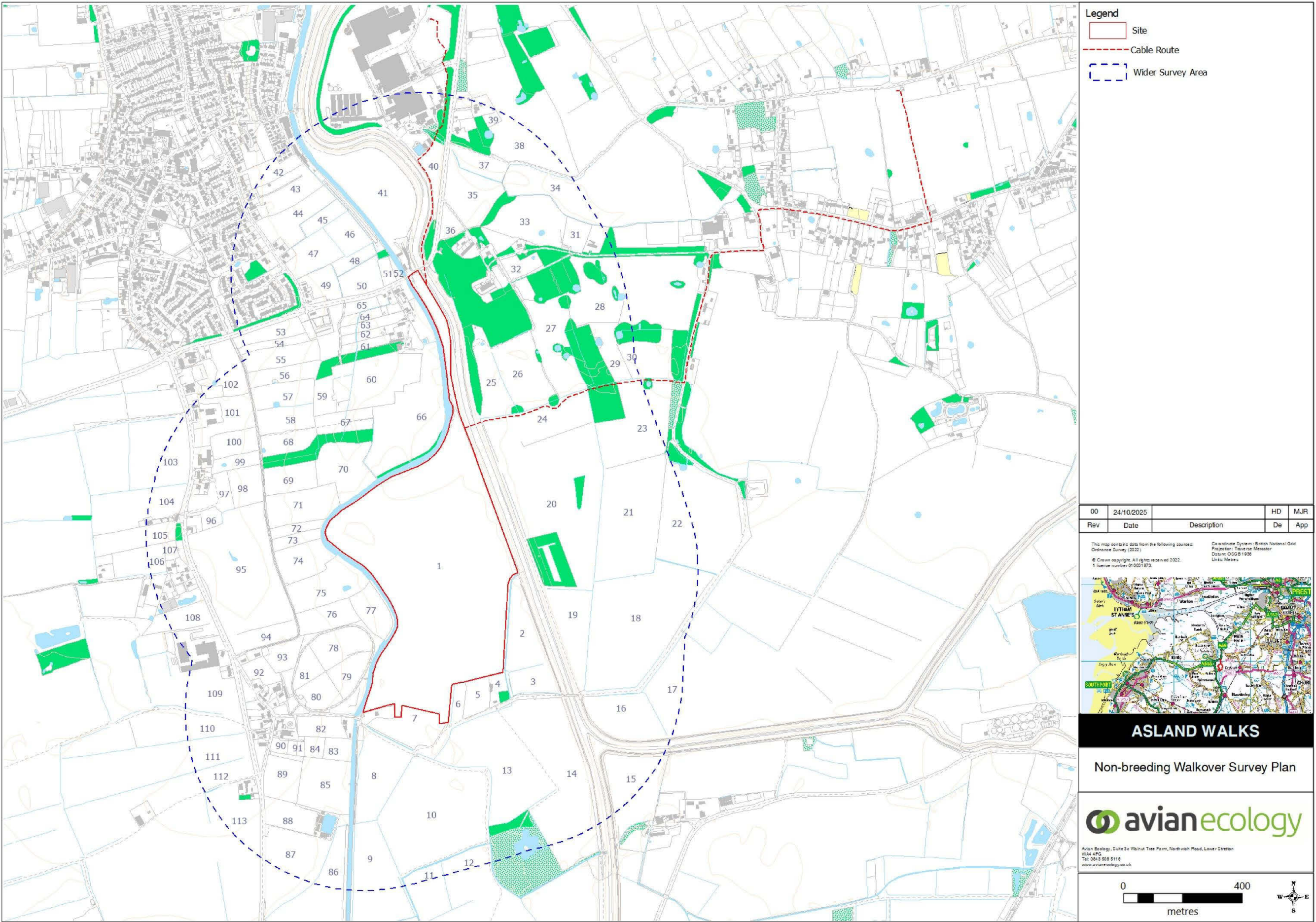


Figure 2.5: Breeding Bird Survey Plan

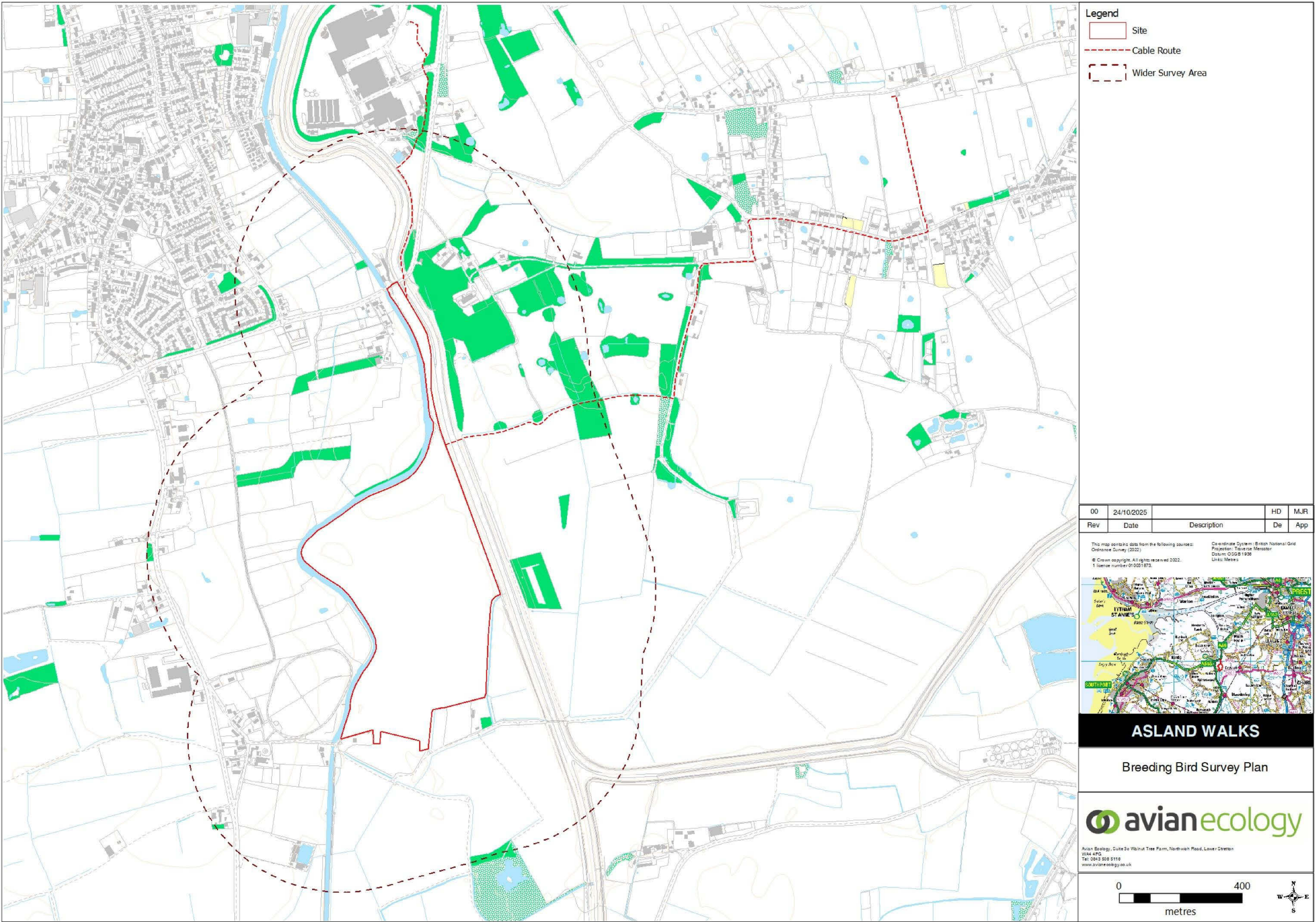


Figure 2.6: VP Flight Activity Survey Results Plan Year 1 – Geese

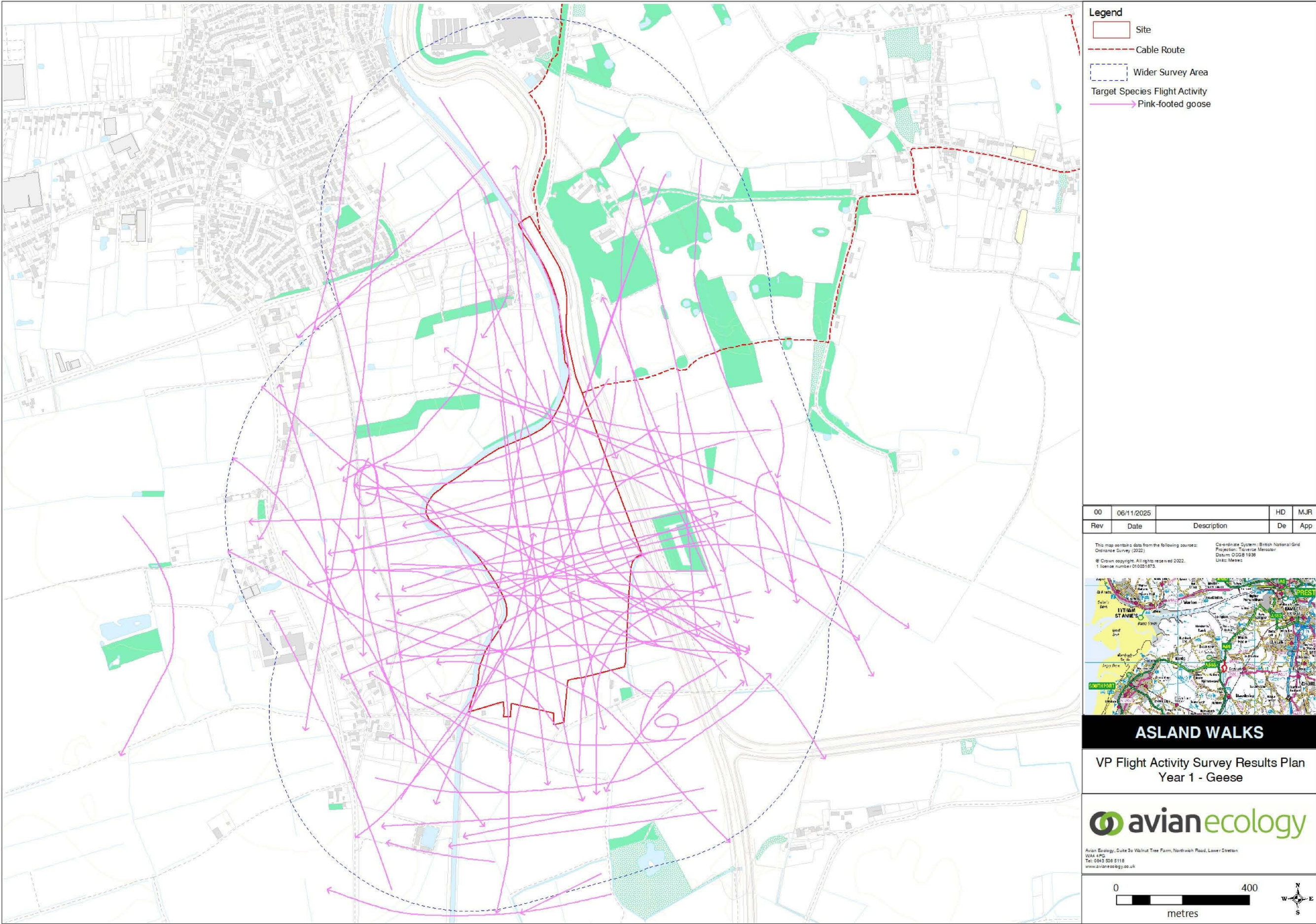


Figure 2.7: VP Flight Activity Survey Results Plan Year 1 – Swans

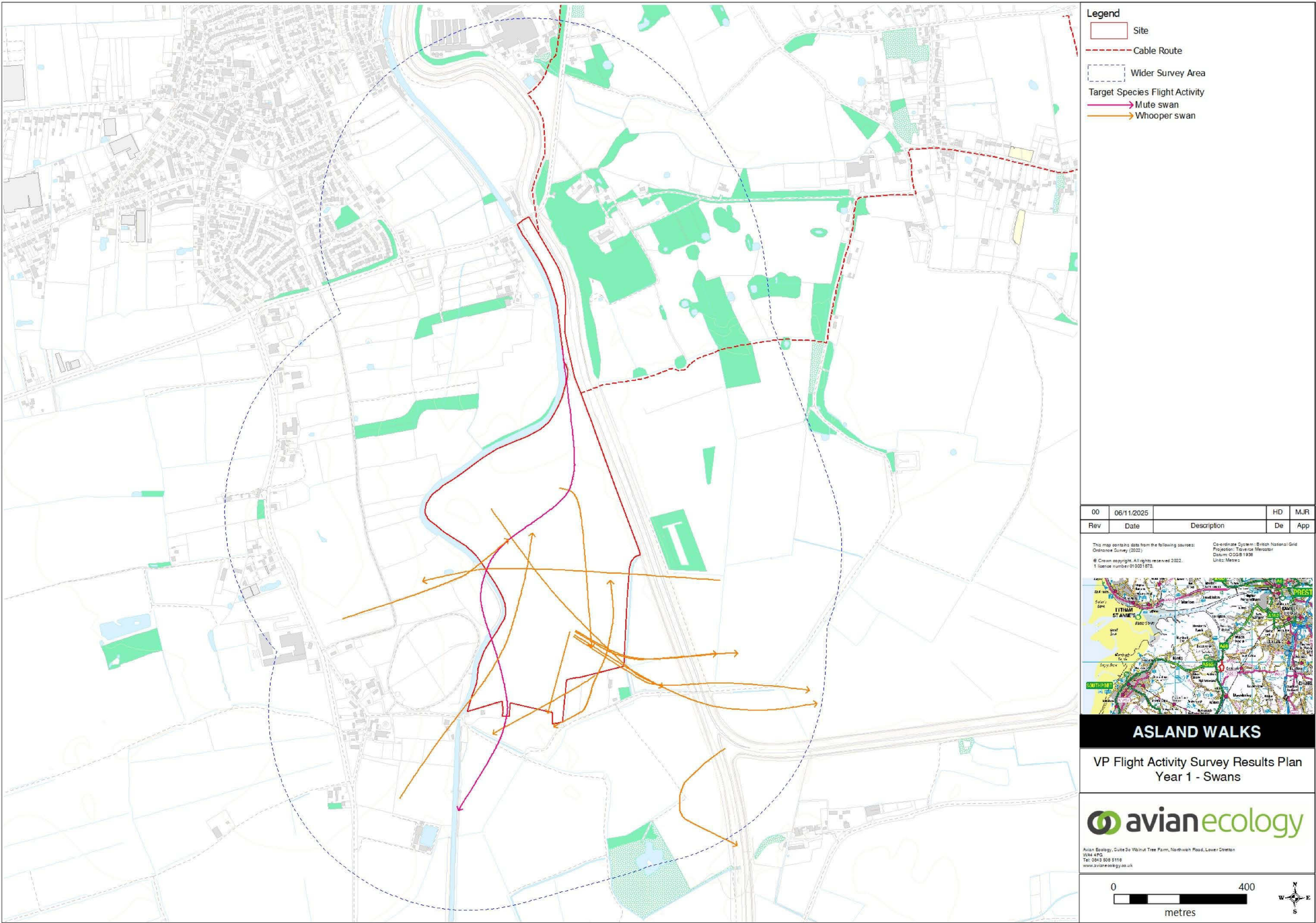


Figure 2.8: VP Flight Activity Survey Results Plan Year 1 – Ducks

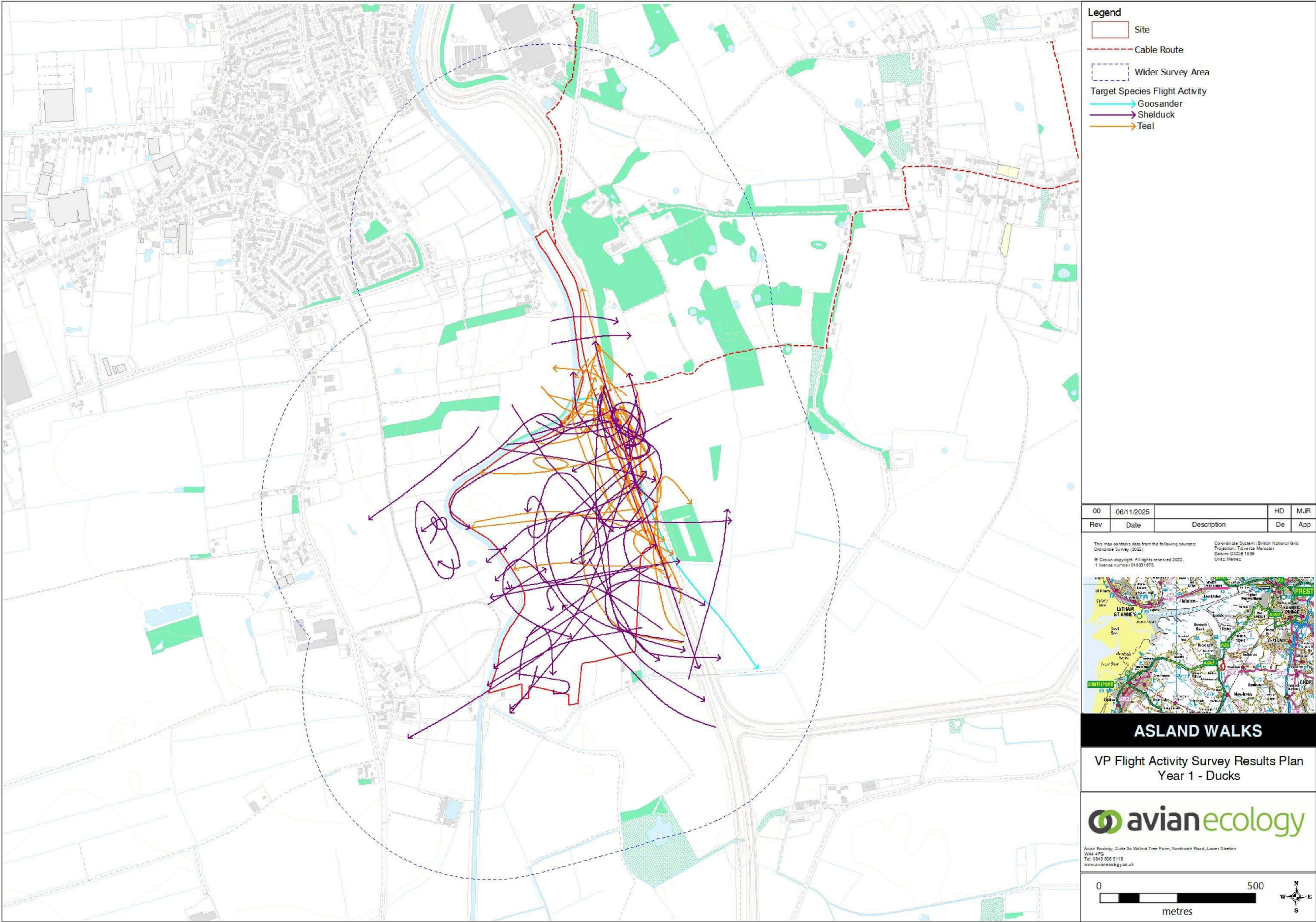


Figure 2.9: VP Flight Activity Survey Results Plan Year 1 – Raptors and Owls

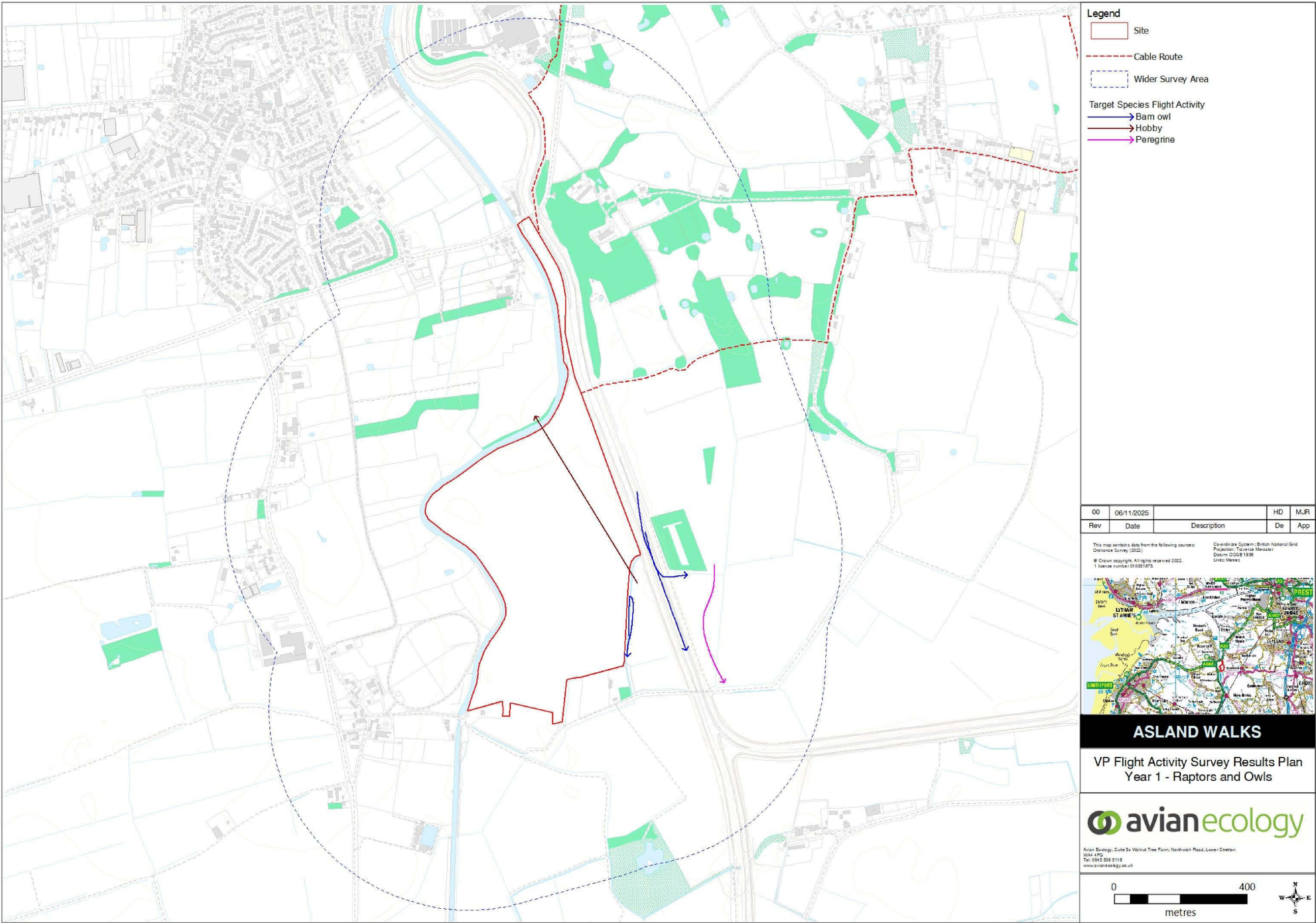


Figure 2.10: VP Flight Activity Survey Results Plan Year 1 – Lapwing

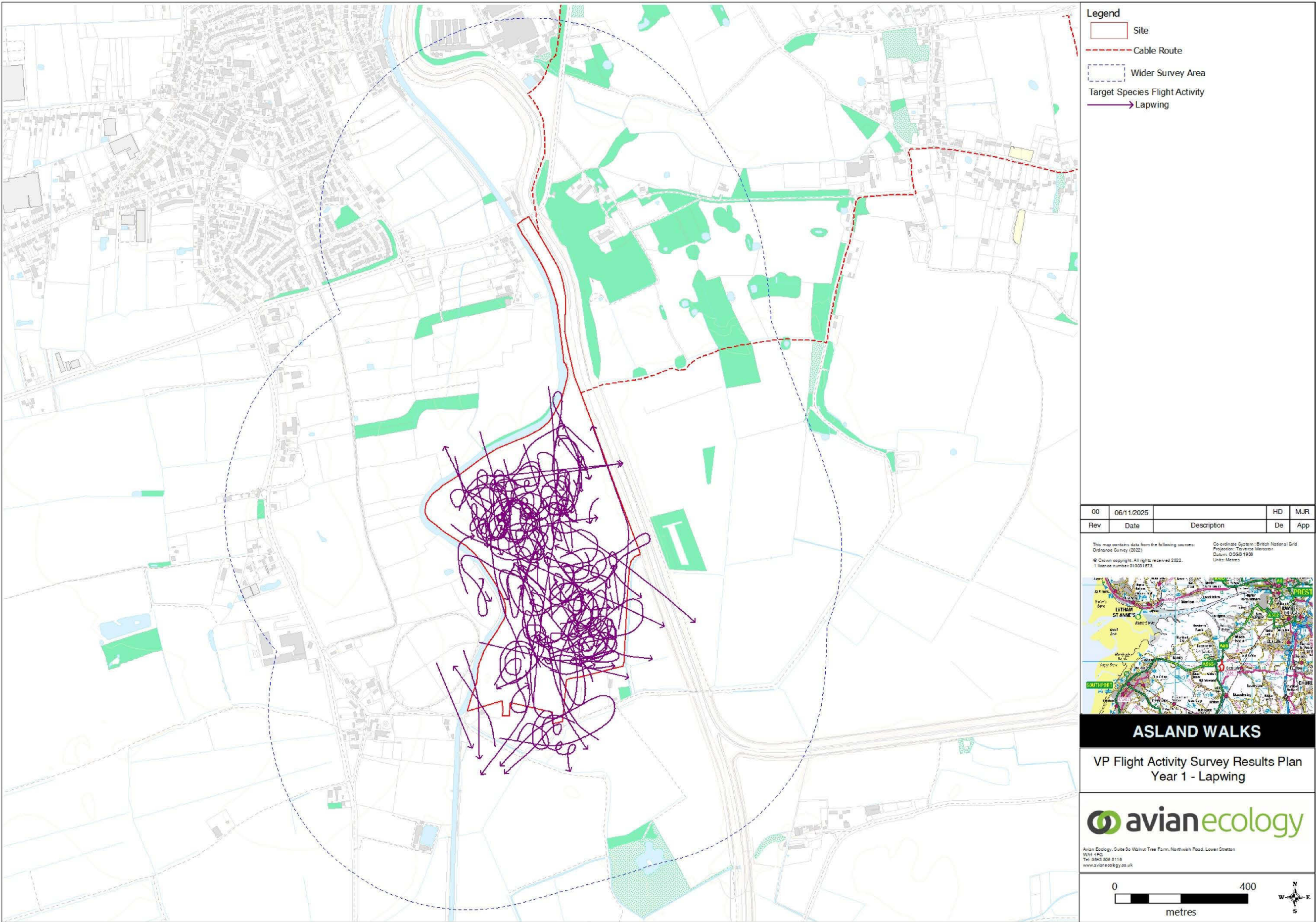


Figure 2.11: VP Flight Activity Survey Results Plan Year 1 – Waders and Others (A)

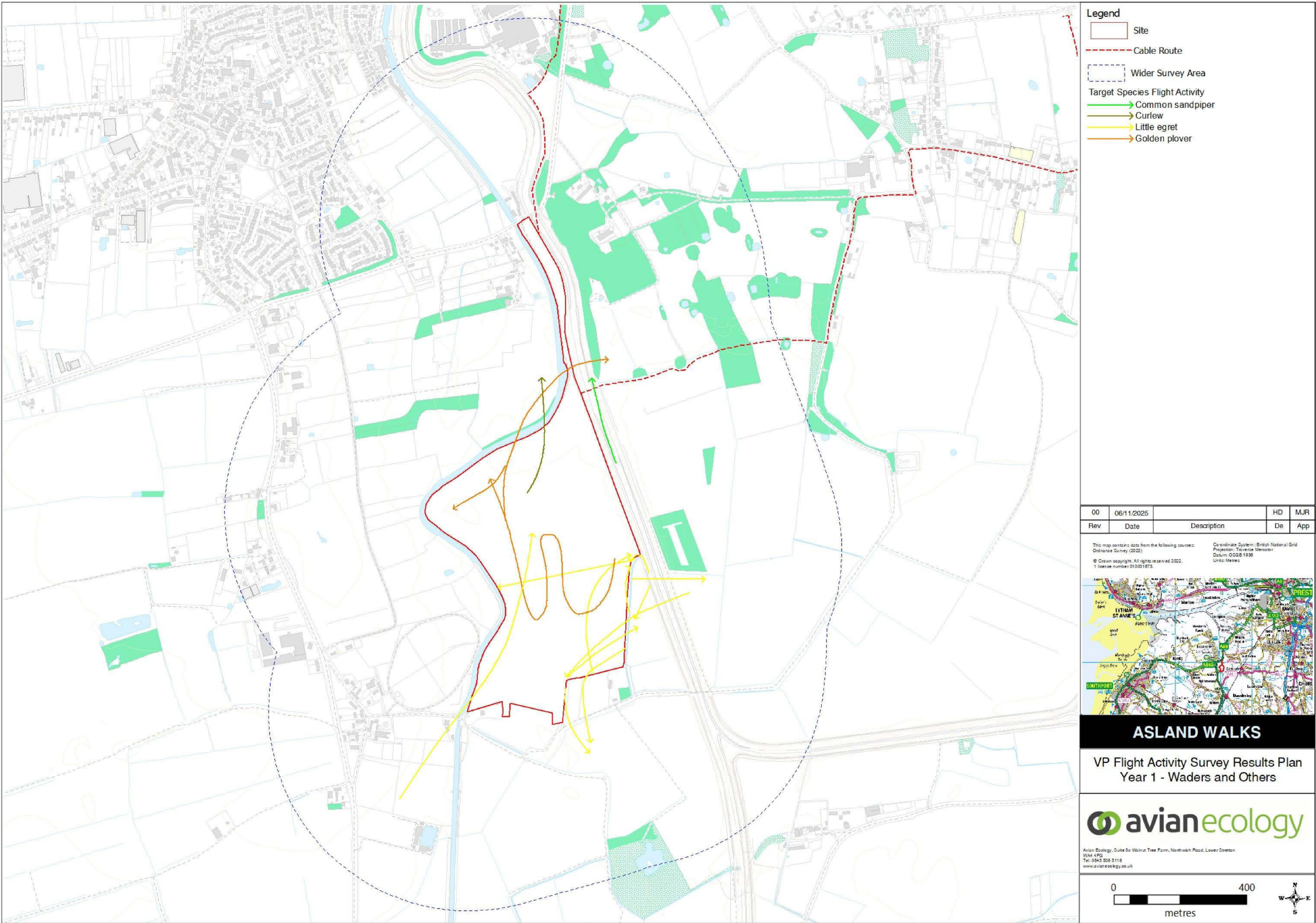


Figure 2.12: VP Flight Activity Survey Results Plan Year 1 – Waders and Others (B)

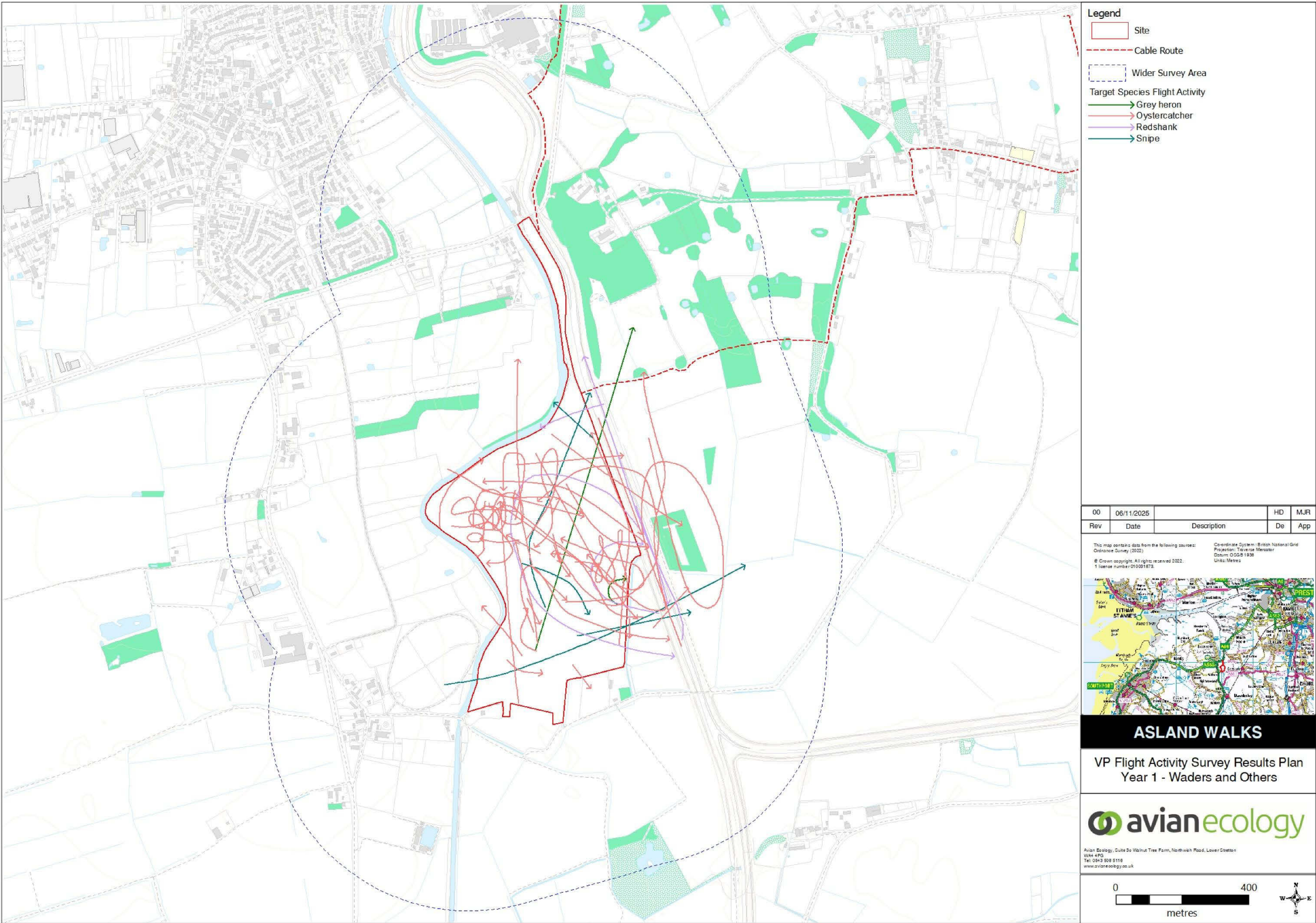


Figure 2.13: Non-breeding Walkover Survey Results Plan Year 1 – SPA/Ramsar Site Qualifying and Important Assemblage Species

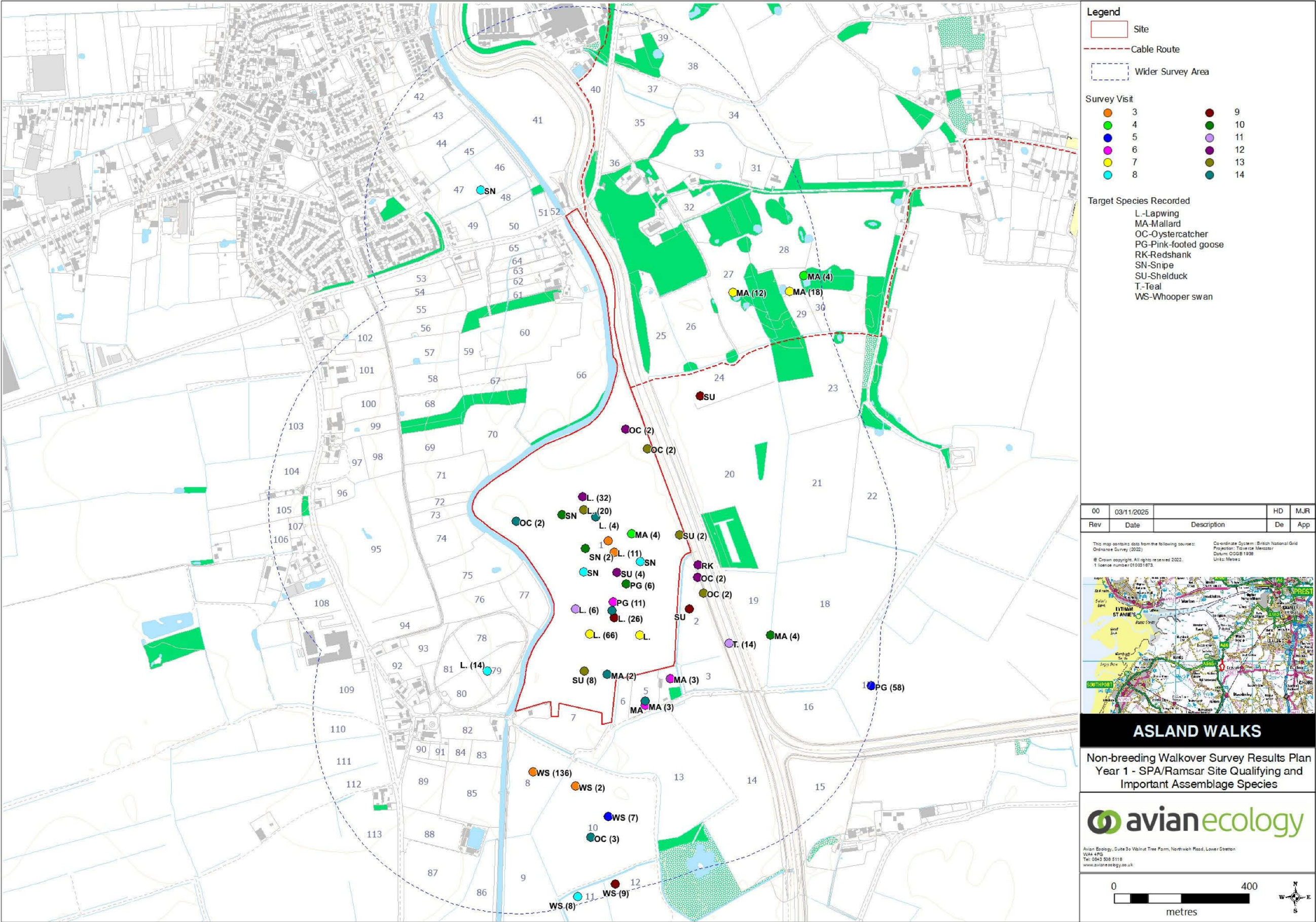


Figure 2.14: Non-breeding Walkover Survey Results Plan Year 1 – Other Target Species

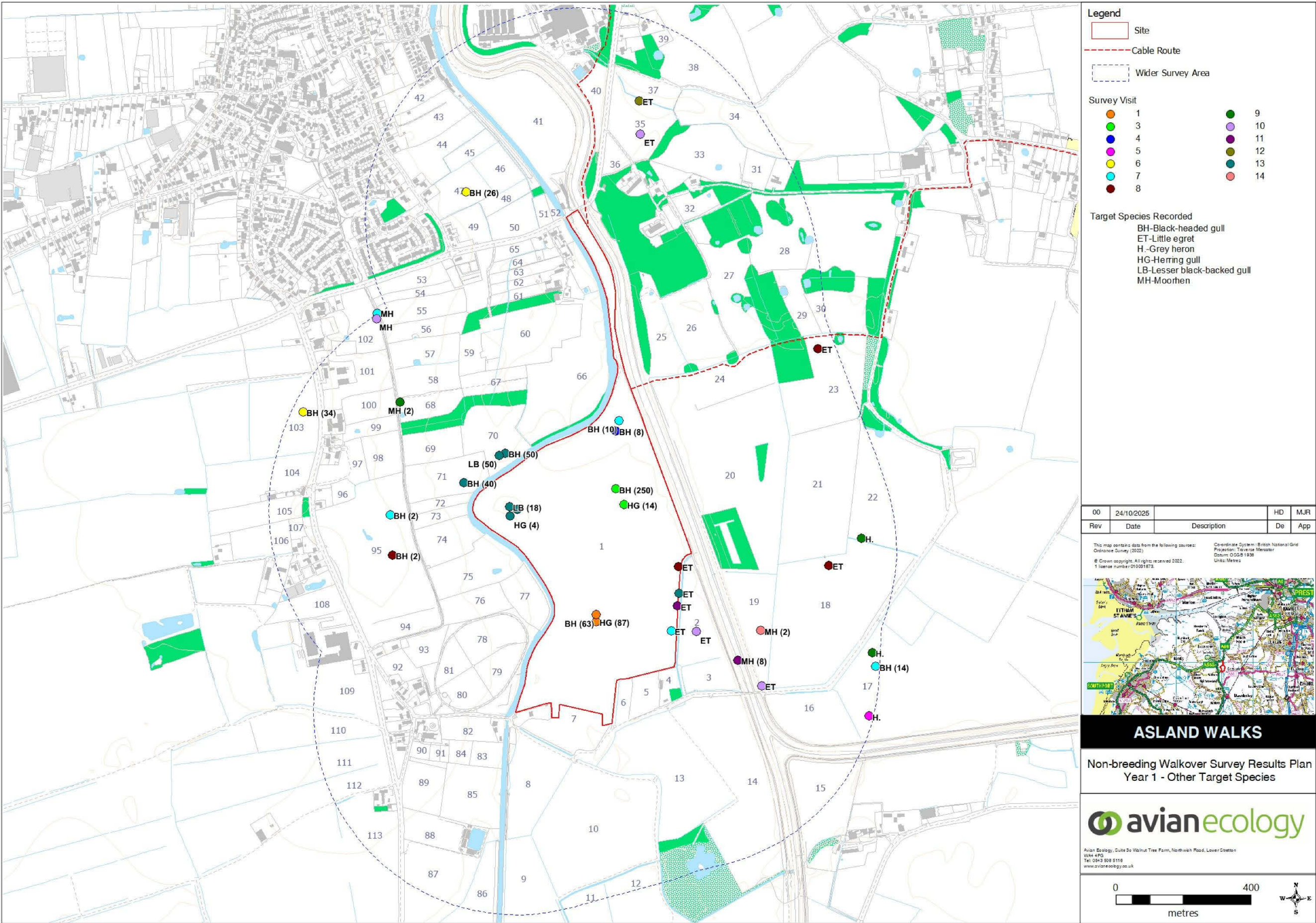


Figure 2.15: Breeding Bird Survey Results

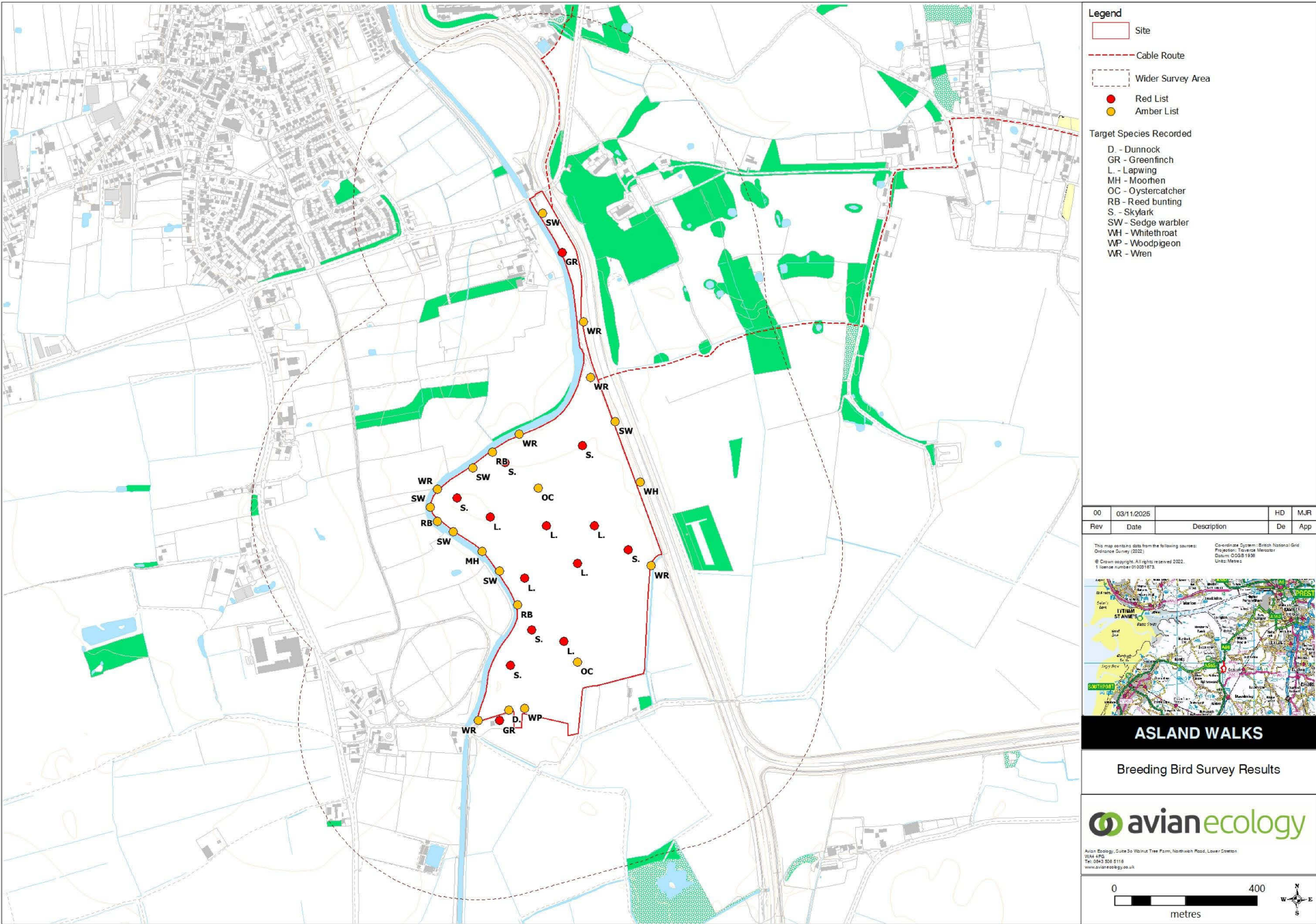


Figure 2.16: Confidential Schedule 1 Species Breeding Bird Survey Results (provided separately)

Figure 2.17: VP Flight Activity Survey Results Plan Year 2 – Geese

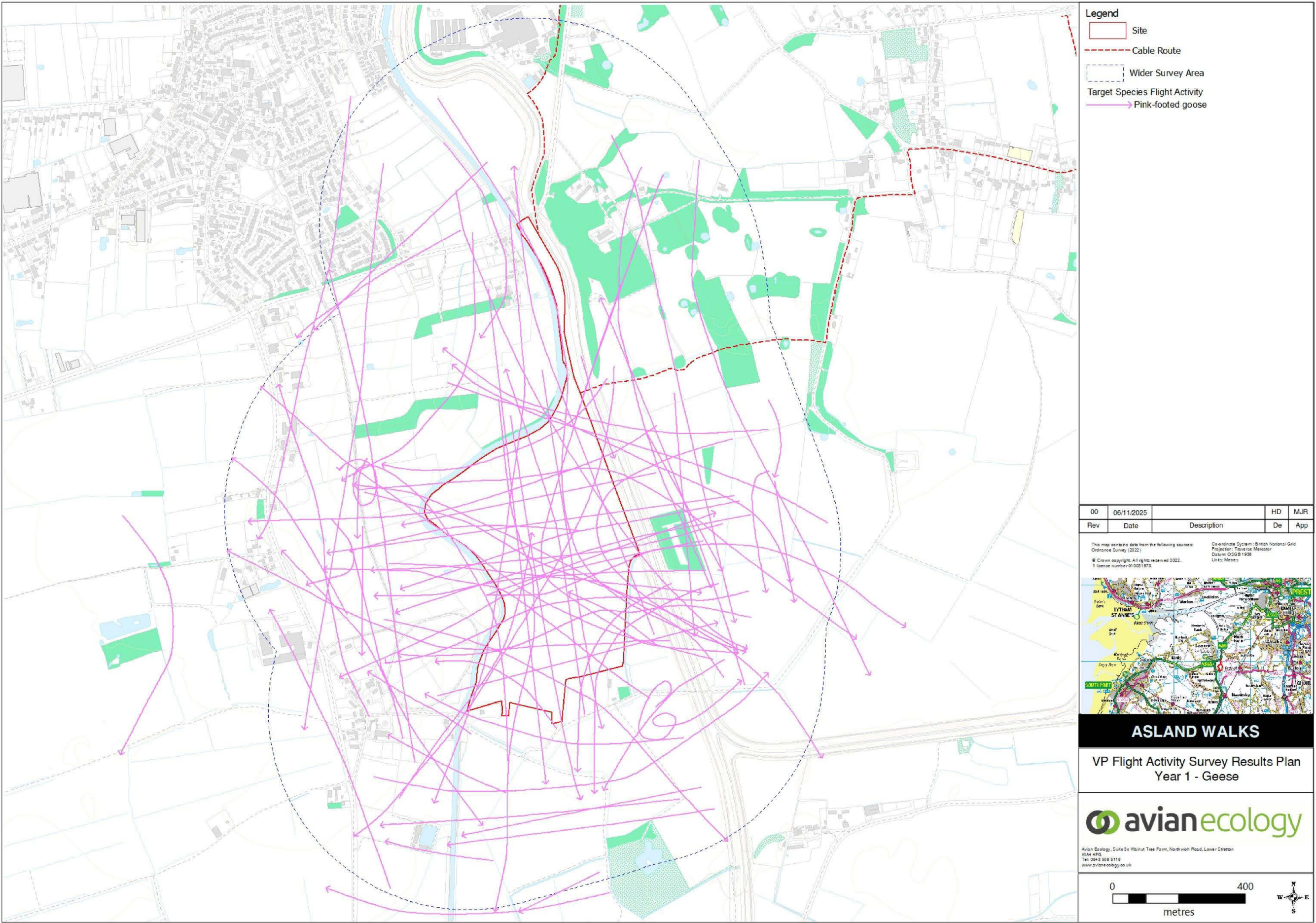


Figure 2.18: VP Flight Activity Survey Results Plan Year 2 – Swans

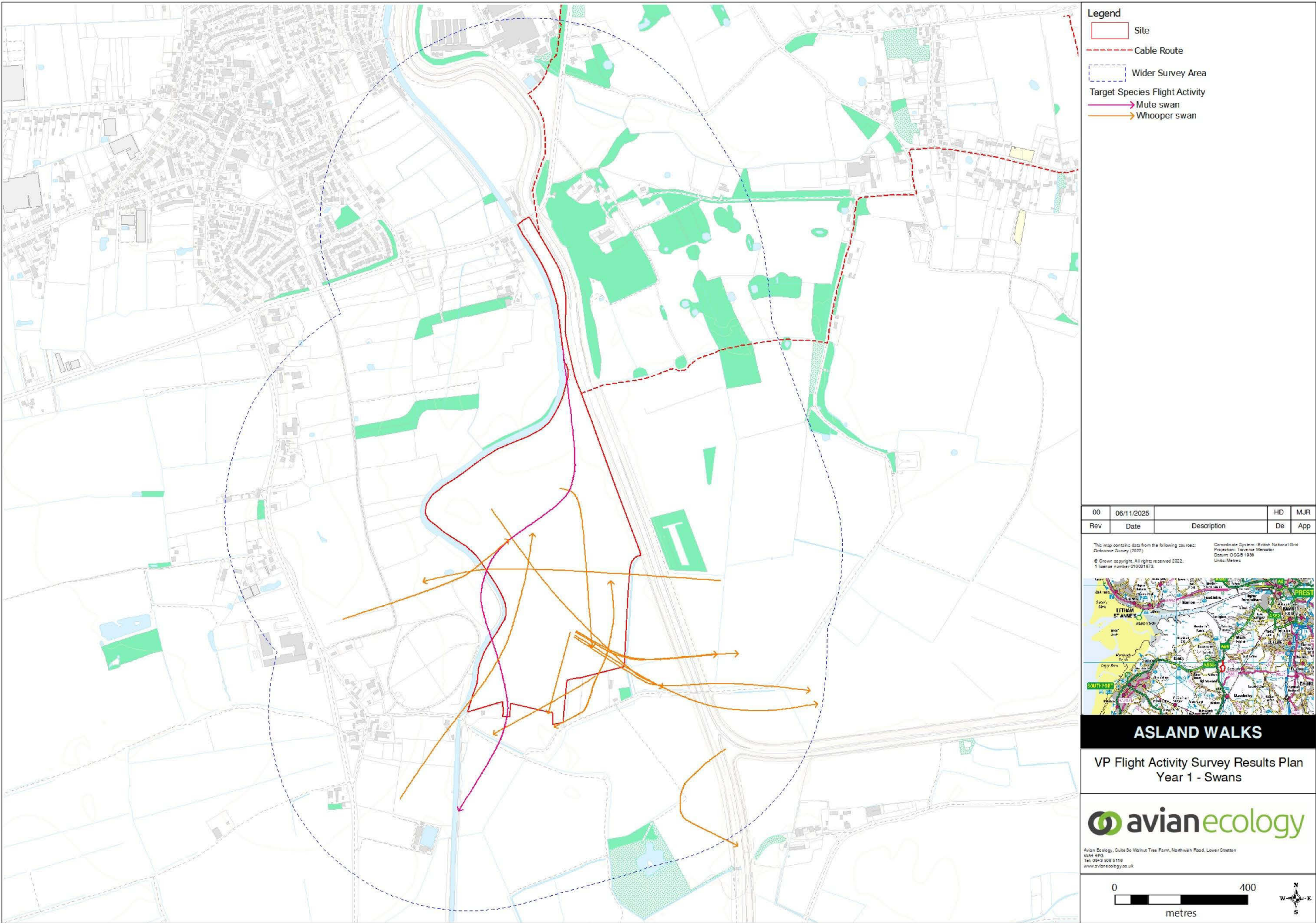


Figure 2.19: VP Flight Activity Survey Results Plan Year 2 – Ducks

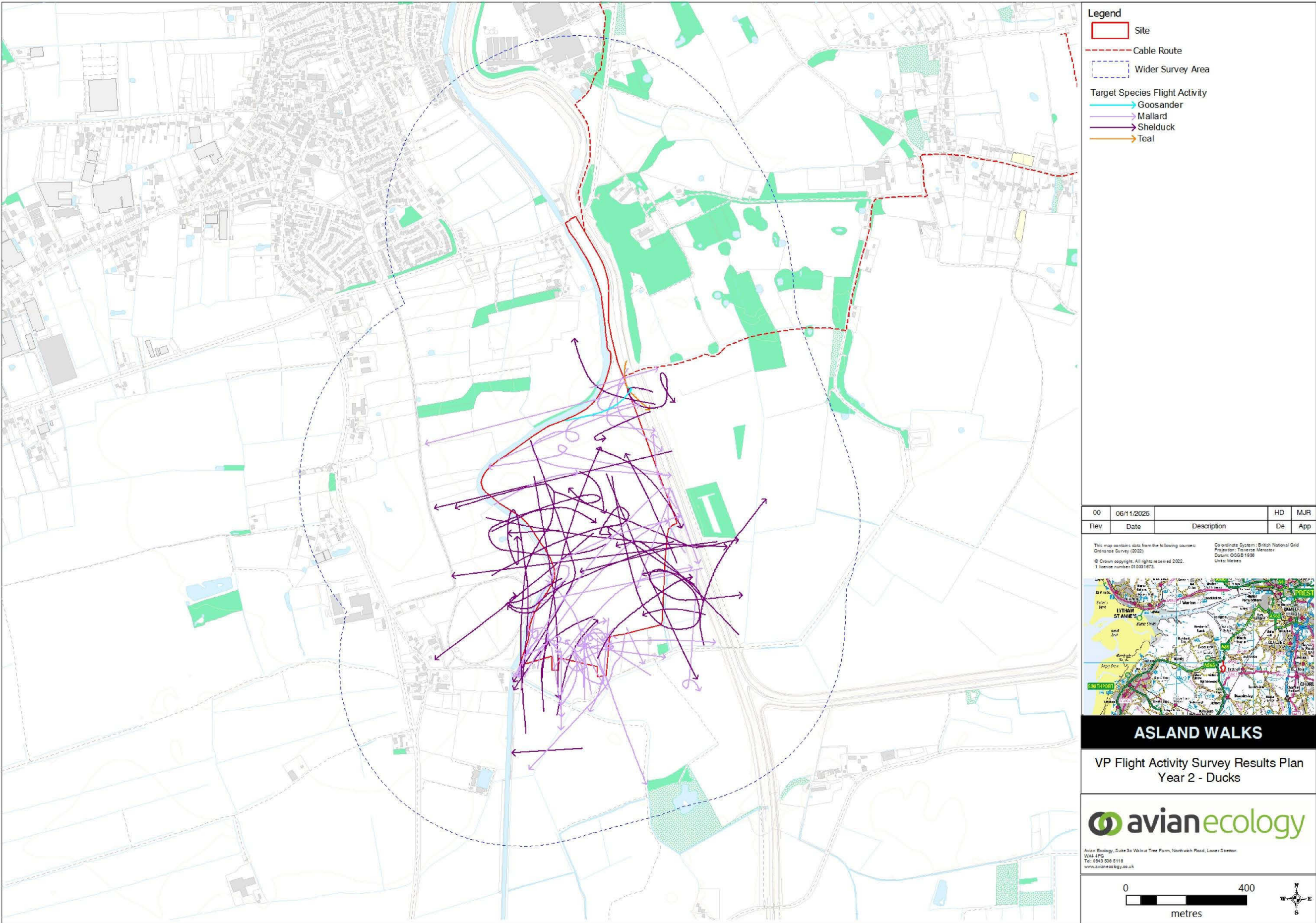


Figure 2.20: VP Flight Activity Survey Results Plan Year 2 – Raptors and Owls

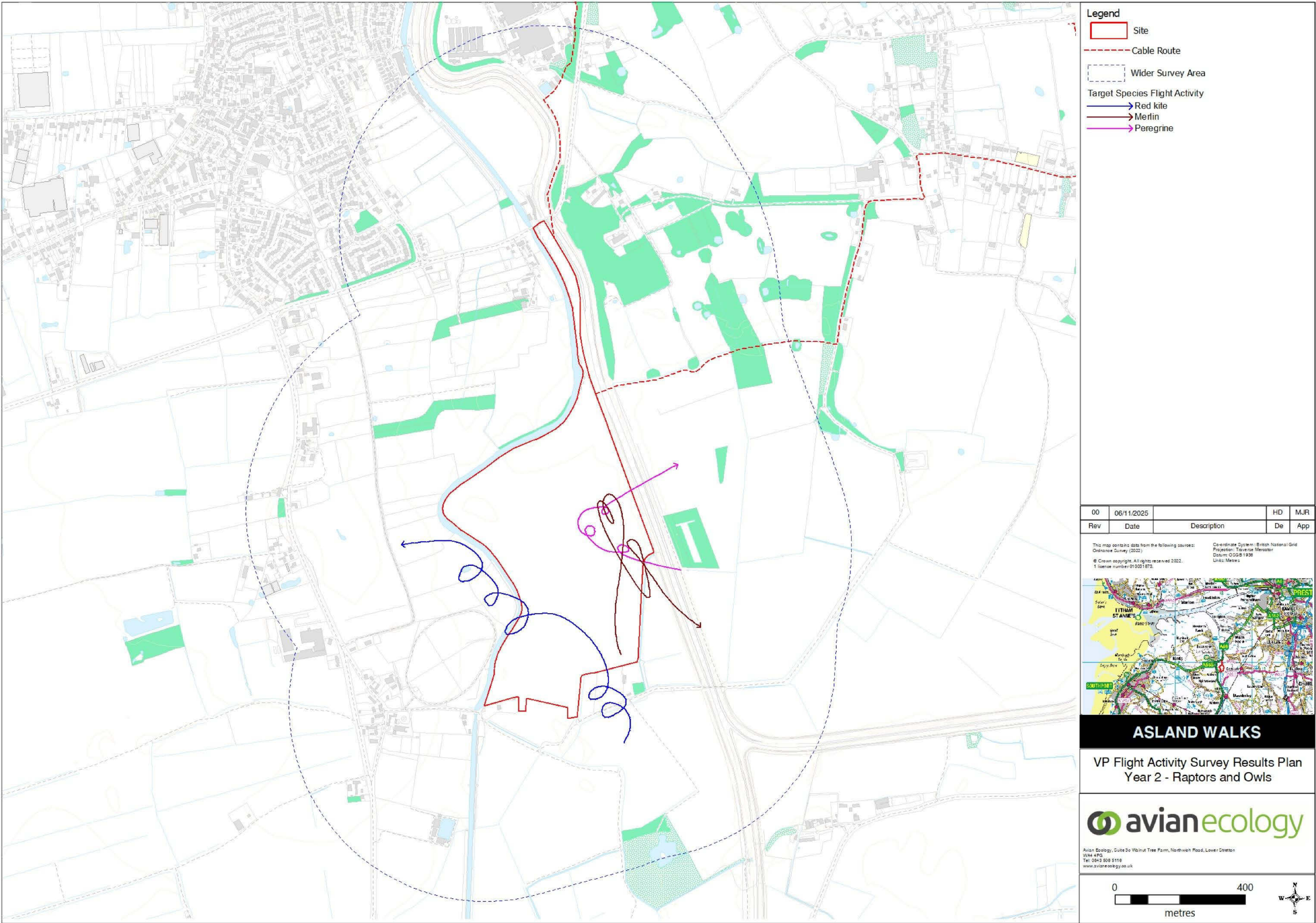


Figure 2.21: VP Flight Activity Survey Results Plan Year 2 – Lapwing

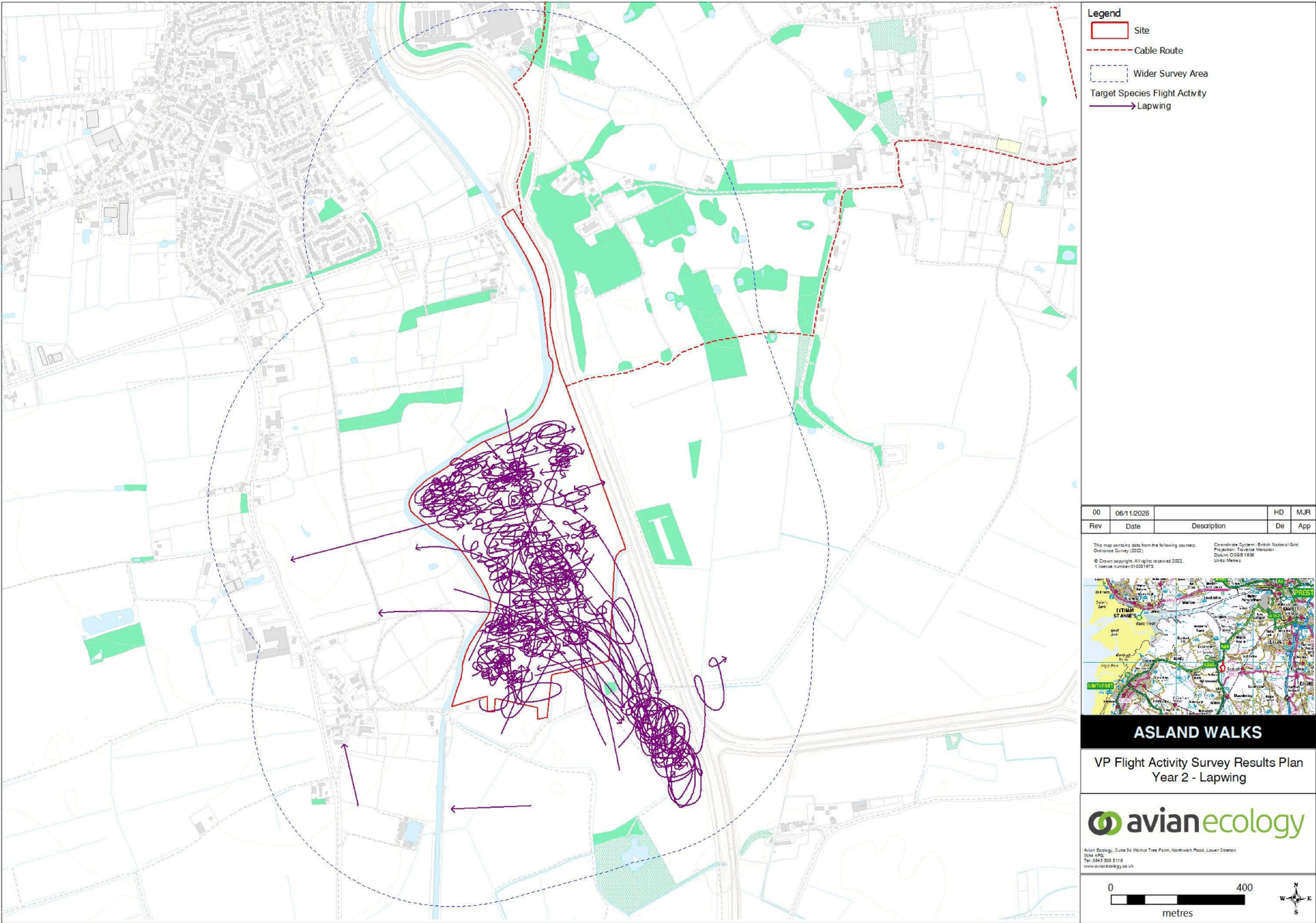


Figure 2.22: VP Flight Activity Survey Results Plan Year 2 – Waders and Others (A)

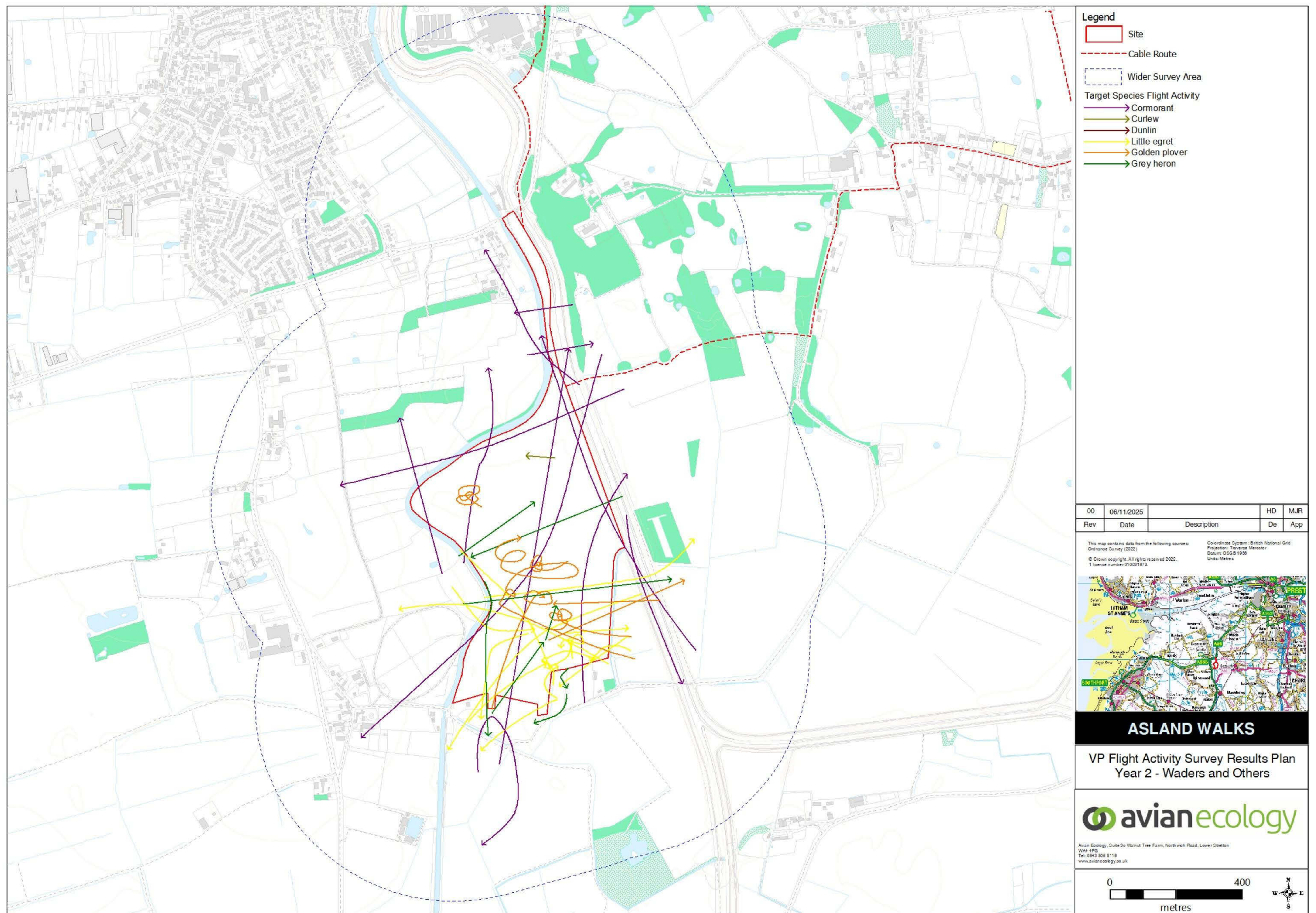


Figure 2.23: VP Flight Activity Survey Results Plan Year 2 – Waders and Others (B)

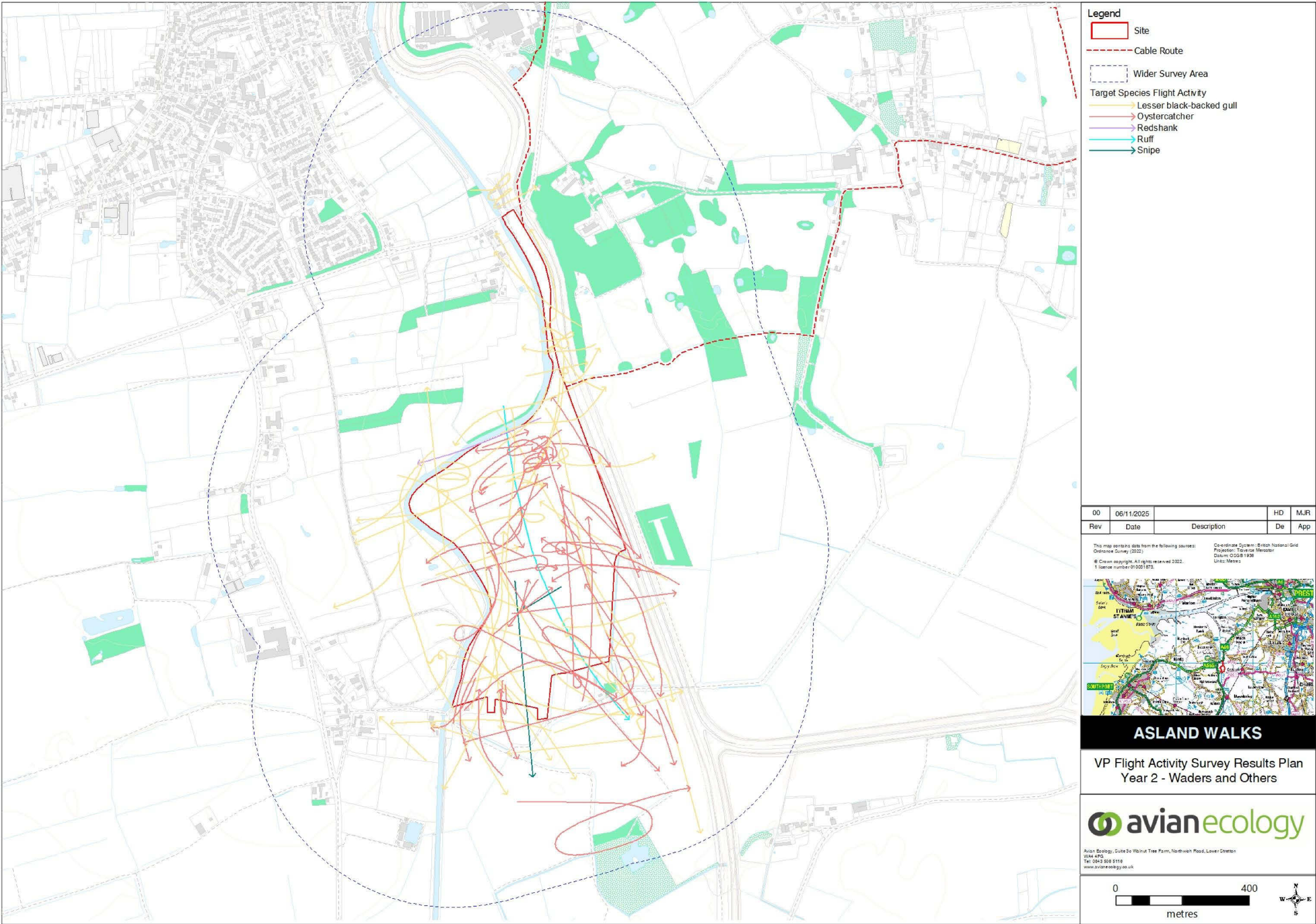


Figure 2.24 Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Qualifying and Important Assemblage Species (A)

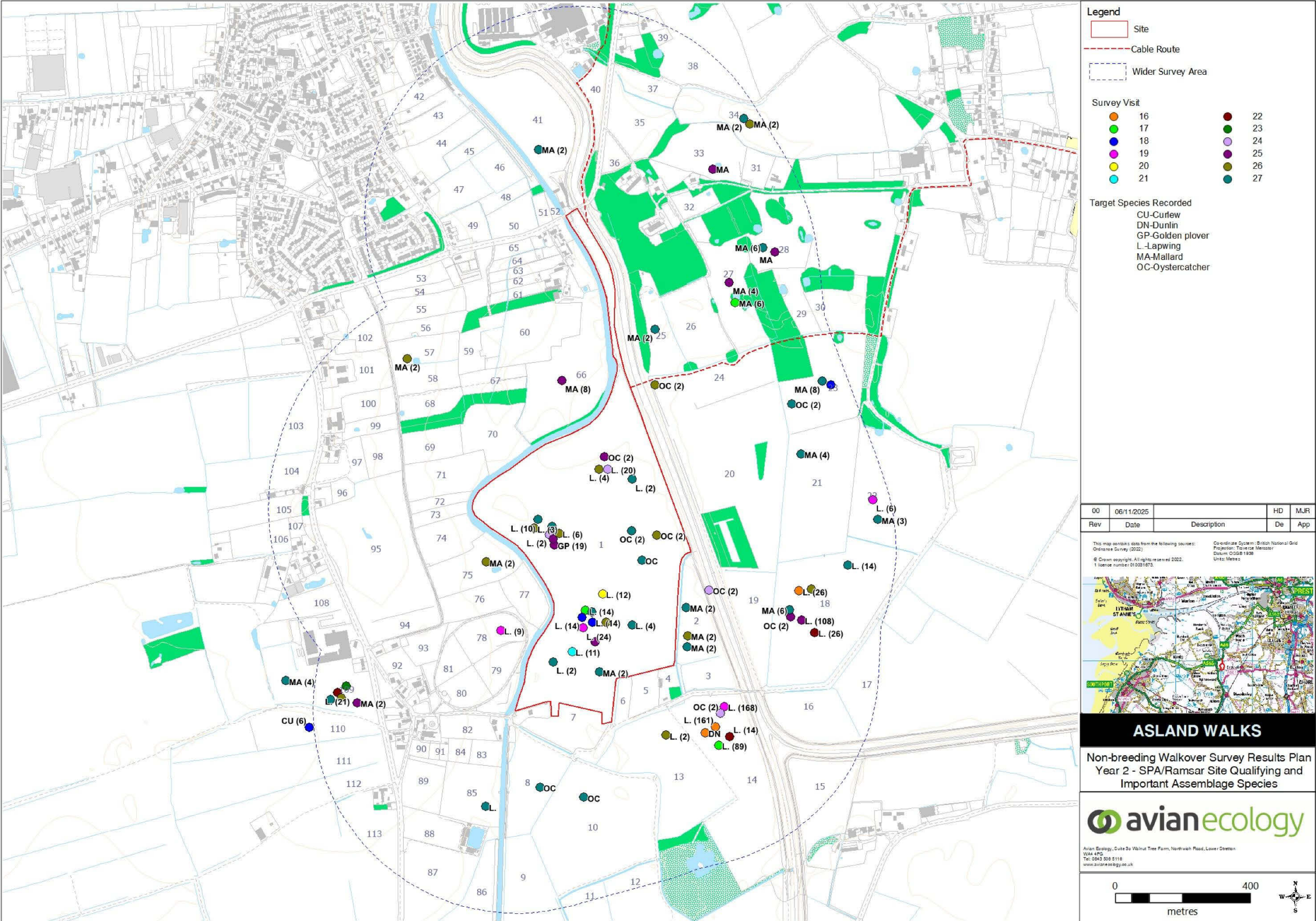


Figure 2.25 Non-breeding Walkover Survey Results Plan Year 2 – SPA/Ramsar Site Qualifying and Important Assemblage Species (B)

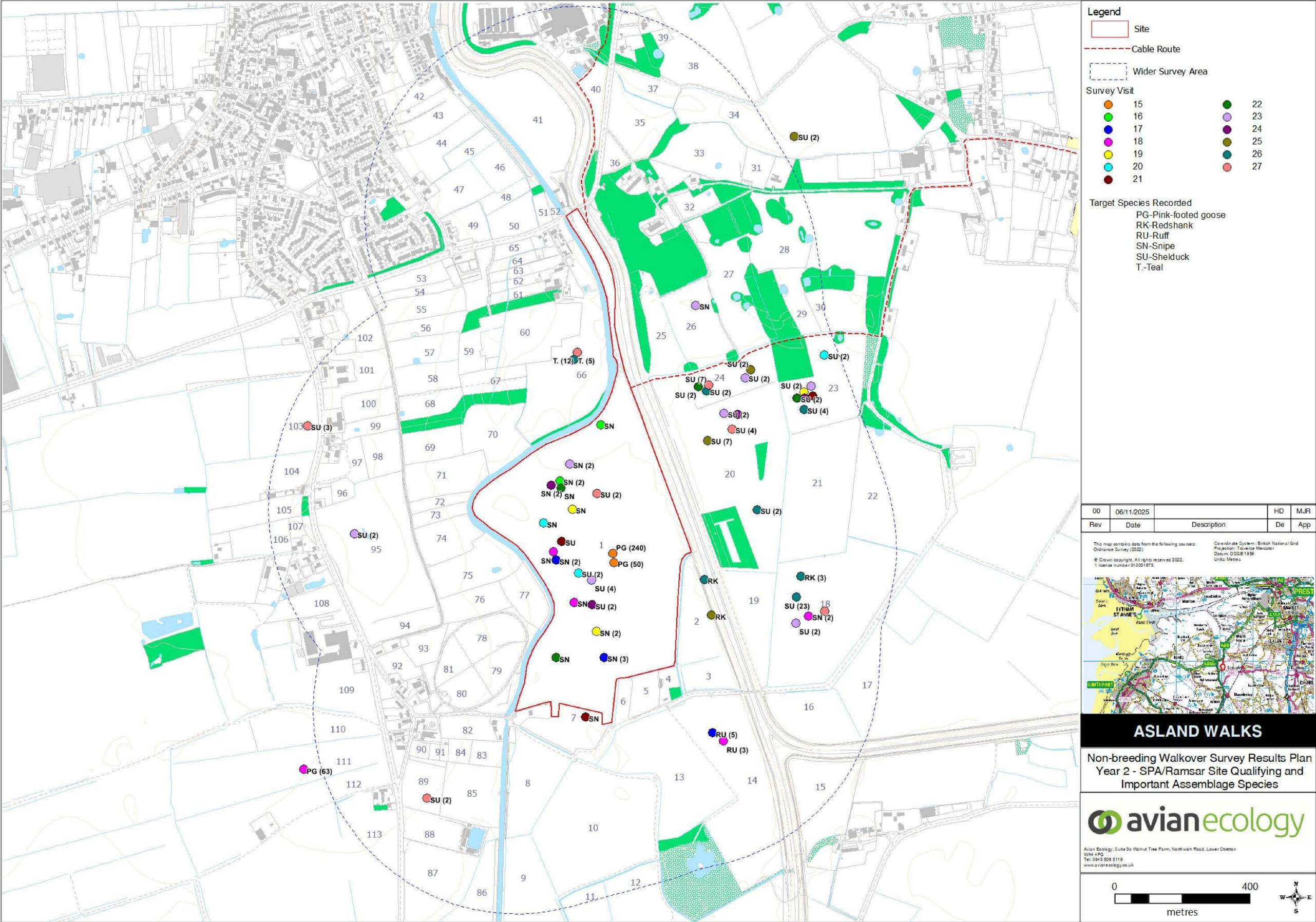


Figure 2.26: Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Waterfowl)

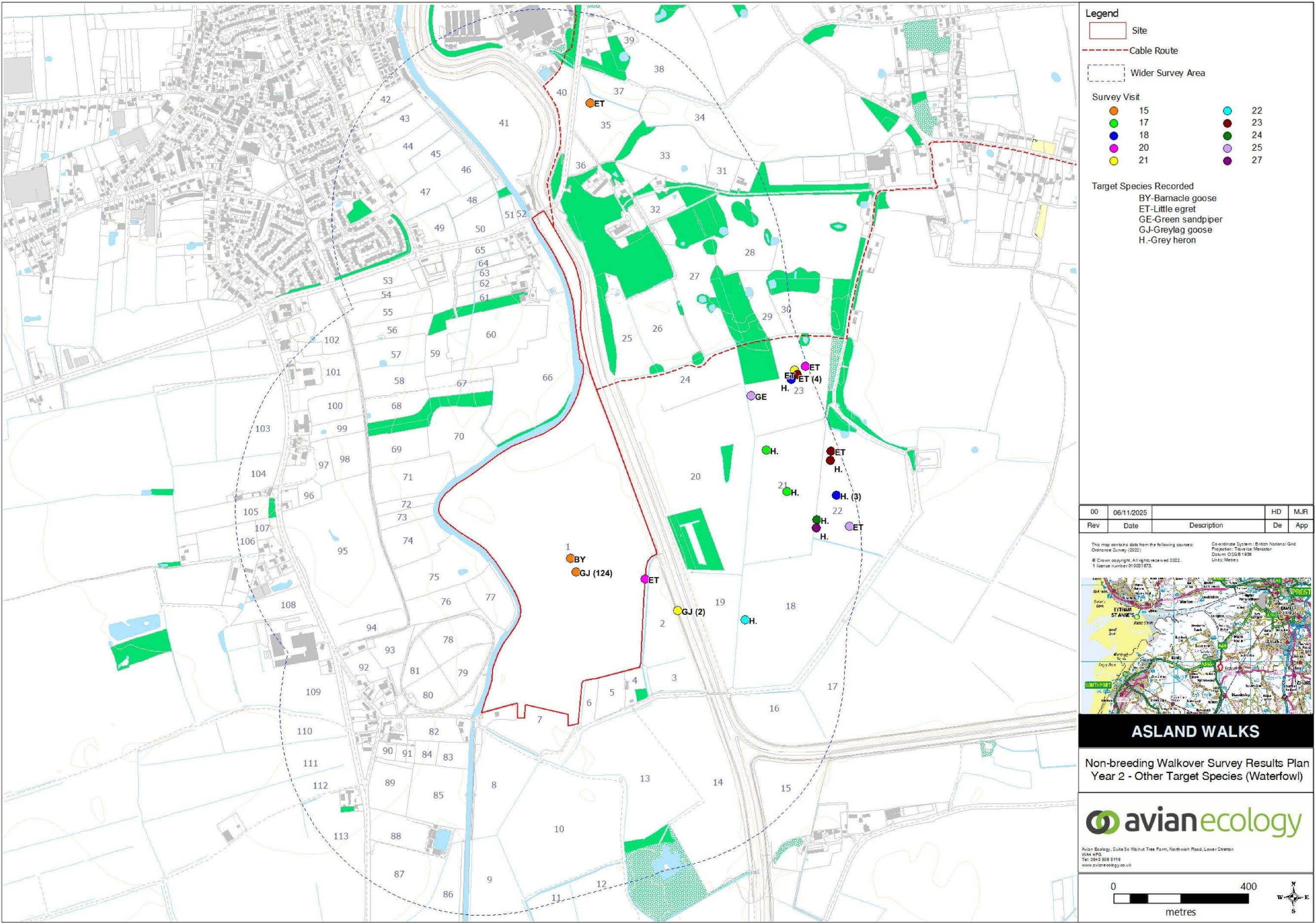
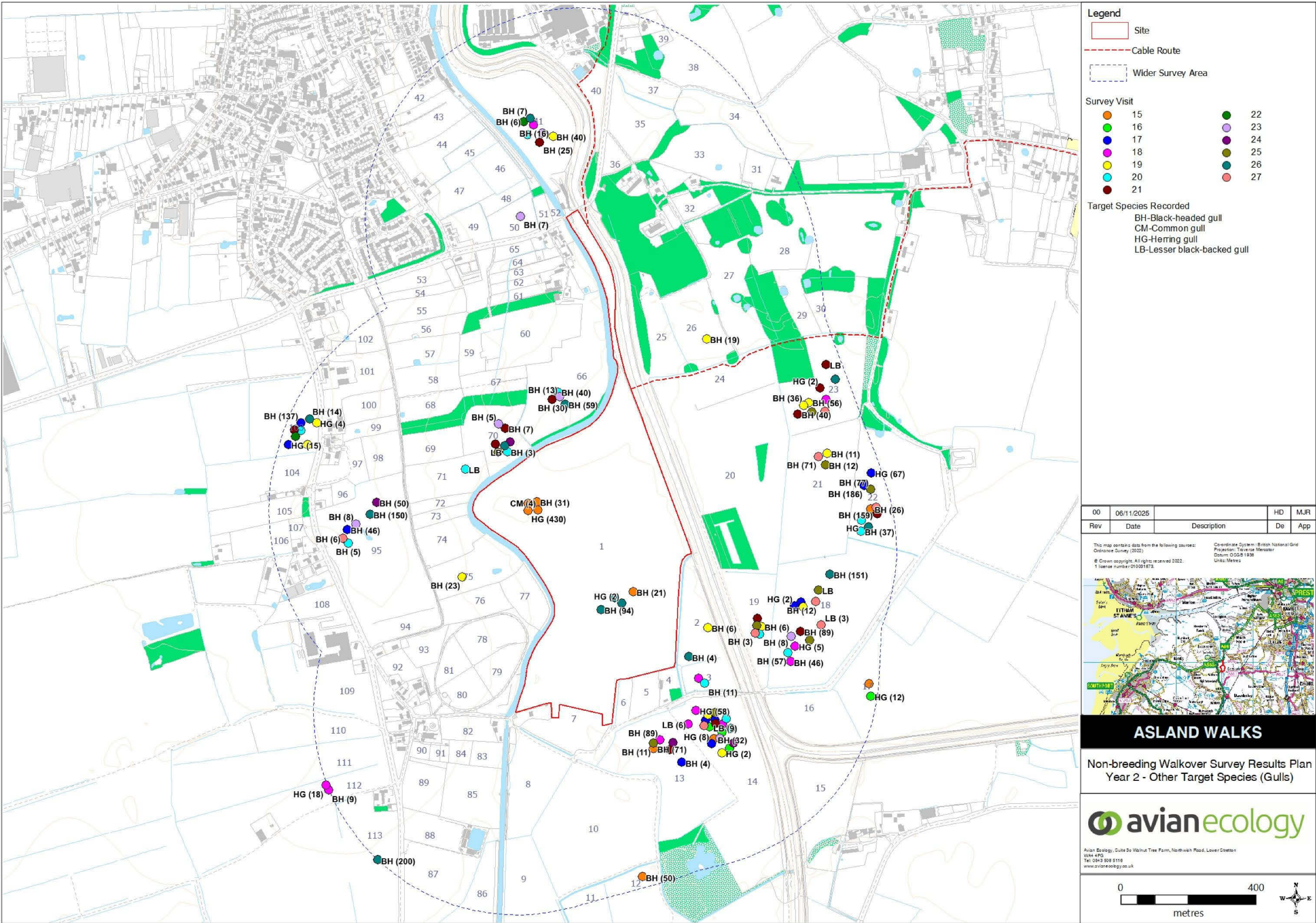


Figure 2.27: Non-breeding Walkover Survey Results Plan Year 2 – Other Target Species (Gulls)



Annex 2.1: 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) ^{30,31};
- 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 bewicki</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 2.1: 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>Sterna 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 2.1: 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
Dunnoch	<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 2.2: 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.	3/8	<150m	0
Light air	1		Light showers	1			150-500m	1
Light breeze	2	N	Heavy showers	2			>500m	2
Gentle breeze	3	NE	Light rain	3				
Mod. breeze	4	ENE	Heavy rain	4				
Fresh breeze	5	E						
Strong breeze	6	Etc	Visibility		Snow		Frost	
Mod. gale	7		Poor	0	None	0	None	0
Fresh gale	8		< 1km	1	On site	1	Ground	1
Strong gale	9		>1km	2	High ground	2	All day	3
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 2.2: 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 2.2: 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 2.2: 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 2.2: 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
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Annex 2.3: 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
2	Pasture- stocked
3	Pasture- stocked
4	House and garden
5	Pasture - unstocked
6	Pasture - unstocked
7	Pasture - unstocked/ploughed
8	Arable stubble → crop
9	Arable stubble → crop
10	Arable stubble → crop
11	Arable stubble → crop
12	Arable stubble → crop
13	Arable stubble → crop
14	Arable stubble → crop
15	Pasture - unstocked
16	Tilled → crop
17	Crop → arable stubble
18	Arable stubble → arable stubble/crop
19	Arable Stubble
20	Arable stubble/crop → crop
21	Pasture unstocked
22	Arable stubble/crop
23	Arable stubble → arable stubble/crop
24	Arable stubble → crop
25	Crop
26	Arable stubble/crop

27	Pasture - unstocked/stocked
28	Pasture - unstocked/stocked
29	Arable stubble/pasture unstocked
30	Arable stubble/pasture unstocked
31	Pasture - unstocked
32	Pasture - unstocked
33	Pasture - unstocked
34	Arable stubble → crop
35	Arable stubble → crop
36	Pasture - unstocked
37	Crop
38	Crop
39	Crop
40	Pasture unstocked
41	Crop → arable stubble/crop
42	Pasture - unstocked
43	Pasture - unstocked
44	Pasture - unstocked
45	Pasture - unstocked
46	Pasture - unstocked
47	Pasture - unstocked
48	Pasture - unstocked
49	Pasture - stocked
50	Pasture - unstocked
51	Pasture - unstocked
52	Pasture - unstocked
53	Pasture - unstocked
54	Pasture - unstocked/stocked
55	Pasture - unstocked
56	Pasture - unstocked

Annex 2.3: Wintering Bird Surveys Habitat Appraisal Results

57	Pasture - unstocked
58	Pasture - unstocked
59	Not viewable
60	Pasture - unstocked/reed
61	Not viewable
62	Not viewable
63	Pasture - unstocked
64	Not viewable
65	Not viewable
66	Pasture - unstocked/stocked
67	Not viewable
68	Pasture - stocked
69	Pasture - unstocked
70	Pasture - unstocked
71	Pasture - unstocked
72	Pasture - unstocked
73	Pasture - unstocked
74	Pasture - unstocked/stocked
75	Pasture - unstocked
76	Pasture - stocked
77	Pasture - unstocked
78	Pasture - stocked
79	Pasture - stocked
80	Pasture - stocked
81	Pasture - stocked
82	Pasture - unstocked/stocked
83	Pasture - stocked
84	Pasture - unstocked
85	Pasture - unstocked/stocked

86	Crop
87	Tilled/pasture - unstocked → tilled
88	Pasture - unstocked
89	Tilled → crop
90	Not viewable
91	Not viewable
92	Pasture - unstocked
93	Pasture - stocked
94	Crop
95	Crop
96	Pasture - stocked
97	Pasture - stocked
98	Ploughed/ley → crop
99	Ley → crop
100	Ley → crop
101	Ley → crop
102	Ley → crop
103	Ploughed/ley → crop
104	Pasture - unstocked/stocked
105	Arable stubble → ploughed
106	Not viewable
107	Not viewable
108	Arable stubble
109	Arable stubble
110	Ley/crop → crop/arable stubble
111	Crop
112	Arable stubble/crop → crop
113	Pasture - unstocked