

Preliminary Environmental Information Report Volume 2

**Appendix 8.14 Baseline Report –
Breeding Bird Survey 2024
[Redacted]**

LLK1-ARU-REP-ENV-000008_AP8.14
Version 0.0
January 2026

LionLink:

National Grid LionLink Ltd

LionLink

Breeding Bird Survey Report 2024 (Confidential)

Reference: EURO-ARUP-XX-XX-RP-YE-000005

January 2025



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Job number 287334-00

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1. Introduction

Ove Arup & Partners (Arup) were commissioned by National Grid LionLink Limited (NGLL) to carry out a suite of breeding bird surveys (undertaken between March 2024 and July 2024, inclusive) to provide information to inform the design and environmental assessment of the proposed LionLink scheme (the ‘scheme’).

The Project comprises a multi-purpose interconnector (MPI) providing a High Voltage Direct Current (HVDC) electricity link with a capacity of up to 1.8 gigawatts (GW) between the National Transmission Systems of Great Britain and the Netherlands and offshore wind farms located in Dutch waters.

Due to this report identifying the location of rare breeding birds and the attendant risk of persecution should this information be disclosed, this report and associated figures should be treated as confidential and not released into the public domain.

1.1 Site Context

Breeding bird surveys were completed within a 200m buffer around potential cable routes in Suffolk (the ‘survey area’), running south to north from Friston to Stoven, with two branches in the north connecting eastwards to two potential landfall locations at Southwold and Walberswick, shown on **Figure 1 (Appendix A)**.

The entirety of the survey area was either within or near to internationally/nationally designated coastal/wetland sites, notified for their ornithological interest (**Section 3.1.1**).

1.2 Legislative and Policy Context

1.2.1 Protected Site Designations

A network of nationally designated sites has been established through the designation of SSSIs under the Wildlife and Countryside Act 1981 (as amended) (WCA). Sites are designated if they are of special interest by reason of their flora, fauna (e.g. birds), or geological/physiographical features. The protection afforded by the WCA means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation (SNCO) (Natural England (NE) in this case).

Some bird species are listed as features of European designated sites, notably Special Protection Areas (SPAs) and Ramsar sites. SPAs are classified in accordance with Article 4 of the EC Birds Directive (2009/147/EC). The provisions of the Birds Directive are implemented and transposed to UK legislation through the WCA and the Conservation of Habitats and Species Regulations 2017. The Conservation of Habitats and Species Regulations 2017 transposes EC Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora into UK national law.

Ramsar sites are also afforded protection under the Ramsar Convention 1971.

These designations are applied to areas that support nationally (SSSIs) or internationally (SPAs and Ramsar sites) important numbers of birds, the conservation of which is necessary for the maintenance of the range of that species across Europe. A site may be designated as an SPA based on its importance to breeding, wintering, or migratory birds. In the UK, SPA designations are underpinned by national legislation which identifies them as SSSIs.

1.2.2 Protection of Bird Species

All wild birds (defined as species which are resident or are visitors to the United Kingdom (UK), but generally not game birds) are protected by the WCA. As far as development is concerned, it is an offence to kill, injure or take any wild bird.

Annex 1 of the Birds Directive and Schedule 1 of the WCA list species that are protected because of their rarity and nature conservation value. Annex 1 species are the subject of special conservation measures concerning their habitat, receiving protection through the designation of SPAs in order to ensure their survival

and reproduction in their area of distribution. Schedule 1 species are protected by special provisions because of their rarity as breeding species in Britain, and it would constitute an offence to disturb them while nesting (which includes nest building). It is also an offence to disturb dependent young of a Schedule 1 bird.

Species of concern in England may also be identified on a list of species and habitats where Priority Action is required. This list is published under The Natural Environment and Rural Communities (NERC) Act 2006, which came into force on 1st October 2006. Section 41 (S41) of the Act requires the Secretary of State for England to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. These are known as Priority Habitats and Priority Species. The list has been drawn up in consultation with NE, as required by the NERC Act. The S41 list is used to guide decision makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Additionally, conservation importance is ascribed to certain species by their presence on the Red List and Amber List of Birds of Conservation Concern (BoCC5¹) in the UK. Under BoCC5 birds are classified into three lists as follows:

- **Red List:** species that are globally threatened, whose population or range has declined severely (>50%) in recent years or the longer term, and those whose populations have declined historically and not exhibited any signs of recovery;
- **Amber List:** species that are threatened in Europe, whose population or range has declined moderately (>25% to <50%) in recent years or the longer term, species that show a historical decline but whose populations have shown a substantial increase, species that are rare, species with localised populations and those species of international importance with UK populations;
- **Green List:** All regularly occurring native species that do not qualify under any of the Red or Amber criteria are green listed. The Green list also includes those species listed as recovering from historical decline in the last review that have continued to recover and do not qualify under any of the other criteria.

Although the BoCC lists confer no legal status in themselves, they are useful in evaluating the importance of bird species and assemblages.

1.3 Objectives

The breeding bird surveys detailed within this report were conducted with three objectives:

- 1) To provide baseline data on the assemblages, numbers and distribution of breeding birds within the survey area.
- 2) To provide data on the use of the survey area by qualifying species of the nearby European designated sites: Outer Thames Estuary SPA, Sandlings SPA, Minsmere-Walberswick SPA and Ramsar site, Alde-Ore Estuary SPA and Ramsar site and Benacre to Easton Bavents SPA, during the breeding period.
- 3) To highlight the presence of any breeding species of value that may influence the design of the scheme.

¹ 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, December 2021, 723-747.

2. Methodology

2.1 Desk Study

2.1.1 Designated Sites

The MAGIC (Multi-Agency Geographic Information for the Countryside) website² was used to identify statutory designated sites within the vicinity of the survey area. Search radii of 10km and 2km from the survey area were employed for European and nationally designated sites, respectively.

The Joint Nature Conservation Committee (JNCC) website³ and NE designated sites website⁴ provided details and descriptions of protected sites, with cross-reference to maps and citations.

2.2 Survey Methods

The ornithological surveys were designed to enable the mapping of breeding birds of conservation concern and qualifying ornithological features which may be associated with the Outer Thames Estuary SPA, Minsmere-Walberswick SPA/Ramsar site, Alde-Ore Estuary SPA/Ramsar site and Benacre to Easton Bavents SPA (henceforth termed ‘target species’). Qualifying ornithological features of Sandlings SPA were not treated as ‘target species’, as the survey area lies outside the relevant Impact Risk Zone⁵ recommended by NE with respect to the ground-nesting heathland species for which the SPA is designated (**Section 3.1**).

The survey methods were derived from current best practice as described in Bibby *et al.* (2000)⁶, Gilbert *et al.* (1998)⁷, Hardey *et al.* (2013)⁸ and Bird Survey & Assessment Steering Group (2024)⁹.

The survey methods employed comprised a series of breeding bird transect surveys spread across the survey area, acoustic monitoring at a single point on each transect and viewpoint (VP) surveys for bittern *Botaurus stellaris* and marsh harrier *Circus aeruginosus* in three locations. Full details of the surveys undertaken are provided in the following sections.

Further survey work including beach surveys and inshore bird surveys was also undertaken, and will be documented in a separate report.

2.2.1 Breeding Bird Survey Transects

The breeding bird transects were designed to achieve representative coverage across the entire survey area, taking in a variety of habitats; particularly those considered suitable for qualifying features of the relevant designated sites. The ten transect routes are shown on **Figure 2**.

Six evenly-spaced survey visits to each transect were completed between late March and early July (**Appendix B**). Days of high winds (wind above Beaufort force 5), poor visibility or heavy rain were avoided. One of the six visits to each transect took place in the evening (during the last few hours of the day, and extending beyond sunset for at least one hour) with the intention of identifying species not readily recorded early in the morning. All other survey visits commenced within half an hour of sunrise and were completed by mid-morning. The direction of survey was varied between visits to ensure all areas received adequate coverage during the peak periods of bird activity.

² Defra website. *MAGIC, for maps of statutory nature conservation sites and Section 41 NERC Act habitats of principal importance*. Available at: <https://magic.defra.gov.uk/> [Accessed 25/09/2024].

³ Joint Nature Conservation Committee. *UK Protected Areas*. Available at: <https://jncc.gov.uk/our-work/uk-protected-areas/> [Accessed 25/09/2024].

⁴ Natural England. *Designated Sites View*. Available at: <https://designatedsites.naturalengland.org.uk/> [Accessed 25/09/2024].

⁵ Natural England (2019) *Impact Risk Zones Guidance Summary: Sites of Special Scientific Interest Notified for Birds*. Version 1.1. Natural England, York.

⁶ Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe, S.H. (2000) *Bird Census Techniques* (2nd ed.). Academic Press, London.

⁷ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods*. RSPB, Sandy.

⁸ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B., Thompson, D. and Scottish Natural Heritage (2013) *Raptors: A field guide for surveys and monitoring*, (3rd edition). The Stationery Office, Edinburgh.

⁹ Bird Survey & Assessment Steering Group (2022) *Bird Survey Guidelines for assessing ecological impacts, v.1.0.0. Breeding bird survey methodology*. <https://birdsurveyguidelines.org/methods/survey-method/>.

During fieldwork two surveyors (at least one an ornithologist experienced in undertaking bird survey work) logged all recorded birds (both those observed and heard) on field maps using standard British Trust for Ornithology (BTO) coding, paying particular attention to behaviour indicative of breeding (following the BTO's breeding evidence criteria¹⁰). All target species and non-target species within visible or audible range of the transect routes were recorded during transect surveys, with a focus on target species, which comprised:

- qualifying features of Minsmere-Walberswick SPA and Ramsar site, Outer Thames Estuary SPA, Alde-Ore Estuary SPA and Ramsar site and Benacre to Easton Bavents SPA;
- Schedule 1 and Annex 1 species;
- Section 41 species; and
- Red and Amber listed BoCC species.

2.2.2 Bittern Viewpoint Surveys

Species-specific VP surveys covering suitable breeding habitat for bittern (i.e. reedbeds) across the survey area (**Figure 3**) were used to identify breeding territories of this species, which is a key qualifying feature of both the Benacre to Easton Bavents SPA and the Minsmere-Walberswick SPA. Surveys were undertaken based on standard guidance (Gilbert et al. 1998⁷), with visits lasting at least three hours (including the first or last hour of daylight, plus two hours of darkness) to detect 'booming' males and display flights.

Three survey visits were made to each VP: in early April, late April – early May and mid-May. Some of these surveys were undertaken concurrently with marsh harrier VP surveys (see **Section 2.2.3**), due to the substantial overlap in survey methods, timings and breeding habitat between the two species.

Surveys at each VP were completed by an experienced ornithologist. All bittern recorded were logged on maps using standard BTO coding. Details of weather, numbers of individuals and the birds' behaviour were all recorded, paying particular attention to evidence of breeding.

Territories were recorded where birds were heard 'booming', with particular care taken to prevent double counting where territories were recorded in close proximity.

2.2.3 Marsh Harrier Viewpoint Surveys

Species-specific VP surveys covering suitable breeding habitat for marsh harrier across the survey area (**Figure 3**) were used to identify breeding territories and, where possible, nests. Marsh harrier is a qualifying feature of the Alde-Ore Estuary SPA, the Benacre to Easton Bavents SPA and the Minsmere-Walberswick SPA and Ramsar site.

Surveys were undertaken in line with standard guidance ((Gilbert et al. (1998)⁷ and Hardey et al. (2013)⁸). Surveys were undertaken for a minimum of four hours, with three visits to each VP between mid-March and mid-June. Due to the substantial overlap in survey methods, timings and breeding habitat between the two species, some of these surveys were undertaken concurrently with bittern VP surveys (see **Section 2.2.2**).

Surveys at each VP were completed by an experienced ornithologist. All marsh harrier recorded were logged on maps using standard BTO coding. Details of weather, numbers of individuals and the birds' behaviour were all recorded, paying particular attention to evidence of breeding, with a view to identifying nest sites.

Territories were defined in line with guidance by:

- A female carrying nest material staying at a potential nest site for an hour or more; and/or
- A female staying at the nest site for more than four hours and receiving a prey delivery from the male during this time.

Nest sites were reclassified as confirmed if adults were observed bringing in prey or young were observed.

¹⁰ British Trust for Ornithology. *Breeding evidence* [online] <https://www.bto.org/our-science/projects/birdatlas/methods/breeding-evidence> [accessed 20/09/2024]

2.2.4 Territory Mapping

Territory mapping was completed for all target species with the exception of woodpigeon *Columba palumbus* and wren *Troglodytes troglodytes*, which were excluded from the territory mapping process due to their abundance and ubiquity across all habitats.

Territories were mapped where the survey data indicated probable or confirmed breeding (following the BTO's breeding evidence criteria¹⁰), with the exceptions of marsh harrier and bittern which were mapped according to the criteria in Sections 2.2.2 and 2.2.3:

- **Probable breeding** - A pair observed in suitable nesting habitat in the breeding season; a permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two different days a week or more apart at the same place or many individuals on one day; courtship and display observed in or near potential breeding habitat; birds visiting a probable nest site; agitated behaviour or anxiety calls from adults, suggesting probable presence of a nest or young nearby; and/or nest building or excavating a nest hole.
- **Confirmed breeding** - Distraction display or injury feigning; a used nest or eggshells (occupied or laid within the period of survey); recently fledged young (nidicolous species) or downy young (nidifugous species), with careful consideration given to the likely provenance of any juveniles capable of significant geographical movement; adults entering or leaving a nest in circumstances indicating an occupied nest, or adults seen incubating; adults carrying faecal sacs or food for young; a nest containing eggs; and/or a nest with young seen or heard.

2.2.5 Acoustic Monitoring

Acoustic monitoring was carried out across the survey area to sample a range of habitats and to provide supplementary data for each breeding bird transect.

A single static recording device (Wildlife Acoustics Song Meter Micro 2) was placed on or in close proximity (within 250m) to each breeding bird survey transect for a period of 30 days (8th June to 7th July inclusive). The devices were set to record continuously for one hour before and after sunrise and one hour before and after sunset during the monitoring period.

Locations were chosen based on proximity to suitable habitat for species considered less likely to be recorded during other survey types, such as stone-curlew *Burhinus oedicnemus*, bittern, nightingale *Luscinia megarhynchos*, nightjar *Caprimulgus europaeus*, snipe *Gallinago gallinago* and owls; locations are illustrated on Figure 4 and precise locations included in Table 1.

Table 1. Acoustic monitoring device locations

Device	X (Easting)	Y (Northing)	Habitat
AM1	651030	277281	Wet grassland, grazing marsh, pig fields, coastal scrub.
AM2	648413	278639	Arable land, scrub, woodland, mature hedgerows.
AM3	645923	279570	Wet grassland, marshland and willow scrub with mature trees.
AM4	644068	277219	Woodland, arable land.
AM5	644021	275073	Wet grassland, reedbed, arable land, scrub.
AM6	648245	274837	Acidic grassland, scrub, heathland, arable land.
AM7	644685	272528	Woodland, pig fields, arable land.
AM8	642778	268301	Wetland, alder carr, wet grassland, river.
AM9	642501	265254	Woodland, arable land, mature hedgerows.
AM10	640246	262248	Woodland, arable land, mature hedgerows.

2.2.6 Acoustic Data Analysis

Analysis of the acoustic data was carried out by Carbon Rewild Ltd, with input and subsequent verification by experienced ornithologists who completed the surveys (Section 2.2.7).

The data were analysed by Carbon Rewild Ltd using automated species identification algorithms based on machine learning models, trained on extensive datasets to detect and classify bird species based on their vocalisations. The results were then statistically modelled and filtered to improve accuracy, using a series of custom rules, algorithms and filters. These were refined with input from the survey ornithologists based on their site knowledge, including information on the habitats surrounding each recorder and the potential for

rarer species which could be present within the survey area (and which may otherwise be under-recorded using standard filters). A confidence score, associated with the species identification, was generated for each species recording.

Human verification was then applied to a subset of the data to eliminate false positives and confirm lower-confidence identification. This was first completed by Carbon Rewild Ltd, with samples of the results provided to the survey ornithologists (including at least one recording of every species from every transect). Samples of every species were manually verified by an experienced survey ornithologist with significant knowledge of the local avifauna. Verification focussed on rarer species, unusual records and those with low confidence scores. All samples of Schedule 1 species provided were manually verified.

2.2.7 Surveyors

Surveys were managed and completed by lead surveyor Richard Moores MCIEEM, with support from ornithologists David Bratt (qualifying member of CIEEM), Ollie King (qualifying member of CIEEM), Craig Robson and Will Soar. Ornithological input to the acoustic data analysis and subsequent verification was completed by David Bratt, with support from Richard Moores and Ollie King.

Richard is a highly experienced ornithologist based in Norfolk, with over 25 years' professional bird survey experience. David is an experienced ornithologist with over 15 years of professional experience conducting bird surveys, primarily working in conservation and monitoring roles. Ollie is an ornithologist with experience spanning 5 years of bird survey work, particularly monitoring migrant passerines and breeding seabirds. Craig has been an ornithologist for over 45 years and Will for more than 20 years.

Health and safety support was provided by William Moores, William Walmsley, Olivia Barnes, Alex Bratt, Beryl Bratt, Jon Crawford, Heidi Doman and Robert Smith.

2.3 Limitations and Assumptions

The findings of this report represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys are limited by factors which affect the presence of species, such as weather conditions, migration patterns and behaviour.

In summary, survey effort/coverage is considered sufficiently robust to identify areas favoured by target species, and the species and numbers present, to inform the design and environmental assessment of the scheme.

The locations of territories on **Figures 5 to 7** should be viewed as approximate, with the locations shown indicating a point in the territory of a breeding species rather than a nest location.

Observations of marsh harrier on transect 9 were professionally judged to indicate a territory on the basis of the regular presence of a male foraging in this area during the breeding season. Although this approach deviates from standard guidance, a territory was mapped on a precautionary basis given the distance from other territories.

All of the bittern territories recorded and illustrated were the result of booming males each recorded on only one occasion. These birds were assumed to be holding territory. Although the timing of surveys was in line with guidance and in suitable weather conditions, unseasonably cold weather during the second visit in particular (0-4 degrees Celsius on two of the VP surveys) is considered to have limited territorial activity during these visits, when typically these visits would have yielded results. This period of cold weather appears to have subdued territorial activity across sites in East Anglia (Robert Smith, Senior Reserves Assistant for the Norfolk Wildlife Trust, pers. comm.) and it is considered likely that the results of the bittern surveys are an underestimate of the true number of territories in those areas surveyed.

Weather conditions on all visits were otherwise considered suitable, across survey types. Instances of relatively high winds or limited visibility were very rare, and are not considered to compromise the overall conclusions of this report given the level of survey effort employed.

Due to the large volume of acoustic monitoring data generated it was not feasible to check all recording data manually. Data analysis was therefore automated, with subsequent manual verification completed for a sample of the results. Efforts were made to increase the reliability of the automation process by applying site

knowledge and experienced ornithological input to refine the initial screening process. Manual verification by experienced ornithologists included at least one recording of every species from every transect, to ensure reliability of the species lists generated, focussing on rarer species, unusual records and those with low confidence scores. This process is considered to have generated a set of reliable results, with manual verification confirming that the overwhelming majority of automated identifications were accurate. False positive results are likely to be rare, with the manual verification process ensuring that the species list generated for each transect is accurate, and that no false positives are present within the results for rare and Schedule 1 species. Whilst it is possible that some vocalisations of rarer species may have been overlooked during the screening process, such instances are likely to be rare and are not considered to affect the overall conclusions drawn from the results.

3. Results

3.1 Desk Study

3.1.1 Designated Sites

Seven European statutory designated sites with bird interest were identified within 10km of the survey area (**Table 2**), and nine other statutory designated sites with bird interest were identified within 2km (**Table 3**).

Table 2: European designated sites for birds within 10km

Site Name	Reason for designation	Distance, connectivity and orientation from survey area
Minsmere-Walberswick Ramsar site ¹¹	Designated as a Wetland of International Importance, Minsmere-Walberswick supports internationally important populations of breeding, wintering and passage birds. The site comprises a complex mosaic of habitats, including areas of marsh dykes, extensive reedbeds, intertidal mudflats, saline lagoons, shingle, woodland and areas of lowland heath. The site supports the largest continuous stand of reed in England and Wales and demonstrates the nationally rare transition in grazing marsh ditch plants from brackish to fresh water. The habitats create exceptional areas which support nationally-scarce plants, British Red Data Book invertebrates, and notable assemblages of breeding and wintering wetland birds. The criteria for designation include an important assemblage of rare breeding birds associated with marshland and reedbeds (including bittern, gadwall <i>Mareca strepera</i> , teal <i>Anas crecca</i> , shoveler <i>Spatula clypeata</i> , marsh harrier, avocet <i>Recurvirostra avosetta</i> and bearded tit <i>Panurus biarmicus</i>).	Within, connected floodplain.
Minsmere-Walberswick Special Protection Area (SPA) ¹²	An area of 1997.67 hectares of the Minsmere to Walberswick area is designated as SPA. The Minsmere-Walberswick SPA is designated for its significant waterbird assemblages. The SPA extends from the intertidal mudflats of the River Blyth near the town of Blythburgh to the mouth of the estuary between the coastal towns of Southwold and Walberswick. The SPA also includes the Minsmere RSPB reserve and all the areas of grazing marshes, reedbeds and areas of lowland heath and woodland which lie between the reserve and the River Blyth. The range of habitats of the estuary support a variety of wintering, passage and breeding birds, including internationally important populations of a number of species. Qualifying features include populations of breeding avocet, bittern, gadwall, little tern <i>Sterna albifrons</i> , marsh harrier, nightjar, shoveler and teal. The site also qualifies for its non-breeding populations of gadwall, European white-fronted goose <i>Anser albifrons albifrons</i> , hen harrier <i>Circus cyaneus</i> and shoveler.	Within, connected floodplain.
Outer Thames Estuary SPA ¹³	The Outer Thames Estuary SPA is classified for the protection of the largest aggregation of wintering red-throated diver <i>Gavia stellata</i> in the UK, an estimated population of 6,466 individuals, which is 38% of the wintering population of Great Britain. It also protects foraging areas for common tern <i>Sterna hirundo</i> and little tern during the breeding season, both of which are also qualifying features.	Within
Benacre to Easton Bavents SPA ¹⁴	Benacre to Easton Bavents, comprising two sites with a combined total area of 470.61 hectares, is designated as a SPA. The range of habitats support a variety of wintering, passage and breeding birds. Qualifying features are its populations of breeding marsh harrier, bittern and little tern.	0.1km/N of the survey area

¹¹ <https://rsis.ramsar.org/rsis/75> [accessed 24/09/2024]

¹² <https://incc.gov.uk/incc-assets/SPA-N2K/UK9009101.pdf> [accessed 24/09/2024]

¹³ <https://incc.gov.uk/incc-assets/SPA-N2K/UK9020309.pdf> [accessed 24/09/2024]

¹⁴ <https://incc.gov.uk/incc-assets/SPA-N2K/UK9009291.pdf> [accessed 24/09/2024]

Site Name	Reason for designation	Distance, connectivity and orientation from survey area
Sandlings SPA ¹⁵	An area of 3405.72 hectares of heathland, forestry and agricultural land is designated as SPA. Sandlings SPA supports remnant heath, including acid grassland and heath-dominated plant communities and dependant invertebrate and bird communities. It is designated for its significant breeding populations of nightjar and woodlark <i>Lullula arborea</i> .	3km/E of the survey area
Alde-Ore Estuary Ramsar site ¹⁶	Designated as a Wetland of International Importance, the Alde-Ore Estuary supports internationally important populations of breeding and wintering birds. The site comprises the estuary complex of the rivers Alde, Butley and Ore, including Havergate Island and Orfordness. There are a variety of habitats, including intertidal mudflats, saltmarsh, vegetated shingle (including the second-largest and best-preserved area in Britain at Orfordness), saline lagoons and grazing marsh. The Orfordness/Shingle Street landform is unique within Britain in combining a shingle spit with a cuspat foreland. The site supports nationally-scarce plants, British Red Data Book invertebrates, and notable assemblages of breeding and wintering wetland birds. The qualifying features include the breeding bird assemblage and an internationally important breeding population of lesser black-backed gull <i>Larus fuscus</i> , as well as the winter bird assemblage and internationally important populations of wintering (pied) avocet and (common) redshank <i>Tringa totanus</i> .	4km/S of the survey area
Alde-Ore Estuary SPA ¹⁷	An area of 2403.63 hectares of the Alde-Ore Estuary is designated as SPA. The Alde-Ore Estuary SPA is designated for its significant waterbird assemblages. The SPA lies partly within Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB), extending from the intertidal mudflats near the town of Snape, which lies approximately 7.3km inland, and follows the River Alde, along the coast, down to the mouth of the estuary near the coastal town of Shingle Street and beyond to Bawdsey. The range of habitats of the estuary support a variety of wintering, passage and breeding birds, including internationally important populations of a number of species. Qualifying features include its breeding populations of avocet, lesser back-backed gull, little tern, marsh harrier and Sandwich tern <i>Thalasseus sandvicensis</i> , and its wintering populations of ruff <i>Calidris pugnax</i> , avocet and redshank.	4km//S of the survey area

Table 3: Other statutory designated sites for birds within 2km

Site Name	Reason for designation	Distance, connectivity and orientation from the survey area
The Haven, Aldeburgh Local Nature Reserve (LNR)	This site, located north of Aldeburgh, comprises shingle, shallow lagoons and large reedbeds. It lies within the Leiston-Aldeburgh SSSI.	Within, connected floodplain.
Westleton Heath National Nature Reserve (NNR)	The Westleton Heath NNR is part of the best remaining tract of heathland in Suffolk and can be found within the Minsmere-Walberswick SPA and Ramsar site. The open heath and light scrub of the site are home to tree pipit <i>Anthus trivialis</i> , Dartford warbler <i>Sylvia undata</i> , stonechat <i>Saxicola rubicola</i> and nightjar while the woodland supports nightingale <i>Luscinia megarhynchos</i> and woodcock <i>Scolopax rusticola</i> .	Within, connected floodplain, to the west of the site.
Suffolk Coast NNR	This NNR is made up of three reserves: Walberswick, Hen Reedbed and Dingle Marshes. The NNR has a rich beach flora, wetland flora and heath habitats. The site hosts over 280 species of birds including bittern, marsh harrier, bearded tit, woodlark and nightjar.	Within, connected floodplain

¹⁵ <https://incc.gov.uk/incc-assets/SPA-N2K/UK9020286.pdf> [accessed 24/09/2024]

¹⁶ <https://incc.gov.uk/incc-assets/RIS/UK11002.pdf> [accessed 24/09/2024]

¹⁷ <https://incc.gov.uk/incc-assets/SPA-N2K/UK9009112.pdf> [accessed 24/09/2024]

Site Name	Reason for designation	Distance, connectivity and orientation from the survey area
Sizewell Marshes Site of Special Scientific Interest (SSSI) ¹⁸	<p>The Sizewell Marshes are important for their large area of lowland, unimproved wet meadows which support outstanding assemblages of invertebrates and breeding birds.</p> <p>The site's qualifying features include its breeding bird assemblage of lowland damp grasslands. The assemblage is of national significance with many species typical of wet grassland such as shoveler, gadwall, teal, snipe and lapwing <i>Vanellus vanellus</i>.</p>	Within, connected floodplain
Leiston-Aldeburgh SSSI ¹⁹	<p>This SSSI includes part of the RSPB and Suffolk Wildlife Trust reserves and includes a mosaic of habitats including acid grassland, heath, scrub, woodland, fen, open water and shingle. This range of habitats support a diverse and abundant community of breeding and wintering birds.</p> <p>The site's qualifying features include its variety of breeding bird species, its breeding populations of marsh harrier, woodlark and gadwall, and breeding assemblages of lowland damp grasslands and lowland open waters and their margins. Breeding bird species found in the dry grassland and heath include nightjar, woodlark and skylark <i>Alauda arvensis</i>; the scrub and woodland support tree pipit, turtle dove <i>Streptopelia turtur</i>, bullfinch <i>Pyrrhula pyrrhula</i> and nightingale; the marshes support water rail <i>Rallus aquaticus</i>, marsh harrier, gadwall and grasshopper warbler <i>Locustella naevia</i>.</p> <p>Wintering bird species found at this site include Bewick's swan <i>Cygnus columbianus</i>, bittern, European white-fronted goose, gadwall and teal.</p>	Within, connected floodplain
Minsmere-Walberswick Heaths and Marshes SSSI ²⁰	<p>The site is part of the Minsmere-Walberswick SPA and Ramsar site and is designated as SSSI for its series of habitats which include mudflats, shingle beach, reedbeds, heathland and grazing marsh.</p> <p>The mudflats of the River Blyth estuary are feeding grounds for wigeon <i>Mareca penelope</i>, shelduck <i>Tadorna tadorna</i>, redshank and dunlin <i>Calidris alpina</i>. The reedbeds present at this site are important habitats for reed warbler <i>Acrocephalus scirpaceus</i>, bearded tit, marsh harrier, bittern, Cetti's warbler <i>Cettia cetti</i>, garganey <i>Spatula querquedula</i> and water rail.</p> <p>The shallow lagoons and islands at Minsmere host breeding colonies of avocets, shoveler, gadwall, teal and shelduck. The grazing marshes also offer good habitat for snipe, redshank, gadwall, shoveler and black-tailed godwit <i>Limosa limosa</i>. The heathland supports nightjar and woodlark.</p> <p>The site's qualifying features include its assemblage of breeding birds of lowland damp grassland, and breeding populations of avocet, bearded tit, bittern, Cetti's warbler, garganey and marsh harrier</p>	Within, connected floodplain
Pakefield to Easton Bavents SSSI ²¹	<p>The site is designated as SSSI for its vegetated shingle features, saline lagoons, flood-plain fens, nationally rare and scarce plant species, breeding bird species and assemblages, and wintering birds.</p> <p>The site's qualifying features include important breeding populations of bittern, marsh harrier, little tern, water rail and bearded tit. It also supports the following qualifying breeding bird assemblages: of lowland open waters and their margins (including bittern, gadwall and marsh harrier); lowland heath (including hobby <i>Falco subbuteo</i>, quail <i>Coturnix coturnix</i> and woodlark); scrub (including cuckoo <i>Cuculus canorus</i>, nightingale and grasshopper warbler); and woodland (including sparrowhawk <i>Accipiter nisus</i>, willow tit <i>Parus montanus</i> and nuthatch <i>Sitta europea</i>).</p>	Within the survey area

¹⁸ <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1003416.pdf> [accessed 24/09/2024]

¹⁹ <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/2000370.pdf> [accessed 24/09/2024]

²⁰ <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1000721.pdf> [accessed 24/09/2024]

²¹ <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/2000508.pdf> [accessed 24/09/2024]

Site Name	Reason for designation	Distance, connectivity and orientation from the survey area
Alde-Ore Estuary SSSI ²²	<p>This site, part of the SPA and Ramsar site under the same name, stretches along the coast from Bawdsey to Aldeburgh and inland to Snape.</p> <p>It is designated as SSSI for its diverse habitats comprising mudflats, saltmarsh, shingle and coastal lagoons which are all of ornithological value.</p> <p>Havergate Island holds the largest colony of avocets in Britain, and they also use the Hazelwood Marshes and Alde mudflats to feed. Other species found on the Island include: gadwall, shoveler, oystercatcher <i>Haematopus ostralegus</i>, ringed plover <i>Charadrius hiaticula</i>, common tern, Arctic tern <i>Sterna paradisaea</i>, Sandwich tern, little tern, common gull <i>Larus canus</i>, short-eared owl <i>Asio flammeus</i>, wheatear <i>Oenanthe oenanthe</i> and marsh harrier.</p> <p>On Orfordness there are large breeding colonies of black-headed gull <i>Chroicocephalus ridibundus</i>, lesser black-backed gull and herring gull <i>Larus argentatus</i>.</p> <p>The site's qualifying features include its assemblage of breeding birds of lowland damp grasslands and breeding populations of avocet, black-headed gull, herring gull, lesser black-backed gull, little tern, marsh harrier, Sandwich tern and shoveler.</p> <p>In winter and during migration the site is visited by nationally important numbers of Bewick's swan, shelduck, teal, wigeon, redshank and avocet.</p>	3.2km/S of the survey area
Benacre NNR	<p>This site includes the reedbeds and lagoons of Benacre, Covehithe and Easton Broads with the woodlands and heathlands on the higher grounds between them.</p> <p>Over 100 breeding bird species use the reserve including marsh harrier, bearded tits, water rail, ducks and bittern.</p> <p>Little terns are known to be summer visitors and the heathlands host woodlark, wheatear and hobby.</p>	0.4km/N from the survey area

3.2 Field Surveys

Breeding bird survey data collected are summarised within **Table 4**, with the results mapped on **Figures 5, 6 and 7** and further details provided in the following sections.

Territories of target species (excluding Schedule 1 species) are illustrated on **Figures 5.1-5.10**.

Territories of Schedule 1 target species recorded during the breeding bird transect surveys are illustrated on **Figures 6.1-6.10**.

The results of the marsh harrier and bittern surveys are summarised in **Table 5** and illustrated in **Figures 7.1-7.3**. One marsh harrier territory was identified during breeding bird transect surveys, on transect 9, away from the marsh harrier survey locations, and is included in **Table 4** and **Figure 6.9**.

Survey metadata, including dates, times and weather conditions, are shown in **Appendix B**.

²² <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1003208.pdf> [accessed 24/09/2024]

Table 4. Breeding bird survey results

Species	Conservation Status	Transect									
		1	2	3	4	5	6	7	8	9	10
Greylag goose <i>Anser anser</i>	BoCC5 Amber	-	-	-	-	1	1	-	-	-	
Shelduck <i>Tadorna tadorna</i>	BoCC5 Amber	-	-	-	2	2	1	3	-	-	-
Gadwall <i>Mareca strepera</i>	Minsmere-Walberswick SPA Minsmere-Walberswick Ramsar BoCC5 Amber	-	-	1	-	1	1	-	1	-	-
Mallard <i>Anas platyrhynchos</i>	BoCC5 Amber	2	-	1	-	1	-	-	3	-	-
Grey partridge <i>Perdix perdix</i>	Section 41 BoCC5 Red	-	-	-	1	-	-	-	-	-	-
Nightjar <i>Caprimulgus europaeus</i>	Minsmere-Walberswick SPA Annex 1 Section 41 BoCC5 Amber	-	-	-	-	-	-	3	-	-	-
Swift <i>Apus apus</i>	BoCC5 Red	3	11	-	-	-	-	-	-	-	-
Cuckoo <i>Cuculus canorus</i>	Section 41 BoCC5 Red	1	-	-	-	1	-	-	1	-	1
Stock dove <i>Columba oenas</i>	BoCC5 Amber	1	3	10	8	1	1	11	4	2	4
Moorhen <i>Gallinula chloropus</i>	BoCC5 Amber	1	-	3	1	1	-	-	3	1	2
Stone-curlew <i>Burhinus oedicnemus</i>	Schedule 1 Annex 1 Section 41 BoCC5 Amber	-	-	-	-	-	-	1	-	-	-
Oystercatcher <i>Haematopus ostralegus</i>	BoCC5 Amber	2	-	-	1	-	1	1	1	-	-
Lapwing <i>Vanellus vanellus</i>	Section 41 BoCC5 Red	-	-	-	-	1	-	-	-	-	-
Snipe <i>Gallinago gallinago</i>	BoCC5 Amber	-	-	-	-	1	-	-	-	-	-
Redshank <i>Tringa totanus</i>	BoCC5 Amber	-	-	-	-	4	1	-	-	-	-
Herring gull <i>Larus argentatus</i>	Section 41 BoCC5 Red	1	-	1	-	-	-	-	-	-	-
Sparrowhawk <i>Accipiter nisus</i>	BoCC5 Amber	-	-	1	-	-	-	-	-	-	-
Goshawk <i>Accipiter gentilis</i>	Schedule 1 BoCC5 Green	-	-	-	-	-	-	-	1	-	-
Marsh harrier <i>Circus aeruginosus</i>	Alde-Ore Estuary SPA Benacre to Easton Bawents SPA Minsmere-Walberswick SPA Minsmere-Walberswick Ramsar Schedule 1 Annex 1 BoCC5 Amber	-	-	-	-	-	-	-	-	1	-

Species	Conservation Status	Transect									
		1	2	3	4	5	6	7	8	9	10
Barn owl <i>Tyto alba</i>	Schedule 1 BoCC5 Green	2	1	1	-	2	-	-	-	-	-
Tawny owl <i>Strix aluco</i>	BoCC5 Amber	-	-	-	1	1	1	-	-	-	-
Kingfisher <i>Alcedo atthis</i>	Schedule 1 Annex 1 BoCC5 Green	-	-	1	-	-	-	-	2	-	-
Kestrel <i>Falco tinnunculus</i>	BoCC5 Amber	-	1	2	1	1	-	-	-	-	-
Rook <i>Corvus frugilegus</i>	BoCC5 Amber	-	10	-	-	46	-	5	-	10	2
Marsh tit <i>Poecile palustris</i>	Section 41 BoCC5 Red	-	-	-	-	-	-	-	1	-	-
Bearded tit <i>Panurus biarmicus</i>	Schedule 1 Minsmere-Walberswick Ramsar BoCC5 Green	-	-	-	-	-	2	-	-	-	-
Woodlark <i>Lullula arborea</i>	Schedule 1 Annex 1 Section 41 BoCC5 Green	-	-	-	-	-	4	1	-	-	-
Skylark <i>Alauda arvensis</i>	Section 41 BoCC5 Red	10	10	8	10	15	21	20	6	15	23
House martin <i>Delichon urbicum</i>	BoCC5 Red	2	-	-	-	-	-	-	5	-	-
Cetti's warbler <i>Cettia cetti</i>	Schedule 1 BoCC5 Green	6	-	-	-	13	12	-	2	1	-
Sedge warbler <i>Acrocephalus schoenobaenus</i>	BoCC5 Amber	7	-	1	-	3	6	-	-	-	-
Marsh warbler <i>Acrocephalus palustris</i>	Schedule 1 Section 41 BoCC5 Red	2	-	-	-	-	-	-	-	-	-
Grasshopper warbler <i>Locustella naevia</i>	Section 41 BoCC5 Red	1	-	3	-	-	1	-	-	-	-
Whitethroat <i>Currucà communis</i>	BoCC5 Amber	-	3	3	5	2	2	7	-	10	12
Firecrest <i>Regulus ignicapilla</i>	Schedule 1 BoCC5 Green	-	-	-	1	-	-	-	-	-	-
Starling <i>Sturnus vulgaris</i>	Section 41 BoCC5 Red	1	-	-	-	-	-	-	-	-	-
Song thrush <i>Turdus philomelos</i>	Section 41 BoCC5 Amber	-	3	6	-	5	1	-	3	8	4
Mistle thrush <i>Turdus viscivorus</i>	BoCC5 Red	-	1	1	-	-	-	-	1	-	-
Nightingale <i>Luscinia megarhynchos</i>	BoCC5 Red	-	-	-	-	2	6	1	-	5	-
House sparrow <i>Passer domesticus</i>	Section 41 BoCC5 Red	9	-	-	-	15	-	5	2	2	3

Species	Conservation Status	Transect									
		1	2	3	4	5	6	7	8	9	10
Dunnock <i>Prunella modularis</i>	Section 41 BoCC5 Amber	12	9	9	9	9	6	10	2	10	9
Bullfinch <i>Pyrrhula pyrrhula</i>	BoCC5 Amber	-	-	-	-	1	-	-	-	-	-
Greenfinch <i>Chloris chloris</i>	BoCC5 Red	1	2	-	-	2	1	-	1	1	-
Linnet <i>Linaria cannabina</i>	Section 41 BoCC5 Red	3	2	-	1	3	3	-	-	1	5
Yellowhammer <i>Emberiza citrinella</i>	Section 41 BoCC5 Red	-	-	4	8	3	5	2	8	14	10
Reed bunting <i>Emberiza schoeniclus</i>	Section 41 BoCC5 Amber	-	-	4	-	4	1	-	1	-	-

Table 5. Marsh harrier and bittern survey results

Species	Conservation Status	VP1	VP2	VP3
		No. of Territories	No. of Territories	No. of Territories
Bittern <i>Botaurus stellaris</i>	Benacre to Easton Bavents SPA Minsmere-Walberswick SPA Minsmere-Walberswick Ramsar Schedule 1 Section 41 BoCC5 Amber	-	2	1
Marsh harrier <i>Circus aeruginosus</i>	Alde-Ore Estuary SPA Benacre to Easton Bavents SPA Minsmere-Walberswick SPA Minsmere-Walberswick Ramsar Schedule 1 Annex 1 BoCC5 Amber	3	1	2

3.2.1 Target Species

A total of 735 territories of 47 target species were identified from breeding bird transects, bittern and marsh harrier surveys, including 17 Red-listed and 24 Amber-listed species of conservation concern, 19 Section 41 species, twelve Schedule 1 species and six Annex 1 species (**Tables 3 and 4**).

3.2.1.1 Transect 1 (67 Territories)

Habitats

Coastal scrub, lowland wet grassland/grazing marsh with small pools and dykes and mixed agricultural land (pig fields and cover crops) with mixed-age hedgerows.

Summary of Breeding Bird Survey Results

Lowland wet grassland with open water supported small populations of waterbirds, and strong populations of marginal species of reedbeds and scrub such as sedge warbler, grasshopper warbler and dunnock. Skylarks and other farmland birds were well represented throughout agricultural land away from the coast, and populations of garden birds were well represented in and around habitation.

Schedule 1 species were all in fairly typical habitats, including six Cetti's warblers in marginal vegetation or scrub around wetlands [REDACTED], two barn owls associating with wet grassland and farmland, [REDACTED]

3.2.1.2 Transect 2 (56 Territories)

Habitats

Agricultural land, primarily arable with pockets of woodland and significant amounts of mature hedgerow and marginal scrub; some urban development and pig fields in the wider area.

Summary of Breeding Bird Survey Results

Relatively low numbers of species typical of these habitats were recorded, with a moderate population of skylarks, nesting kestrel, barn owl and mistle thrush.

Schedule 1 species included a barn owl nest, [REDACTED]

3.2.1.3 Transect 3 (60 Territories)

Habitats

Wet grassland and marsh with many ditches and channels, grazing pasture and blocks of woodland/stands of trees. Arable with mature hedgerows to the west and a sand extraction site.

Summary of Breeding Bird Survey Results

Farmland birds including skylark and yellowhammer to the west of the transect and wetland and woodland species in the east including three territories of grasshopper warbler, gadwall (SPA/Ramsar qualifying feature), mallard and mistle thrush.

Schedule 1 species included a barn owl territory [REDACTED]

[REDACTED] and a kingfisher territory [REDACTED]

3.2.1.4 Transect 4 (49 Territories)

Habitats

Arable land (with occasional composes and mixed-aged hedgerows) in the north and an area of mixed woodland (game cover) in the south of the transect with several ponds and dykes in this area.

Summary of Breeding Bird Survey Results

Strong populations of farmland birds to the north and around the centre of the transect, including skylarks and yellowhammers. A firecrest territory was recorded in woodland to the south of the transect.

Schedule 1 species included a firecrest territory [REDACTED]

3.2.1.5 Transect 5 (141 Territories)

Habitats

The transect route ran mostly between arable farmland and a large complex of grazing marsh, reedbed and floodplain with an extensive network of dykes, with standing water present throughout the breeding season. Pasture and arable land were present in the south, with alder *Alnus glutinosa* carr, rows of mature poplar *Populus spp.* and willow *Salix spp.*, areas of scrub and mature hedgerows.

Summary of Breeding Bird Survey Results

The highest total number of territories was recorded on this transect, in part due to a large rookery at the western end of the transect, but also strong populations of waterbirds including breeding snipe, lapwing, redshank, shelduck, mallard, gadwall (SPA/Ramsar qualifying feature) and moorhen. Strong populations of marginal wetland species were also present.

Other noteworthy findings included fifteen skylark territories, spread across all habitat types, and two territories of nightingale.

Schedule 1 species included 13 territories of Cetti's warbler in marginal and scrub habitats on the edge of reedbeds and wet grassland [REDACTED], and two barn owl territories [REDACTED]

3.2.1.6 Transect 6 (81 Territories)

Habitats

Coastal reedbed and brackish pools, abutting arable land, heathland and lowland dry acid grassland inland, with a relatively large coniferous forestry block and significant areas of scrub and young mixed woodland.

Summary of Breeding Bird Survey Results

Three nightjar (SPA qualifying feature) territories were recorded in suitable habitat away from the coast. Six nightingale territories were recorded across a range of habitats. Farmland areas hosted strong populations of skylark and yellowhammer. Bearded tit (Ramsar qualifying feature), redshank, gadwall (SPA/Ramsar qualifying feature) and oystercatcher were represented towards the coast.

Schedule 1 species included 12 territories of Cetti's warbler, most of which were associated with marginal or scrub habitat [REDACTED]

[REDACTED] A bearded tit territory was recorded in a large area of reedbed [REDACTED] and four woodlark territories were located [REDACTED]

3.2.1.7 Transect 7 (67 Territories)

Habitats

Predominately arable land, with areas of woodland, mature hedgerows, heathland, scattered ponds and an area of sand extraction.

Summary of Breeding Bird Survey Results

This transect hosted strong numbers of skylark and yellowhammer in arable habitats; three shelduck territories were also recorded in association with sand extraction and arable land. Nearby single territories of nightingale and oystercatcher were of note.

Schedule 1 species included a woodlark territory [REDACTED]

[REDACTED] and a stone-curlew territory [REDACTED]

3.2.1.8 Transect 8 (48 Territories)

Habitats

Primarily arable land with small ponds, a large newly built reservoir and a significant tract of broad-leaved woodland. To the south, extensive areas of alder carr, grazing marsh and wet meadow were present, with reedbeds and larger areas of open water.

Summary of Breeding Bird Survey Results

A strong population of farmland birds was present in the north. At the southern end a larger wetland hosted gadwall (SPA qualifying species), mallard and moorhen, with breeding mistle thrush and marsh tit in the surrounding habitats.

Schedule 1 species included a goshawk territory [REDACTED]

[REDACTED] two Cettis' warblers in marginal/scrub habitat and hedgerows adjacent to wetlands and wet pasture; and two kingfishers [REDACTED]

3.2.1.9 Transect 9 (81 Territories)

Habitats

Mostly arable with blocks of woodland adjacent and some mature hedgerows and pockets of scrub.

Summary of Breeding Bird Survey Results

This transect hosted strong populations of farmland birds including yellowhammer and skylark. Three nightingale territories were also recorded, with other species characteristic of scrub and hedgerows.

Schedule 1 species included a Cetti's warbler territory [REDACTED], and a

marsh harrier (SPA/Ramsar qualifying feature) [REDACTED]

3.2.1.10 Transect 10 (75 Territories)

Habitats

Significant areas of arable land were present with some large dykes. Small tracts of woodland and mature hedgerows and copses scattered throughout, as well as a tree farm comprising young conifers.

Summary of Breeding Bird Survey Results

Strong numbers of farmland birds were present, including yellowhammer, skylark and linnet, with other associated/marginal species well represented, including dunnock, whitethroat and stock dove.

3.2.1.11 Marsh Harrier and Bittern Viewpoint 1

Habitats

A large area of reedbed with sparsely scattered scrub and open water.

Summary of Results

Three marsh harrier (SPA/Ramsar qualifying feature) nests were confirmed during surveys at this location.

3.2.1.12 Marsh Harrier and Bittern Viewpoint 2

Habitats

A large area of reedbed close to the coast with water channels and brackish pools.

Summary of Results

A single marsh harrier (SPA/Ramsar qualifying feature) nest was confirmed in this location and two bitterns (SPA/Ramsar qualifying feature) were heard booming during one visit; both bitterns were recorded only on one occasion, but it is considered likely they held territory throughout the breeding season in this area.

3.2.1.13 Marsh Harrier and Bittern Viewpoint 3

Habitats

A large area of reedbed with many drainage channels and areas of wet grassland adjacent. The river Blyth runs west to east through the surveyed area.

Summary of Results

Two marsh harrier (SPA/Ramsar qualifying feature) nests were confirmed in this area and a bittern (SPA/Ramsar qualifying feature) was heard booming during one visit; this territory was not confirmed but it is considered likely the territory was held throughout the breeding season.

3.2.2 Non-target Species

A further 35 species non-target species were recorded during surveys, all of which are either green list or unlisted (not assessed) and afforded no additional conservation status or designations. Territories were not mapped for non-target species, but it is considered likely that all of the following species would have attained probable or confirmed breeding status: Canada goose *Branta canadensis*, mute swan *Cygnus olor*, pheasant *Phasianus colchicus*, red-legged partridge *Alectoris rufa*, rock dove/feral pigeon *Columba livia*, collared dove *Streptopelia decaocto*, water rail, coot *Fulica atra*, little grebe *Tachybaptus ruficollis*, buzzard *Buteo buteo*, great spotted woodpecker *Dendrocopos major*, green woodpecker *Picus viridis*, jay *Garrulus glandarius*, magpie *Pica pica*, jackdaw *Coloeus monedula*, carrion crow *Corvus corone*, coal tit *Periparus ater*, blue tit *Cyanistes caeruleus*, great tit *Parus major*, sand martin *Riparia riparia*, swallow *Hirundo rustica*, chiffchaff *Phylloscopus collybita*, reed warbler, blackcap *Sylvia atricapilla*, garden warbler *Sylvia borin*, lesser whitethroat *Currucà curruca*, goldcrest *Regulus regulus*, nuthatch *Sitta europaea*, treecreeper *Certhia familiaris*, blackbird *Turdus merula*, robin *Erithacus rubecula*, stonechat, pied wagtail *Motacilla alba*, chaffinch *Fringilla coelebs* and goldfinch *Carduelis carduelis*.

Further notable observations of non-breeding species included a flock of cattle egret *Ardea ibis* on transect 3 during the first round of surveys (but no signs of breeding subsequently) and an osprey *Pandion haliaetus* on transect 10 on the 17th May, seemingly roosting in an arable field away from suitable nesting/foraging habitat and presumed to be on passage.

3.2.3 Acoustic Monitoring

Results of the acoustic monitoring are summarised within **Table 6**, with further details on each transect provided in the following sections.

In total 326,912 bird recordings were identified across all devices. Overall, the acoustic monitoring results were similar to those of the breeding bird transect surveys, but included a number of species that were not reported. These were typically non-target or non-breeding species, or species that were recorded infrequently during the acoustic monitoring period. However, species that are difficult to detect through standard transect methods were in some instances better represented in the acoustic monitoring dataset.

Certain species that do not fall into these categories, such as curlew and oystercatcher, were also recorded at greater frequency, likely reflecting the mobility and detectability of vocalisations of both species. These may include a large proportion of overflying birds rather than birds present for extended periods around the recording devices; whilst curlew and oystercatcher were recorded on a high proportion of days, they were typically recorded only infrequently on those days compared with other species. It is considered likely that the majority of oystercatcher records may relate to breeding pairs present in the wider area, whilst records of curlew are likely to relate to failed breeders rather than local birds.

Table 6. Acoustic monitoring results

Species	Conservation Status	Acoustic Monitoring Device (Number of days/30)									
		AM1	AM2	AM3	AM4	AM5	AM6	AM7	AM8	AM9	AM10
Barnacle goose <i>Branta leucopsis</i>	BoCC5 Amber	12	-	1	-	-	2	-	-	-	12
Greylag goose <i>Anser anser</i>	BoCC5 Amber	-	-	6	-	-	-	-	-	-	-
Shelduck <i>Tadorna tadorna</i>	BoCC5 Amber	-	-	-	-	-	-	10	-	-	-
Mallard <i>Anas platyrhynchos</i>	BoCC5 Amber	24	9	22	8	18	-	-	22	-	10
Teal <i>Anas crecca</i>	Minsmere-Walberswick Ramsar BoCC5 Amber	-	-	26	-	-	-	-	-	-	-
Pheasant <i>Phasianus colchicus</i>	Not assessed	27	9	21	14	30	27	30	28	22	30
Quail <i>Coturnix coturnix</i>	Schedule 1 BoCC5 Amber	-	-	-	-	-	-	4	-	-	-
Red-legged partridge <i>Alectoris rufa</i>	Not Assessed	18	11	-	-	28	-	28	-	15	14
Nightjar <i>Caprimulgus europaeus</i>	Minsmere-Walberswick SPA Annex 1 Section 41 BoCC5 Amber	-	-	-	-	-	21	1	-	-	-
Swift <i>Apus apus</i>	BoCC5 Red	8	2	2	-	9	5	1	7	-	-
Cuckoo <i>Cuculus canorus</i>	Section 41 BoCC5 Red	-	26	-	-	24	21	24	28	29	28
Stock dove <i>Columba oenas</i>	BoCC5 Amber	1	30	-	16	15	-	30	29	20	-
Wood pigeon <i>Columba palumbus</i>	BoCC5 Amber	29	30	30	20	30	30	30	30	30	30
Water rail <i>Rallus aquaticus</i>	BoCC5 Green	-	-	25	-	27	-	-	-	-	-
Moorhen <i>Gallinula chloropus</i>	BoCC5 Amber	28	9	1	9	6	-	-	27	27	-
Coot <i>Fulica atra</i>	BoCC5 Green	8	-	-	-	-	-	-	-	-	-
Little grebe <i>Tachybaptus ruficollis</i>	BoCC5 Green	-	-	-	-	18	-	-	1	-	-
Stone-curlew <i>Burhinus oedicnemus</i>	Schedule 1 Annex 1 Section 41 BoCC5 Amber	-	-	-	-	-	-	12	-	-	-
Oystercatcher <i>Haematopus ostralegus</i>	BoCC5 Amber	16	23	14	12	27	21	11	-	-	-

Species	Conservation Status	Acoustic Monitoring Device (Number of days/30)									
		AM1	AM2	AM3	AM4	AM5	AM6	AM7	AM8	AM9	AM10
Lapwing <i>Vanellus vanellus</i>	Section 41 BoCC5 Red	-	-	-	8	23	-	-	-	-	-
Curlew <i>Numenius arquata</i>	Section 41 BoCC5 Red	13	-	21	18	27	28	19	-	29	1
Redshank <i>Tringa totanus</i>	BoCC5 Amber	-	-	-	-	28	-	-	-	-	-
Greenshank <i>Tringa nebularia</i>	Schedule 1 BoCC5 Amber	-	-	-	-	28	-	-	-	-	-
Black-headed gull <i>Chroicocephalus ridibundus</i>	BoCC5 Amber	15	15	23	-	13	20	30	-	11	-
Mediterranean gull <i>Ichthyaetus melanocephalus</i>	Schedule 1 Annex 1 BoCC5 Amber	-	-	-	1	-	1	-	-	-	-
Herring gull <i>Larus argentatus</i>	Section 41 BoCC5 Red	29	20	8	-	-	14	23	7	9	18
Sandwich tern <i>Thalasseus sandvicensis</i>	Alde-Ore Estuary SPA Annex 1 BoCC5 Amber	1	-	-	-	-	1	-	-	-	-
Grey heron <i>Ardea cinerea</i>	BoCC5 Green	14	18	6	9	26	21	30	17	-	-
Little Egret <i>Egretta garzetta</i>	Annex 1 BoCC5 Green	-	-	-	-	-	29	-	-	-	-
Marsh harrier <i>Circus aeruginosus</i>	Alde-Ore Estuary SPA Benacre to Easton Bavents SPA Minsmere-Walberswick SPA Minsmere-Walberswick Ramsar Schedule 1 Annex 1 BoCC5 Amber	-	-	-	-	21	-	-	-	-	-
Buzzard <i>Buteo buteo</i>	BoCC5 Green	-	29	16	10	24	9	25	27	30	21
Barn owl <i>Tyto alba</i>	Schedule 1 BoCC5 Green	-	-	5	-	11	-	-	-	10	-
Short-eared owl <i>Asio flammeus</i>	Annex 1 BoCC5 Amber	1	-	-	-	-	-	-	-	-	-
Tawny owl <i>Strix aluco</i>	BoCC5 Amber	1	30	24	15	-	27	-	28	30	22
Kingfisher <i>Alcedo atthis</i>	Schedule 1 Annex 1 BoCC5 Green	1	-	-	-	1	-	-	24	-	-
Great spotted woodpecker <i>Dendrocopos major</i>	BoCC5 Green	-	26	-	8	6	-	19	22	23	29
Green woodpecker <i>Picus viridis</i>	BoCC5 Green	-	30	-	25	9	11	-	-	17	-
Kestrel <i>Falco tinnunculus</i>	BoCC5 Amber	2	14	9	2	-	4	-	-	-	-
Hobby <i>Falco Subbuteo</i>	Schedule 1 BoCC5 Green	-	-	30	12	1	-	-	3	-	-
Jay <i>Garrulus glandarius</i>	BoCC5 Green	8	13	-	7	-	6	-	-	22	13
Magpie <i>Pica pica</i>	BoCC5 Green	18	30	25	11	18	27	30	22	10	18
Jackdaw <i>Coloeus monedula</i>	BoCC5 Green	25	30	27	11	29	10	30	29	30	8
Rook <i>Corvus frugilegus</i>	BoCC5 Amber	-	30	29	-	29	-	30	29	30	-
Carriion crow <i>Corvus corone</i>	BoCC5 Green	30	30	30	29	30	30	30	30	30	30
Blue tit <i>Cyanistes caeruleus</i>	BoCC5 Green	29	15	9	19	24	21	11	-	26	-
Great tit <i>Parus major</i>	BoCC5 Green	-	8	3	13	11	-	-	-	4	12
Bearded tit <i>Panurus biarmicus</i>	Schedule 1 Minsmere-Walberswick Ramsar BoCC5 Green	-	-	-	-	28	-	-	-	-	-

Species	Conservation Status	Acoustic Monitoring Device (Number of days/30)									
		AM1	AM2	AM3	AM4	AM5	AM6	AM7	AM8	AM9	AM10
Woodlark <i>Lullula arborea</i>	Schedule 1 Annex 1 Section 41 BoCC5 Green	-	-	-	-	-	-	14	-	-	-
Skylark <i>Alauda arvensis</i>	Section 41 BoCC5 Red	4	-	25	-	17	27	24	-	4	19
Sand martin <i>Riparia riparia</i>	BoCC5 Green	12	-	-	-	9	-	-	-	-	-
Swallow <i>Hirundo rustica</i>	BoCC5 Green	-	4	-	-	23	4	-	-	-	-
House martin <i>Delichon urbicum</i>	BoCC5 Red	-	-	-	-	-	-	-	6	-	-
Cetti's warbler <i>Cettia cetti</i>	Schedule 1 BoCC5 Green	28	-	-	-	28	18	-	-	-	-
Long-tailed tit <i>Aegithalos caudatus</i>	BoCC5 Green	6	28	-	29	5	7	-	-	18	-
Chiffchaff <i>Phylloscopus collybita</i>	BoCC5 Green	4	30	11	25	13	24	7	-	25	24
Sedge warbler <i>Acrocephalus schoenobaenus</i>	BoCC5 Amber	12	-	-	-	10	-	-	-	-	-
Reed warbler <i>Acrocephalus scirpaceus</i>	BoCC5 Green	24	-	-	-	27	-	-	-	-	-
Grasshopper warbler <i>Locustella naevia</i>	Section 41 BoCC5 Red	-	-	21	-	1	-	-	-	-	-
Blackcap <i>Sylvia atricapilla</i>	BoCC5 Green	3	30	7	27	15	-	25	-	24	22
Garden Warbler <i>Sylvia borin</i>	BoCC5 Green	-	-	19	21	-	-	-	-	23	-
Whitethroat <i>Currucà communis</i>	BoCC5 Amber	16	-	21	-	28	29	13	-	19	-
Goldcrest <i>Regulus regulus</i>	BoCC5 Green	-	8	-	17	-	-	-	-	-	-
Wren <i>Troglodytes troglodytes</i>	BoCC5 Amber	30	29	30	19	27	30	30	30	30	30
Tree creeper <i>Certhia familiaris</i>	BoCC5 Green	-	9	-	13	-	-	10	29	11	20
Song thrush <i>Turdus philomelos</i>	Section 41 BoCC5 Amber	12	19	8	15	30	-	-	28	30	26
Blackbird <i>Turdus merula</i>	BoCC5 Green	28	30	11	29	20	23	16	29	30	30
Robin <i>Erythacus rubecula</i>	BoCC5 Green	9	29	17	24	8	28	30	26	27	30
Nightingale <i>Luscinia megarhynchos</i>	BoCC5 Red	-	-	-	-	-	-	-	-	27	-
Stonechat <i>Saxicola rubicola</i>	BoCC5 Green	15	-	-	-	17	-	-	-	-	-
Dunnock <i>Prunella modularis</i>	Section 41 BoCC5 Amber	25	8	-	22	13	30	22	-	17	28
Pied Wagtail <i>Motacilla alba</i>	BoCC5 Green	4	7	-	-	-	-	-	-	-	-
Chaffinch <i>Fringilla coelebs</i>	BoCC5 Green	6	10	-	7	-	10	20	-	14	8
Bullfinch <i>Pyrrhula pyrrhula</i>	BoCC5 Amber	-	-	-	20	-	-	-	-	-	-
Greenfinch <i>Chloris chloris</i>	BoCC5 Red	-	-	-	-	-	-	-	3	-	-
Linnet <i>Linaria cannabina</i>	Section 41 BoCC5 Red	19	2	-	-	28	-	-	-	-	-
Goldfinch <i>Carduelis carduelis</i>	BoCC5 Green	5	-	7	-	5	14	-	-	-	-
Siskin <i>Spinus spinus</i>	BoCC5 Green	-	-	-	-	-	6	-	-	-	-
Yellowhammer <i>Emberiza citrinella</i>	Section 41 BoCC5 Red	-	-	-	-	-	23	-	-	19	12
Reed bunting <i>Emberiza schoeniclus</i>	Section 41 BoCC5 Amber	9	-	30	-	30	-	-	26	-	-

3.2.3.1 Acoustic Monitoring Device 1

Forty-four species were recorded and identified at this location. Species identified were mostly those expected of the habitats in the vicinity of the device (**Table 1**), and largely mirrored those recorded during the breeding bird survey transects. Noteworthy differences included records of a number of species that were not detected during the transect surveys: these primarily involved species recorded only on a single date, including Sandwich tern (SPA qualifying feature) and a short-eared owl alarm-calling on the 17th June. A short-eared owl was also observed during a transect survey on 5th June; whilst breeding was not confirmed, these findings indicate that the species was present for an extended period during the breeding season.

Other noteworthy results included records of barnacle goose on 12 days during the monitoring period – not recorded during the transect surveys, and likely to relate to a feral breeding population in the wider area – and curlew and oystercatcher on 13 days and 16 days, respectively.

3.2.3.2 Acoustic Monitoring Device 2

Thirty-eight species were recorded and identified at this location; species identified were typical of the habitats present around the recording device, but also included species likely to be commuting over the area and those roosting or foraging in adjacent areas, including herring gull (recorded on 20 days), black-headed gull (15 days), oystercatcher (23 days) and mallard (nice days).

3.2.3.3 Acoustic Monitoring Device 3

Thirty-seven species were recorded and identified at this location. Most species identified were recorded during breeding bird survey transects, but differing results included 30 days of hobby and 26 days of teal (Ramsar qualifying feature). It is considered likely that both species bred in this area due to the continued presence of both during the monitoring period and suitable breeding habitat present for both in the vicinity. Additional results of note included 14 days of oystercatcher and 21 days of curlew, for which suitable foraging habitat exists nearby.

3.2.3.4 Acoustic Monitoring Device 4

Thirty-five species were recorded and identified at this location; most species identified were expected given the location and habitats around the recording device. In comparison with the breeding bird transect surveys, differing results included 12 days of hobby, for which suitable breeding habitat was present, suggesting a territory in the vicinity. Additional results of note included 12 days of oystercatcher, 18 days of curlew, eight days of lapwing and a single record of Mediterranean gull. The Minsmere-Walberswick Ramsar site supports a nationally important breeding population of Mediterranean gull, although it is not a qualifying feature of the site.

3.2.3.5 Acoustic Monitoring Device 5

Fifty-one species were recorded and identified at this location. Species were largely similar to those recorded during breeding bird survey transects, and were typical of the habitats surrounding the device. Records of note included 28 days of redshank, 21 days of marsh harrier (SPA/Ramsar qualifying feature) and 23 days of lapwing; the frequency of detection indicates breeding for all of these species and supports the breeding bird survey transect results.

Additional species beyond the findings of the breeding bird transects and considered likely to be breeding in the vicinity include 28 days of bearded tit (Ramsar qualifying feature), 27 days of oystercatcher, and 27 days of water rail.

Records of other species potentially breeding in the wider area (based on the extent of suitable habitat) included grasshopper warbler, kingfisher and hobby, each recorded on one day only.

Curlew were recorded on 27 days and greenshank on 28 days; neither are considered to have bred in the area, and the records are likely to relate to passage/non-breeding birds. A single Greenshank was also heard calling from a different location on transect 5 during a breeding bird survey visit on 26th March. The Minsmere-Walberswick Ramsar site supports a nationally important passage population of the species, although it is not a qualifying feature of the site.

3.2.3.6 Acoustic Monitoring Device 6

Thirty-seven species were recorded and identified at this location; most of those recorded aligned with the results of the breeding bird survey transects, and included 21 days of nightjar (SPA qualifying feature) recordings. Additional findings not reflected in the breeding bird survey transect results included six days of siskin, which were the only records across the scheme during the survey period.

It is likely that many of the recordings of waterbirds on this transect relate to birds commuting overland between the Blyth estuary/Blythburgh marshes and the coast at Walberswick, given that suitable habitat in the vicinity of the recorder is largely absent; these include 21 days of oystercatcher, 20 days of black-headed gull, 29 days of little egret, 21 days of grey heron, two days of barnacle goose, 14 days of herring gull and single recordings of Mediterranean gull and Sandwich tern (SPA qualifying feature).

3.2.3.7 Acoustic Monitoring Device 7

Thirty-three species were recorded and identified at this location; most of those recorded were typical of the surrounding habitats and were well-represented on breeding bird survey transects.

Stone-curlew were recorded on 12 days and woodlark were recorded on 14 days. Both likely relate to the breeding territories identified near to the recording device location.

A nightjar (SPA qualifying feature) was recorded churring distantly on the 17th June; the recording device was approximately 4.8km from the nearest identified nightjar territory, and as such this recording may indicate the presence of an additional breeding territory away from the locations established during breeding bird survey transects.

A quail was recorded singing on four days during the period, and is considered likely to have been holding territory in suitable arable farmland to the north of the device location.

Non-breeding/foraging species included 23 days of herring gull, 30 days of black-headed gull and 19 days of curlew. However, records of shelduck (10 days) and oystercatcher (11 days) may have related to breeding birds, with two shelduck territories identified nearby during breeding bird transect surveys.

3.2.3.8 Acoustic Monitoring Device 8

Twenty-seven species were recorded and identified at this location; most were typical of the alder carr, wet grassland and open water habitats present. Twenty-four days of kingfisher reflected the proximity of the recorder to an identified territory. Species of note for which breeding bird survey transects did not identify territories included three days of hobby, for which there is significant suitable nesting habitat present in the immediate vicinity and wider area.

3.2.3.9 Acoustic Monitoring Device 9

Thirty-six species were recorded and identified at this location. Most were typical of the habitats present and were recorded during breeding bird survey transects. Tawny owl was recorded on 30 days and is likely to have bred in nearby woodland, whilst a barn owl was recorded on 10 days. Both probably reflect unidentified territories in the vicinity. Twenty-nine days of curlew were also notable.

3.2.3.10 Acoustic Monitoring Device 10

Twenty-seven species were recorded and identified at this location; most were typical of the habitats present in the immediate vicinity of the recording device. Tawny owl was recorded on 22 days, indicating the presence of an otherwise unidentified territory. Additional species records included 18 days of herring gull and 12 days of barnacle goose.

4. Summary and Conclusions

A suite of breeding bird surveys, including breeding bird survey transects, species-specific bittern and marsh harrier VP surveys and supplementary acoustic monitoring were completed across the survey area, between March and July 2024 inclusive, to inform the proposed LionLink scheme. Beach surveys and inshore bird surveys was also completed, and will be documented in a separate report.

Breeding territories of 47 target species were identified during breeding bird survey transects and species specific VP surveys; territory mapping was not completed for non-target species, although 35 non-target species were also considered likely to be breeding. Of the target species recorded, 17 were Red-listed species of conservation concern, 24 were Amber-listed species of conservation concern, 19 were Section 41 species, 12 were Schedule 1 species and six were Annex 1 species. Territories of four local SPA qualifying features (marsh harrier, bittern, gadwall and nightjar) and four local Ramsar qualifying features (marsh harrier, bittern, gadwall and bearded tit) were also recorded.

Recordings of 79 species were identified during analysis of the acoustic monitoring results. The majority of recordings of target species are considered to relate to territories identified during breeding bird survey transects and territory mapping. However, the results indicate the presence of a number of additional potential breeding territories, including a barn owl (Schedule 1) at AM9, nightjar (SPA qualifying feature, Annex 1, Section 41) at AM7, and bearded tit (Ramsar qualifying feature, Schedule 1) at AM5.

In addition, the acoustic monitoring results suggest the presence of territories of several species for which territories were not detected through breeding bird transect surveys. These included potential territories of teal (SPA qualifying feature), quail (Schedule 1) and up to four hobby (Schedule 1).

The breeding bird assemblage comprised mostly species typical of arable farmland, woodland, heathland and wetlands, which were the predominant habitat types within the survey area. A relatively high proportion of the species recorded were of conservation concern, including a number of species which are geographically localised in the UK (such as marsh warbler, bittern and stone-curlew).

The highest density and variety of species occurred in areas where multiple large-scale habitats were present, particularly those with larger wetland components.

Territories of species that are qualifying features of three SPAs (Minsmere-Walberswick SPA, Alde-Ore Estuary SPA, and Benacre to Easton Bavents SPA) and one Ramsar site (Minsmere-Walberswick Ramsar site) present within or near to the survey area were identified: on or adjacent to transects 3, 5, 6, 8 and 9, and from all three VPs.

Territories of Schedule 1 species were identified on all transects, with the exception of transect 10.

Two marsh warbler territories were identified on transect 1, representing a significant proportion of the British breeding population of this species (the most recently published annual figure is 3-17 breeding pairs nationally²³). It is considered likely that more marsh warbler territories were present in this area, based on communications with local ornithologists, and it is believed that between approximately two and six territories have been present since the late 2010s.

²³ Eaton M., & the Rare Breeding Birds Panel. *Rare breeding birds in the UK in 2021*. British

Appendix A

Figures

Figure 1 Survey Area

Figure 2.1 Breeding Bird Survey Transect 1

Figure 2.2 Breeding Bird Survey Transect 2

Figure 2.3 Breeding Bird Survey Transect 3

Figure 2.4 Breeding Bird Survey Transect 4

Figure 2.5 Breeding Bird Survey Transect 5

Figure 2.6 Breeding Bird Survey Transect 6

Figure 2.7 Breeding Bird Survey Transect 7

Figure 2.8 Breeding Bird Survey Transect 8

Figure 2.9 Breeding Bird Survey Transect 9

Figure 2.10 Breeding Bird Survey Transect 10

Figure 3 Bittern/Marsh Harrier Survey VP Locations

Figure 4 Acoustic Monitoring Locations

Figure 5.1 Transect 1 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.2 Transect 2 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.3 Transect 3 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.4 Transect 4 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.5 Transect 5 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.6 Transect 6 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.7 Transect 7 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.8 Transect 8 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.9 Transect 9 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 5.10 Transect 10 Breeding Bird Survey Results (excluding Schedule 1 species)

Figure 6.1 Transect 1 Schedule 1 Breeding Bird Survey Results

Figure 6.2 Transect 2 Schedule 1 Breeding Bird Survey Results

Figure 6.3 Transect 3 Schedule 1 Breeding Bird Survey Results

Figure 6.4 Transect 4 Schedule 1 Breeding Bird Survey Results

Figure 6.5 Transect 5 Schedule 1 Breeding Bird Survey Results

Figure 6.6 Transect 6 Schedule 1 Breeding Bird Survey Results

Figure 6.7 Transect 7 Schedule 1 Breeding Bird Survey Results

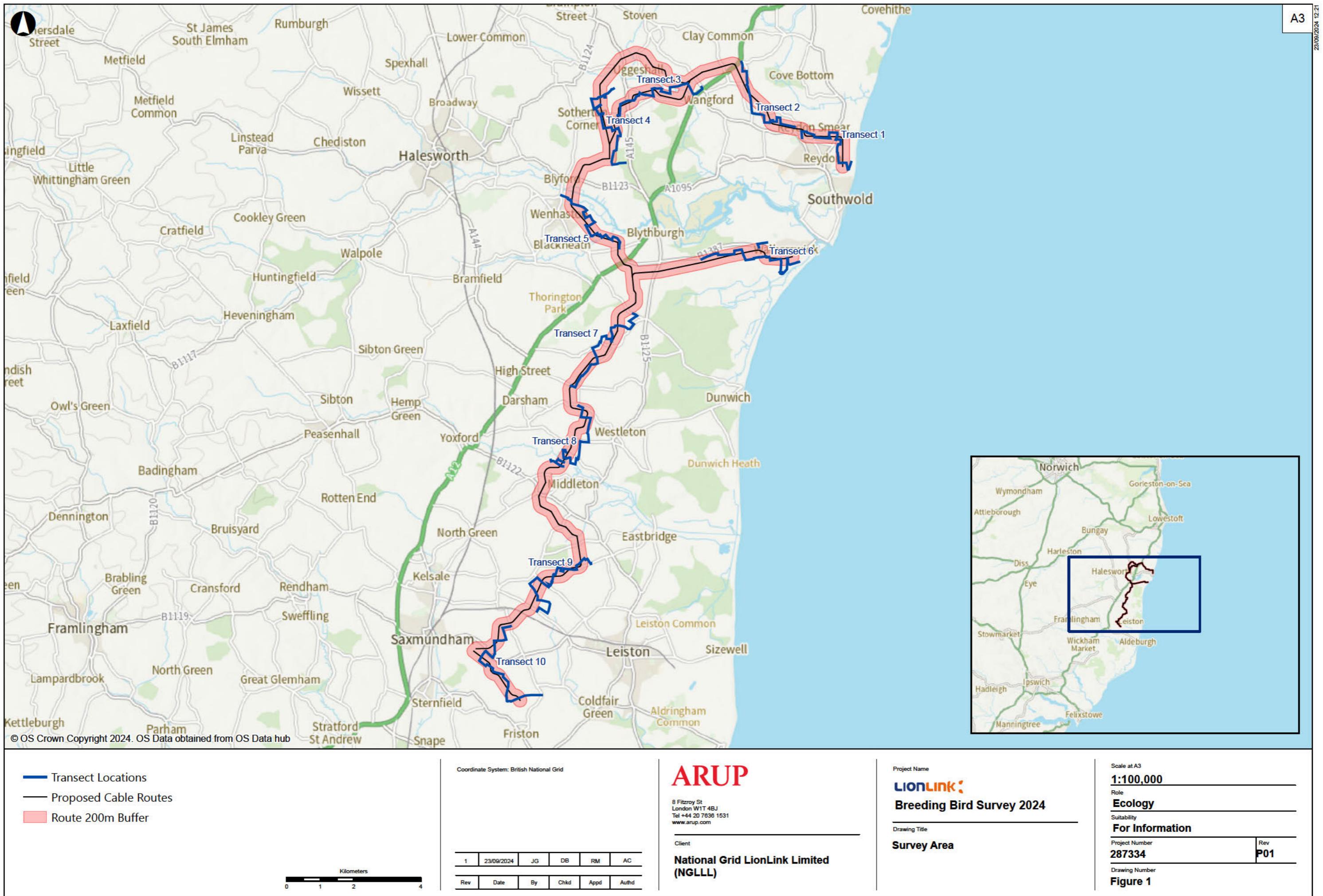
Figure 6.8 Transect 8 Schedule 1 Breeding Bird Survey Results

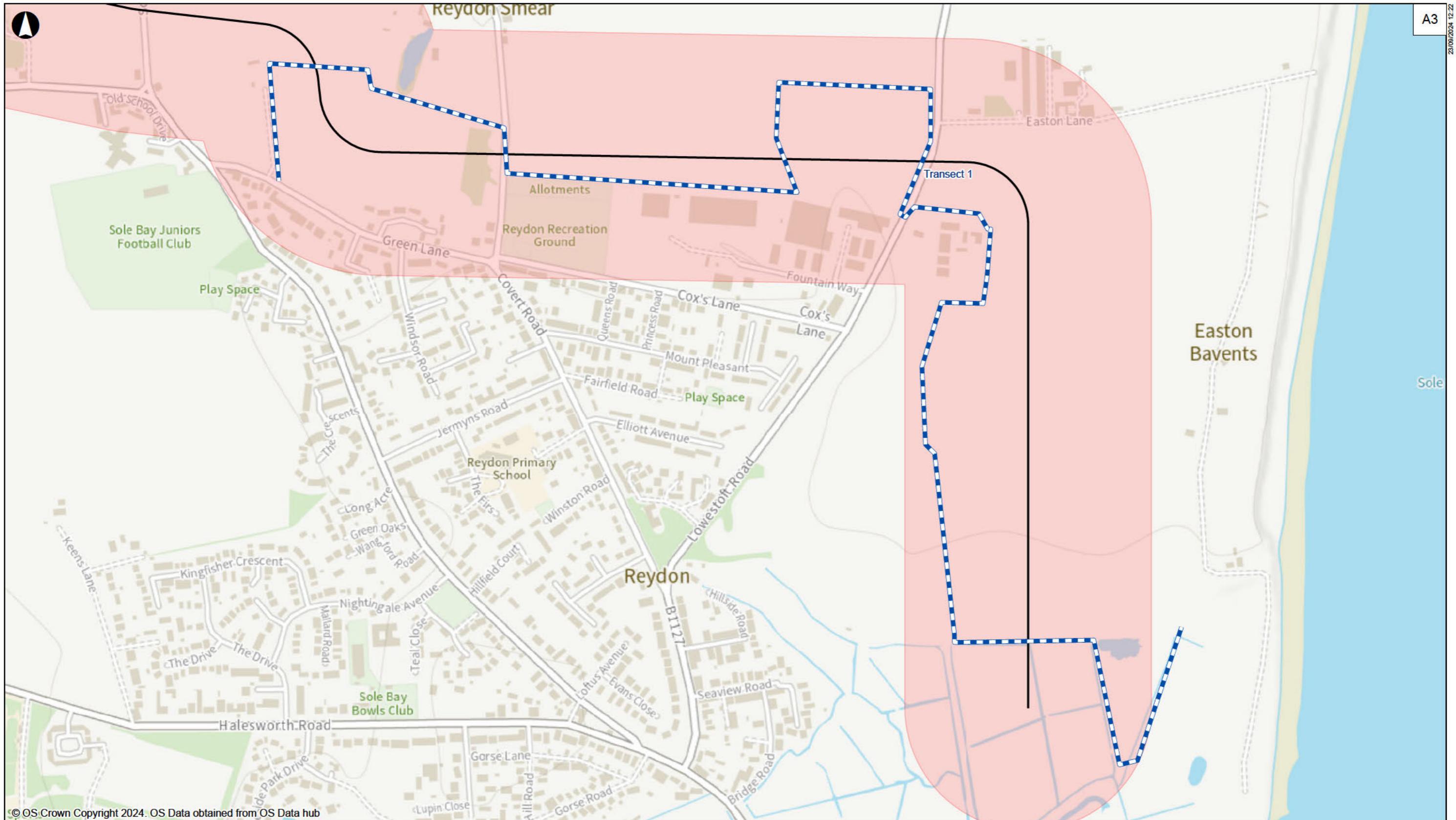
Figure 6.9 Transect 9 Schedule 1 Breeding Bird Survey Results

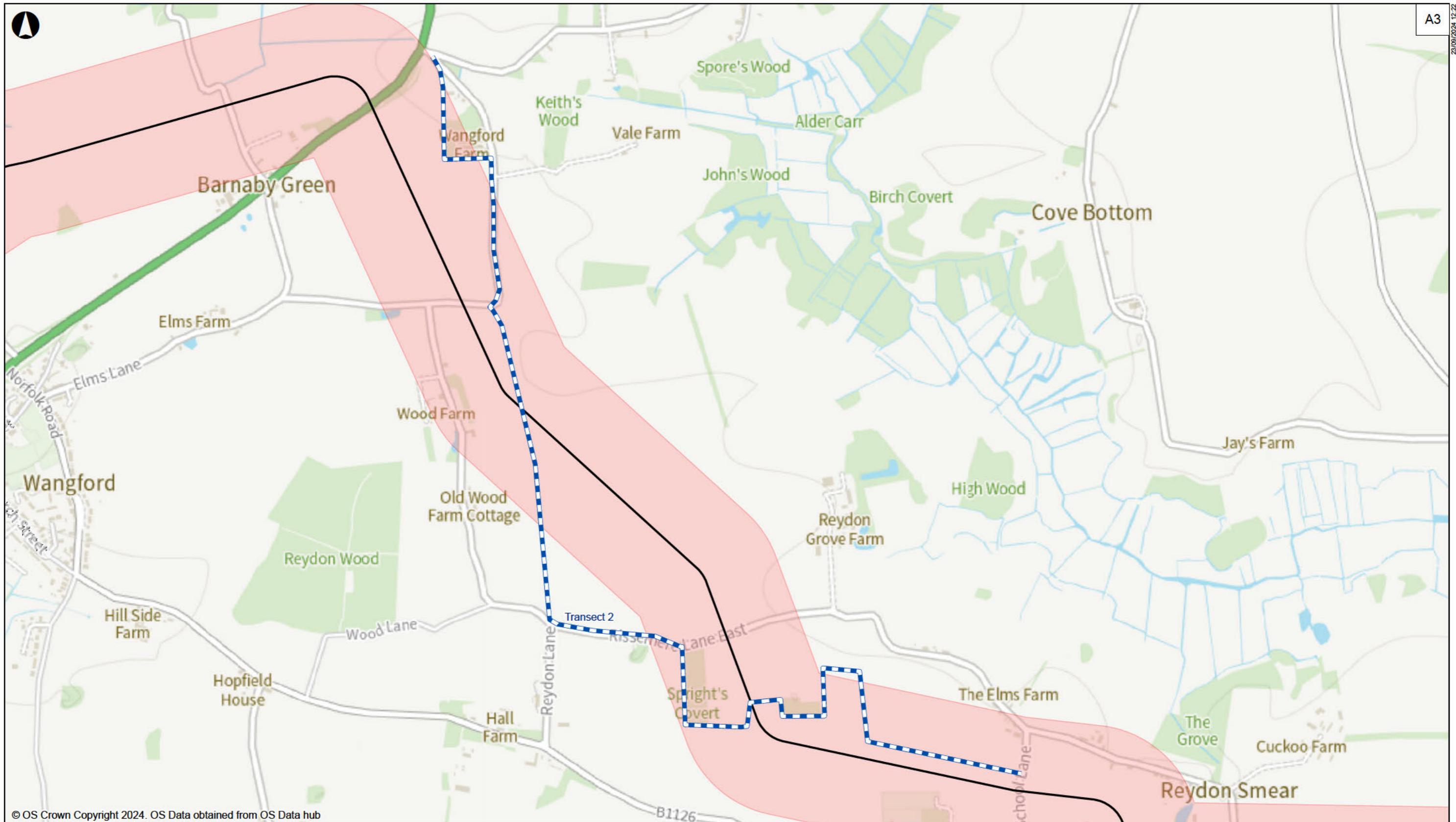
Figure 7.1 VP1 Schedule 1 Breeding Bird Survey Results

Figure 7.2 VP2 Schedule 1 Breeding Bird Survey Results

Figure 7.3 VP3 Schedule 1 Breeding Bird Survey Results







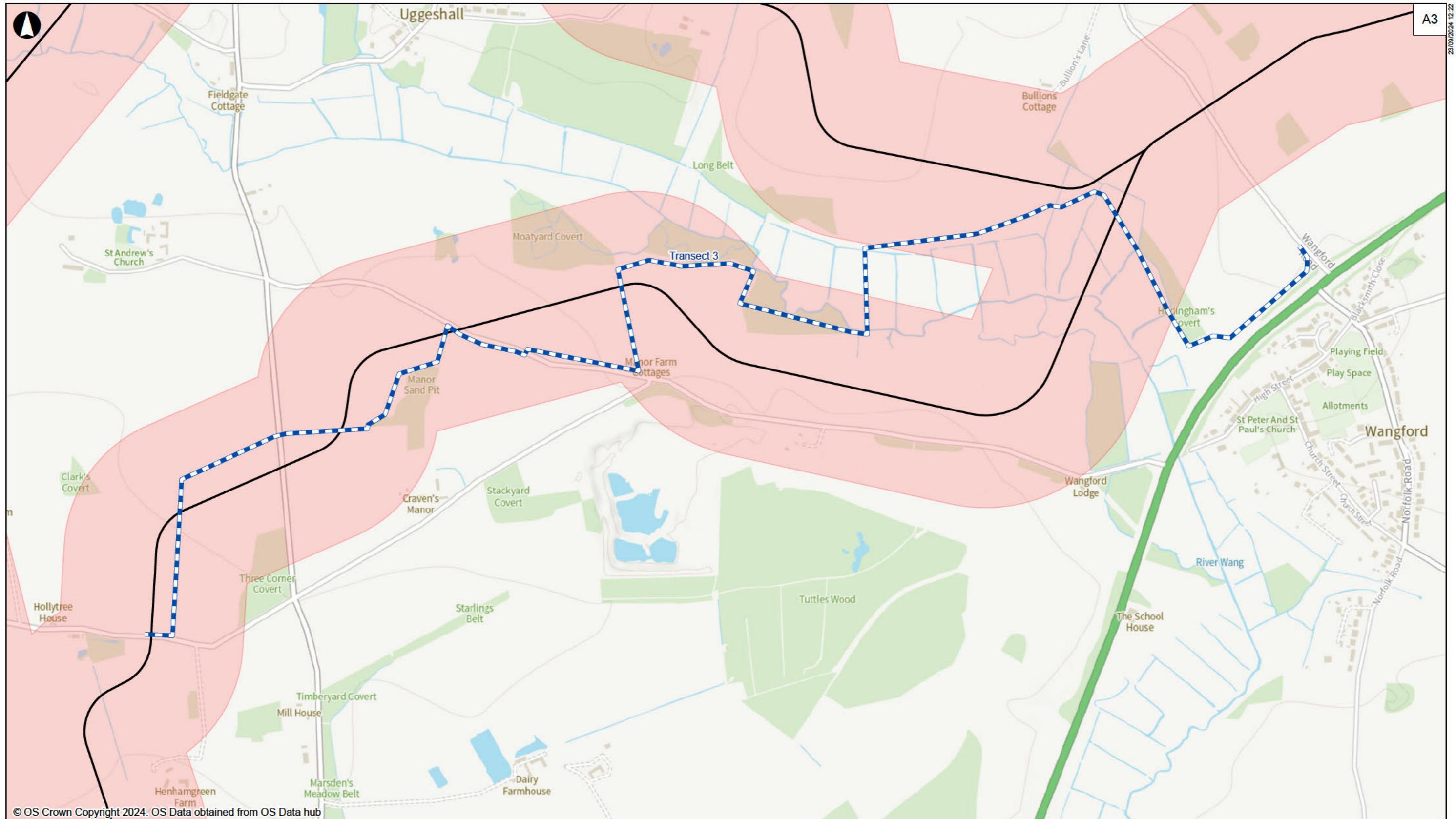
Transect Location
Proposed Cable Routes
Route 200m Buffer

Metres
0 100 200 400

1	23/09/2024	JG	DB	RM	AC
Rev	Date	By	Chkd	Appd	Authd

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— Proposed Cable Routes

Route 200m Buffer

Metres



0 100 200 400

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Breeding Bird Survey 2024

Drawing Title

Breeding Bird Survey Transect 3

146

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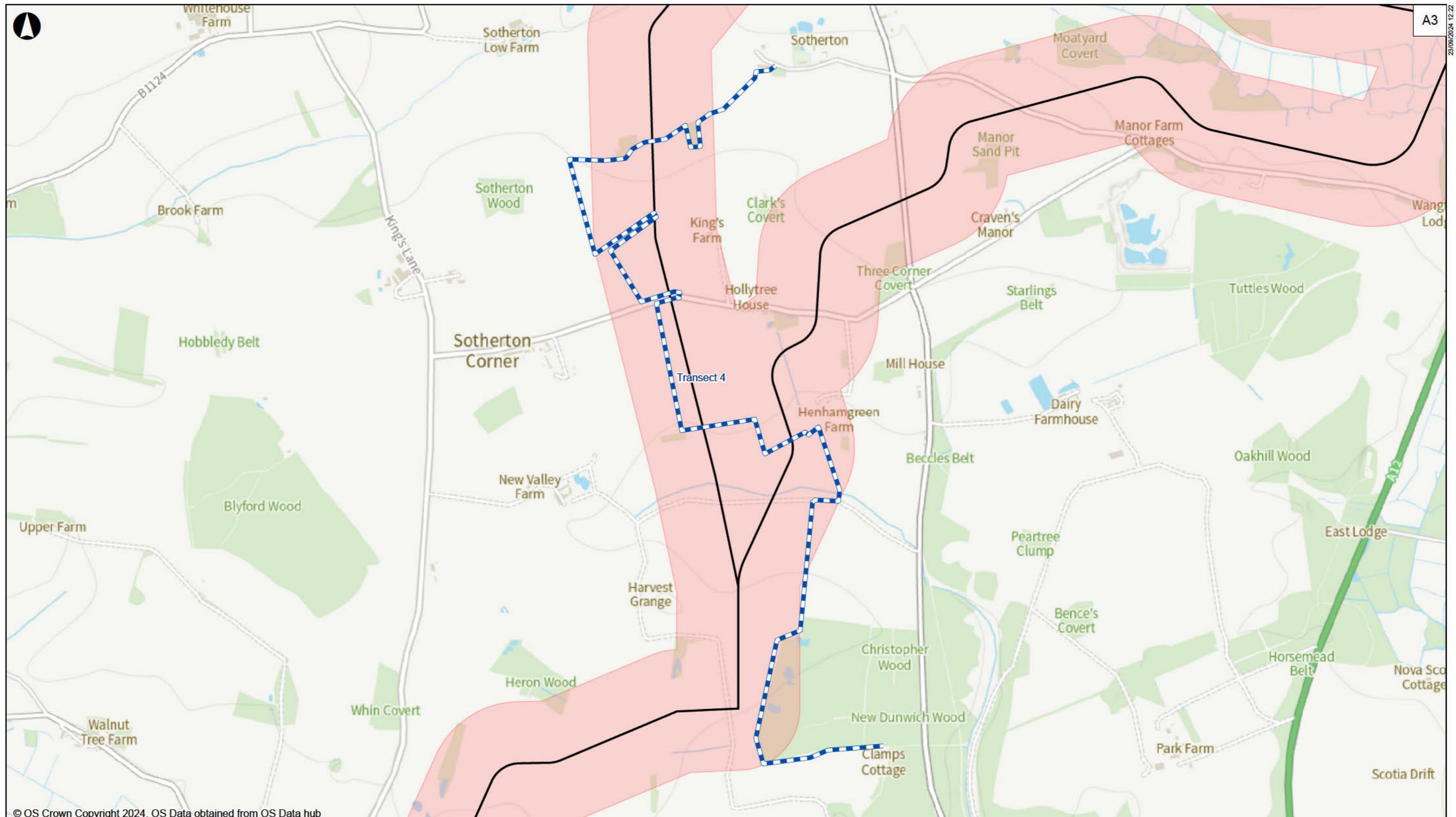
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Drawing Number



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Transect Location
Proposed Cable Routes
Route 200m Buffer

Metres



A horizontal scale bar with a black line and white tick marks at 0, 100, 200, 400, and 600. The word 'Metres' is centered above the scale.

Coordinate System: British National Grid

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Rev	Date	By	Chkd	Appd	Authd

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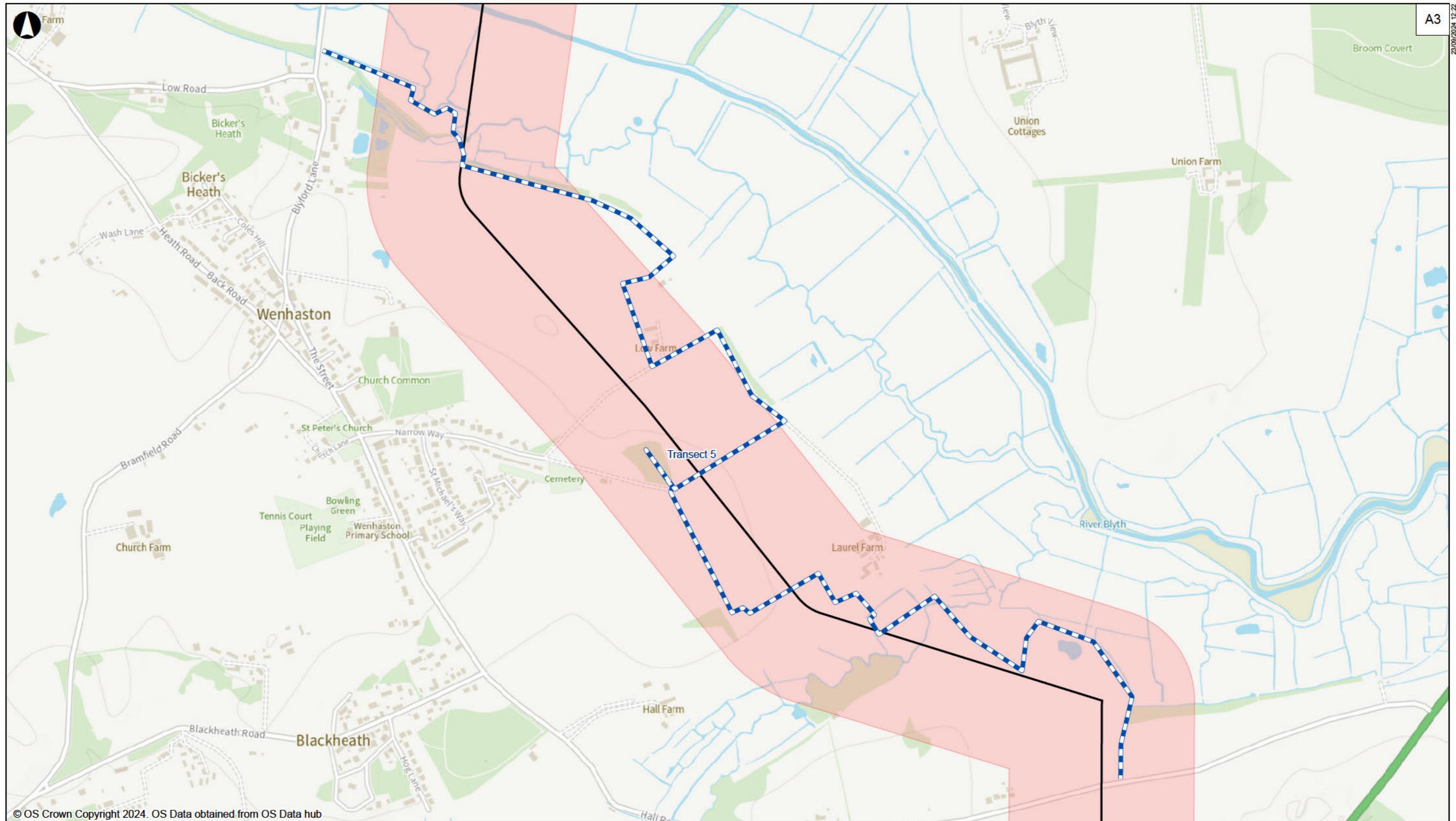
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Drawing Title

Scale at A3	1:12,000
Role	Ecology
Suitability	For Information
Project Number	287334
Drawing Number	Figure 2.4
Rev	P01



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Transect Location
Proposed Cable Routes
Route 200m Buffer

Metres

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Breeding Bird Survey 2024

Drawing Title

Breeding Bird Survey Transect 5

Scale at A3

1:8,000

Role

Ecology

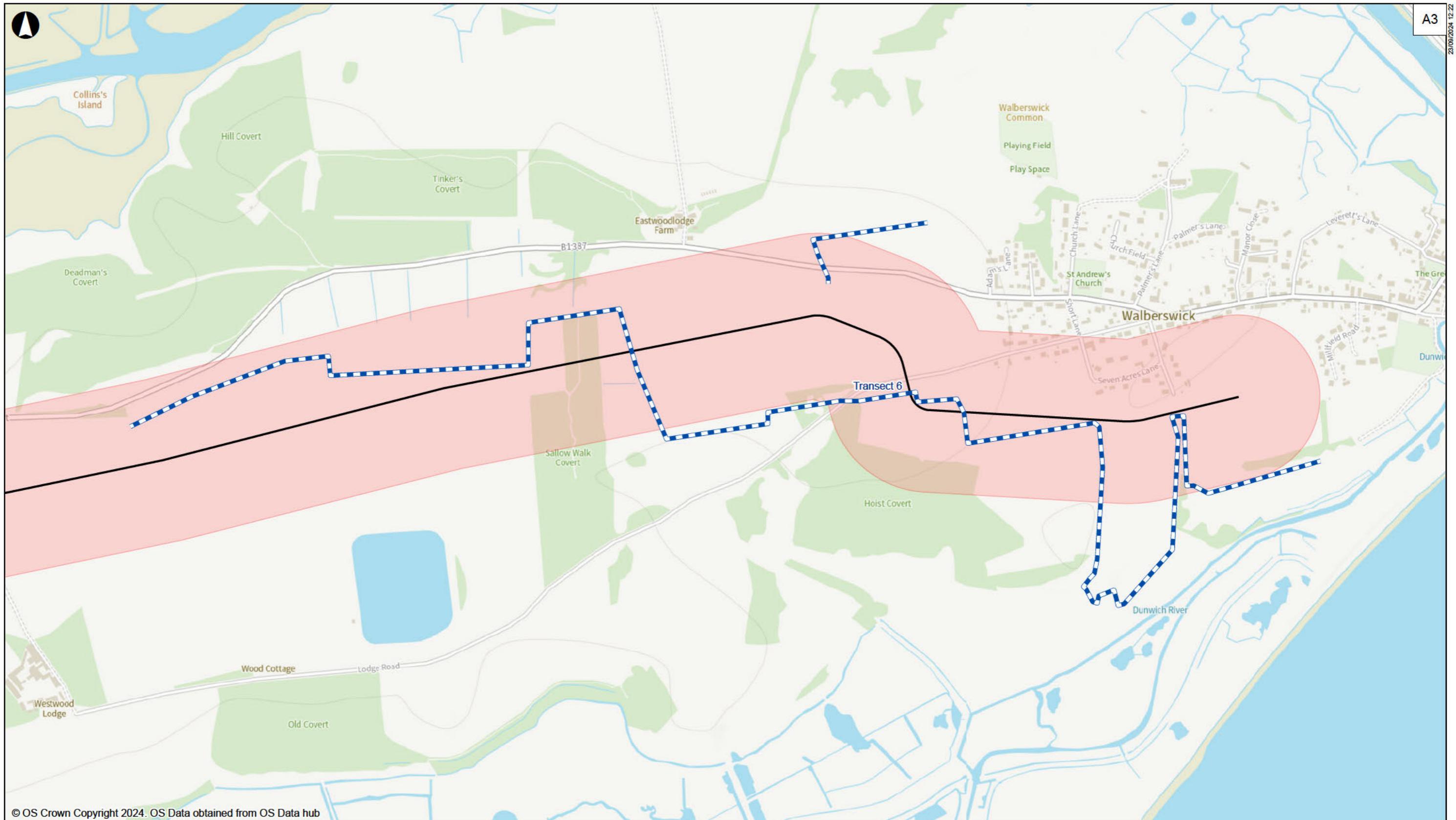
Suitability For Inform

For more

Project Number:

Drawing Number

Figure 2.5



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■ Transect Location

— Proposed Cable Routes

Route 200m Buffer

A horizontal scale bar labeled "METERS" with numerical markings at 0, 100, 200, and 400.

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Drawing Tip

Breeding Bird Survey Transect 6

Scale at A3

1:9,000

Role

Ecology

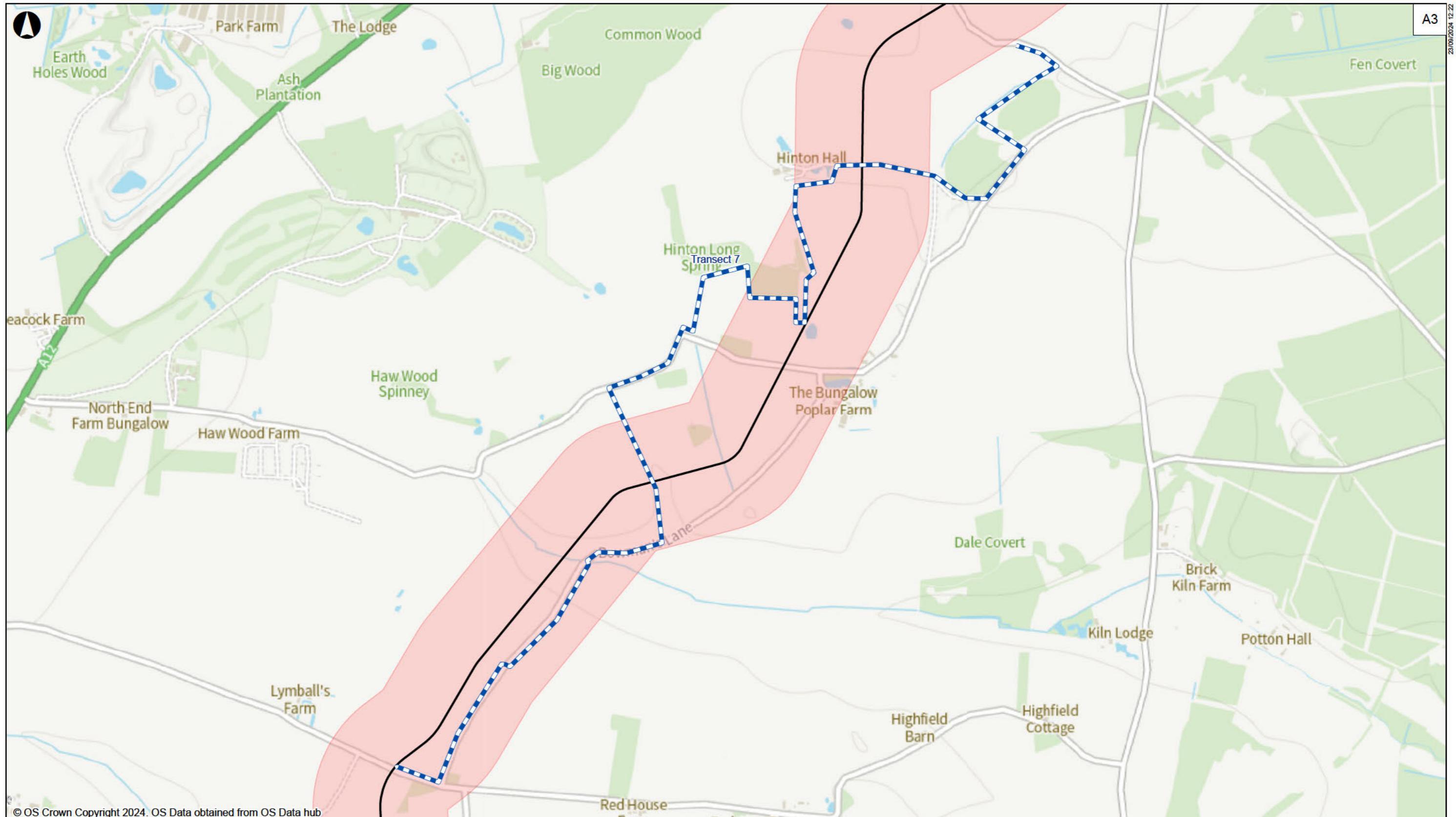
Suitability

Project Number:

Project Number

Drawing Number

Figure 2.6



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Transect Location
Proposed Cable Routes
Route 200m Buffer

MESES

0 100 200 400

Coordinate System: British National Grid

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Rev	Date	By	Chkd	Appd	Authd

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Project Name

Breeding Bird Survey 2024

Drawing Title

Breeding Bird Survey Transect 7

Scale at A3

1:11,000

Role

Ecology

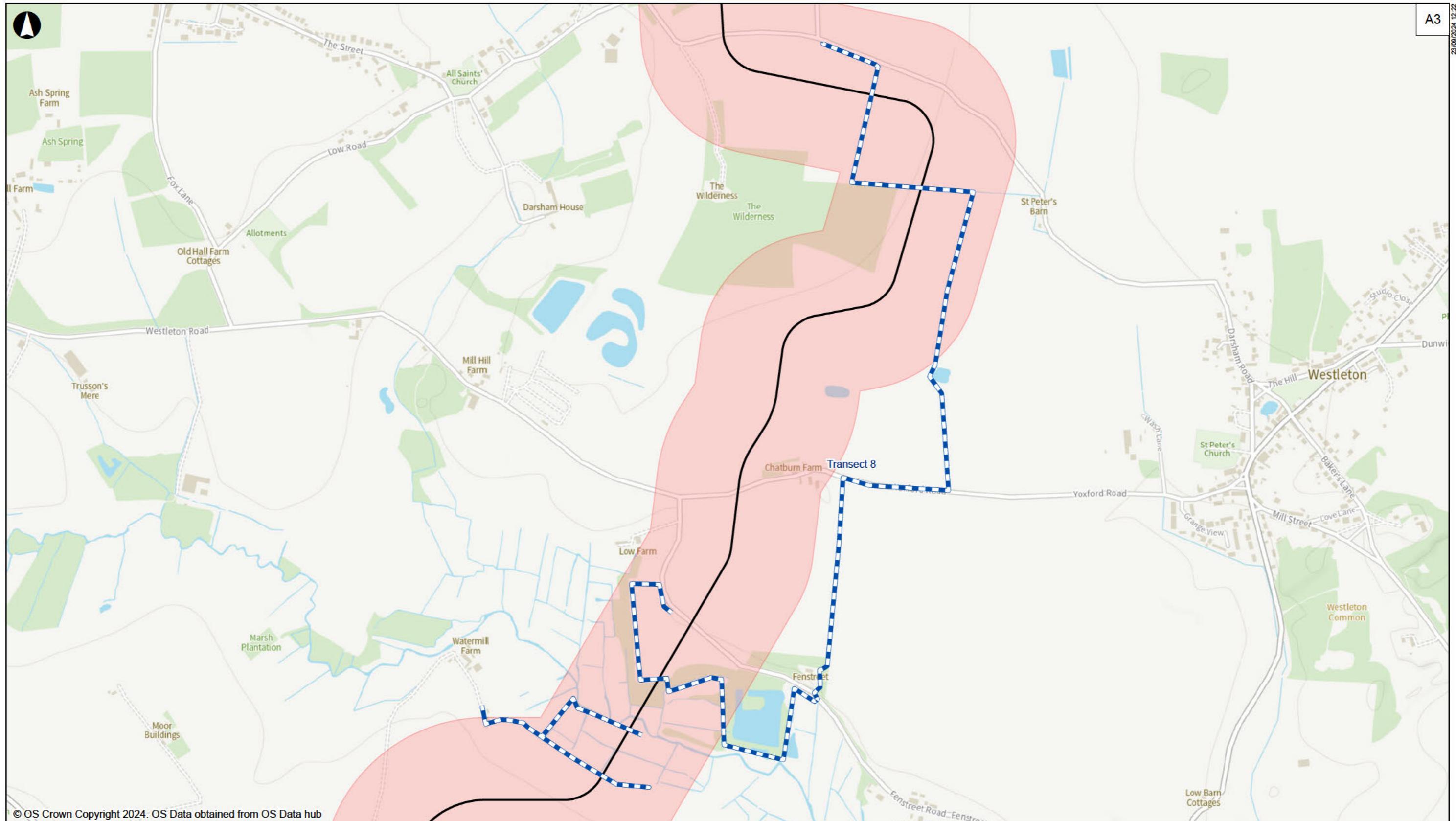
Suitability

For Information

Project Number

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Drawing Number



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Transect Location
Proposed Cable Routes
Route 200m Buffer

Metres

Coordinate System: British National G

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Rev	Date	By	Chkd	Appd	Auth

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Breeding Bird Survey 2024

Drawing T

Breeding Bird Survey Transect 8

Scale at A3

1:9.000

Role

Ecology

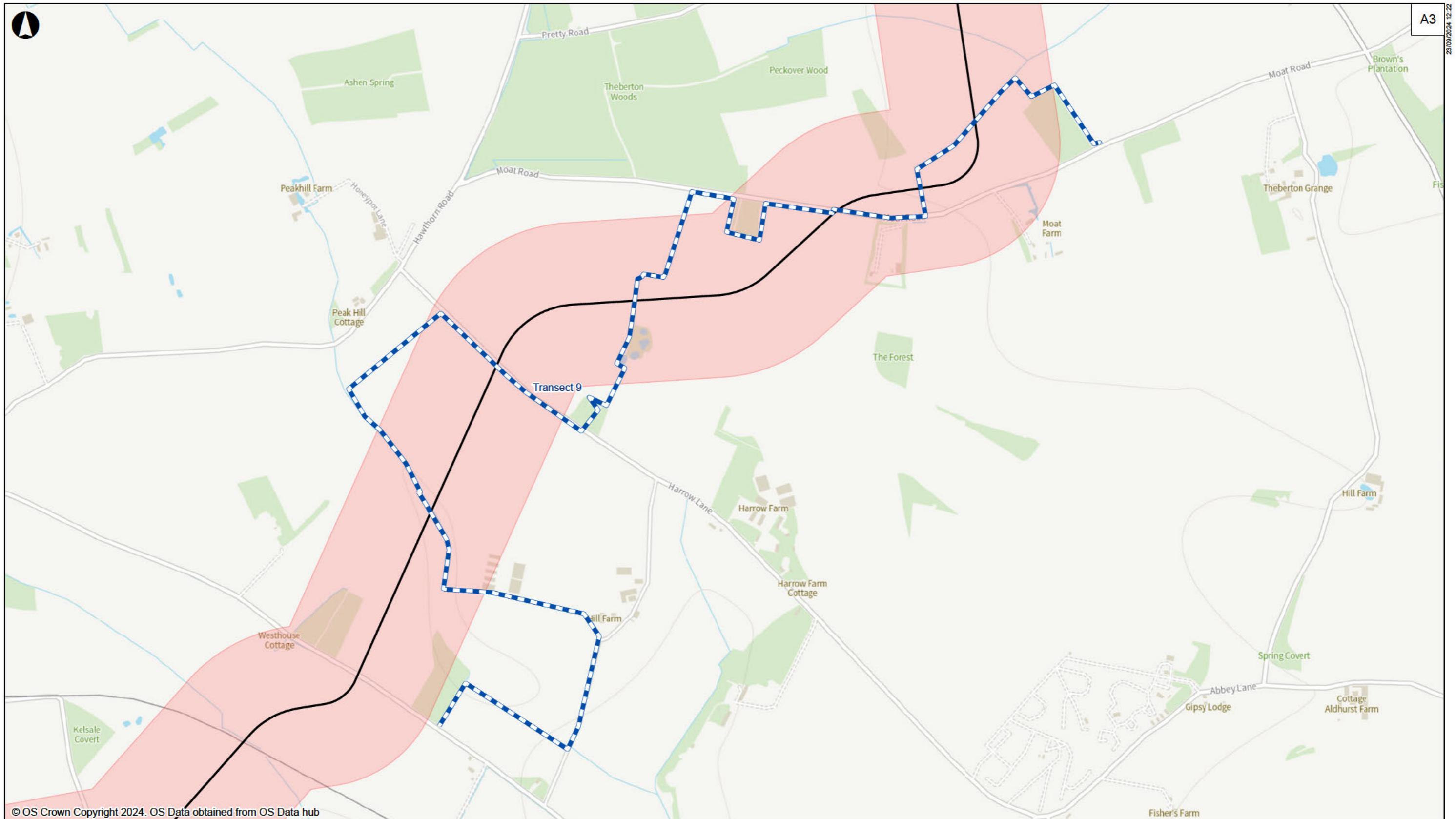
Suitability

For Information

Project Number

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Breeding Bird Survey Transect 9

Scale at A3

1:9,000

Role

Ecology

Suitability

For Information

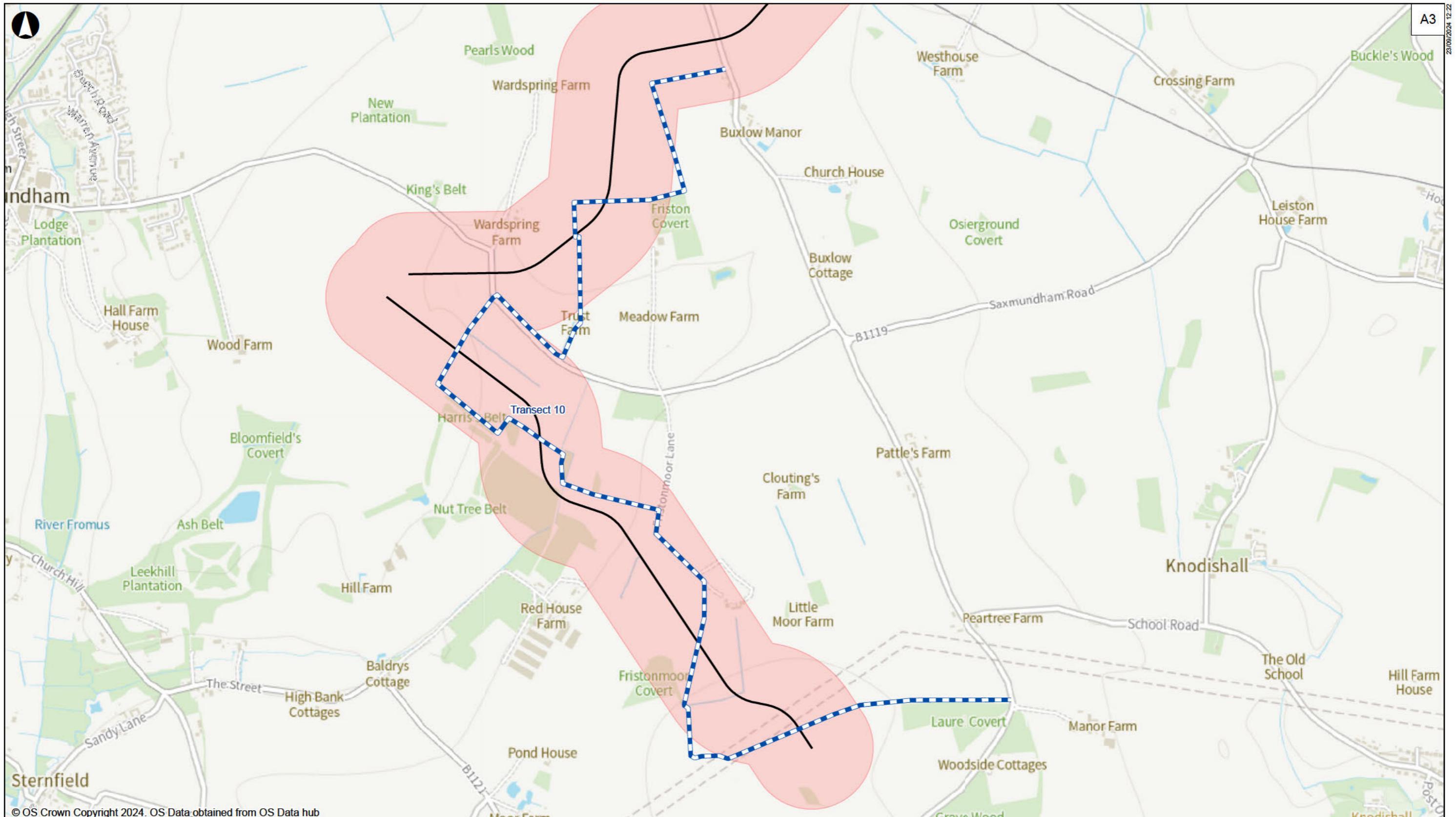
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P01

Drawing Number

Figure 2.9



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Transect Location
Proposed Cable Routes
Route 200m Buffer

MICRONS

0 100 200 400 600

Coordinate System: British National Grid

1	23/09/2024	JG	DB	RM	AC
Rev	Date	By	Chkd	Appd	Authd

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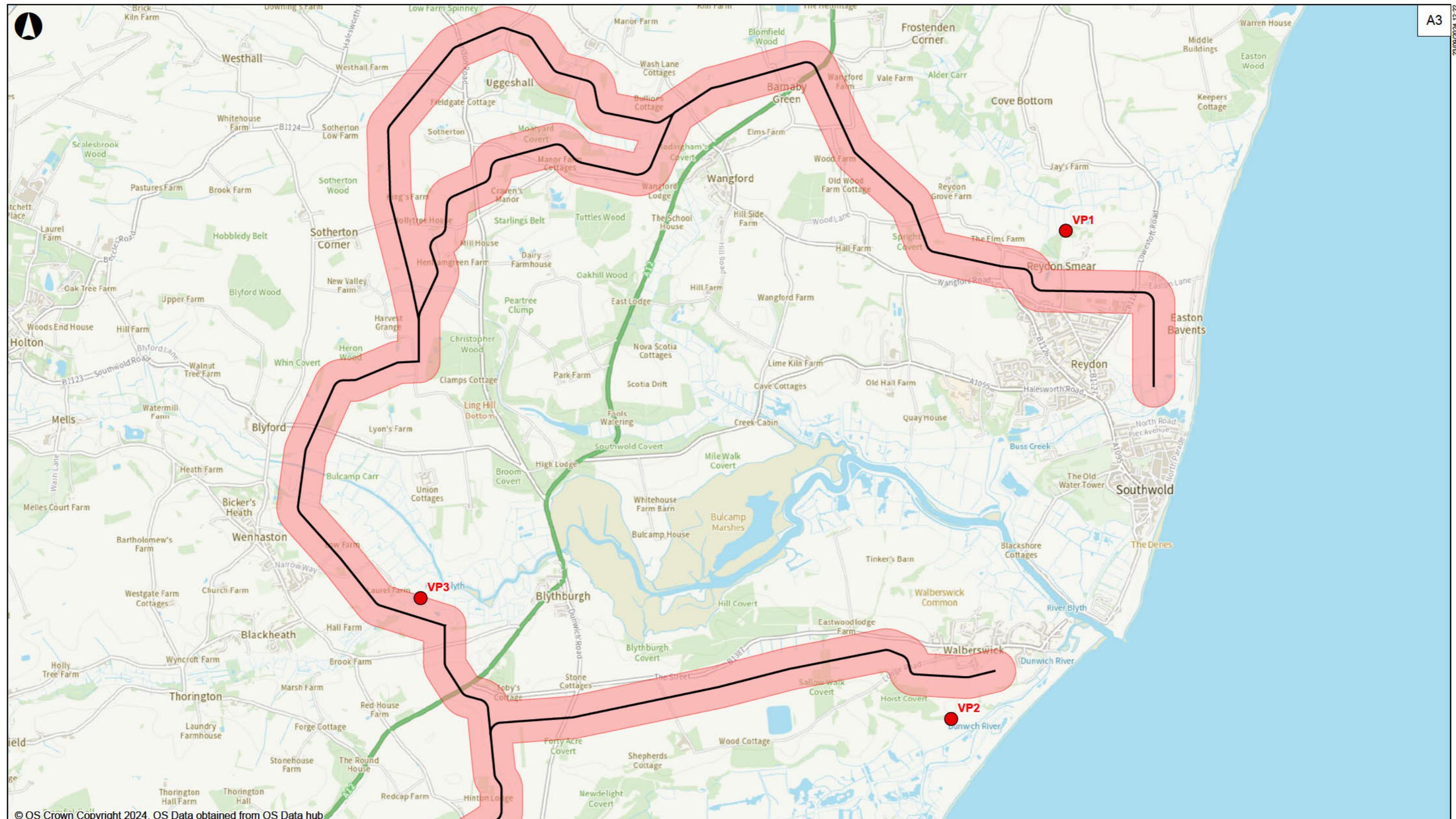
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Scale at A3	1:12,000
Role	Ecology
Suitability	For Information
Project Number	287334
Drawing Number	Figure 2.10
Rev	P01



- Species Specific Survey VP locations
- Proposed Cable Routes
- Route 200m Buffer

A horizontal number line with tick marks at 0, 1, and 2. The segment from 0 to 1 is shaded black. Above the line, the word "Kilometers" is written in a bold, italicized font.

Coordinate System: British National Grid

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Rev	Date	By	Chkd	Appd	Authd

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Drawing Title

Bittern/Marsh Harrier Survey VP Locations

Page 148

Scale at A3

Role

Ecology

Suitability

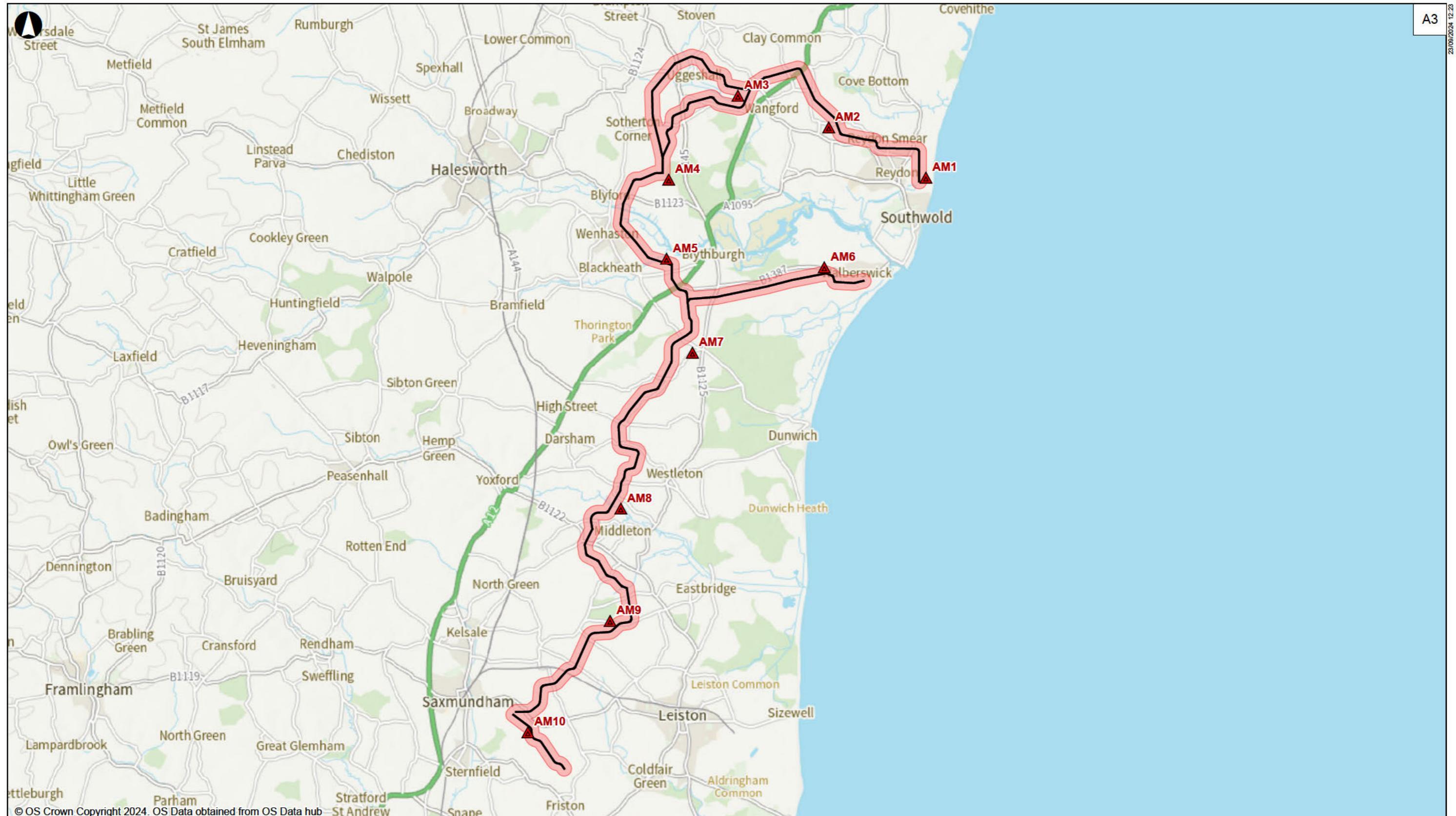
For Information

Project Number

287334

Drawing Number

Figure 3



▲ Acoustic Monitoring Device Location

— Proposed Cable Routes

Route 200m Buffer

A horizontal number line with tick marks at 0, 0.5, 1, 2, 3, 4, and 5. The segment from 0 to 2 is shaded in gray. Above the number line, the word "Kilometers" is written in a bold, italicized font.

Coordinate System: British National Grid

1	23/09/2024	JG	DB	RM	AC
Rev	Date	By	Chkd	Appd	Authd

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Acoustic Monitoring Locations

scale at A3

1:100,000

ole

Ecology

suitability

For Information

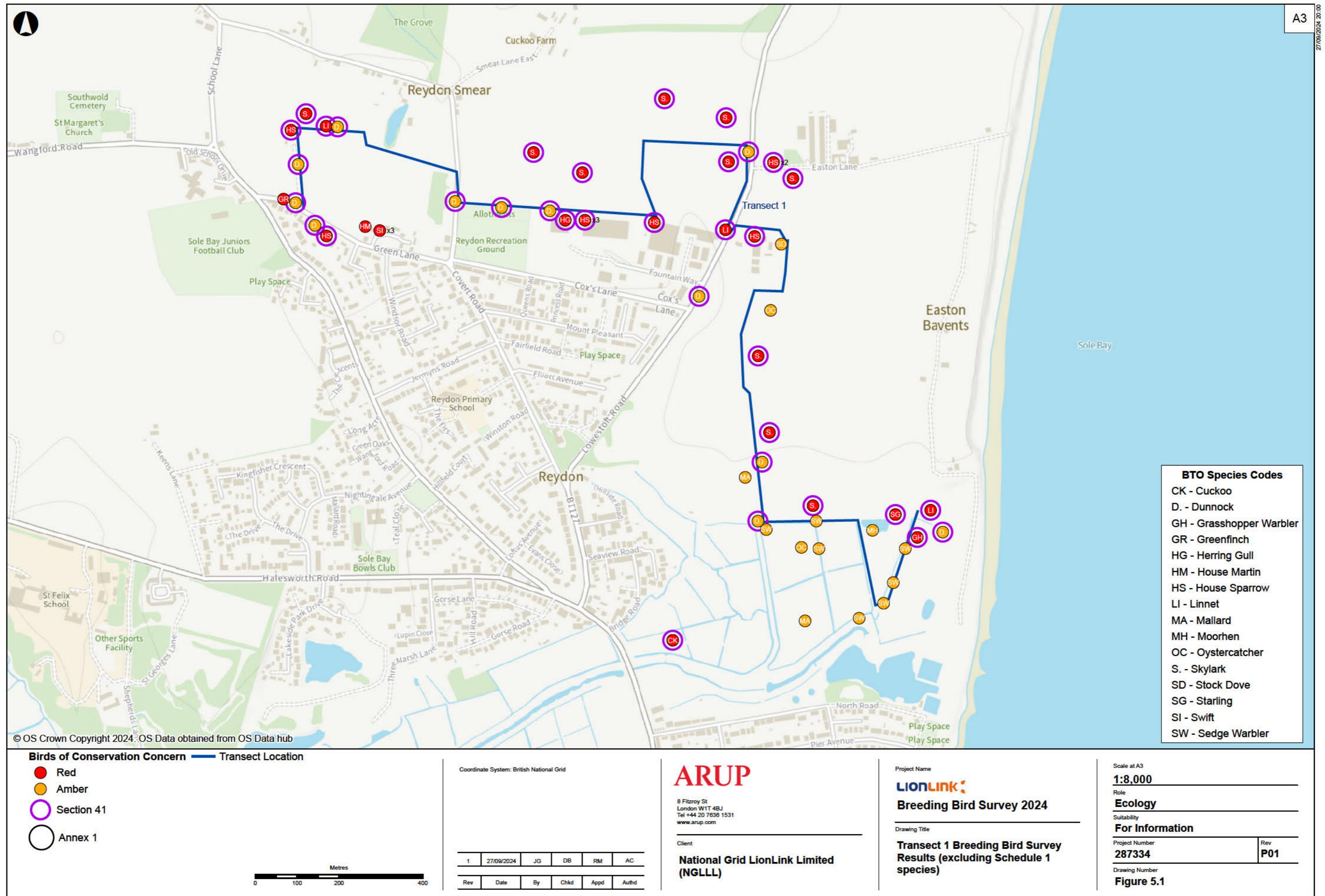
Project Number

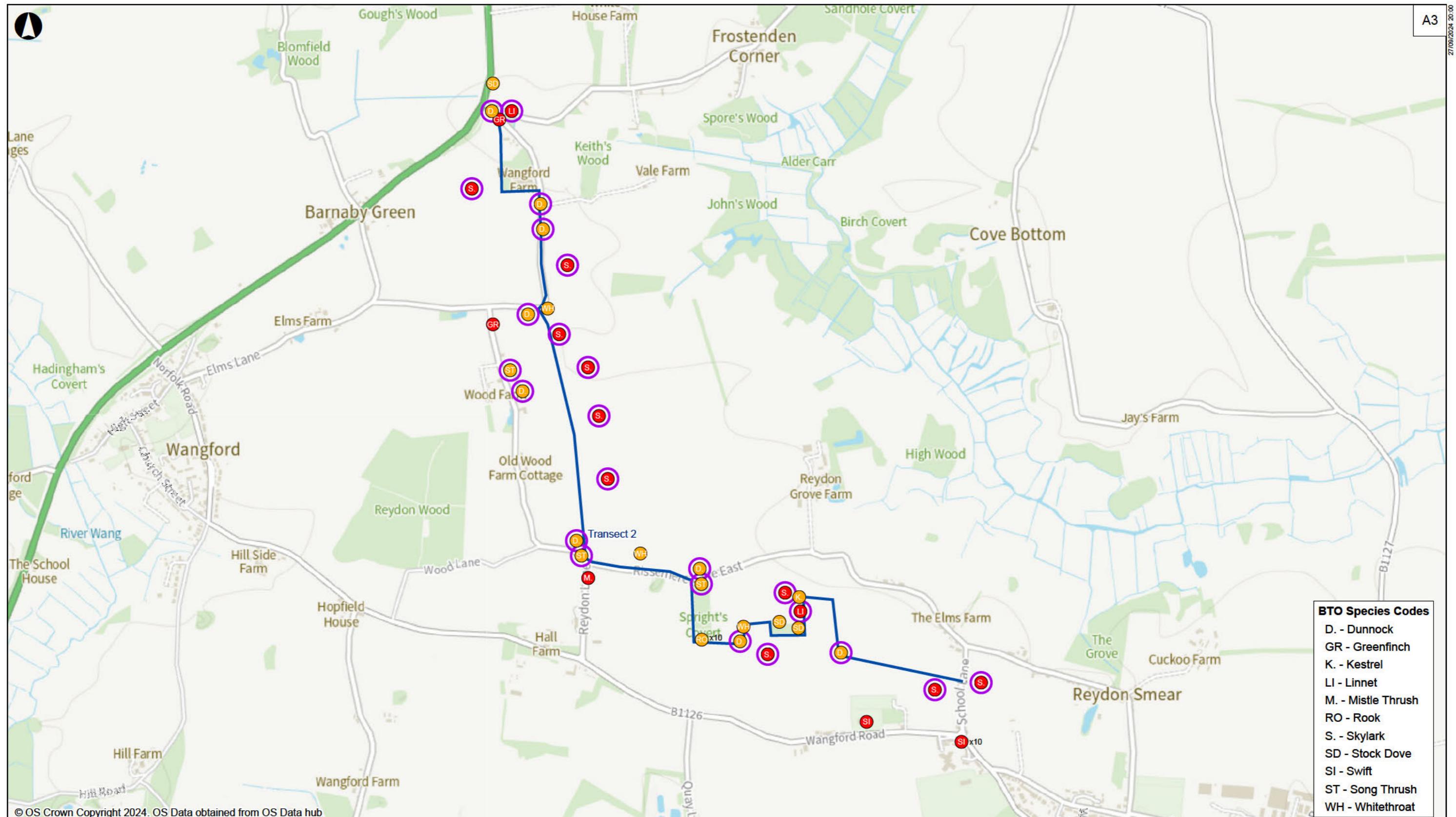
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Figure 4





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Birds of Conservation Concern — Transect Location

● Red

● Amber

8

metres

Coordinate System: British National Grid

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Breeding Bird Survey 2024

Drawing

Transect 2 Breeding Bird Survey Results (excluding Schedule 1 species)

Scale at A3

1:12,500

Role

Ecology

Suitability

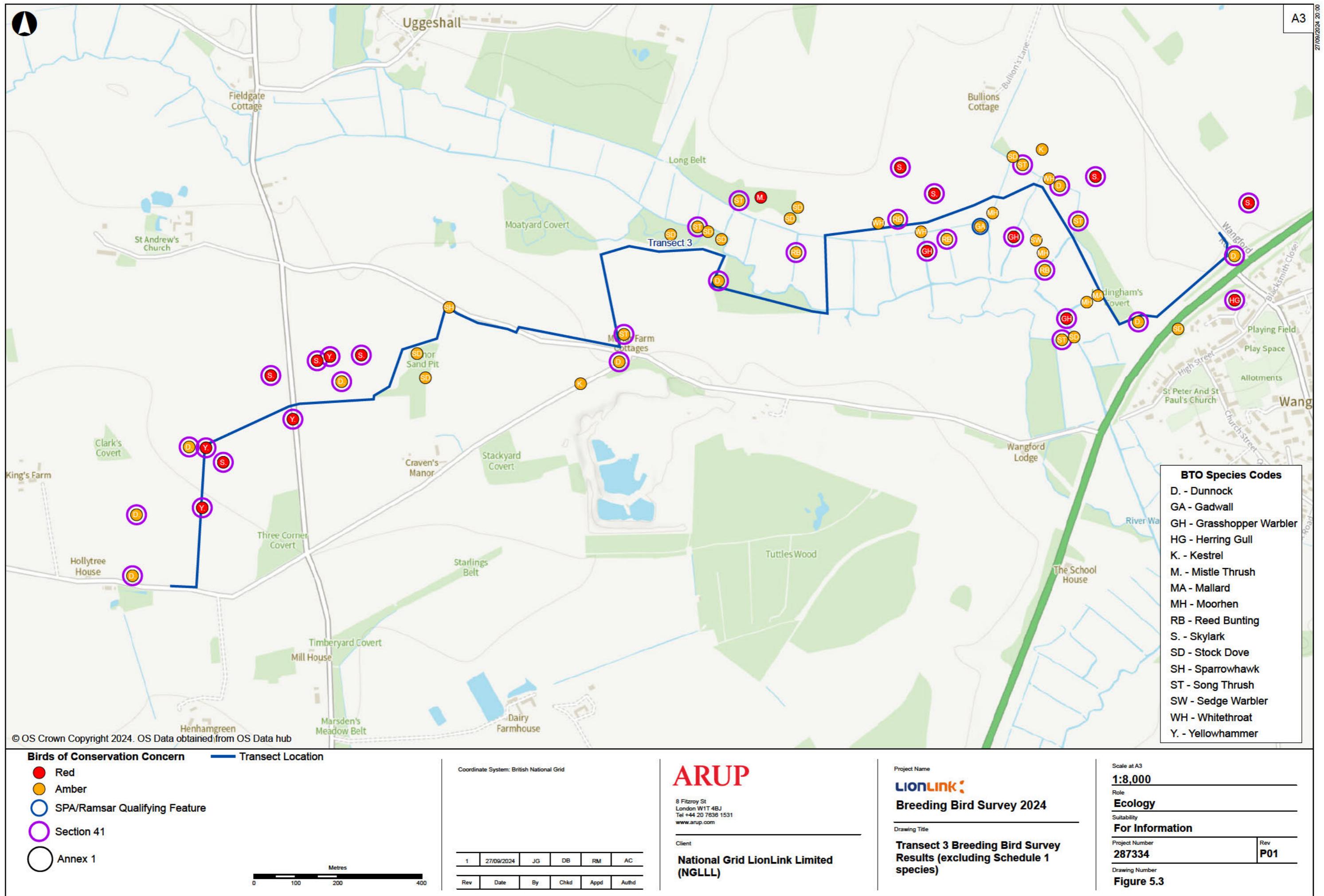
For Info

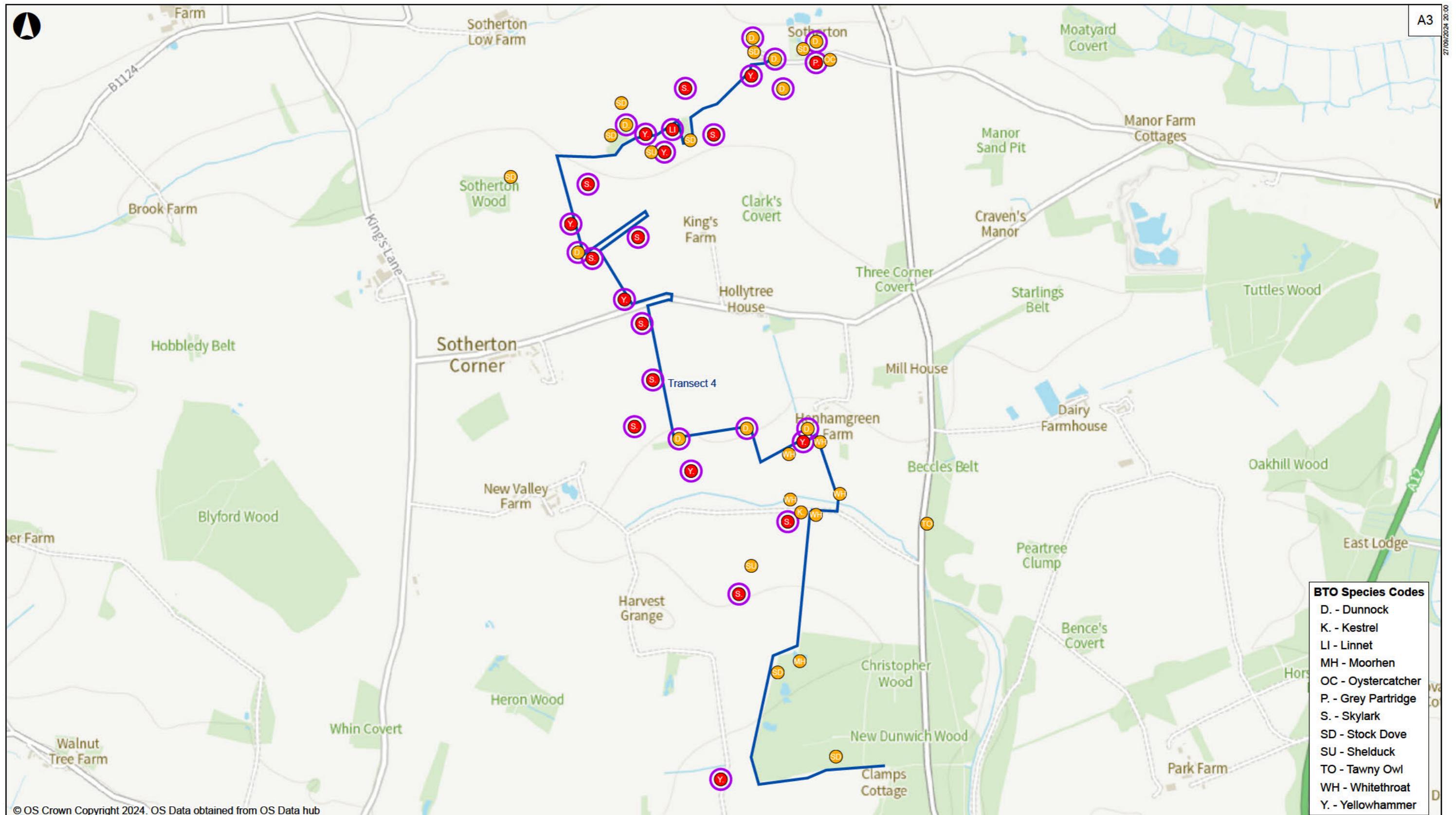
Project Number

Project Name
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201804

Drawing Number





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Birds of Conservation Concern — Transect Location

● Red

Amber

Annex 1

Metres



0 100 200 400

Coordinate System: British National Grid

1	27/09/2024	JG	DB	RM	AC
Rev	Date	By	Chkd	Appd	Authd

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Breeding Bird Survey 2024

Drawing

Transect 4 Breeding Bird Survey Results (excluding Schedule 1 species)

Scale at A3

1:11,500

Role

Ecology

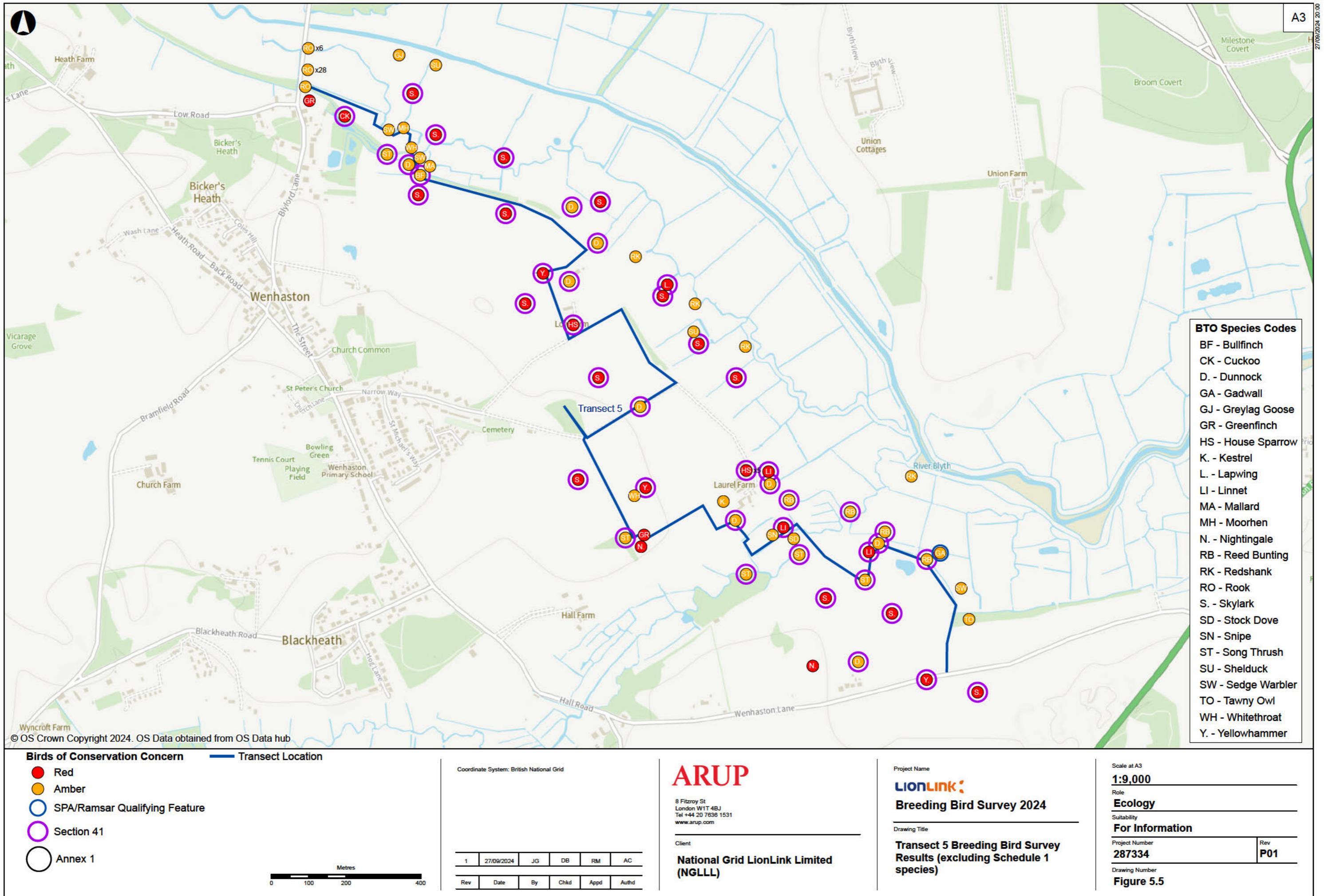
Suitability

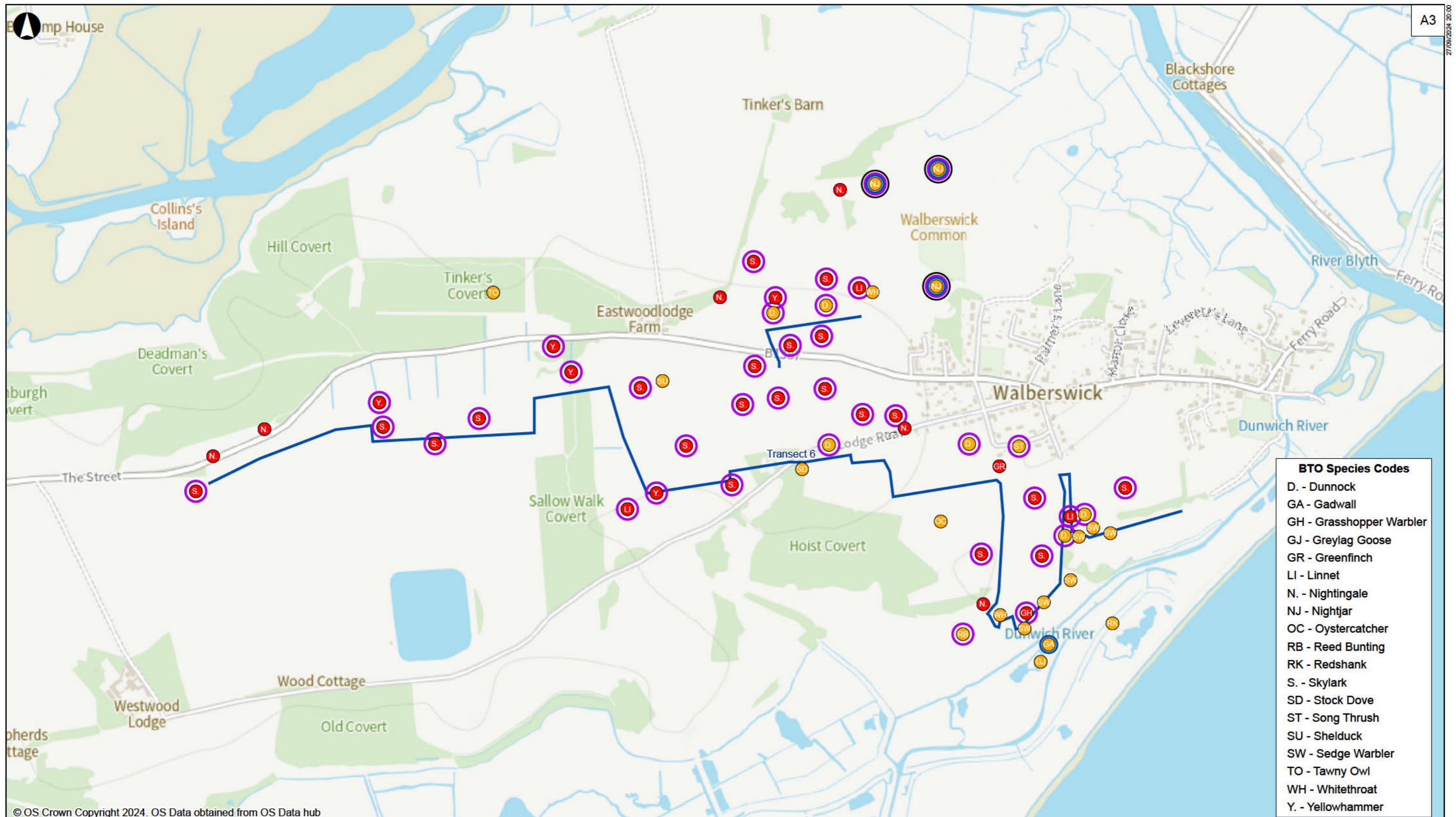
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Project Number

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Drawing Number





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Birds of Conservation Concern — Transect Location

- Red
- Amber
- SPA/Ramsar Qualifying Feature
- Section 41
- Annex 1

Coordinate System: British National Grid

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Rev	Date	By	Chkd	Appd	Authd

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Breeding Bird Survey 2024

Drawing Tip

Transect 6 Breeding Bird Survey Results (excluding Schedule 1 species)

Scale at A3

1:11,000

Role

Ecology

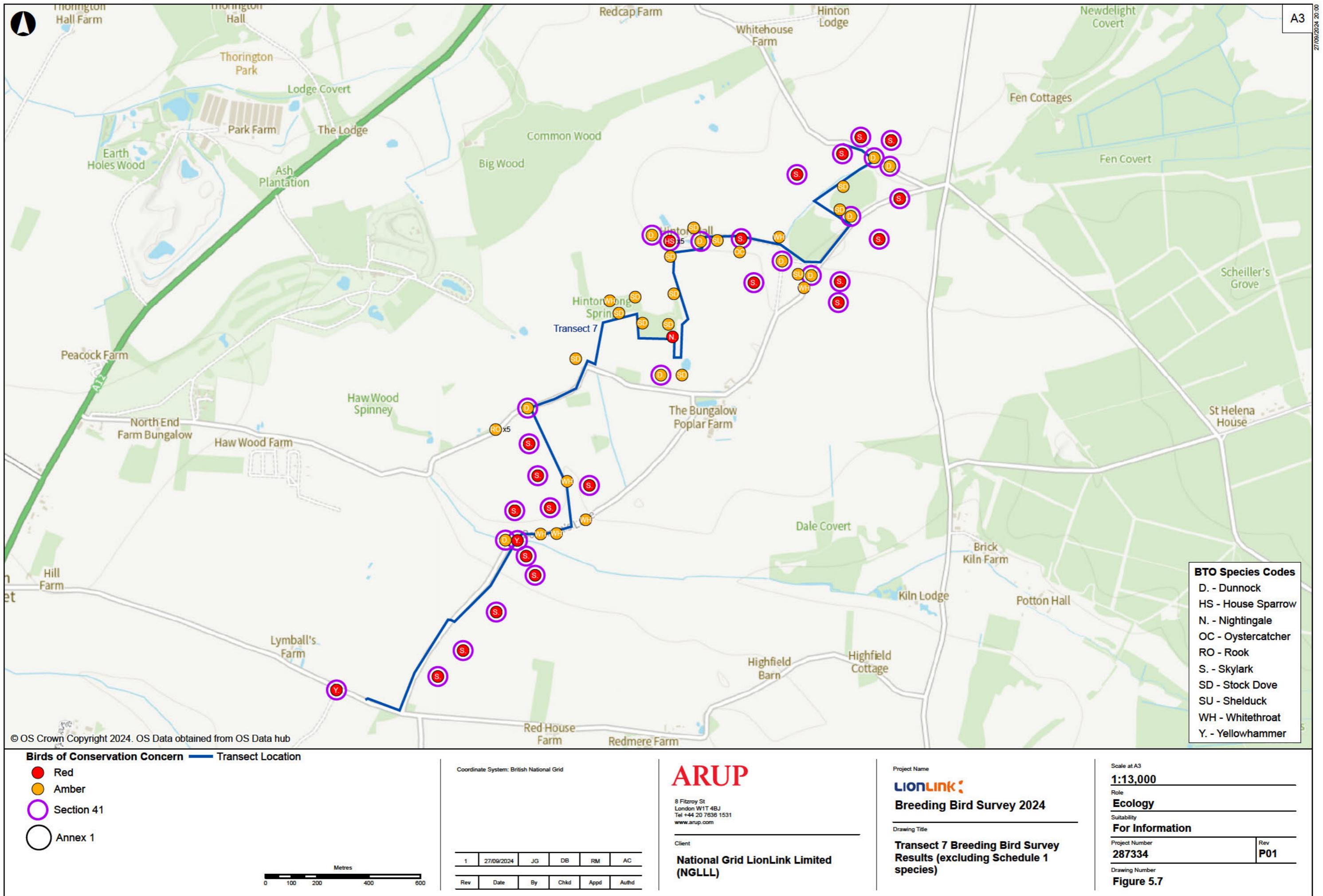
Suitability

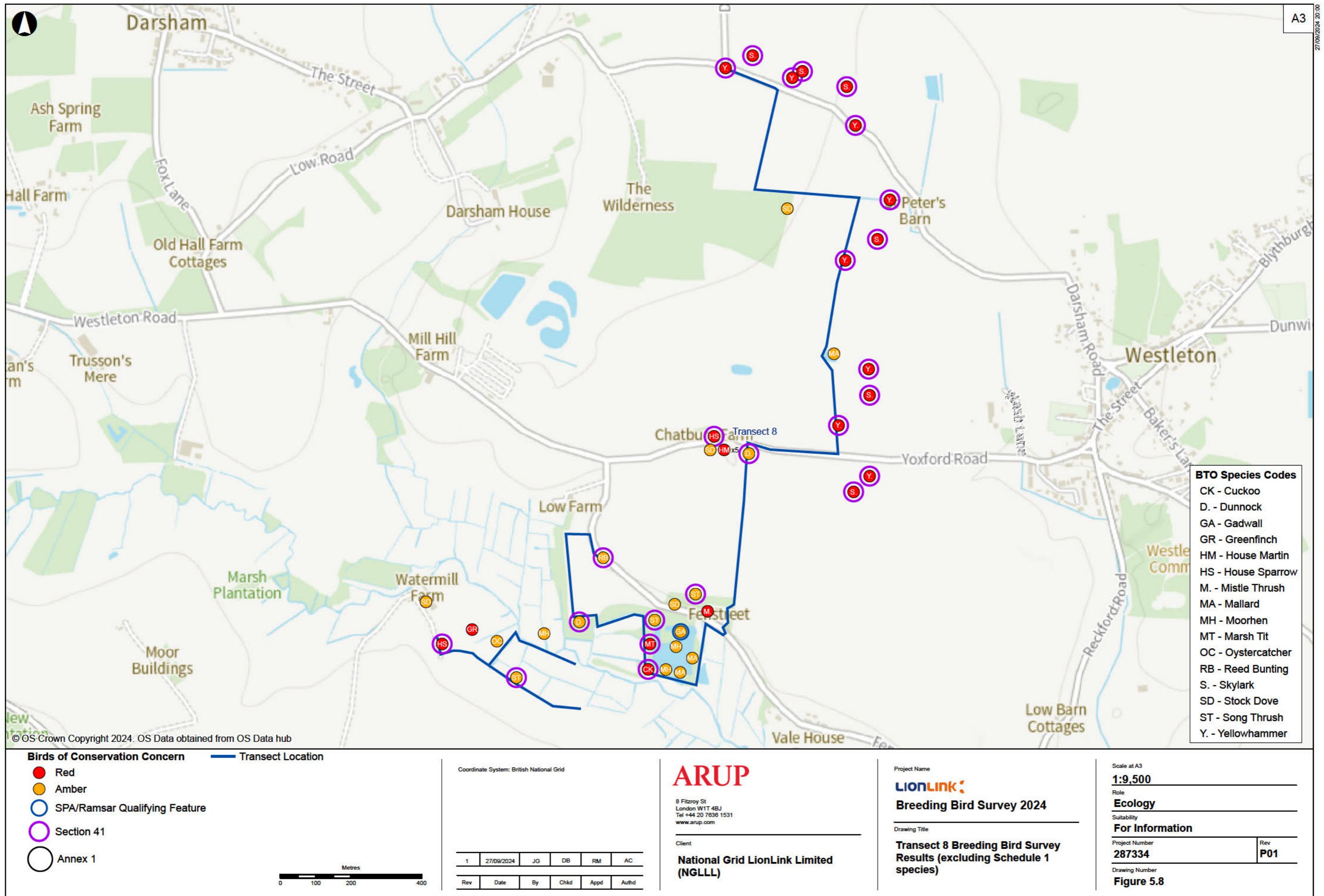
For Info

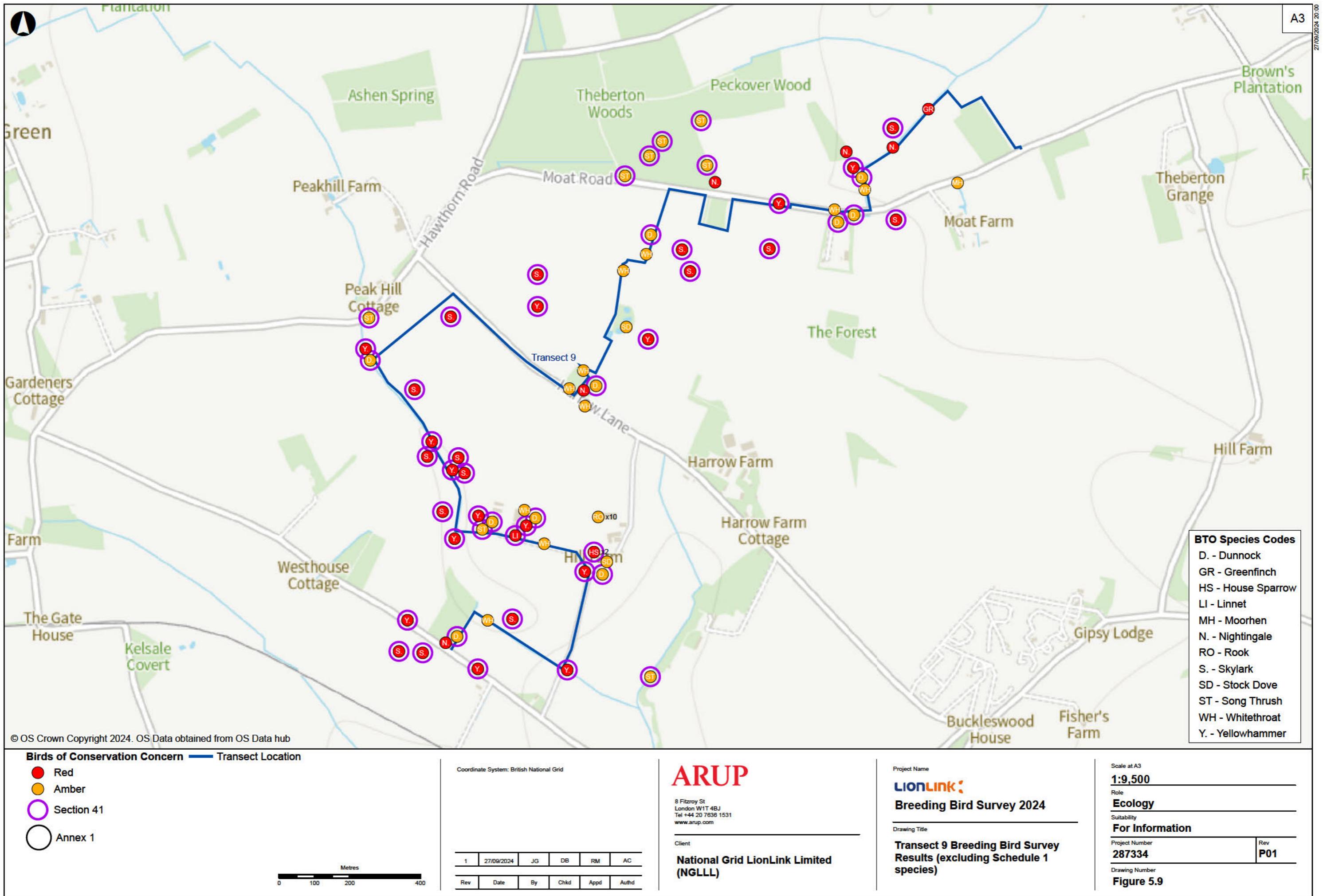
Project Numbr

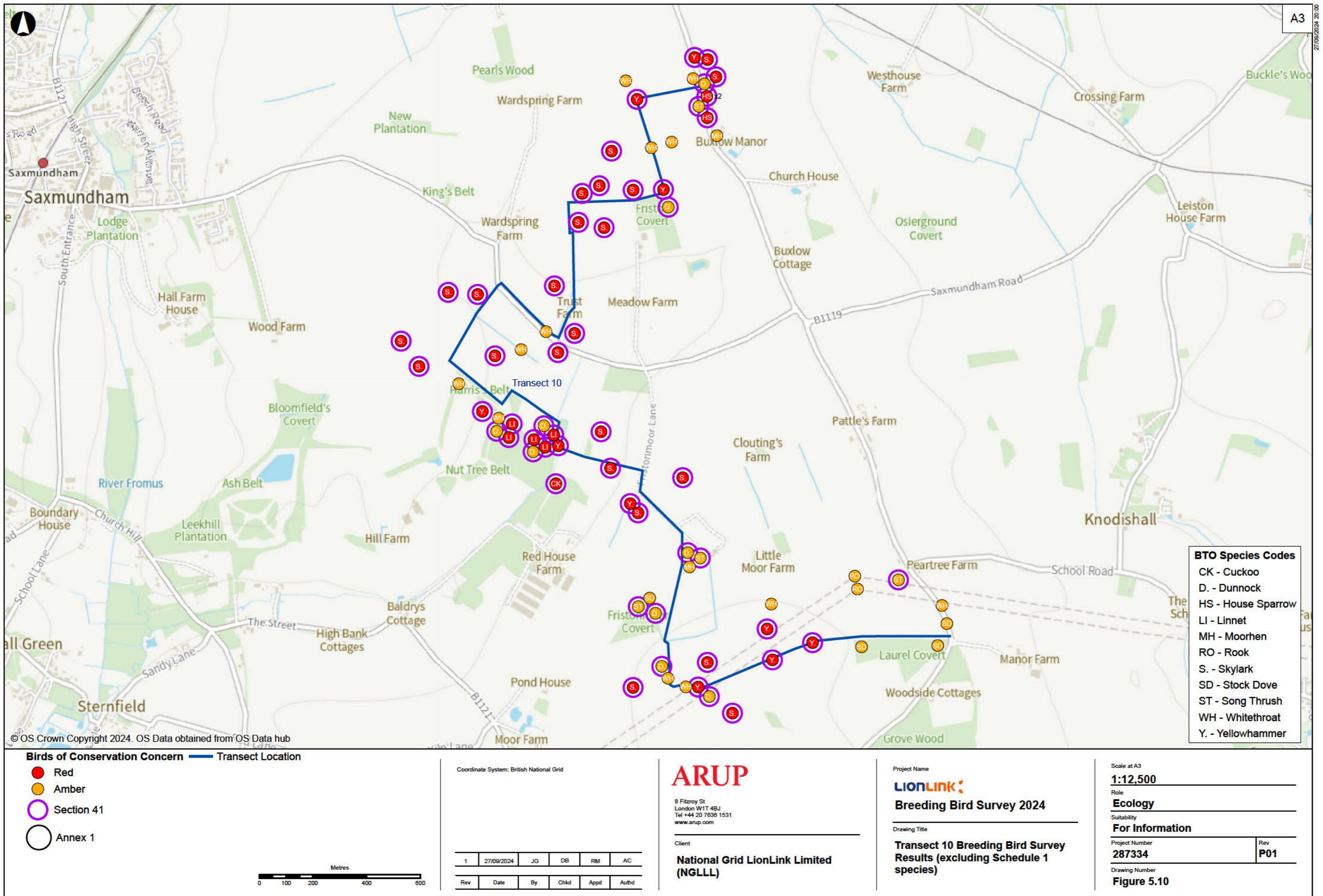
287334

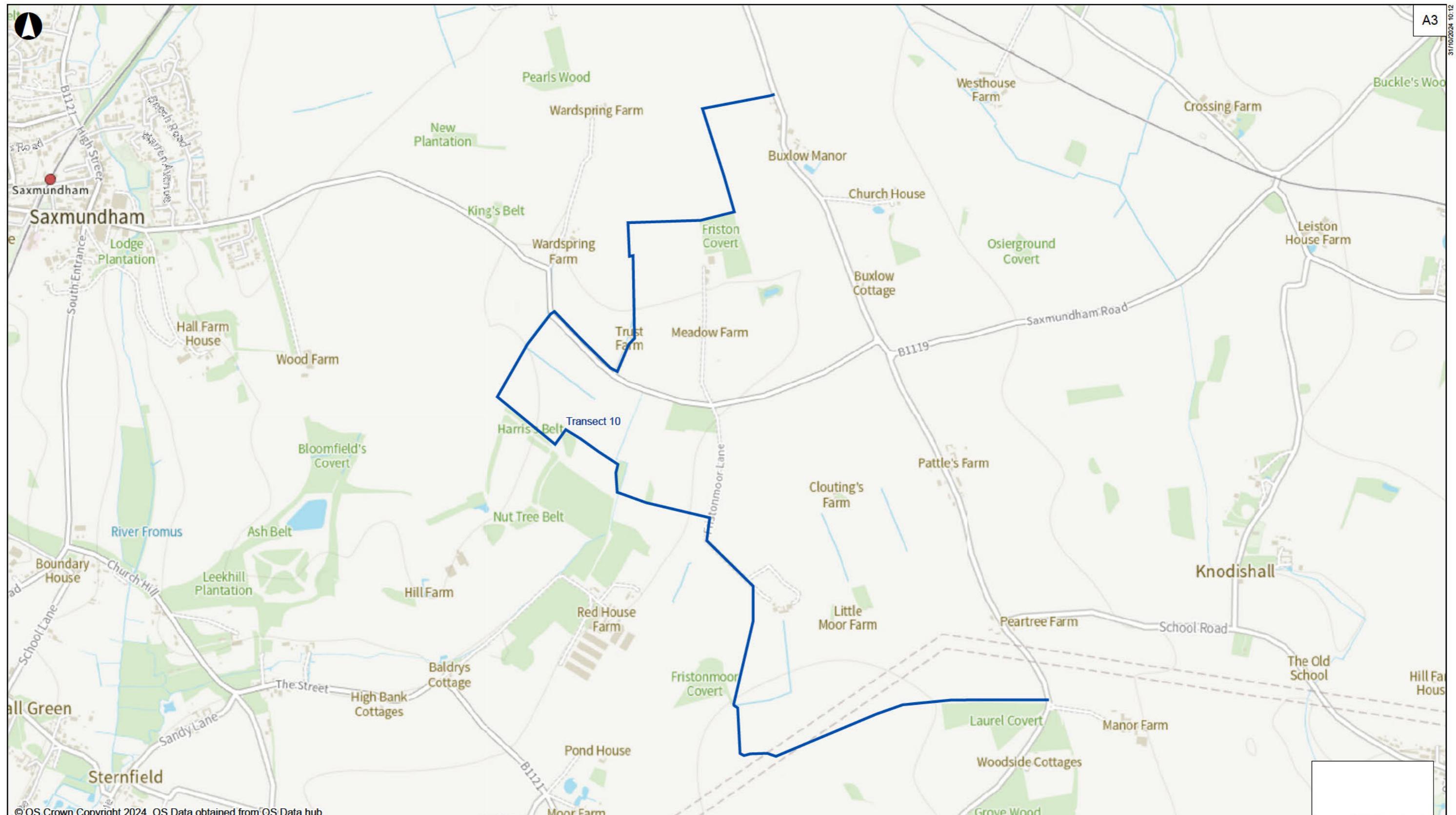
Drawing Num











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— Transect Location

Metres

0 100 200 400 600

Coordinate System: British National Grid

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Breeding Bird Survey 2024

Drawing Triangles

Transect 10 Schedule 1 Breeding Bird Survey Results

Scale at A3

1:12,500

Role

Ecology

Suitability

For Information

Project Number

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Drawing Number

Figure 6.10

Appendix B

Survey Details

Weather Data

Transect Ref	Date	Start Time	End Time	Wind Speed (Beaufort Scale)	Wind Direction	Precipitation (0 - none to 4 - heavy rain/snow)	Cloud cover (oktas)	Cloud Height (0 - <150m, 1 - 150-500m, 2 - >500m)	Visibility (0 - <1km, 1 - 1-3km, 2 - >3km)	Lying Snow (0 - none, 1 - on site, 2 - on higher ground)	Frost (0 - none, 1 - ground, 2 - all day)	Temp (°C)
Transect Surveys												
Visit 1 (March 2024)												
T1	28/03/2024	05:50	09:10	2-3	S/SE	0	6-8	2	2	0	0	7-8
T2	27/03/2024	05:55	09:15	2-4	S/SSW	0	6-7	2	2	0	0	6-10
T3	27/03/2024	05:55	09:15	2-4	S/SSW	0	6-7	2	2	0	0	6-10
T4	27/03/2024	05:55	09:15	2-4	S/SSW	0	6-7	2	2	0	0	6-10
T5	26/03/2024	06:05	09:10	2	SE	0	5-8	2	2	0	0	8-9
T6	26/03/2024	06:05	09:10	2	SE	0	5-8	2	2	0	0	8-9
T7	26/03/2024	06:05	09:10	2	SE	0	5-8	2	2	0	0	8-9
T8	25/03/2024	06:00	09:30	1-3	S/SE	0	5-6	2	1-2	0	0	6-9
T9	25/03/2024	06:00	09:30	1-3	S/SE	0	5-6	2	1-2	0	0	6-9
T10	25/03/2024	06:00	09:30	1-3	S/SE	0	5-6	2	1-2	0	0	6-9
Visit 2 (April 2024)												
T1	17/04/2024	06:05	09:00	1-2	WNW/NW	0	0-5	2	2	0	0	5-6
T2	18/04/2024	06:20	08:30	1-2	N/NNW	0	1-2	2	2	0	0	6-8
T3	17/04/2024	06:05	09:00	1-2	WNW/NW	0	0-5	2	2	0	0	5-6
T4	17/04/2024	06:05	09:00	1-2	WNW/NW	0	0-5	2	2	0	0	5-6
T5	16/04/2024	06:20	10:05	3	NW	0	6-8	2	2	0	0	8-9
T6	16/04/2024	06:20	10:05	3	NW	0	6-8	2	2	0	0	8-9
T7	16/04/2024	06:20	10:05	3	NW	0	6-8	2	2	0	0	8-9
T8	15/04/2024	06:10	09:30	4	SW	0	6-8	2	2	0	0	8-10
T9	15/04/2024	06:10	09:30	4	SW	0	6-8	2	2	0	0	8-10
T10	15/04/2024	06:10	09:30	4	SW	0	6-8	2	2	0	0	8-10
Visit 3 (April – May 2024)												
T1	01/05/2024	05:55	08:55	1-2	ESE	0	3-8	2	2	0	0	11-12
T2	29/04/2024	06:00	09:00	1-3	S/SSW	0	0-3	2	2	0	0	8-12
T3	30/04/2024	05:55	08:50	1-2	SE/SSE	0	0-3	2	2	0	0	9-13
T4	03/05/2024	05:45	08:45	1-2	W/WSW	0-1	8	2	2	0	0	10-11

Transect Ref	Date	Start Time	End Time	Wind Speed (Beaufort Scale)	Wind Direction	Precipitation (0 - none to 4 - heavy rain/snow)	Cloud cover (oktas)	Cloud Height (0 - <150m, 1 - 150-500m, 2 - >500m)	Visibility (0 - <1km, 1 - 1-3km, 2 - >3km)	Lying Snow (0 - none, 1 - on site, 2 - on higher ground)	Frost (0 - none, 1 - ground, 2 - all day)	Temp (°C)
T5	30/04/2024	05:55	09:00	1-2	SE/SSE	0	0-3	2	2	0	0	9-13
T6	02/05/2024	05:55	09:55	1-2	E/NE	0	3-6	2	2	0	0	10-14
T7	29/04/2024	06:00	09:00	1-3	S/SSW	0	0-3	2	2	0	0	8-12
T8	01/05/2024	05:55	08:55	1-2	ESE	0	3-8	2	2	0	0	11-12
T9	29/04/2024	06:00	09:00	1-3	S/SSW	0	0-3	2	2	0	0	8-12
T10	29/04/2024	06:00	09:00	1-3	S/SSW	0	0-3	2	2	0	0	8-12
Visit 4 (May – June 2024)												
T1	20/05/2024	05:15	08:55	3	N/NNE	0	7-8	2	2	0	0	10-13
T2	22/05/2024	19:00	22:00	3	SW	0	3-4	2	2	0	0	14
T3	22/05/2024	19:00	22:00	3	SW	0	3-4	2	2	0	0	14
T4	28/05/2024	05:00	08:55	1-2	S/SSW	0	6-8	2	2	0	0	10-15
T5	21/05/2024	19:00	22:00	1-2	N/NE	0	6-7	2	2	0	0	15-13
T6	21/05/2024	05:20	09:40	1-2	N/NE	0	7-8	2	2	0	0	12-14
T7	20/05/2024	05:15	08:55	3	N/NNE	0	7-8	2	2	0	0	10-13
T8	03/06/2024	05:00	08:30	1	SW/WNW	0	3-7	2	2	0	0	10-14
T9	24/05/2024	05:10	08:20	1	SW/WSW	0	0-3	2	2	0	0	10-13
T10	17/05/2024	05:15	08:45	0-1	N	0	2-4	2	2	0	0	9-12
Visit 5 (June 2024)												
T1	05/06/2024	20:00	22:30	0	-	0	1-2	2	2	0	0	11-12
T2	04/06/2024	05:00	08:55	1-2	S/SW	0	8	2	2	0	0	12-14
T3	03/06/2024	05:00	08:50	1	WNW	0	3-7	2	2	0	0	11-16
T4	06/06/2024	19:30	22:30	1-2	E/SSE	0	4-6	2	2	0	0	13-15
T5	05/06/2024	04:55	08:45	1-2	W	0	5-7	2	2	0	0	8-11
T6	07/06/2024	19:30	22:30	2	WSW/SW	0	1-3	2	2	0	0	15-17
T7	07/06/2024	04:50	07:50	2	W	0	2	2	2	0	0	9-12
T8	21/06/2024	05:00	09:00	1	N	0	3-5	2	2	0	0	9-15
T9	04/06/2024	19:30	22:30	2-3	WSW/NNW	0-1	8	2	2	0	0	14-15
T10	03/06/2024	05:00	08:50	1	WNW	0	3-7	2	2	0	0	10-16
Visit 6 (July 2024)												
T1	11/07/2024	05:00	09:20	1	SW/W	0	3-7	2	2	0	0	12-16
T2	08/07/2024	05:10	08:40	1	SW	0	1	2	2	0	0	11-15
T3	09/07/2024	05:05	08:45	2-4	SE/SSE	0-2	7-8	2	2	0	0	15-17
T4	11/07/2024	05:00	09:20	1	SW/W	0	3-7	2	2	0	0	12-16
T5	11/07/2024	05:00	09:20	1	SW/W	0	3-7	2	2	0	0	12-16

Transect Ref	Date	Start Time	End Time	Wind Speed (Beaufort Scale)	Wind Direction	Precipitation (0 - none to 4 - heavy rain/snow)	Cloud cover (oktas)	Cloud Height (0 - <150m, 1 - 150-500m, 2 - >500m)	Visibility (0 - <1km, 1 - 1-3km, 2 - >3km)	Lying Snow (0 - none, 1 - on site, 2 - on higher ground)	Frost (0 - none, 1 - ground, 2 - all day)	Temp (°C)
T6	10/07/2024	05:05	09:45	2-3	SW/SSW	0	5-7	2	2	0	0	17-18
T7	09/07/2024	19:40	22:40	2	S/SW	0-1	7-8	2	2	0	0	18-20
T8	10/07/2024	19:40	22:40	2-3	SW/WSW	0	8	2	2	0	0	16-20
T9	12/07/2024	05:15	08:45	2-3	N	0	7	2	2	0	0	13-15
T10	08/07/2024	19:35	22:40	2	SE/ESE	0	2-3	2	2	0	0	16-18
Bittern Surveys												
Visit 1												
VP1	02/04/2024	04:30	07:30	0-1	SW	0-1	0-8	2	1-2	0	0	7-10
VP2	04/04/2024	04:30	07:30	1	S/N	0	6-8	2	2	0	0	9
VP3	03/04/2024	04:30	07:00	1-2	SW	0	8	2	2	0	0	10
Visit 2												
VP1	26/04/2024	03:31	06:31	2	WNW	0	6	2	2	0	0	3-4
VP2	03/05/2024	03:15	06:15	2-3	W	0	8	2	2	0	0	10-11
VP3	25/04/2024	03:34	06:34	3	W	0	4-6	2	2	0	0	0-1
Visit 3												
VP1	20/05/2024	20:00	23:00	1-2	NNE	0	4-6	2	2	0	0	12
VP2	21/05/2024	20:00	23:00	1-2	N/NNW	0-1	8	2	2	0	0	14
VP3	23/05/2024	02:50	05:50	1-2	SW	0	0	2	2	0	0	12-13
Marsh Harrier Surveys												
Visit 1												
VP1	02/04/2024	07:30	11:30	0-1	SW	0-1	0-7	2	1-2	0	0	10
VP2	04/04/2024	07:30	11:30	1-3	N/SW	0	8	2	2	0	0	9-12
VP3	03/04/2024	07:00	10:30	1-2	SW	0	8	2	1-2	0	0	10
Visit 2												
VP1	26/04/2024	06:31	10:31	2	WNW	0	6	2	2	0	0	3-4
VP2	03/05/2024	06:15	10:15	1-2	W/WSW	0-1	8	2	2	0	0	10-11
VP3	25/04/2024	06:34	10:34	3	W	0	4-6	2	2	0	0	0-1
Visit 3												
VP1	20/05/2024	16:00	20:00	2	NNE	0	5	2	2	0	0	13-15
VP2	21/05/2024	16:00	20:00	1	N/NN	0-1	8	2	2	0	0	14-16
VP3	23/05/2024	05:50	09:50	2-3	SW/WSW	0	4-7	2	2	0	0	13-14

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