MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 3, Annex 4.2: Wintering and migratory birds technical report – Part 1 of 2

September 2024
Rev: ES Issue
MOR001-FLO-CON-ENV-RPT-0087
MRCNS-J3303-RPS-10102

PINS Reference: EN020028
APFP Regulations: 5(2)(a)
Document reference: F3.4.2

Document status					
Version	**Purpose of document**	**Approved by**	**Date**	**Approved by**	**Date**
ES	For issue	AS	July 2024	IM	July 2024

Prepared by:

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Prepared for:

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Glossary

Term	Meaning
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL).
Baseline	The status of the environment without the Transmission Assets in place.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Expert Working Group	A forum for targeted engagement with regulators and interested stakeholders through the Evidence Plan process.
Functionally Linked Land	Natural England's criteria from a recent report (Bowland Ecology, 2021) of what constitutes functionally linked land are areas of land that are regularly used by a significant number of qualifying bird species. A significant number of birds is defined as 0.5 % of the Great British population or 1,000 individuals (whichever is lowest). In addition, the phrase 'regularly used' is defined as seven or more years out of ten.
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bays inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore and onshore infrastructure connecting the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to the national grid. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).
Preliminary Environmental Information Report	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
Ramsar sites	Wetlands of international importance that have been designated under the criteria of the Ramsar Convention. In combination with Special Protection Areas and Special Areas of Conservation, these sites contribute to the national site network.
Study area	This is an area which is defined for each environmental topic which includes the Transmission Assets Order Limits: Onshore as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each topic is intended to cover the area within which an impact can be reasonably expected.
Survey area	The area within which each survey has been undertaken. This may differ from the Study Area as a Survey Area will be based on species or survey-specific guidance on the extent of survey required, which may be limited by, for example, habitat conditions, or be defined in terms of buffer areas around an area of potential impact.

Term	Meaning
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above).
Transmission Assets Order Limits: Onshore	The area within which all components of the Transmission Assets landward of Mean High Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds). Also referred to in this report as the Onshore Order Limits, for ease of reading.

Acronyms

Acronym	Meaning
BOCC5 UK	Birds of Conservation Concern
BTO	British Trust for Ornithology
ES	Environmental Statement
EWG	Expert Working Group
LNR	Local Nature Reserve
NNR	National Nature Reserve
PEIR	Preliminary Environmental Information Report
PRoW	Public Rights of Way
RSPB	Royal Society for the Protection of Birds
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom
VPs	Vantage point

Units

Unit	Description
ha	Hectares
km	Kilometres
km^2	Square kilometres
m	Metres
%	Percentage

1 Onshore and intertidal ornithology - wintering and migratory birds technical report

1.1 Introduction

1.1.1 Background

1.1.1.1 This document forms Annex 4.2 Wintering and migratory birds technical report of the Environmental Statement (ES) prepared for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (hereafter referred to as the 'Transmission Assets'). It describes the methods used to characterise the baseline wintering and migratory bird assemblage and presents the results of the desk-based studies and site-specific surveys undertaken across the 2022/23 and 2023/24 wintering and migratory seasons.

1.1.1.2 This annex should be read in conjunction with Volume 3, Annex 4.1: Breeding birds technical report, Volume 3, Annex 4.3: Intertidal birds technical report and Volume 3, Annex 4.4: Onshore and intertidal ornithology survey methodologies of the ES.

1.1.1.3 This baseline information has been used to inform the assessment reported in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.

1.1.1.4 Throughout this report the order in which birds are presented is based upon the British List (2023) as maintained by the British Ornithologists' Union and is correct as of the most recent update published in December 2023.

1.2 Methodology

1.2.1 Study and survey areas

1.2.1.1 In this report, there are two specific terms used to identify areas used for baseline data collection, as outlined below.

1.2.2 The study area

1.2.2.1 The Transmission Assets onshore ornithology study area (hereafter referred to as 'the study area') is defined as the Transmission Assets Order Limits: Onshore, and the Intertidal Infrastructure Area plus a 20 kilometre (km) buffer. This has been used to identify any designated sides which could be impacted by the Transmission Assets and is based upon the core foraging range of pink-footed goose *Anser brachyrinchus* (NatureScot, 2016), which has largest foraging range of those features considered in the assessment. Designated sites identified include the following.

- Internationally designated ornithological sites, specifically Special Protection Areas (SPAs), potential SPAs and Ramsar sites with qualifying wintering and migratory features (**Figure 1.1**).

- Nationally designated sites, specifically Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) with qualifying wintering and migratory features (**Figure 1.2**).
- Locally designated sites, specifically Local Nature Reserves (LNRs) and Biological Heritage Sites (BHSs) (**Figure 1.3**).

1.2.3 The survey area

1.2.3.1 The Transmission Assets onshore ornithology survey area (hereafter referred to as 'the survey area') encompasses the Onshore Order Limits and the Intertidal Infrastructure Area (excluding the proposed mitigation area at Fairhaven Saltmarsh, 3 St Annes) plus a 500 metre (m) buffer. This was clipped at Highest Astronomical Tide as the area between Highest Astronomical Tide and Mean Low Water Springs is covered by Volume 3. Annex 4.3: Intertidal ornithology (document reference F3.4.3). The 500 m buffer was included to take account of bird interests that may occur adjacent or close to the Transmission Assets. The 500 m buffer was based on typical disturbance buffers (Goodship & Furness, 2022) for the non-breeding bird assemblage expected to occur in the survey area.

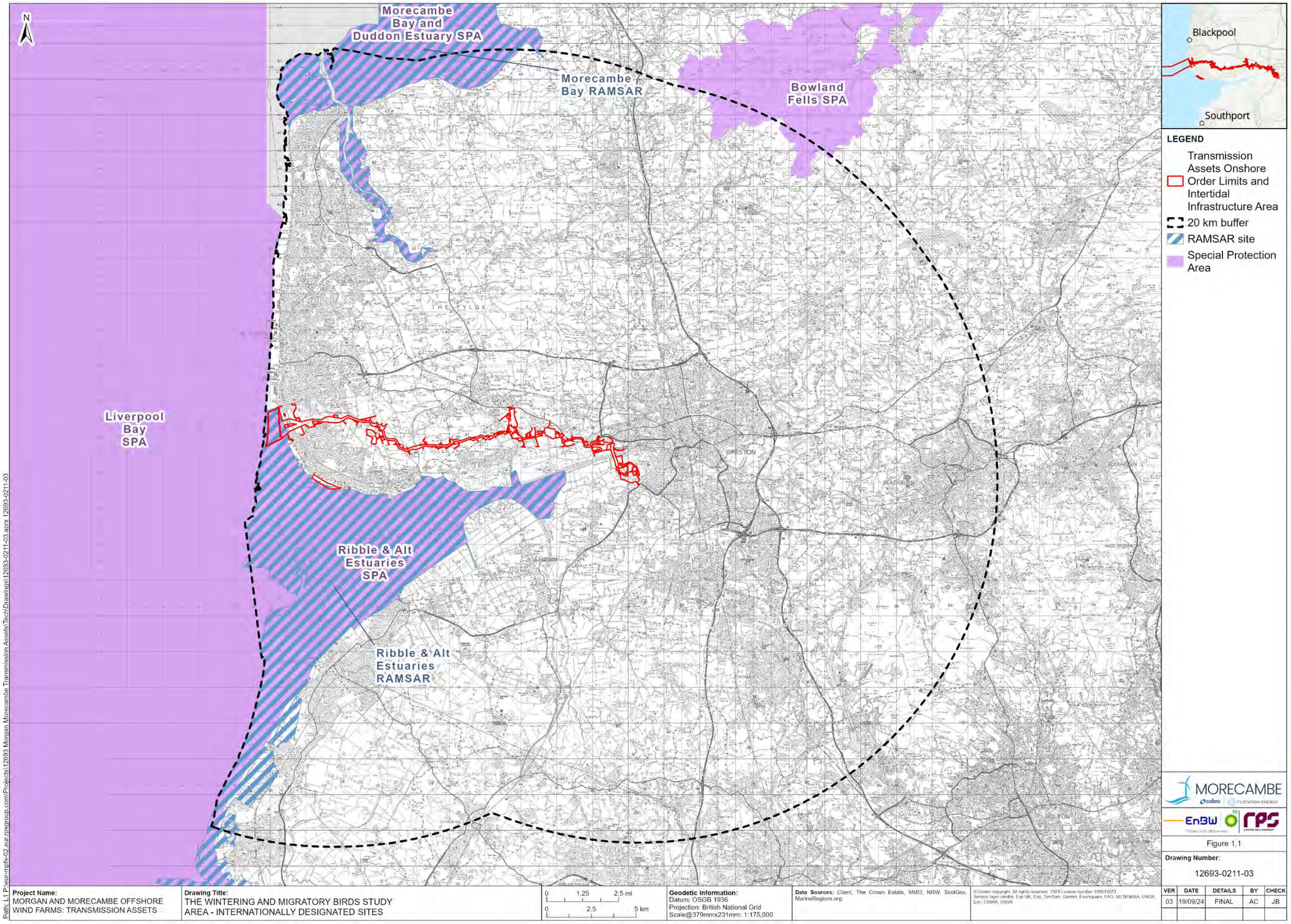


Figure 1.1: The wintering and migratory birds study area - internationally designated sites

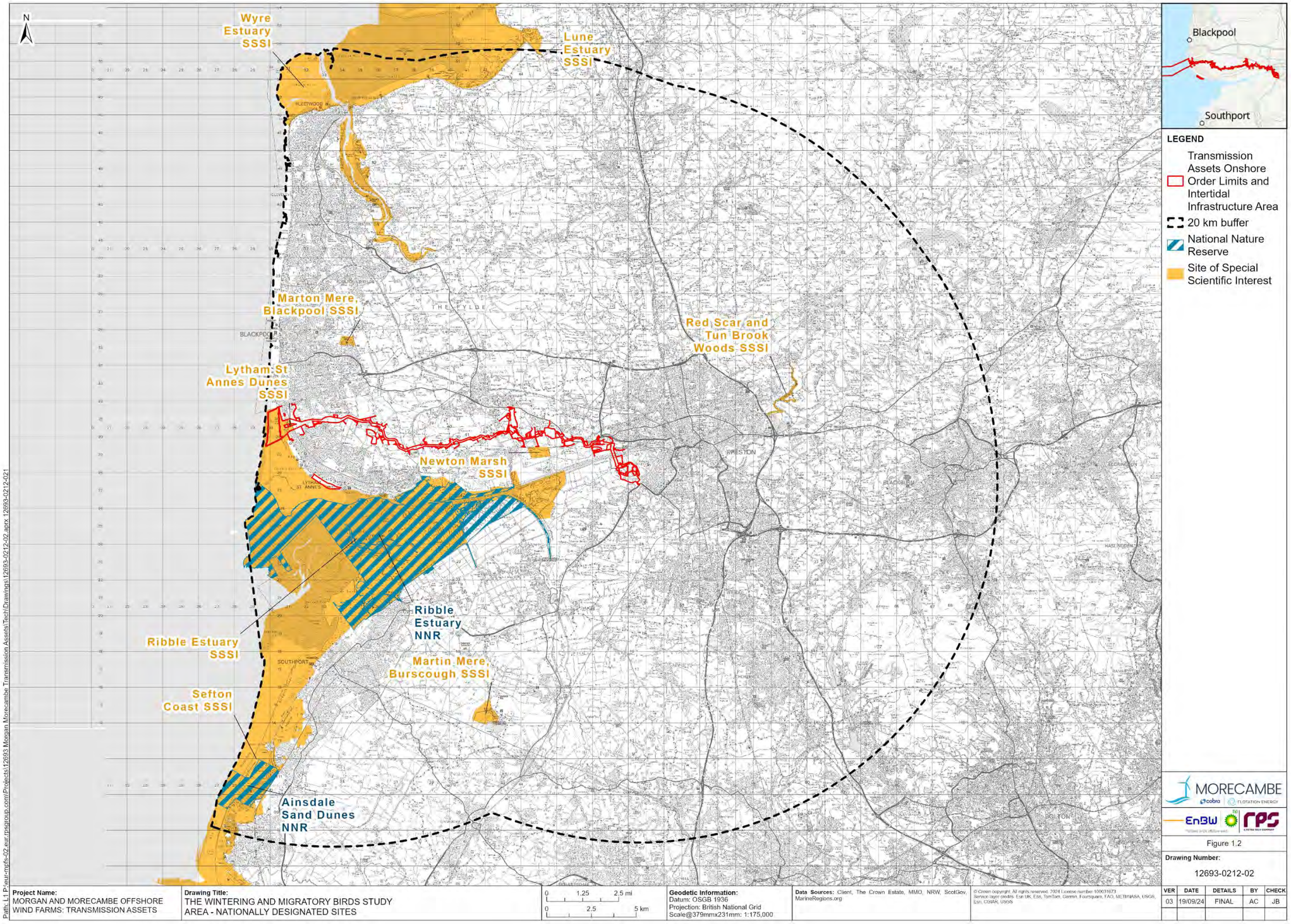


Figure 1.2: The wintering and migratory birds study area - nationally designated sites

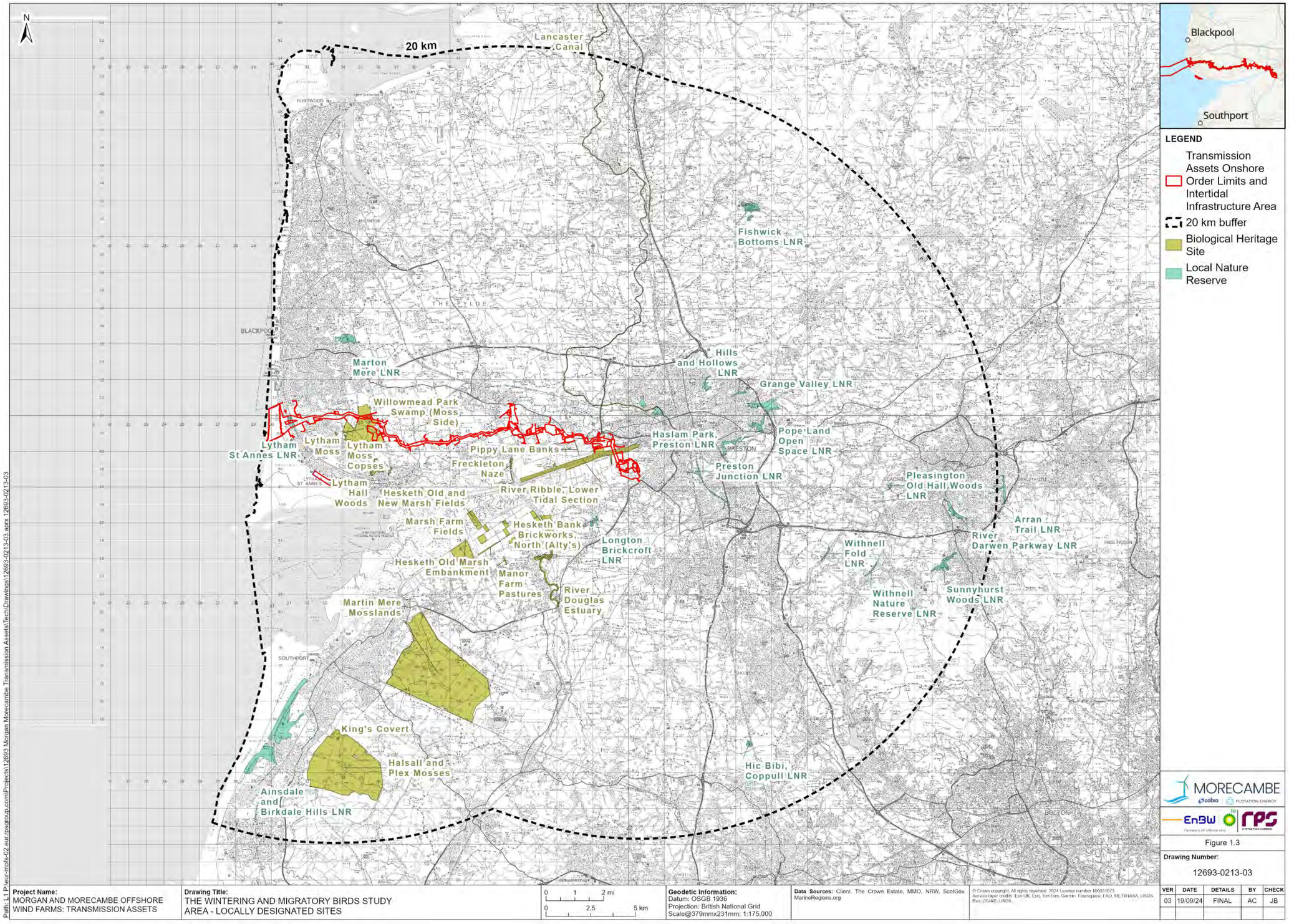


Figure 1.3: The wintering and migratory birds study area - locally designated sites

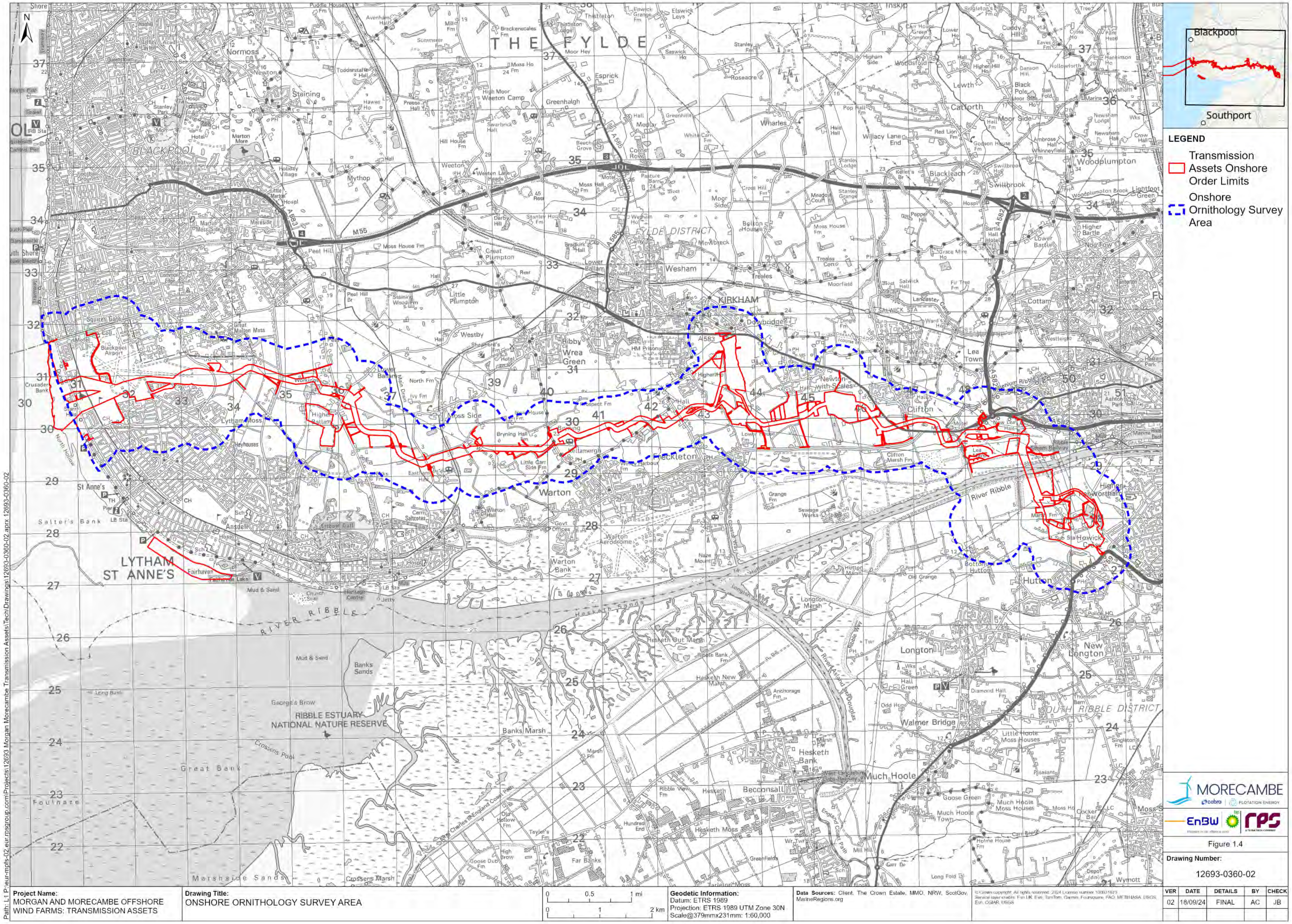


Figure 1.4: The survey area

1.2.4 Relevant legislation for wintering birds

1.2.4.1 There are two main pieces of legislation that protect birds under UK law, namely the Conservation of Habitats and Species Regulations 2017, as amended (hereafter referred to as 'the Conservation of Habitats and Species Regulations 2017'), and the Wildlife and Countryside Act 1981, as amended (hereafter referred to as 'the Wildlife and Countryside Act 1981').

1.2.4.2 European Council Directive 2009/147/EC (otherwise known as 'the Birds Directive') recognised that habitat loss and degradation are the most serious threats to the conservation of wild birds. It stated that all member States must designate SPAs for the survival of all Annex 1 species, sub-species, and all migratory bird species. After the UK left the European Union certain elements of the Birds Directive were transposed into UK law through the Conservation of Habitats and Species Regulations 2017. This has created a national site network to ensure continued protection for existing SPAs and to any new sites designated under these regulations.

1.2.4.3 All wild birds are protected under Part 1 of the Wildlife and Countryside Act 1981. Subject to the provisions of Section 1, if any person intentionally:

- kills, injures or takes any wild bird;
- takes, damages, or destroys the nest of a wild bird included in Schedule ZA1;
- takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
- takes or destroys an egg of any wild bird,

they will be guilty of an offence.

1.2.4.4 The two main pieces of legislation described above are supported by additional legislation. One key piece of legislation is Section 41 of the Natural Environment and Rural Communities Act 2006, which provides a list of 'species and habitats of principle importance'. Public bodies, including local authorities have a legal duty to have regard to conserving biodiversity in the exercise of their normal functions.

1.2.4.5 The collation of baseline data presented within this annex has considered the following guidance.

- Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines on ecological impact assessment (CIEEM, 2022).
- Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications (Natural England, 2022).

1.2.5 Consultation

1.2.5.1 The proposed wintering and migratory bird survey methodology and brief findings of the 2022/23 winter surveys were presented at the first Expert Working Group (EWG) in March 2023.

1.2.5.2 The overarching methodologies presented have been agreed by all consultees following presentation, and comments on detailed methodologies were provided by Natural England in September 2023. The full survey methodologies are reflected in Volume 3, Annex 4.4: Onshore and intertidal ornithology survey methodologies of the ES (document reference F3.4.4).

1.2.5.3 A summary of the key comments relevant to onshore and intertidal ornithology raised during consultation activities undertaken to date is presented in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES (document reference F3.4).

1.2.6 Approach to establishing the baseline

1.2.6.1 To establish a baseline of potential wintering and migratory birds within the study area, a combination of site-specific surveys and a review of existing data sources have been undertaken. The methodology followed during the site-specific surveys is described in **section 1.4.1**.

1.2.6.2 The results of the desk-based study undertaken are described in **section 1.3** and the results of the site-specific surveys in **section 1.4**.

1.2.7 Desk-based study data sources

1.2.7.1 Information on wintering and migratory birds within the survey area was collected through a desk-based study of existing data sources. These sources are summarised in **Table 1.1** below.

Table 1.1: Summary of key desk-based sources

Title	Source	Year published	Author	Year data obtained
British Trust for Ornithology (BTO) Data Report for the Transmission Assets – onshore elements.	BTO	2023	BTO	2023
Fylde Bird Club records.	Fylde Bird Club	2023	Ellis, P.	2023
Queensway Farmland Conservation Area and Nature Park Lytham St Annes Winter Bird Survey report 2020/2021.	The Environment Partnership Ltd.	2021	Jenkins, L.	2022
Morecambe Offshore Windfarm - Fylde Export Cable Route: Coastal and Estuarine Wintering Bird Survey Report – 2021/2022.	Avian Ecology Ltd.	2022	Hinchcliffe, Z.	2022

BTO records

1.2.7.2 Data from the BTO is presented for two periods and two data sources: survey data from across the UK between 2007 and 2011 to provide data for a complete atlas of the UK's wintering and breeding species and a separate list of species between 2018 and 2022 from the BTO's breeding bird survey BirdTrack application data.

1.2.7.3 The 2007 to 2011 data uses a 2 km square resolution, whereas the more recent data (2018 to 2022) uses a 1 km resolution, therefore the BTO records provide an indication of species that could be present within or in the vicinity of the Onshore Order Limits and the Intertidal Infrastructure Area. The resolution of the BTO data is high enough to know if presence at the 1 km or 2 km square indicates presence within the Onshore Order Limits and the Intertidal Infrastructure Area.

Fylde Bird Club data

1.2.7.4 Fylde Bird Club records were provided for a total of 26 tetrad squares (a group of four 1 km squares arranged into a 2 km by 2 km square) that are within, or partly overlap with, the survey area. Records were provided detailing a combination of individual species counts, dates and locations recorded across all months for ten years of data (2014 to 2023).

1.2.7.5 The Fylde Bird Club data records provide a wealth of valuable data, particularly in providing evidence of a species presence within the survey area. However, as the records represent a collation of member records, they do not necessarily represent an accurate relative abundance of all species present in the area as no evidence that they were systematically collected (e.g., defined methodologies, survey effort per area, and survey boundaries) were provided with the data set. Local records often include notable records of rarities but not necessarily regularly submitted records of common species within defined survey boundaries.

Processing the Fylde Bird Club data records

1.2.7.6 The Fylde Bird Club data was split into records submitted within the breeding season, March to July, and those outside the breeding season, August to February. A summary of the records for the non-breeding months are analysed and presented in this annex. The remaining monthly records, March to July, were categorised as potentially breeding and have been analysed and presented separately in Volume 3, Annex 4.1: Breeding birds technical report of the ES (document reference F3.4.1).

1.2.7.7 Further details of those species using the habitats that overlap with the Transmission Assets within the intertidal areas at the landfall and the tidal River Ribble crossing are presented in Volume 3, Annex 4.3: Onshore and intertidal ornithology - intertidal birds technical report of this ES (document reference F3.4.3).

1.2.7.8 As the data contained multiple sightings for multiple sites and years, a peak count per species per month per year was calculated for the whole survey area. The maximum peak count was then calculated from the last five years

(2018/19 winter through to 2022/23 winter). The five year-peak count represents the maximum abundance recorded by the Fylde Bird Club between 2018/19 and 2022/23. These results are shown in **Table 1.9**.

Morecambe Offshore Windfarm: Generation Assets - Fylde export cable route records

1.2.7.9 Before the amalgamation of the Morecambe and Morgan Transmission Assets, several surveys were undertaken by Avian Ecology Ltd. (Hinchcliffe, 2022) for the Morecambe Offshore Windfarm.

1.2.7.10 These surveys were conducted by Avian Ecology Ltd. between October 2021 and April 2022. Avian Ecology Ltd. was commissioned to conduct surveys within the Fylde plain and Lancashire area between Longton to the south and Heysham to the north. The area of the study relevant to this annex is termed 'Penwortham' and includes two areas known for foraging geese and swans. One area was located at Lytham Moss (referred to as P1), north east of Lytham St. Annes and approximately 400 m east of Blackpool Airport, and the second area south of the River Ribble between Howick Cross on the east and Hutton Marsh to the west (referred to as P2) (locations of P1 and P2 provided in **Figure 1.7**).

1.2.7.11 The aim of the surveys was to ascertain if any of the land parcels could be described as functionally linked land. Natural England's criteria from a recent report (Bowland Ecology, 2021) of what constitutes functionally linked land is 'areas of land occurring within 20 km of an SPA that are regularly used by a significant number of qualifying bird species'. A significant number of birds is defined as '0.5 % of the Great British population or 1,000 individuals'. In addition, the phrase 'regularly used' is defined as 'being used by a significant number of birds for seven or more years since 2010'. (Bowland Ecology, 2021). It should be noted that this criterion is specific to the north west of England due to the highly mobile nature of geese and the high density of SPAs.

1.2.7.12 A total of 14 visits were undertaken, the surveys used a 'look and see' methodology based on Gilbert *et al.* (1998) with surveyors observing each field, walking the boundaries (when access was possible) and stopping at intervals and scanning fields to record target species. All surveys were conducted during daylight hours and were timed to coincide with a range of tidal conditions. Surveys took place on a twice monthly basis.

1.2.7.13 The surveys focused on a range of target species, these being:

- all waders, waterfowl, raptors, owls and gulls;
- species listed on Annex 1 of the Birds Directive; and
- non-breeding qualifying species of the Morecambe Bay and Duddon Estuary SPA, Morecambe Bay Ramsar site, Liverpool Bay SPA and Ribble and Alt Estuaries SPA/Ramsar site.

Queensway development data

1.2.7.14 The Queensway development, which overlaps with a small section of the survey area includes a phased residential development as well as the creation of a Farmland Conservation Area and Nature Park to compensate for the loss of functionally linked land associated with the Ribble and Alt Estuaries SPA and Ramsar site. The project is a large, phased residential development adjacent to Heyhouses Lane (B5261). The ornithological surveys for this project have covered an area to the north east of Lytham St Annes, close to Blackpool Airport. The development is now referred to as 'Richmond Point', however throughout this annex, it will be referred to as 'the Queensway development'. Surveys commenced in 2016, with data collected annually up to at least 2020/2021. Within this annex, only the most recent available survey report has been reviewed: Queensway FCA and Nature Park, Lytham St Annes, Winter Bird Survey Report 2020/2021 (Jenkins, 2021).

1.2.7.15 Wintering bird surveys of the Farmland Conservation Area and Nature Park associated with the Queensway Development were conducted by The Environment Partnership Ltd. between September 2020 and April 2021. The Environment Partnership Ltd. were commissioned to survey the Farmland Conservation Area and Nature Park which commenced in 2016.

1.2.7.16 The Queensway development survey was conducted across largely arable land at Lytham Moss, an area located north east of Lytham St Annes and approximately 400 m east of Blackpool Airport. The survey area covered a large proportion of Lytham Moss, which is approximately 600 hectares (ha) in size. The survey extent is shown in **Figure 1.6**.

1.2.7.17 A total of 21 surveys were undertaken between September 2020 to April 2021, approximately every 10 days. Nineteen of these surveys were carried out during the day and two were nocturnal surveys. For health and safety reasons nocturnal visits were not undertaken during the gamebird and wildfowl shooting season which takes place from October to the end of January.

1.2.7.18 On each visit the surveyor travelled between 11 predetermined observation points. At each observation point, all visible field clusters were scanned and any target species present were recorded and mapped. The primary target species were whooper swan *Cygnus cygnus*, Bewick's swan *Cygnus columbianus* and pink-footed goose *Anser brachyrhynchus*. Secondary target species were lapwing *Vanellus vanellus*, curlew *Numenius arquata* and black-tailed godwit *Limosa limosa*. Any other wild goose or swan species in flocks exceeding 20 birds were also recorded.

1.2.8 Designated sites

1.2.8.1 As noted in **section 1.2.2**, all internationally and nationally designated sites with wintering and migratory qualifying bird features and all locally designated sites within the study area were identified.

1.2.8.2 Citations for each designated site were reviewed to identify those with wintering and migratory bird interests. Locally designated sites do not have

published citations details of specific ornithological features therefore are difficult to identify. Therefore, on a precautionary basis, all LNRs within the study area have been included for further assessment at this stage.

1.2.9 Conservation status

1.2.9.1 For the wintering and migratory species considered likely to be present, consideration was also given to their conservation status, specifically whether the species were listed in Annex 1 of the Birds Directive. Schedule 1 of the Wildlife and Countryside Act, 1981 gives protection to breeding birds at their nest site so is not relevant for birds during the wintering and migratory stage.

1.2.9.2 Consideration was also given to species listed as priority species by the Secretary of State under Section 41 of the Natural Environment and Rural Communities Act 2006, and those that were either red or amber-listed species on the Birds of Conservation Concern 5 (BOCC5 UK) (Stanbury *et al.*, 2021). The BOCC5 UK is the latest assessment of the conservation status of all the UK's 245 regularly occurring bird species.

1.2.9.3 Lastly, consideration was also given to those species listed as a Lancashire Biodiversity Action Plan (LBAP) species (Lancashire County Council, 2024).

1.3 Desk-based study – baseline characterisation

1.3.1 Designated sites

SPAs

1.3.1.1 There are four SPAs with qualifying wintering and/or migratory bird species within, or partly within, the study area. These are the Ribble and Alt Estuaries, Morecambe Bay and Duddon Estuary, Martin Mere and Liverpool Bay. The locations of these designated sites can be seen in **Figure 1.1**. The wintering and migratory (non-breeding) designated features for each of the SPAs is listed in **Table 1.2** together with the individual SPA population size. All data is taken from site citation documents.

1.3.1.2 A summary of the designated features is provided below, some species may be designated for both the breeding and non-breeding seasons.

- The Ribble and Alt Estuaries SPA is designated for a total of 20 species, including non-breeding waders, wildfowl, swan and geese and gull and tern species. Of these, there are 17 that are qualifying non-breeding species. The site also supports a waterbird assemblage in addition to the individually named species.
- Liverpool Bay/Bae Lerpwl SPA is designated for three non-breeding features. The site also supports a waterbird assemblage in addition to the individually named species.
- Morecambe Bay and Duddon Estuary SPA is designated for a total of 24 species, including non-breeding waders, wildfowl, swan and geese and gulls. Of these 20 are designated as non-breeding features. The site also

supports a waterbird assemblage and a seabird assemblage in addition to the individually named species.

- Martin Mere SPA is designated for a total of five species of non-breeding waterfowl. The site also supports a waterbird assemblage in addition to the individually named species.

1.3.1.3 Species may qualify as an assemblage component if they make up an assemblage totalling over 20,000 waterfowl or seabirds in any season within an SPA.

Table 1.2: Wintering and migratory qualifying features of the SPAs within or partly within the study area

SPA	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest feature	SPA population at designation (dates in brackets)
Ribble and Alt Estuaries UK9005103	Partly within the Onshore Order Limits and/or the Intertidal Infrastructure Area	Pink-footed goose	11,764 (1993/94 to 1997/97)
		Bewick's swan	276 (1993/94 to 1997/97)
		Whooper swan	182 (1993/94 to 1997/97)
		Shelduck *Tadorna tadorna*	4,925 (1993/94 to 1997/97)
		Wigeon *Mareca penelope*	85,259 ((1993/94 to 1997/97)
		Pintail *Anas acuta*	2,731 (1993/94 to 1997/97)
		Teal *Anas crecca*	7,157 (1993/94 to 1997/97)
		Oystercatcher *Haematopus ostralegus*	18,535 (1993/94 to 1997/97)
		Golden plover *Pluvialis apricaria*	3,598 (1993/94 to 1997/97)
		Grey plover *Pluvialis squatarola*	9,355 (1993/94 to 1997/97)
		Ringed plover *Charadrius hiaticula*	1,657 (1993 to 1997)
		Bar-tailed godwit *Limosa lapponica*	20,086 (1993/94 to 1997/97)
		Black-tailed godwit	1,273 (1993/94 to 1997/97)
		Knot *Calidris canutus*	68,922 (1993/94 to 1997/97)
		Sanderling *Calidris alba*	6,535 (passage) 2,882 (wintering)
		Dunlin *Calidris alpina*	39,376 (1993/94 to 1997/97)
		Redshank *Tringa totanus*	3,247 (passage 1993 to 1997) 2,505 (wintering 1993/94 to 1997/97)
		Non-breeding waterbird assemblage	323,861 individual waterbirds (5-year peak mean 1993/94 to 1997/98)
Liverpool Bay/Bae Lerpwl UK9020294	0.7	Common scoter *Melanitta nigra*	56,679 (2004/05 to 2010/11)
		Little gull *Hydrocoloeus minutus*	319 (2004/05 to 2010/11)
		Red-throated diver *Gavia stellata*	1,171 (2004/05 to 2010/11)
		Non-breeding waterbird assemblage	69,687 (2004/05 to 2010/11) individual waterbirds.

SPA	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest feature	SPA population at designation (dates in brackets)
Morecambe Bay and Duddon Estuary UK9020326	9.5	Pink-footed goose	15,648 (2009/10 to 2013/14)
		Whooper swan	113 (2009/10 to 2013/14)
		Shelduck	5,878 (2009/10 to 2013/14)
		Pintail	2,498 (2009/10 to 2013/14)
		Oystercatcher	55,888 (2009/10 to 2013/14)
		Golden plover	1,900 (Morecambe Bay SPA citation value 1991)
		Grey plover	2,000 (Morecambe Bay SPA citation value 1991)
		Ringed plover	1,049 (2009/10 to 2013/14)
		Curlew	12,209 (2009/10 to 2013/14)
		Bar-tailed Godwit	3,046 (2009/10 to 2013/14)
		Black-tailed godwit	2,413 (2009/10 to 2013/14)
		Turnstone *Arenaria interpres*	1,359 (2009/10 to 2013/14)
		Knot	32,739 (2009/10 to 2013/14)
		Ruff	8 (2009/10 to 2013/14)
		Sanderling	3,600 (Morecambe Bay SPA citation value 1991)
		Dunlin	26,982 (2009/10 to 2013/14)
		Redshank	11,133 (2009/10 to 2013/14)
		Mediterranean gull *Ichthyaetus melancephalus*	18 (2009/10 to 2013/14)
		Lesser black-backed gull *Larus fuscus*	9,450 (2009/10 to 2013/14)
		Little egret *Egretta garzetta*	134 (2009/10 to 2013/14)
		Waterbird assemblage	266,751 individual waterbirds (2009/10 to 2013/14)
		Seabird assemblage	40,672 individual seabirds (1997)
Martin Mere UK9005111	11.49	Pink-footed goose	18,000 (1984)
		Pintail	1,000-2,500 (1984)
		Teal	5,000-10,000 (1984)
		Non-breeding waterbird assemblage	No count data available but includes Bewick's swan, whooper swan, snipe, lapwing and gadwall.

Ramsar sites

1.3.1.4 There are three Ramsar sites with wintering and migratory bird qualifying features within the study area. These are the Ribble and Alt Estuaries, Morecambe Bay and Martin Mere, as shown on **Figure 1.1**. The designated non-breeding features for each of the three Ramsar sites are listed in **Table 1.3** together with details of the population size.

1.3.1.5 A brief summary of the designated features is listed below, some species may be designated for the breeding and non-breeding seasons.

- The Ribble and Alt Estuaries Ramsar site is designated for 17 species non-breeding species of geese, ducks, swans, waders and gulls. The site also supports an assemblage of non-breeding waterbirds.
- Morecambe Bay Ramsar site is designated for a total of 22 non-breeding species. The site also supports a wintering assemblage of waterbirds.
- Martin Mere Ramsar site is designated for a total of six wintering species including swan and geese, wildfowl and waders. The site is also noted as supporting a wintering waterbird assemblage.

Table 1.3: Wintering and migratory qualifying features of Ramsar sites within or partly within the study area

Ramsar site	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest feature	Ramsar population at designation
Ribble and Alt Estuaries UK11057	Partly within the Onshore Order Limits and/or the Intertidal Infrastructure Area	Pink-footed goose	6,552 (1998/99 to 2002/03)
		Bewick's swan	230 (1998/99 to 2002/03)
		Whooper swan	211 (1998/99 to 2002/03)
		Shelduck	2,944 (1998/99 to 2002/03)
		Wigeon	69,841 (1998/99 to 2002/03)
		Pintail	1,497 (1998/99 to 2002/03)
		Teal	5,107 (1998/99 to 2002/03)
		Oystercatcher	18,926 (1998/99 to 2002/03)
		Grey plover	11,021 (1998/99 to 2002/03)
		Ringed plover	3,761 (1998/99 to 2002/03)
		Bar-tailed godwit	13,935 (1998/99 to 2002/03)
		Black-tailed godwit	3,323 (1998/99 to 2002/03)
		Knot	42,692 (1998/99 to 2002/03)
		Sanderling	7,401 (1998/99 to 2002/03)
		Dunlin	38,196 (1998/99 to 2002/03)
		Redshank	4,465 (1998/99 to 2002/03)
		Lesser black-backed gull	1,747 (1998/99 to 2002/03)
Morecambe Bay UK11045	9.5	Pink-footed goose	3,665 (1998/99 to 2002/03)
		Shelduck	7,032 (1998/99 to 2002/03)
		Wigeon	6,133 (1998/99 to 2002/03)
		Pintail	3,743 (1998/99 to 2002/03)
		Eider *Polysticta stelleri*	5,657 (1998/99 to 2002/03)
		Goldeneye	285 (1998/99 to 2002/03)
		Red-breasted merganser	327 (1998/99 to 2002/03)
		Great crested grebe *Podiceps cristatus*	217 (1998/99 to 2002/03)

Ramsar site	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest feature	Ramsar population at designation
		Oystercatcher	66,577 (1998/99 to 2002/03)
		Lapwing	16,492 (1998/99 to 2002/03)
		Golden plover	4,073 (1998/99 to 2002/03)
		Grey plover	1,655 (1998/99 to 2002/03)
		Ringed plover	1,041 (1998/99 to 2002/03)
		Curlew	20,018 (1998/99 to 2002/03)
		Bar-tailed godwit	4,579 (1998/99 to 2002/03)
		Turnstone	1,371 (1998/99 to 2002/03)
		Knot	66,335 (1998/99 to 2002/03)
		Sanderling	703 (1998/99 to 2002/03)
		Dunlin	26,416 (1998/99 to 2002/03)
		Redshank	8,816 (1998/99 to 2002/03)
		Lesser black-backed gull	40,393 (1998/99 to 2002/03)
		Cormorant	967 (1998/99 to 2002/03)
Martin Mere UK11039	11.49	Pink-footed goose	32,967 (1987/88 to 1991/92)
		Bewick's swan	747 (1987/88 to 1991/92)
		Whooper swan	513 (1987/88 to 1991/92)
		Wigeon	9,606 (1987/88 to 1991/92)
		Pintail	1,344 (1987/88 to 1991/92)
		Ruff	50 (1987/88 to 1991/92)

SSSIs

1.3.1.6 A total of nine SSSIs with non-breeding ornithological features are within or partly within the study area. The non-breeding features of these sites are provided in **Table 1.4**. A brief summary of the sites with non-breeding features is listed below, some species may be of interest for more than one season. All data is taken from site citation documents.

- Lytham St Annes Dunes has one ornithological feature that is of interest during the wintering and migratory periods.

- Ribble Estuary has a total of 18 bird features of interest in the wintering and migratory periods. The site is noted as supporting over 20,000 non-breeding waterbirds.
- Newton Marsh has 15 features of interest in the wintering and migratory periods.
- Marton Mere has a total of four bird features cited as being of intertest in the wintering and migratory periods. An additional eight species listed on the citation without any specific season noted, however it is deemed likely that these species will use the site in the wintering and migratory period.
- Red Scar and Tun Brook Woods has one ornithological feature noted on the citation.
- Wyre Estuary has a total of eight ornithological features of interest in the wintering and migratory periods.
- Martin Mere, Burscough has a total of 16 bird features of interest in the wintering and migratory periods. The site also supports an aggregation of a variety of wintering birds.
- Sefton Coast has a total of seven ornithological features of interest in the wintering and migratory periods.
- Lune Estuary has a total of ten ornithological features of interest in the wintering and migratory periods. An additional three species listed on the citation without any specific season noted, however it is deemed likely that these species will use the site in the wintering and migratory period.

Table 1.4: SSSIs with non-breeding features within or partly within the study area

Designated site	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest features
Lytham St Annes Dunes	Partly within the Onshore Order Limits and/or the Intertidal Infrastructure Area	Stonechat *Saxicola rubicola*
Ribble Estuary	Partly within the Onshore Order Limits and/or the Intertidal Infrastructure Area	Pink-footed goose
		Bewick's swan
		Whooper swan
		Shelduck
		Wigeon
		Mallard
		Pintail
		Oystercatcher
		Golden plover
		Grey plover
		Ringed plover

Designated site	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest features
		Curlew
		Bar-tailed godwit
		Black-tailed godwit
		Knot
		Sanderling
		Dunlin
		Redshank
Newton Marsh	0.02	Shelduck
		Wigeon
		Mallard
		Teal
		Lapwing
		Golden plover
		Bar-tailed godwit
		Black-tailed godwit
		Sanderling
		Dunlin
		Snipe
		Common sandpiper *Actitis hypoleucos*
		Redshank
		Spotted redshank *Actitis macularius*
		Greenshank
Marton Mere, Blackpool	3.78	Shoveler
		Mallard
		Pochard *Aythya ferina*
		Tufted duck *Aythya fuligula*
		Coot *Fulica atra*
		Little grebe *Tachybaptus ruficollis*
		Great crested grebe
		Oystercatcher
		Curlew
		Ruff

Designated site	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest features
		Redshank
		Greenshank
Red Scar and Tun Brook Woods	7.83	Hawfinch *Coccothraustes coccothraustes*
Wyre Estuary	8.81	Teal
		Oystercatcher
		Lapwing
		Golden plover
		Black-tailed godwit
		Turnstone
		Dunlin
		Redshank
Sefton Coast	8.63	Oystercatcher
		Grey plover
		Ringed plover
		Bar-tailed godwit
		Knot
		Sanderling
		Dunlin
Martin Mere, Burscough	11.49	Pink-footed geese
		Bewick's swan
		Whooper swan
		Shoveler
		Gadwall *Mareca strepera*
		Mallard
		Pintail
		Teal
		Avocet *Recurvirostra avosetta*
		Lapwing
		Black-tailed godwit
		Ruff
		Snipe

Designated site	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest features
		Lesser yellowlegs *Tringa flavipes*
		Marsh sandpiper *Tringa stagnatilis*
		White-winged black tern *Chlidonias leucopterus*
Lune Estuary	16.7	Pink-footed goose
		Shelduck
		Wigeon
		Mallard
		Oystercatcher
		Grey plover
		Ringed plover
		Curlew
		Turnstone
		Knot
		Sanderling
		Dunlin
		Redshank

NNRs

1.3.1.7 Two NNRs with qualifying features relevant to wintering and migratory birds are within the study area. Details of these NNRs are provided in **Table 1.5**.

Table 1.5: Features of NNRs within or partly within the study area relevant to wintering and migratory birds

NNR	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)	Interest features
Ribble Estuary	0.68	Lesser black-backed gull (season not specified) Saltmarsh - non-breeding birds – migratory species curlew, lapwing Saltmarsh - non-breeding Annex 1 species Saltmarsh - a seabird assemblage of international importance (season not specified) Saltmarsh - littoral sediment internationally significant migratory birds waterfowl Saltmarsh - littoral sediment internationally significant populations of regularly occurring migratory bird species
Ainsdale Sand Dunes	15.6	Supralittoral sediment: Aggregations of non-breeding birds

LNRs

1.3.1.8 There are seventeen LNRs within or partly within the study area. A list of these LNRs and their distance from the Onshore Order Limits and the Intertidal Infrastructure Area are provided in **Table 1.6**.

Table 1.6: LNRs within the study area and their distance from the Onshore Order Limits and the Intertidal Infrastructure Area

LNR	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)
Lytham St. Annes	Partly within the Onshore Order Limits and/or the Intertidal Infrastructure Area
Fishwick Bottoms	0.03
Longton Brickcroft	1.62
Haslam Park, Preston	2.02
Preston Junction	2.17
Marton Mere	3.78
Hills and Hollows	6.16
Grange Valley	6.63
Pope Land Open Space	7.39
Ainsdale and Birkdale Hills	10.88
Withnell Fold	10.96
Pleasington Old Hall Woods	13.50

LNR	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)
Withnell Nature Reserve	13.54
Hic Bibi, Coppull	15.62
River Darwen Parkway	16.72
Sunnyhurst Woods	16.84
Arran Trail	19.57

BHS

1.3.1.9 There are seventeen BHSs within, or partly within, the study area. A list of the BHSs and their distances to the Onshore Order Limits and the Intertidal Infrastructure Area is provided in **Table 1.7**.

Table 1.7: BHSs within, or partly within, the study area and their distance from the Onshore Order Limits and the Intertidal Infrastructure Area

BHS	Distance from the Onshore Order Limits and the Intertidal Infrastructure Area (km)
Lytham Moss	Partly within the Onshore Order Limits and/or the Intertidal Infrastructure Area
River Ribble, Lower Tidal Section	Partly within the Onshore Order Limits and/or the Intertidal Infrastructure Area
Pippy Lane Banks	0.04
Willowmead Park Swap (Moss Side)	0.59
Lytham Moss Copses	0.72
Freckleton Naze	0.99
Lytham Hall Woods	0.99
LSCLA Lancaster Canal Whole Length in Lancashire Including Glasson Branch	1.49
Hesketh Old and New Marsh Fields	3.76
River Douglas Estuary	4.06
Marsh Farm Fields	5.37
Hesketh Old Marsh Embankment	5.57
Hesketh Bank Brickworks, North (Alty's)	6.30
Manor Farm Pastures	6.41
Martin Mere Mosslands	8.99
Halsall and Plex Mosses	16.10
King's Covert	16.52

1.3.2 Land use

1.3.2.1 In order to characterise land use with the survey area, the Corine Land Cover 2018 data set was downloaded and clipped to the survey area (Copernicus, 2020). The total area for each land use type was calculated in ArcGIS.

1.3.2.2 The survey area is predominantly characterised by pasture, which comprises over half of the survey area (54.3 %) (**Table 1.8**). Arable and urban are respectively the second (19.8 %) and third largest land use type (15.6 %) of the total land use type present within the survey area.

1.3.2.3 Estuarine, sport and leisure (e.g., golf courses) and sand dune represented only 5.2 % of the total land use type present. Blackpool Airport accounts for 4.5 % of the total land use type present within the survey area.

Table 1.8: The area and percentage of land use types present within the survey area

Land use type	Area of land use types (km^2)	Percentage of total land use type present (%)
Pasture	23.5	54.34
Arable	7.69	19.81
Urban	6.77	15.65
Airport	1.95	4.52
Sport and leisure	0.12	2.78
Sand dunes	0.60	1.39
Estuarine	0.47	1.10
Landfill	0.17	0.40
Total	41.27	N/A

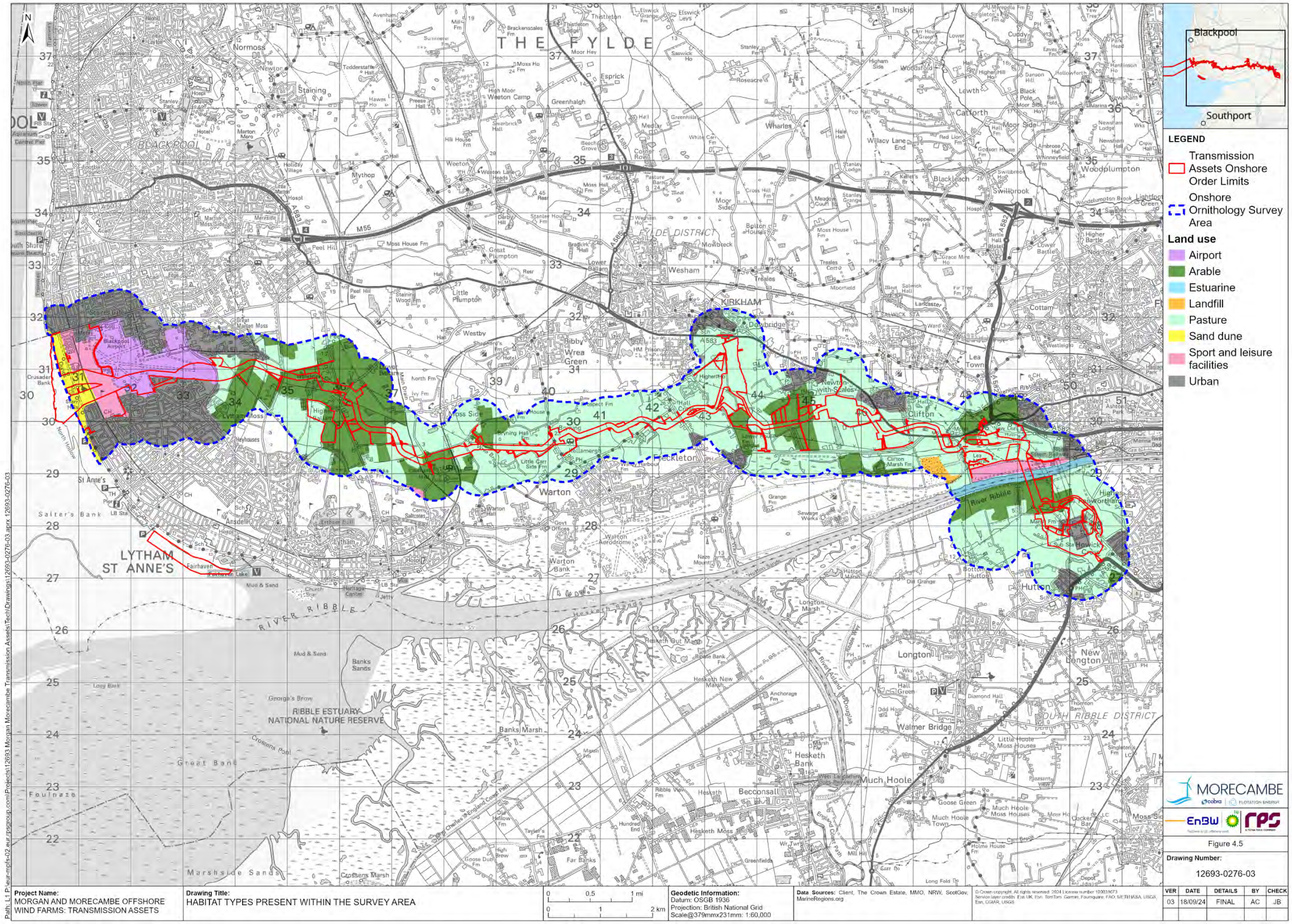


Figure 1.5: Land use within the survey area

1.3.3 BTO records

BTO bird atlas 2007 to 2011

1.3.3.1 During the BTO bird atlas 2007 to 2011 surveys 147 species were recorded during the non-breeding period within the 33 tetrads which overlap with the survey area. Of the 147 species, 19 are listed on Annex 1 of the Birds Directive.

BTO bird data 2018 to 2022

1.3.3.2 Data from the BTO's BirdTrack application showed that 134 species have been recorded within the 2 km tetrads which overlap the survey area. A total of 18 species listed on Annex 1 of the Birds Directive have been recorded within the tetrads.

1.3.4 Fylde Bird Club records

Summary of Fylde Bird Club data species records

1.3.4.1 A total of 204 species were recorded at least once during the non-breeding season (August to February) from the Fylde Bird Club data records (2018/19 through to 2022/23). Of the 204 species recorded, the most abundant taxonomic group was passerines (85,499 individuals) across 67 species when looking at the five year peak count. Passerines were followed by geese, ducks and swans (55,061 individuals) across 32 species, waders (31,967 individuals) across 31 species and gulls and terns (21,481 individuals) across 15 species. An additional 6,558 individual birds across 17 other taxonomic groups were also recorded. Additional taxa included: cormorants and shags, cuckoos, divers, doves and pigeons, grebes, herons, storks and ibis, kingfishers, owls, parakeets, pheasants and partridges, rails, crakes and coots, raptors, seabirds, skuas, swallows, martins and swifts and woodpeckers.

1.3.4.2 Across the 204 species, the most abundant taxonomic group when looking at the five year mean of peaks (rounded up to a whole number) were geese, ducks and swans (28,274 individuals) followed by passerines (22,451 individuals), waders (17,316 individuals) and gulls and terns (7,135 individuals). This change in order of abundance between five year peaks and five year mean of peaks may be due to several factors such as recording habits, changes in weather patterns or the impact of the covid 19 pandemic on surveyors ability to record birds.

1.3.4.3 It should be noted that the Fylde Bird Club data also includes records of species that may be escaped or deliberately released captive birds as well as rare and/or vagrant species e.g., rose-coloured starling *Pastor roseus*, Inca tern *Larosterna inca* and pectoral sandpiper *Calidris melanotos*.

1.3.4.4 A short summary of the species present and abundance for each taxonomic group is provided below, with all species detailed and listed in **Table 1.9**.

Geese, ducks and swans

1.3.4.5 A total of 32 goose, duck and swan species were recorded as present within tetrads overlapping with the survey area during the non-breeding season in the five most recent years.

1.3.4.6 When analysing the five year peak count, pink-footed goose (22,362), common scoter (15,043), wigeon (10,109), teal (3,386) and Canada goose *Branta canadensis* (1,014) were the most abundant of these species. As an introduced species Canada goose are not considered within the assessment but are included within this technical report for completeness. The fifth most commonly recorded species, excluding Canada goose, was shelduck (955).

1.3.4.7 The five year mean of peaks shows the same species as being the most abundant of the group recorded: pink-footed goose (12,129), common scoter (6,895), wigeon (5,346), teal (1,745) and shelduck (369). Common scoter are likely to have been sighted off the coastline and are covered in greater depth in Volume 3. Annex 4.3: Intertidal birds of the ES (document reference F3.4.3).

Pheasants and partridges

1.3.4.8 Three species of pheasant and partridge were recorded as present within the survey area: grey partridge *Perdix perdix*, pheasant *Phasianus colchicus* and red-legged partridge *Alectoris rufa*. As introduced species, pheasant and red-legged partridge are included for completeness.

1.3.4.9 Grey partridge had a five year peak count of 10 individuals. Grey partridge had a five year mean of peak of six.

1.3.4.10 Grey partridge were recorded in all five of the most recent years.

Cuckoos

1.3.4.11 An individual cuckoo *Cuculus canorus* was recorded in the 2022/21 non-breeding season. The species was not noted in any other of the five most recent years of data.

Doves and pigeons

1.3.4.12 Four species from this taxonomic group were recorded within the Fylde Bird Club data during the non-breeding seasons from 2018/19 through to 2022/23. This included woodpigeon *Columba palumbus*, feral pigeon *Columba livia*, stock dove *Columba oenas* and collared dove *Streptopelia decaocto*. All four species were recorded in each of the five non-breeding seasons analysed.

1.3.4.13 The most abundant species were woodpigeon, with a five year peak count of 950 and a five year mean of peaks of 475.

1.3.4.14 Feral pigeon were the second most abundant species with a five year peak count of 306 and a five year mean of peaks of 138. The lowest peak count of three occurred in the 2019/20 non-breeding season. The variation in counts

for this species could be due to inconsistent recorded of this common species.

1.3.4.15 Stock dove had a five year peak count of 101 and a five year mean of peaks of 69.

1.3.4.16 The least most abundant species from this taxonomic group were collared dove with a peak count of 87 and a five year mean of peaks of 47.

Rails, crakes and coots

1.3.4.17 Three species from this taxonomic group were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data, moorhen *Gallinula chloropus*, coot and water rail *Rallus aquaticus*. All three species were recorded in each of the five years analysed.

1.3.4.18 The most abundant species were coot with a five year peak count of 40 and a five year mean of peak of 17. This variation in count could be attributed to inconsistent reporting of this BOCC5 UK green listed species.

1.3.4.19 Moorhen had a five year peak count of 21 and a five year mean of peak of 15. The species was far more commonly recorded than water rail that had a five year peak count of three and a five year mean of peak of two.

Grebes

1.3.4.20 Three species of grebe were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data.

1.3.4.21 The most abundant were great crested grebe, recorded in each of the five most recent years. The five year peak count was 48 and the five year mean of peaks was 26 individuals.

1.3.4.22 Little grebe were the second most abundant grebe species, recorded in four of the five most recent years but not recorded in the 2021/22 non-breeding season. The five year peak count was four and the five year mean of peaks was one.

1.3.4.23 Red-necked grebe *Podiceps grisegena* were recorded in the 2019 to 2020 and 2020/21 non-breeding seasons with one individual noted across each season. The five year peak count for this species was therefore one individual and the five year mean of peaks was less than one.

Waders

1.3.4.24 A total of 30 wader species were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data.

1.3.4.25 The most abundant species were consistent when comparing the five year peak counts and five year mean of peaks. In order this was lapwing (five year peak count of 12,032 and five year mean of peaks of 6,868), black-tailed godwit (4,920 and 2,520), knot (3,200 and 2,017), dunlin (2,639 and 1,482) and golden plover (2,601 and 1,223).

1.3.4.26 All five of these species were recorded in each of the five most recent years.

1.3.4.27 Of note were sanderling, with peak counts of 2,427 and 1,560 in the 2021/22 and 2022/23 non-breeding seasons respectively. These counts were significantly higher than sanderling counts in the three years prior. Redshank peak counts were also significantly higher in the 2022/23 non-breeding season than the four years prior.

1.3.4.28 Several rarer migratory wader species were also recorded in some years. This included spotted redshank (five year peak count of seven), wood sandpiper *Tringa glareola* (five year peak count of five) and grey phalarope *Phalaropus fulicarius* (five year peak count of one).

Gulls and terns

1.3.4.29 A total of 16 gull and tern species were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data, this comprised of eight gulls and seven terns. The most abundant of these species were herring gull. This list included scarce migrant and vagrant birds such as the pelagic Sabine's gull *Xema sabini*, the rare roseate tern *Sterna*, *dougallii* and the vagrant Inca tern.

1.3.4.30 A five year peak count of 15,042 was made in the 2020/21 non-breeding season for herring gull. This figure is significantly higher than any other non-breeding season in the five most recent years for this species, the next highest annual count was 1,047. The five year mean of peaks for herring gull was 3,535.

1.3.4.31 Black-headed gull had a five year peak count of 3,168 and a five year mean of peaks of 2,246. This species was recorded in each of the five most recent years of data.

1.3.4.32 Sandwich tern *Thalasseus sandvicensis* had a five year peak count of 2,150 and a five year mean of peaks of 715. The five year peak occurred in the 2021/22 non-breeding season and was significantly higher than counts in the other five years with the next highest being 830 in the previous year.

1.3.4.33 A five year peak count of 587 was made for common gull. The five year mean of peaks for common gull was 324.

1.3.4.34 The fifth most common gull and tern species was lesser black-backed gull with a five year peak count of 222 and five year mean of peak of 186.

1.3.4.35 Six other gull and tern species were also recorded in each of the five most recent years of data: kittiwake *Rissa tridactyla*, common tern *Sterna hirundo*, great black-backed gull *Larus marinus*, little gull, little tern *Sternula albifrons* and Mediterranean gull.

Skuas

1.3.4.36 All four northern hemisphere species of skua were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data, Arctic skua *Stercorarius parasiticus*, great skua *Stercorarius skua*, long-tailed skua *Stercorarius icaudus* and pomarine skua *Stercorarius pomarinus*.

1.3.4.37 The most abundant skua were Arctic skua, with a five year peak count of nine and a five year mean of peaks of five. Arctic skua were recorded in each of the five years analysed.

1.3.4.38 Great skua were also recorded in each of the five most recent years and have a five year peak count of three. The five year mean of peaks for great skua was two.

1.3.4.39 Both pomarine skua and long-tailed skua were recorded in the 2020/21 non-breeding season only. Pomarine skua had a peak count of three and a five year mean of peak of one. Long-tailed skua had a peak count of one and a five year mean of peak of less than one.

1.3.4.40 All skuas are likely to have been sighted during passage periods off the coastline and are covered in greater depth in Volume 3. Annex 4.3: Intertidal birds of the ES (document reference F3.4.3).

Seabirds

1.3.4.41 A total of nine species of seabird were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data. Four of these species, Manx shearwater *Puffinus puffinus*, gannet *Morus bassanus*, guillemot *Uria aalge* and razorbill *Alca torda* were recorded in each of the five most reason years. With fulmar *Fulmarus glacialis*, Leach's petrel *Hydrobates leacorhous*, black guillemot *Cepphus grylle*, little auk *Alle alle* and puffin *Fratercula arctica* recorded in at least one of these five years.

1.3.4.42 The most abundant seabird species were Manx shearwater with a five year peak count of 563 and a five year mean of peaks of 236. It is noted that counts for this species decreased each year from the peak of 563 in the 2018/19 season to a low of 54 in the 2022/23 non-breeding season.

1.3.4.43 Gannet were the second most abundant seabird species with a five year peak count of 277 and a five year mean of peak of 94. Peak annual counts were below 65 in all years except the 2020/21 non-breeding season which contained the peak count of 277.

1.3.4.44 An annual peak count of 33 was made for guillemot, with a five year mean of peaks of 19.

1.3.4.45 A peak count of 11 was made for both fulmar and Leach's petrel. Both of these species had a five year mean of peaks of five and were recorded in each of the five analysed years with the exception of the 2022/23 non-breeding season.

1.3.4.46 All seabirds are likely to have been sighted off the coastline and are covered in greater depth in Volume 3. Annex 4.3: Intertidal birds of the ES (document reference F3.4.3).

Divers

1.3.4.47 Three species of diver were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data.

1.3.4.48 Black-throated diver *Gavia arctica* and great northern diver *Gavia immer* were each recorded once in the 2019/20, 2020/21 and 2022/23 non-breeding

seasons and had therefore each had a five year peak count of one and a five year mean of peaks of one.

1.3.4.49 The most abundant diver species were red-throated diver with a five year peak count of 221 and a five year mean of peak of 130. The species was recorded in each of the five most recent years of data.

1.3.4.50 All diver species are likely to have been sighted off the coastline and are covered in greater depth in Volume 3. Annex 4.3: Intertidal birds of the ES (document reference F3.4.3).

Cormorants and shags

1.3.4.51 Two species from this group were recorded as present in the non-breeding season across the five most recent years of Fylde Bird Club data, cormorant and shag *Gulosus aristotelis*.

1.3.4.52 The most abundant species were cormorant with a five year peak count of 2,162. This count occurred in the 2022/23 non-breeding season and all other counts were lower than 870 individuals. The five year mean of peaks for cormorant was 800.

1.3.4.53 A five year peak count of seven was made for shag, with a five year mean of peaks of three individuals.

1.3.4.54 The majority of cormorant species are likely to have been sighted off the coastline and are covered in greater depth in Volume 3. Annex 4.3: Intertidal birds of the ES (document reference F3.4.3).

Herons, storks and ibises

1.3.4.55 A total of seven heron, stork and ibis species were recorded within the Fylde Bird Club data during the non-breeding seasons from 2018/19 through to 2022/23: little egret, cattle egret *Bubulcus ibis*, grey heron *Ardea cinerea*, spoonbill, glossy ibis *Plegadis falcinellus*, great white egret and common crane *Grus grus*.

1.3.4.56 The most abundant of these species was little egret with a five year peak of 280 and five year mean of peaks of 189.

1.3.4.57 Cattle egret were the second most recorded species from this taxonomic group with a five year peak of 29 and a five year mean of peaks of nine. The species was not recorded during the 2021/22 non-breeding season. The second highest peak count for this species was nine.

1.3.4.58 The third most abundant species were grey heron, however it should be noted that low recording numbers for this species may be due to the likelihood that not all observations of this BOCC5 UK green listed species were recorded. The five year peak for this species was 26 and the five year mean of peaks was 19.

1.3.4.59 The five year peak count for spoonbill was 14, with a five year mean of peaks of four. This species was recorded for the three most recent years but not in the two years prior.

1.3.4.60 Glossy ibis were recorded in two of the five most recent years, in the 2020/21 and 2022/23 non-breeding seasons. The five year peak count was eight and the five year mean of peaks was two.

Raptors

1.3.4.61 A total of ten raptor species were recorded within the Fylde Bird Club data during the non-breeding seasons from 2018/19 through to 2022/23. The most commonly recorded species was buzzard *Buteo buteo*, followed by kestrel *Falco tinnunculus*, peregrine *Falco peregrinus*, sparrowhawk *Accipiter nisus* and marsh harrier *Circus aeruginosus*.

1.3.4.62 The five year peak counts for buzzard and kestrel (27 and 22 respectively) were over double that of peregrine and sparrowhawk (nine for both species). The five year mean of peaks for buzzard was 25, 18 for kestrel, eight for sparrowhawk and seven for peregrine.

1.3.4.63 Marsh harrier were the fifth most abundant raptor with a five year peak count of seven and a five year mean of peak of six.

1.3.4.64 Merlin *Falco columbarius* and hen harrier *Circus cyaneus* were raptor species that were also recorded in each of the five most recent years of data. Osprey *Pandion haliaetus*, hobby *Falco subbuteo* and red kite *Milvus milvus* were also recorded in at least one non-breeding season across those five years.

Owls

1.3.4.65 A total of four owl species were recorded within the Fylde Bird Club data during the non-breeding season months from 2018/19 through to 2022/23. This included, in order of high to low abundance, barn owl *Tyto alba*, little owl *Athene noctua*, short-eared owl *Asio flammeus* and tawny owl *Strix aluco*.

1.3.4.66 The five year peak count for barn owl was eight with the five year mean of peaks at five. For both little owl and short-eared owl the five year peak was four and five year mean of peaks three.

1.3.4.67 Tawny owl had a five year peak of two and a five year mean of peaks of one. Tawny owl were the only owl species not recorded in all five years of data being absent from the 2019/20 and 2021/22 non-breeding season lists.

Kingfishers

1.3.4.68 Kingfisher *Alcedo atthis* were recorded in each of the five most recent years of data. The five year peak count for the species was six and the five year mean of peaks was four.

Woodpeckers

1.3.4.69 One species of woodpecker, great spotted woodpecker *Dendrocopos major*, was recorded in each of the five most recent years of data. The five year peak was seven and the five year mean of peaks was six.

Parakeets

1.3.4.70 One species of parakeet, ring-necked parakeet *Psittacula krameri*, has been recorded across the five most recent years of data. The five year peak was six and the five year mean of peaks was three. As an introduced species, ring-necked parakeet is included for completeness.

Swifts

1.3.4.71 Swift *Apus apus* was recorded across the five most recent years of data. Swift had a five year peak count of 98 and a five year mean of peaks of 54. The range of counts for swift was from eight to 98.

Swallows and martins

1.3.4.72 Three species of swallow and martin were recorded across the five most recent years of data. This included swallow *Hirundo rustica*, house martin *Delichon urbicum* and sand martin *Riparia riparia* in order of high to low abundance.

1.3.4.73 The five year peak count of swallow was 537 and the five year mean of peaks was 367.

1.3.4.74 House martin were the second most abundant species with a five year peak count of 219 and a five year mean of peaks of 91. The peak count occurred in the 2018/19 non-breeding season. Each of the other four years of data had counts lower than 80.

1.3.4.75 The third species from this group, sand martin, had a five year peak of 15 and a five year mean of peaks of six. The species was not recorded in the 2019/20 non-breeding season but was recorded in each of the four other most recent years.

Passerines

1.3.4.76 A total of 66 passerine species were recorded within the Fylde Bird Club data during the non-breeding seasons from 2018/19 through to 2022/23. The most abundant species were winter thrushes, particularly redwing *Turdus iliacus* and fieldfare *Turdus pilaris*, along with starling *Sturnus vulgaris*.

1.3.4.77 A broad assemblage of farmland/open habitat species were recorded which included linnet *Linaria cannabina*, meadow pipit *Anthus pratensis*, skylark *Alauda arvensis* and tree sparrow *Passer montanus*. There was also a broad assemblage of woodland species which included chaffinch *Fringilla coelebs*, goldfinch *Carduelis carduelis* and greenfinch *Chloris chloris* as well as jay *Garrulus glandarius* and mistle thrush *Turdus viscivorus*. Nuthatch *Sitta europaea* and treecreeper *Certhia familaris* were also recorded.

1.3.4.78 The most abundant species was redwing with a five year peak count of 61,422 and a five year mean of peaks of 12,631. The peak count occurred in the 2022/23 non-breeding season, the second highest count for this species was 741. The highest count for the second most abundant species, fieldfare, of 10,812 also occurred in the 2022/23 non-breeding season. The next

highest count for this species was 1,203 and the five year mean of peaks was 2,833.

1.3.4.79 Starling were the third most abundant passerine with a five year peak count of 4,673 and a five year mean of peaks of 2,586. This was followed by linnet and meadow pipit with five year peak counts of 1,698 and 1,596 respectively. The five year mean peaks for these two species was 827 for linnet and 725 for meadow pipit.

Table 1.9: The Fylde Bird Club ornithological individual species records (2018 to 2019 through to 2022 to 2023) present during the non-breeding season months (August to February)

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
Geese, ducks and swans	Brent goose	1	8	4
	Canada goose	311	1,014	732
	Todd's Canada goose *Branta canadensis interior*	0	1	1
	Barnacle goose *Branta leucopsis*	5	25	11
	Snow goose *Anser caerulescens*	0	1	0
	Greylag goose *Anser anser*	32	300	122
	Pink-footed goose	6,115	22,362	12,129
	Greater white-fronted goose *Anser albifrons*	0	19	6
	Bar-headed goose *Anser indicus*	0	2	0
	Mute swan *Cygnus olor*	26	44	35
	Bewick's swan	0	4	1
	Whooper swan	117	577	253
	Black swan *Cygnus atratus*	0	2	1
	Shelduck	110	955	369
	Ruddy shelduck *Tadorna ferruginea*	0	4	2
	Mandarin *Aix galericulata*	0	2	0
	Garganey *Spatula querquedula*	0	1	0
	Shoveler	34	87	49
	Gadwall	6	18	11

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
	Wigeon	2,046	10,109	5,346
	Mallard	213	522	299
	Pintail	52	457	198
	Teal	1,151	3,386	1,745
	Tufted duck	0	6	3
	Scaup	0	4	1
	Eider	15	69	39
	Velvet scoter *Melanitta fusca*	0	2	1
	Common scoter	2,200	15,043	6,895
	Long-tailed duck *Clangula hyemalis*	0	2	1
	Goldeneye	0	4	1
	Goosander *Mergus merganser*	9	20	14
	Red-breasted merganser	3	11	6
Pheasants and partridges	Grey partridge	2	10	6
	Pheasant	3	12	9
	Red-legged partridge	0	10	4
Cuckoos	Common cuckoo	0	1	0
Doves and pigeons	Feral pigeon	3	306	138
	Stock dove	47	101	69
	Woodpigeon	68	950	475
	Collared dove	10	87	47
Rails, coots and crakes	Water rail	1	3	2
	Moorhen	12	21	15
	Coot	8	40	17
Grebes	Little grebe	0	4	1
	Red-necked grebe	0	1	0
	Great crested grebe	10	48	26
Waders	Oystercatcher	89	837	429
	Avocet	6	70	34
	Lapwing	2,206	12,032	6,868
	Golden plover	185	2,601	1,223
	Grey plover	55	151	94
	Ringed plover	54	210	130
	Little ringed plover	0	3	1
	Whimbrel	5	19	9

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
	Curlew	241	498	360
	Bar-tailed godwit	0	300	159
	Black-tailed godwit	1,294	4,920	2,520
	Turnstone	10	107	49
	Knot	1,040	3,200	2,017
	Ruff	5	25	15
	Curlew sandpiper	0	9	2
	Sanderling	300	2,427	1,059
	Dunlin	830	2,639	1,482
	Purple sandpiper *Calidris maritima*	0	1	0
	Little stint	0	2	1
	Pectoral sandpiper	0	3	1
	Woodcock *Scolopax rusticola*	1	3	2
	Jack snipe *Limnocryptes minimums*	1	2	1
	Snipe	22	95	71
	Grey phalarope	0	1	0
	Common sandpiper	3	16	10
	Green sandpiper *Tringa ochropus*	2	15	8
	Redshank	322	1,750	753
	Spotted redshank	0	7	3
	Wood sandpiper	0	5	2
	Greenshank	6	19	13
Gulls and terns	Kittiwake	27	153	71
	Sabine's gull	0	1	1
	Black-headed gull	879	3,168	2,246
	Little gull	1	48	14
	Mediterranean gull	2	6	4
	Common gull	208	587	324
	Great black-backed gull	14	80	35
	Herring gull	188	15,042	3,535
	Lesser black-backed gull	95	222	186
	Sandwich tern	158	2,150	715
	Little tern	1	17	5
	Roseate tern	0	1	0

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
	Common tern	25	128	62
	Arctic tern	0	24	6
	Black tern *Chlidonias niger*	0	6	2
	Inca tern	0	1	0
Skuas	Great skua	1	3	2
	Arctic skua	2	9	5
	Pomarine skua	0	3	1
	Long-tailed skua	0	1	0
Seabirds	Little auk	0	1	0
	Guillemot	12	33	19
	Razorbill	1	9	6
	Black guillemot	0	1	1
	Puffin	0	1	0
	Leach's petrel	0	11	5
	Fulmar	0	11	5
	Manx shearwater	54	563	236
	Gannet	24	277	94
Divers	Red-throated diver	64	221	130
	Black-throated diver	0	1	1
	Great Northern diver	0	1	1
Cormorants and shags	Cormorant	242	2162	800
	Shag	1	7	3
Herons, storks and ibises	Common crane	0	1	0
	Glossy ibis	0	8	2
	Spoonbill	0	14	4
	Cattle Egret	0	29	9
	Grey heron	7	26	19
	Great white egret	4	7	5
	Little egret	109	280	189
Raptors	Osprey	0	2	0
	Sparrowhawk	7	9	8
	Marsh harrier	4	7	6
	Hen harrier	3	5	4
	Red kite	0	1	0
	Buzzard	22	27	25
	Kestrel	14	22	18
	Merlin	4	7	5
	Hobby	0	1	1

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
	Peregrine	5	9	7
Owls	Barn owl	3	8	5
	Little owl	2	4	3
	Short-eared owl	2	4	3
	Tawny owl	0	2	1
Kingfishers	Kingfisher	2	6	4
Woodpeckers	Great spotted woodpecker	5	7	6
Parakeets	Ring-necked parakeet	1	6	3
Swifts	Swift	8	98	54
Swallows and martins	Sand martin	0	15	6
	Swallow	230	537	367
	House martin	24	219	91
Passerines	Jay	6	42	15
	Magpie *Pica pica*	19	51	36
	Jackdaw *Coloeus monedula*	101	550	342
	Rook *Corvus frugilegus*	11	630	278
	Carrion crow *Corvus corone*	28	193	78
	Raven *Corvus corax*	9	22	14
	Coal tit *Periparus ater*	2	73	21
	Blue tit *Cyanistes caeruleus*	13	53	25
	Great tit *Parus major*	12	42	22
	Skylark	140	805	442
	Cetti's warbler *Cettia cetti*	0	3	1
	Long-tailed tit *Aegithalos caudatus*	51	75	59
	Yellow-browed warbler *Phylloscopus inornatus*	0	2	1
	Willow warbler *Phylloscopus trochilus*	0	14	8

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
	Chiffchaff *Phylloscopus collybita*	7	27	14
	Siberian chiffchaff *Phylloscopus collybita tristis*	0	1	0
	Reed warbler *Acrocephalus scirpaceus*	0	1	0
	Blackcap *Sylvia atricapilla*	2	9	5
	Garden warbler *Sylvia borin*	0	1	1
	Barred warbler *Curruca nisoria*	0	1	0
	Lesser whitethroat *Curruca curruca*	0	4	2
	Whitethroat *Curruca communis*	2	8	4
	Goldcrest *Regulus regulus*	9	15	12
	Wren *Troglodytes troglodytes*	4	24	14
	Nuthatch *Sitta europaea*	2	7	4
	Treecreeper	1	2	2
	Rose-coloured starling	0	1	0
	Starling	1260	4,673	2,586
	Song thrush *Turdus philomelos*	11	20	15
	Mistle thrush	17	30	22
	Redwing	109	61,422	12,631
	Blackbird *Turdus merula*	41	88	63
	Fieldfare	172	10,812	2,833
	Spotted flycatcher *Muscicapa striata*	1	2	1
	Robin *Erithacus rubecula*	8	47	28
	Pied flycatcher *Ficedula hypoleuca*	0	1	0
	Black redstart *Phoenicurus ochruros*	0	3	1

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
	Redstart *Phoenicurus phoenicurus*	0	2	0
	Whinchat *Saxicola rubetra*	1	6	3
	Stonechat	6	30	17
	Wheatear *Oenanthe oenanthe*	11	32	19
	Tree sparrow	17	126	51
	House sparrow *Passer domesticus*	1	110	53
	Dunnock *Prunella modularis*	2	16	11
	Yellow wagtail *Motacilla flava*	0	12	4
	Grey wagtail *Motacilla cinerea*	16	41	25
	Pied wagtail *Motacilla alba*	43	92	69
	Meadow pipit	202	1,596	725
	Tree pipit *Anthus trivialis*	1	4	2
	Water pipit *Anthus spinoletta*	5	40	16
	Rock pipit *Anthus petrosus*	2	19	9
	Chaffinch	184	1,101	563
	Brambling *Fringilla montifringilla*	2	26	9
	Bullfinch *Pyrrhula pyrrhula*	5	11	9
	Greenfinch	24	142	69
	Twite *Linaria flavirostris*	0	3	1
	Linnet	182	1,698	827
	Lesser redpoll *Acanthis cabaret*	1	8	4
	Crossbill *Loxia curvirostra*	0	1	0
	Goldfinch	162	461	296
	Siskin *Carduelis spinus*	9	38	18
	Lapland bunting *Calcarius lapponicus*	0	1	0

Taxonomic group	Species	Minimum 5-year peak (2018/19 to 2022/23)	Maximum 5-year peak (2018/19 to 2022/23)	5-year mean of peaks (2018/19 to 2022/23)
	Snow bunting *Plectrophenax nivalis*	2	6	4
	Corn bunting *Emberiza calandra*	2	47	21
	Yellowhammer *Emberiza citrinella*	0	9	3
	Reed bunting *Emberiza schoeniclus*	20	67	41

1.3.5 Morecambe Offshore Windfarm: Generation Assets - Fylde export cable route records

1.3.5.1 A total of 12 target species were recorded in area P1 (**Figure 1.7** shows the locations of P1 and P2). The report concluded that the area was not functionally linked to the Ribble and Alt Estuaries SPA during the winter of 2021/22 given that no species recorded within the inland fields of P1 exceeded 0.5 % of the national population. The recorded target species were whooper swan, greylag goose, pink-footed goose, shelduck, golden plover, lapwing, redshank, black-tailed godwit, curlew, black-headed gull, common gull and herring gull.

1.3.5.2 A total of 22 target species were recorded in area P2. Three of these recorded species exceeded the threshold of 0.5 % of the national population: pink-footed goose, black-tailed godwit and ruff. Other notable numbers of target species were recorded along the River Ribble including redshank, lapwing and wigeon.

1.3.5.3 Mute swan, whooper swan, greylag goose, shelduck, mallard, grey heron, little egret, oystercatcher, curlew, dunlin, green sandpiper, snipe, black-headed gull, common gull, herring gull, lesser black-backed gull and great black-backed gull were also recorded in P2.

1.3.6 The Queensway development records

1.3.6.1 Results of the 2020/21 survey (Queensway survey area shown in **Figure 1.6**) showed an increase in pink-footed goose and whooper swan numbers compared to the previous winters. There was a peak count of 11,000 pink-footed goose in 2020/21, with a five-year peak mean of 9,400 birds. Similarly, the peak count of whooper swan in 2020/21 was 247 compared to the five-year peak mean of 120 birds.

1.3.6.2 No Bewick's swan were recorded during the 2020/21 surveys. This matches the regional trend of reduced numbers of birds with less than 10 birds recorded across both local SPAs in 2019/20 (Martin Mere SPA and Ribble and Alt Estuaries SPA).

1.3.6.3 The surveys also indicated an increase in the flock sizes of the targeted wading birds using the area, likely due to the establishment of the Farmland Conservation Area at the site and the current land management practices. Additional wader and wildfowl species recorded were teal, oystercatcher, shelduck, redshank and golden plover.

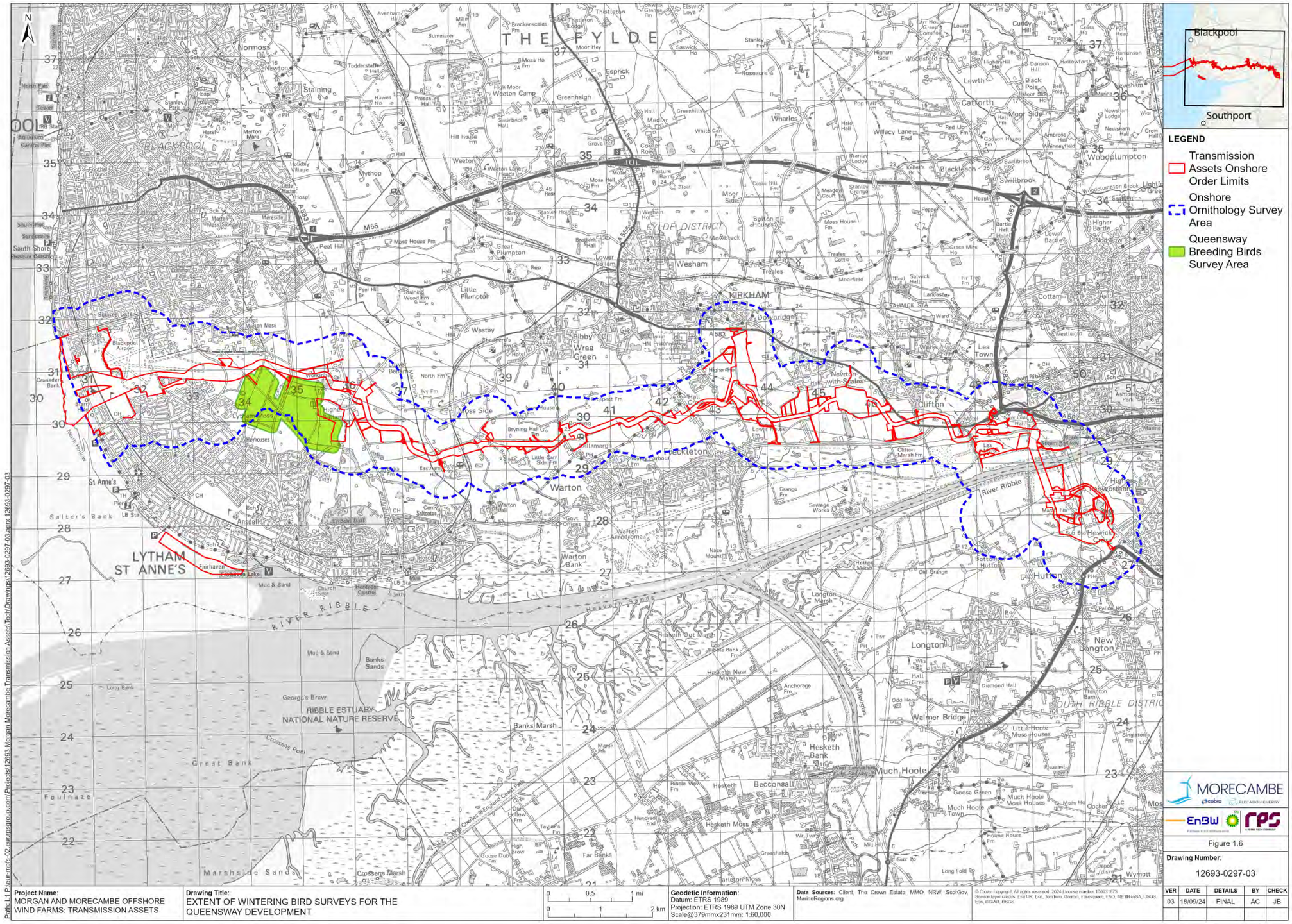


Figure 1.6: Extent of wintering bird surveys for the Queensway development

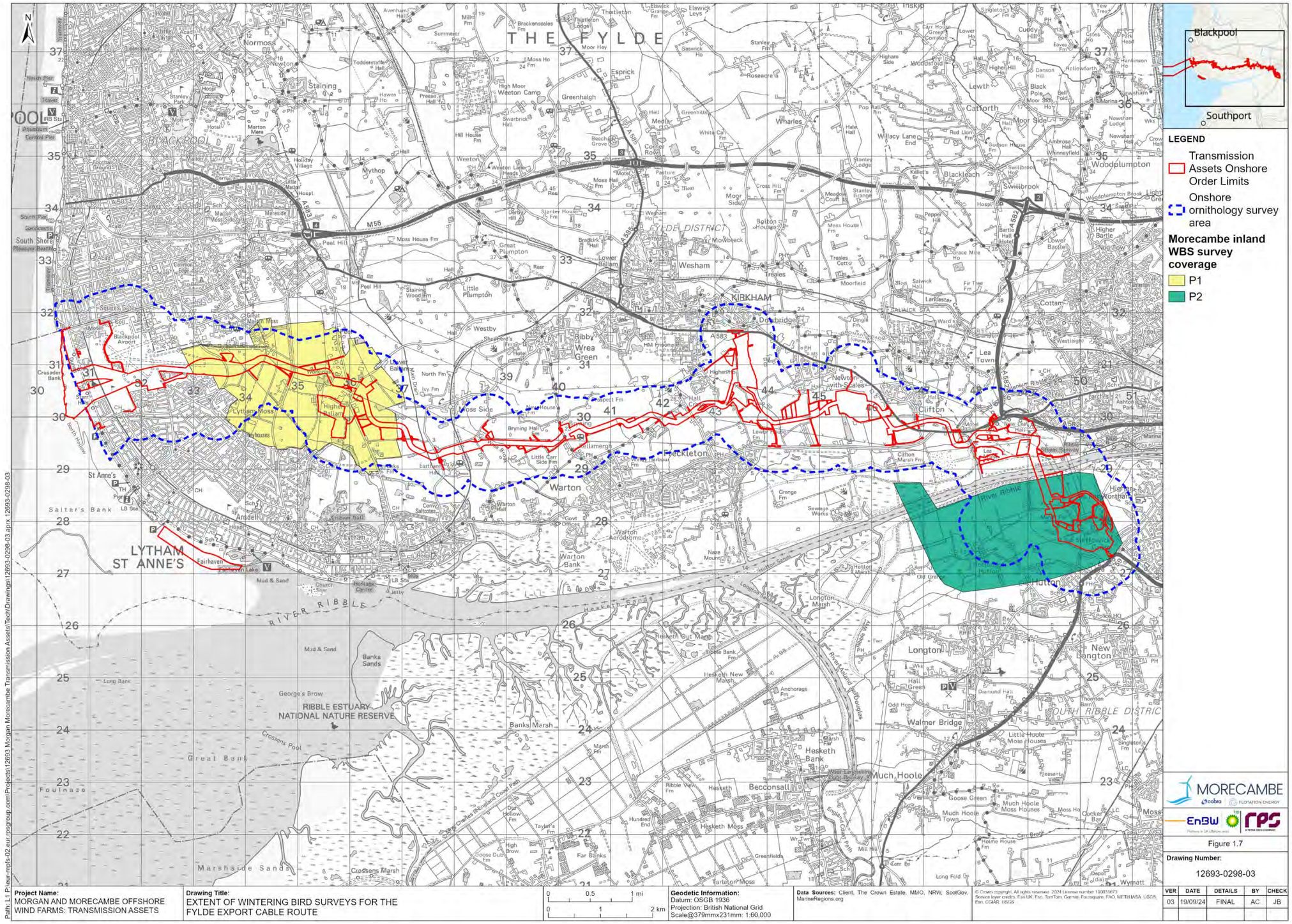


Figure 1.7: Extent of the wintering bird surveys for the Fylde export cable route

1.4 Site-specific surveys – baseline characterisation

1.4.1 Survey methodology

1.4.1.1 Site-specific surveys were undertaken within the survey area (between September 2022 to March 2023, and September 2023 to March 2024) with the aim of characterising the spatial and temporal assemblage of wintering and migratory species.

1.4.1.2 Two types of survey were used to characterise the abundance and distribution of wintering and migratory birds in the onshore survey area:

- Terrestrial waterbird surveys were carried out monthly from public access land with waterbirds as primary target species.
- Supplementary walkover surveys were carried out between two and three times over the winter period and targeted all bird species.

Terrestrial waterbird surveys

1.4.1.3 The terrestrial waterbird surveys were primarily used to identify waterbirds (gulls, waders and wildfowl).

1.4.1.4 The surveys used a 'look and see' approach to locate and map birds broadly based on guidance from Scottish Natural Heritage (2017). Terrestrial waterbird surveys were undertaken monthly between September and March over a two-year period. A detailed methodology is provided in Volume 3, Annex 4.4: Onshore and intertidal ornithology survey methodologies.

1.4.1.5 Waterbird survey visits across the survey area were undertaken monthly and only from publicly accessible land (e.g., footpaths, bridleways and road verges). Monthly survey coverage can be seen in **Figure 1.8** and **Figure 1.9**, differences in coverage between the years is due to different iterations of the Onshore Order Limits and the Intertidal Infrastructure Area .

1.4.1.6 Fields and suitable habitat for foraging, loafing, or roosting waterbirds within the onshore survey area were systematically scanned from either vehicles (when safely parked), or on foot, using binoculars and telescopes. If waterbird species were observed, then individuals were counted, mapped, and behaviour noted.

Supplementary walkover surveys

1.4.1.7 Supplementary walkover surveys were conducted to gather further information relating to the abundance and distribution of all wintering and migratory bird species (e.g., passerines) within the onshore survey area. The survey used a 'look and see' walkover methodology with surveyors visiting areas on foot (including privately owned land parcels where access was granted).

1.4.1.8 Two visits were carried out during the winter of 2022/23 (visit 1 – December/January, visit 2 – February/March) and three visits over the winter of 2023/24 (visit 1 – December, visit 2, January/February, visit 3 – February/March). Full details of survey coverage can be seen in Volume 3,

Annex 4.4: Onshore and intertidal ornithology survey methodologies (document reference F3.4.4).

1.4.1.9 Where possible, surveys were only conducted during periods of good visibility and suitable weather conditions, i.e., avoiding persistent rain or fog, and high winds. During each survey visit an experienced ornithologist, equipped with binoculars, came as close as possible to all habitats present to maximise the detection of birds both visually and aurally. The number, behaviour and location of the individuals or flocks detected were mapped.

1.4.1.10 Surveys were undertaken from a combination of footpaths, bridleways, and within privately owned land parcels where access was agreed. Access throughout the survey area enabled a high level of coverage to be achieved.

Survey schedule

1.4.1.11 Terrestrial waterbird surveys have been undertaken monthly between September 2022 and March 2023 and September 2023 and March 2024 (**Table 1.10**).

1.4.1.12 Supplementary walkover surveys were undertaken between November 2022 and December 2022, February 2023 and March 2023, December 2023, January 2024 and February 2024 and through to March 2024 (**Table 1.10**).

Table 1.10: Summary schedule of wintering and migratory bird surveys undertaken

Visit	Survey duration
Terrestrial waterbird surveys 2022/23	
1	Undertaken between 21 September 2022 and 29 September 2022.
2	Undertaken between 17 October 2022 to 27 October.
3	Undertaken between 14 November 2022 and 22 November 2022.
4	Undertaken between 7 December 2022 and 21 December 2022.
5	Undertaken between 9 January 2023 to 19 January 2023.
6	Undertaken between 13 February 2023 and 19 February 2023.
7	Undertaken between 7 March 2023 and 14 March 2023.
Supplementary walkover surveys 2022/23	
1	Survey completed between 21 November 2022 and 6 December 2022.
2	Survey completed between 15 February 2023 and 1 March 2023.
Terrestrial waterbird surveys 2023/24	
1	Undertaken between 1 September 2023 and 3 October 2023.
2	Undertaken between 16 October 2023 and 31 October 2023.
3	Undertaken between 14 November 2023 and 28 November 2023.
4	Undertaken between 07 December 2023 and 15 December 2023.
5	Undertaken between 16 January 2024 and 02 February 2024.
6	Undertaken between 20 February 2024 and 29 February 2024.

Visit	Survey duration
7	Undertaken between 1 March 2024 and 22 March 2024.
Supplementary walkover surveys 2023/24	
1	Survey completed between 4 December 2023 and 12 December 2023.
2	Survey completed between 15 January 2024 and 2 February 2024.
3	Survey completed between 26 February 2024 and 10 March 2024.

Survey coverage

1.4.1.13 **Figure 1.8** and **Figure 1.9** show the extent of the terrestrial waterbird survey monthly coverage in 2022/23 and 2023/24 respectively. **Figure 1.10** shows the extent of the supplementary walkover surveys. Full details on the percentage coverage that these surveys achieved can be found in Table 2.3, Volume 3, Annex 4.4: Onshore and intertidal ornithology survey methodologies (document reference F3.4.4), however the terrestrial waterbird surveys covered up to 94.89% of the Onshore Infrastructure Area (without urban areas) and the supplementary walkover surveys up to 90.24%.

Data processing and presentation

1.4.1.14 Data collected throughout all wintering and migratory bird surveys was collated and peak counts obtained by the summing of species counts made during each survey visit.

1.4.1.15 Distribution maps were produced for those species listed as red or amber in the BOCC5 UK and, additionally, any green listed species that are qualifying features of designated sites, individually or as part of a described assemblage, as identified in **section 1.3.1**.

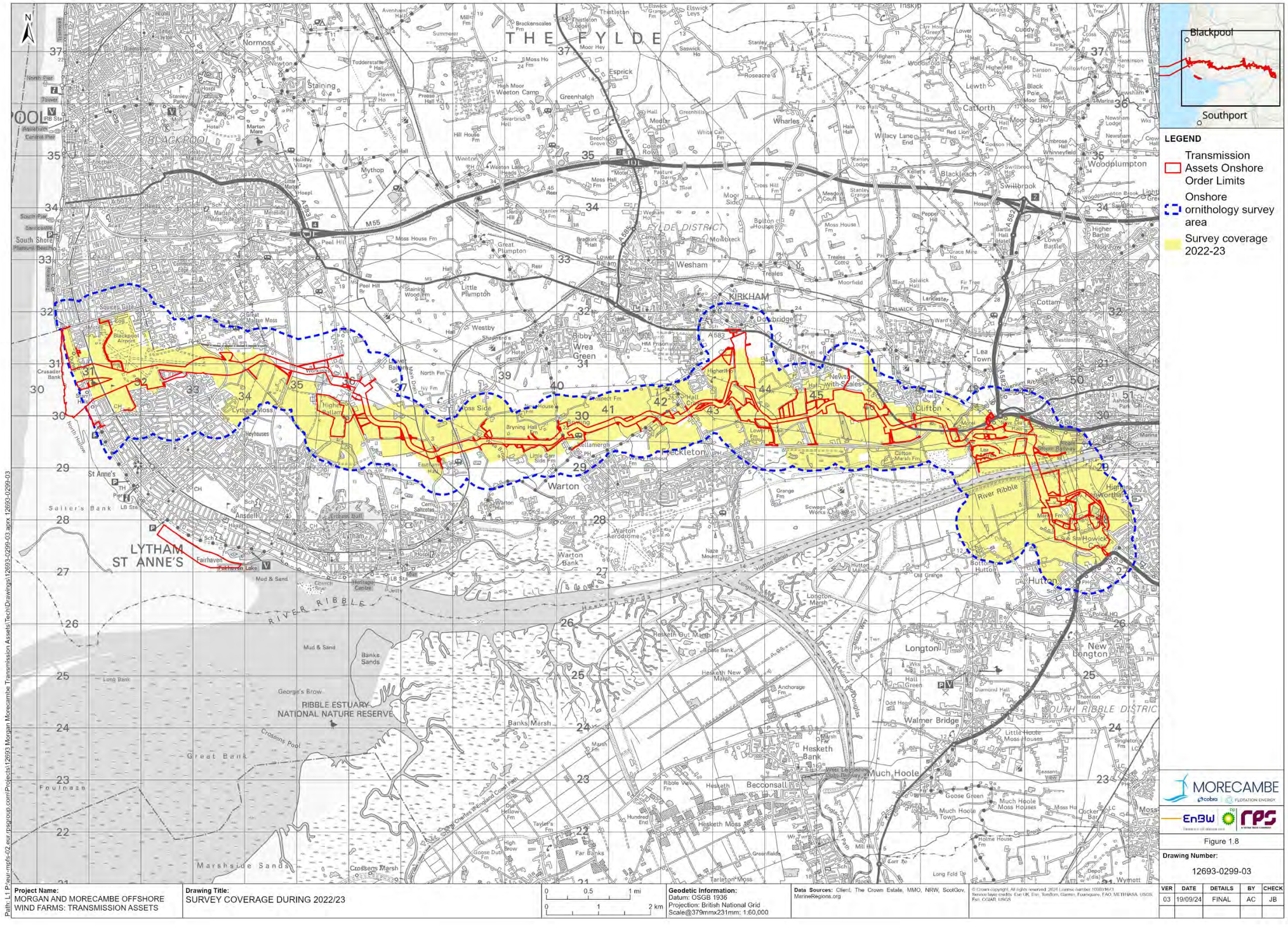


Figure 1.8: Terrestrial waterbird survey coverage during 2022/23

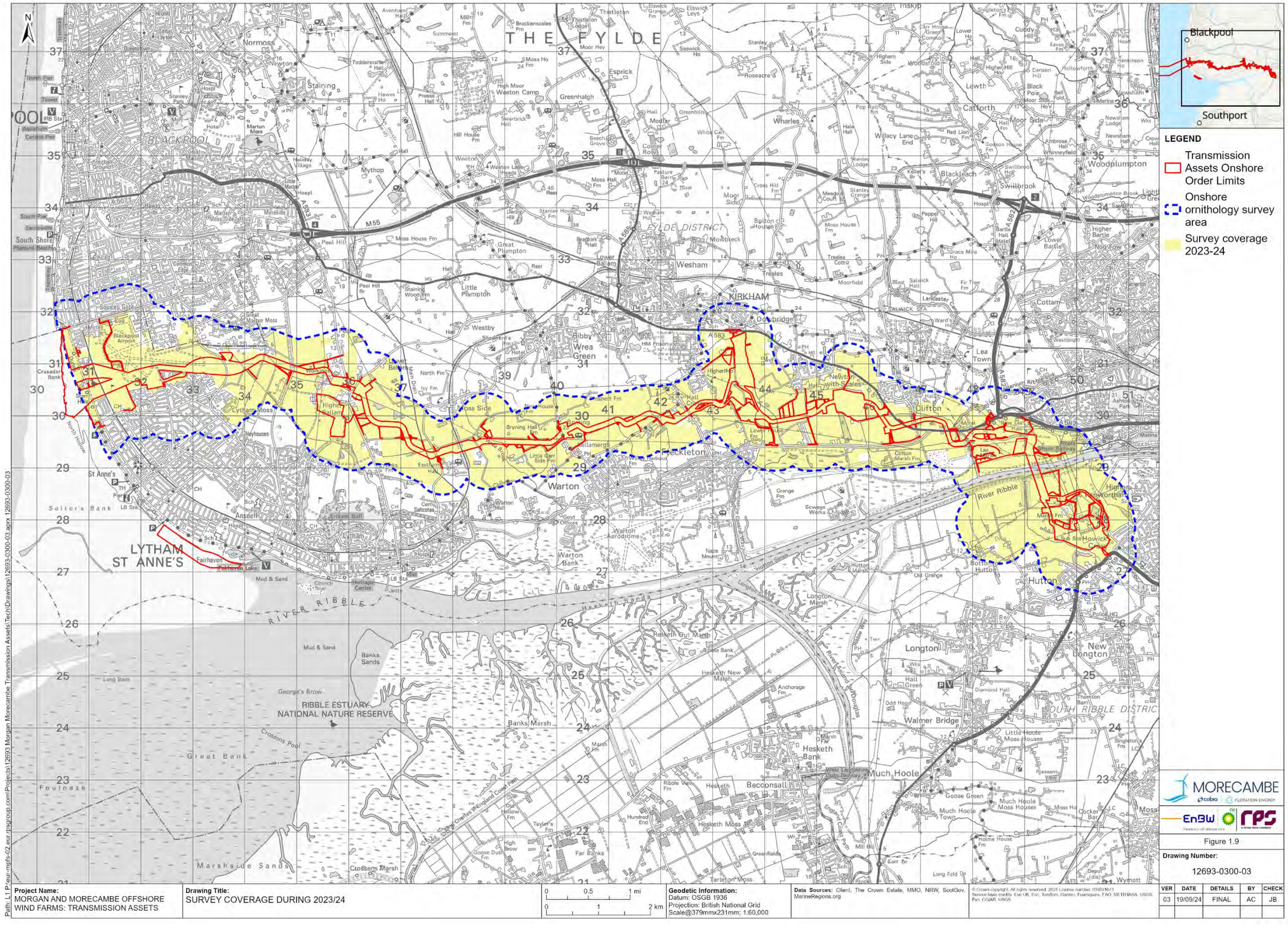


Figure 1.9: Terrestrial waterbird survey coverage during 2023/24

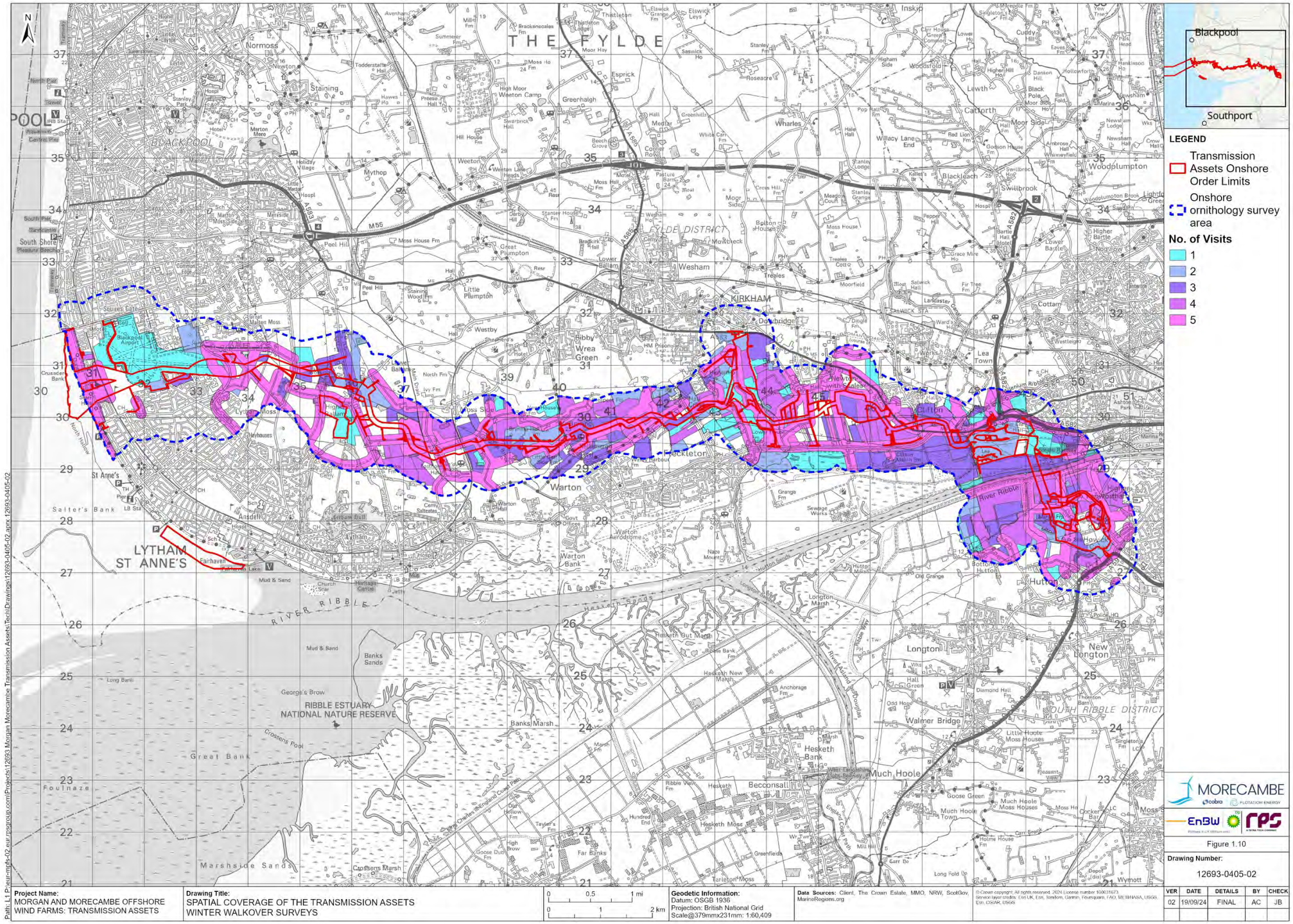


Figure 1.10: Coverage of the supplementary walkover surveys

1.4.2 Wintering and migratory bird survey results

Species summary 2022/23

1.4.2.1 A total of 36 waterbird species, 32 passerine species and seven raptor species were recorded during wintering and migratory bird surveys of the survey area during the 2022/23 non-breeding season (**Table 1.11**). Additionally, two dove and pigeon species, one woodpecker species, one owl species and one kingfisher species were also recorded. A wide range of waterbird species were recorded including 14 species from the goose, duck and swan family group, 13 wader species, five species of gull, two species of heron, one species from the cormorant and shag family group and one species from the rail, crake and coot family group.

1.4.2.2 During the 2022/23 surveys, four species which are features of the SPAs within the study area had monthly peak counts >0.5 % of the GB population, which is one of Natural England's criteria for functionally linked land threshold (Bowland ecology, 2021). These species were: pink-footed goose, whooper swan, shelduck, and black-tailed godwit.

1.4.2.3 The passerine species recorded were species associated with woodland and farmland habitats.

1.4.2.4 The annual peak counts can be seen in **Table 1.11**, and the full monthly count data for all species and both years can be seen in **Table 1.12** and **Table 1.13** (**Appendix A**). These data have been used to inform Volume 3. Chapter 4: Onshore and Intertidal Ornithology of the Environmental Statement (document reference F3.4) and the Habitats Regulations Assessment Stage 2 Information to Support an Appropriate Assessment – Part 3: Special Protection Areas and Ramsar site assessments (document reference E2.3C) so are provided here for transparency.

Annex 1 and Section 41 listed species 2022/23

1.4.2.5 Six of the recorded waterbird species (whooper swan, avocet, ruff, barnacle goose, golden plover and little egret) are listed as Annex 1 species of the EU Habitats Directive. Whooper swan were the most abundant with a monthly peak count of 132 individuals.

1.4.2.6 Four of the recorded waterbird species (black-tailed godwit, curlew, lapwing and herring gull) are listed under Section 41 of the Natural Environment and Rural Communities Act 2006. The most abundant of these species were lapwing with a peak count of 763 individuals.

1.4.2.7 Four of the recorded raptors (peregrine, merlin, marsh harrier, and red kite) are listed as Annex 1 species of the EU Habitats Directive. Peregrine were the most abundant of the raptor species, with a monthly peak count of two birds recorded.

1.4.2.8 Kingfisher are also an Annex 1 listed species and were recorded with a monthly peak count of one.

1.4.2.9 There was a total of 11 species listed under Section 41 of the Natural Environment and Rural Communities Act 2006 recorded during the

supplementary surveys, including starling, linnet, skylark, reed bunting, tree sparrow, song thrush, bullfinch, dunnock, corn bunting, yellowhammer, and lesser redpoll. The most abundant species recorded were starling with a monthly peak count of 4,350.

BOCC5 red and amber listed species 2022/23

1.4.2.10 A total of six of the waterbird species recorded are red listed in the BOCC5 UK. Whilst lapwing was the most abundant, woodcock were the least abundant with a monthly peak count of one. Other red listed species were curlew, black-tailed godwit, ruff and herring gull.

1.4.2.11 A total of 22 of the waterbird species recorded are amber listed in BOCC5 UK. The most abundant of these species were pink-footed goose with a monthly peak count of 5,324 recorded. The least abundant were gadwall and barnacle goose with just one record of each species. Other amber listed species were greylag goose, whooper swan, shelduck, shoveler, wigeon, mallard, teal, moorhen, oystercatcher, avocet, grey plover, snipe, green sandpiper, redshank, black-headed gull, common gull, great black-backed gull and lesser black-backed gull.

1.4.2.12 A total of 11 species recorded during the supplementary surveys are red listed in the Birds of Conservation Concern, BOCC5 UK red list. Starling and fieldfare were the most abundant followed by linnet. Fieldfare had a monthly peak count of 1,170 while a monthly peak count of 304 was recorded for linnet. Other red listed species included merlin, skylark, mistle thrush, whinchat, tree sparrow, greenfinch, lesser redpoll and yellowhammer.

1.4.2.13 A further 13 species recorded during the supplementary surveys are amber listed in the Birds of Conservation Concern, BOCC5 UK amber list. Redwing were the most abundant with a monthly peak count of 192 recorded. This was followed by meadow pipit with a monthly peak count of 61 birds.

Summary of species abundance and distribution by species taxonomic group 2022/23

Geese, ducks and swans

1.4.2.14 Seven duck species were recorded: wigeon (**Figure 1.23**), teal (**Figure 1.26**), mallard (**Figure 1.24**), shelduck (**Figure 1.18**), shoveler (**Figure 1.19**), goosander and gadwall (**Figure 1.21**). Of these duck species, wigeon were the most abundant with a peak monthly count of 1,647 birds.

1.4.2.15 Five goose species were recorded: pink-footed goose (**Figure 1.16**), Canada goose (introduced species), greylag goose (**Figure 1.14**), brent goose (**Figure 1.11**) and barnacle goose (**Figure 1.12**). The most abundant of these goose species was the pink-footed goose with a peak monthly count of 5,324. Despite being the most abundant goose species numbers fluctuated between counts. Indeed, numbers rose from 787 birds in September 2022 to 5,324 in December 2022 before falling to 711 in February 2023 and no records in March 2023.

1.4.2.16 Two species of swan were recorded: whooper swan (**Figure 1.17**) and mute swan. The most abundant species were whooper swan a peak monthly count of 132 individuals.

Doves and pigeons

1.4.2.17 A total of two dove and pigeon species were recorded during 2022/23, these were stock dove (**Figure 1.27**) and woodpigeon (**Figure 1.29**). The most abundant were woodpigeon with a peak count of 18 individuals while stock dove had a peak count of six.

Rails, crakes and coots

1.4.2.18 One rail species, moorhen (**Figure 1.31**), was recorded with a single bird observed.

Waders

1.4.2.19 A total of 13 species of wader were recorded. The most abundant wader species was lapwing (**Figure 1.36**) with a peak count of 763. The other recorded species included: curlew (**Figure 1.39**), black-tailed godwit (**Figure 1.41**), golden plover (**Figure 1.37**), oystercatcher (**Figure 1.33**), snipe (**Figure 1.46**), redshank (**Figure 1.50**), avocet (**Figure 1.34**), grey plover (**Figure 1.38)**, ruff (**Figure 1.43**), jack snipe and woodcock (**Figure 1.44**).

Gulls and terns

1.4.2.20 Five gull species were recorded including: black-headed gull (**Figure 1.52**), common gull (**Figure 1.55**), herring gull (**Figure 1.56**), lesser black-backed gull (**Figure 1.57**), and great black-backed gull (**Figure 1.53**). The most abundant species were black-headed gull with a peak monthly count of 1,123.

Cormorants and shags

1.4.2.21 Cormorant were the only species from this group recorded with a monthly peak count of two (**Figure 1.59**).

Herons

1.4.2.22 Grey heron and little egret (**Figure 1.63**) were recorded in all wintering and migratory survey visits during 2022/23. Grey heron had a peak monthly count of 28 while little egret were more abundant with a peak monthly count of 38.

Kingfishers

1.4.2.23 There was one recording of kingfisher (peak monthly count of one) across all 2022/23 wintering and migratory bird surveys (**Figure 1.71**).

Raptors

1.4.2.24 A total of seven raptor species were recorded in the onshore ornithology survey area. Buzzard, kestrel (**Figure 1.73**), and sparrowhawk (**Figure 1.65**) were recorded in both the November 2022 survey and February 2023 survey. Peregrine (**Figure 1.77**), red kite (**Figure 1.69**), merlin (**Figure 1.75**), and marsh harrier (**Figure 1.67**) were only observed during the November 2022 survey. The most abundant species was buzzard with a maximum count of 20 recorded.

Owls

1.4.2.25 One owl species were recorded during the wintering and migratory bird surveys, little owl. The species was recorded on one occasion with one individual observed.

Woodpeckers

1.4.2.26 One woodpecker species, great spotted woodpecker, was recorded in the Morgan and Morecambe onshore ornithology supplementary wintering and migratory birds surveys. The species had a peak monthly count of two individuals.

Passerines

1.4.2.27 A total of 32 passerine species were recorded in the Morgan and Morecambe onshore ornithology wintering and migratory birds surveys. The most abundant passerines recorded were starlings with a monthly peak count of 4,350. This was followed by fieldfare with a monthly peak count of 1,170. The distributions of passerine species are shown within figures **Figure 1.79** to **Figure 1.119**.

Species summary 2023/24

1.4.2.28 A total of 39 waterbird species, 41 passerine species and six raptor species were recorded during wintering and migratory bird surveys of the survey area during the 2023/24 non-breeding season (**Table 1.11**). Additionally, four dove and pigeon species, one woodpecker species, one owl species, one pheasant species and one kingfisher species were also recorded. A wide range of waterbird species were recorded including 13 species from the goose, duck and swan family group, 13 wader, five gull, four species of heron, one species from the cormorant and shag family group and three species from the rail, crake and coot family group.

1.4.2.29 During the 2023/24 surveys, five species which are features of the SPAs within the study area had monthly peak counts >0.5 % of the GB population, which is one of Natural England's criteria for functionally linked land threshold (Bowland ecology, 2021). These species were: pink-footed goose, whooper swan, shelduck, curlew, and black-tailed godwit.

1.4.2.30 The passerine species recorded were species associated with woodland, hedgerow and farmland habitats.

Annex 1 and Section 41 listed species 2023/24

1.4.2.31 Seven of the recorded waterbird species (whooper swan, avocet, bar-tailed godwit, barnacle goose, golden plover, great white egret and little egret) are listed as Annex 1 species of the EU Habitats Directive. Whooper swan were the most abundant with a monthly peak count of 123 individuals.

1.4.2.32 Four of the recorded waterbird species (black-tailed godwit, curlew, lapwing and herring gull) are listed under Section 41 of the Natural Environment and Rural Communities Act 2006. The most abundant of these species were lapwing with a peak count of 2,081 individuals.

1.4.2.33 Three of the recorded raptors (peregrine, merlin and marsh harrier) are listed as Annex 1 species of the EU Habitats Directive. Peregrine were the most abundant of the raptor species, with a monthly peak count of two birds recorded.

1.4.2.34 Kingfisher are also an Annex 1 listed species and were recorded with a monthly peak count of four individuals.

1.4.2.35 There was a total of 11 non-waterbird species listed under Section 41 of the Natural Environment and Rural Communities Act 2006, including skylark, starling, song thrush, tree sparrow, house sparrow, dunnock, bullfinch, twite, linnet, yellowhammer and reed bunting. The most abundant species recorded were starling with a monthly peak count of 7,579.

BOCC5 red and amber listed species 2023/24

1.4.2.36 A total of six of the waterbird species recorded are red listed in the BOCC5 UK red list. Whilst lapwing was the most abundant, woodcock were again the least abundant with a monthly peak count of six. Other red listed species were curlew, black-tailed godwit, dunlin and herring gull.

1.4.2.37 A total of 25 of the waterbird species recorded are amber listed in BOCC5 UK amber list. The most abundant of these species were pink-footed goose with a monthly peak count of 8,319 recorded. The least abundant were cattle egret, great white egret and green sandpiper with each of these species having a monthly peak count of one. Other amber listed species were barnacle goose, greylag goose, whooper swan, shelduck, shoveler, gadwall wigeon, mallard, teal, moorhen, oystercatcher, avocet, bar-tailed godwit, snipe, redshank, black-headed gull, common gull, great black-backed gull and lesser black-backed gull.

1.4.2.38 A total of 11 non-waterbird species recorded are red listed in the BoCC5 UK. Starling and fieldfare were the most abundant followed by linnet. Fieldfare had a monthly peak count of 1,325 while a monthly peak count of 730 was recorded for linnet. Other red listed species included merlin, skylark, mistle thrush, tree sparrow, house sparrow, greenfinch, twite and yellowhammer.

1.4.2.39 A further 12 species recorded are amber listed in the BOCC5 UK. Song thrush were the most abundant with a monthly peak count of 300 recorded. This was followed by rook with a monthly peak count of 255 birds. Additional amber listed species include sparrowhawk, marsh harrier, kestrel, wren, redwing, dunnock, grey wagtail, meadow pipit, bullfinch and reed bunting.

Summary of species abundance and distribution by species taxonomic group 2023/24

Geese, ducks and swans

1.4.2.40 Seven duck species were recorded: wigeon (**Figure 1.23**), teal (**Figure 1.26**), mallard (**Figure 1.25)**, shelduck (**Figure 1.18)**, shoveler (**Figure 1.20**), goosander and gadwall (**Figure 1.22**). Of these duck species, wigeon were the most abundant with a peak monthly count of 878 birds.

1.4.2.41 Four goose species were recorded: pink-footed goose (**Figure 1.16**), Canada goose, greylag goose (**Figure 1.15**) and barnacle goose (**Figure 1.13**). The most abundant of these goose species was the pink-footed goose with a peak monthly count of 8,319. Despite being the most abundant goose species numbers fluctuated between counts. Count numbers rose reached the peak of 8,319 in October 2022 before falling to 503 in November 2022. Numbers rose again to 4,960 in February 2023 before falling to 59 in March 2023.

1.4.2.42 Two species of swan were recorded: whooper swan (**Figure 1.17**) and mute swan. The most abundant species were whooper swan a peak monthly count of 123 individuals.

Pheasants

1.4.2.43 Pheasant were the only species from this group recorded. The species had a monthly peak count of 16.

Doves and pigeons

1.4.2.44 Four species of dove and pigeon were recorded, collared dove, stock dove (**Figure 1.28**), feral pigeon and woodpigeon (**Figure 1.30**). The most abundant species were woodpigeon with a peak monthly count of 687.

Waders

1.4.2.45 A total of 13 wader species were recorded. The most abundant species were lapwing (**Figure 1.36**) with a peak monthly count of 2,649. The other wader species recorded include avocet (**Figure 1.35**), bar-tailed godwit (**Figure 1.40**), black-tailed godwit (**Figure 1.41**), curlew (**Figure 1.39**), dunlin (**Figure 1.42**), golden plover (**Figure 1.37)**, green sandpiper (**Figure 1.49**), jack snipe, oystercatcher (**Figure 1.33**), redshank (**Figure 1.51**), snipe (**Figure 1.47**) and woodcock (**Figure 1.45**).

Gulls and terns

1.4.2.46 Five gull species were recorded including: black-headed gull (**Figure 1.52**), common gull (**Figure 1.55**), herring gull (**Figure 1.56**), lesser black-backed gull (**Figure 1.58**), and great black-backed gull (**Figure 1.54)**. The most abundant species were black-headed gull with a peak monthly count of 1,927.

Cormorants and shags

1.4.2.47 Cormorant were the only species from this group recorded with a monthly peak count of six (**Figure 1.60**).

Herons

1.4.2.48 A total of four heron species were recorded, cattle egret (**Figure 1.61**), great white egret (**Figure 1.62**), grey heron and little egret (**Figure 1.64**). The most abundant species were grey heron with a peak monthly count of 36.

Kingfishers

1.4.2.49 Kingfisher were the only species from this group observed. The species had a monthly peak count of four (**Figure 1.72**).

Raptors

1.4.2.50 A total of six raptor species were recorded across the 2023/24 non-breeding season. The most abundant species were buzzard with a peak monthly count of 30. The other recorded species were kestrel (**Figure 1.74**), marsh harrier (**Figure 1.68**), merlin (**Figure 1.76**), peregrine (**Figure 1.78**) and sparrowhawk (**Figure 1.66**).

Owls

1.4.2.51 One species of owl, barn owl, was recorded (**Figure 1.70**). A peak monthly count of nine was made for this species.

Woodpeckers

1.4.2.52 One woodpecker species, great spotted woodpecker, was recorded in the 2023/24 wintering and migratory birds surveys. The species had a peak monthly count of three individuals.

Passerines

1.4.2.53 Starling were the most abundant of the 41 passerine species recorded with a peak monthly count of 7,579. This was followed by fieldfare, peak monthly count of 1,325, and linnet, peak monthly count of 730. The distributions of passerine species are shown within figures **Figure 1.79** to **Figure 1.119**.

Table 1.11: Abundance of wintering and migratory birds recorded during the site-specific surveys

Taxonomic group	Species	Monthly peak count recorded in 2022/23	Monthly peak count recorded in 2023/24	UK BOCC5 status	Conservation status	Designated site feature
Geese, ducks and swans	Brent goose	12	0	Amber		SPA
	Canada goose	420	636	Not listed		
	Barnacle goose	1	12	Amber	Annex 1	
	Greylag goose	12	517	Amber		
	Pink-footed goose	5,324	8,319	Amber		SPA, Ramsar, SSSI
	Mute swan	4	24	Green		
	Whooper swan	132	123	Amber	Annex 1	SPA, Ramsar, SSSI
	Shelduck	75	374	Amber		SPA, Ramsar, SSSI
	Shoveler	29	31	Amber		SPA, SSSI
	Gadwall	1	11	Amber		SPA, SSSI
	Wigeon	1,647	878	Amber		SPA, Ramsar, SSSI
	Mallard	273	161	Amber		SPA, SSSI
	Teal	261	312	Amber		SPA, Ramsar, SSSI
	Goosander	2	4	Green		
Pheasants	Pheasant	0	16	Not listed		
Doves and pigeons	Feral pigeon	0	19	Green		
	Stock dove	6	29	Amber		
	Woodpigeon	18	687	Amber		
	Collared dove	0	8	Green		

Taxonomic group	Species	Monthly peak count recorded in 2022/23	Monthly peak count recorded in 2023/24	UK BOCC5 status	Conservation status	Designated site feature
Rails, crakes and coots	Water rail	0	1	Green		
	Moorhen	1	16	Amber		
	Coot	0	6	Green		SSSI
Waders	Oystercatcher	9	126	Amber		SPA, Ramsar, SSSI
	Avocet	6	17	Amber	Annex 1	SSSI
	Lapwing	763	2,081	Red	Section 41	SPA, Ramsar, SSSI
	Golden plover	100	381	Green	Annex 1	SPA, Ramsar, SSSI
	Grey plover	2	0	Amber		SSSI
	Curlew	410	696	Red	Section 41	SPA, Ramsar, SSSI
	Bar-tailed godwit	0	3	Amber	Annex 1	SPA, Ramsar, SSSI
	Black-tailed godwit	390	423	Red	Section 41	SPA, Ramsar, SSSI
	Ruff	2	0	Red	Annex 1	SPA, Ramsar, SSSI
	Dunlin	0	21	Red		SPA, Ramsar, SSSI
	Woodcock	1	6	Red		
	Jack snipe	1	3	Green		
	Snipe	78	72	Amber		SPA, SSSI
	Green sandpiper	1	1	Amber		
	Redshank	7	61	Amber		SPA, Ramsar, SSSI
Gulls and terns	Black-headed gull	1,123	1,927	Amber		SPA
	Common gull	461	404	Red		SPA

Taxonomic group	Species	Monthly peak count recorded in 2022/23	Monthly peak count recorded in 2023/24	UK BOCC5 status	Conservation status	Designated site feature
	Great black-backed gull	36	44	Red		
	Herring gull	185	1,009	Red	Section 41	SPA
	Lesser black-backed gull	152	176	Amber		SPA, Ramsar, NNR
Cormorants and shags	Cormorant	2	6	Green		SPA, Ramsar
Herons	Cattle egret	0	1	Amber		
	Grey heron	28	36	Green		
	Great white egret	0	1	Amber	Annex 1	SPA
	Little egret	38	27	Green	Annex 1	SPA
Kingfishers	Kingfisher	1	4	Green	Annex 1	
Raptors	Sparrowhawk	3	8	Amber		
	Marsh harrier	1	1	Amber	Annex 1	
	Red kite	1	0	Green	Annex 1	
	Buzzard	20	30	Green		
	Kestrel	9	25	Amber		
	Merlin	1	1	Red	Annex 1	
	Peregrine	2	2	Green	Annex 1	
Owls	Barn owl	0	9	Green		
	Little owl	1	0	Not listed		

Taxonomic group	Species	Monthly peak count recorded in 2022/23	Monthly peak count recorded in 2023/24	UK BOCC5 status	Conservation status	Designated site feature
Woodpeckers	Great spotted woodpecker	2	3	Green		
Passerines	Jay	3	6	Green		
	Magpie	0	90	Green		
	Jackdaw	0	325	Green		
	Rook	19	255	Amber		
	Carrion crow	0	312	Green		
	Raven	7	6	Green		
	Coal tit	0	13	Green		
	Blue tit	0	110	Green		
	Great tit	0	59	Green		
	Skylark	78	98	Red	Section 41	
	Cetti's warbler	0	1	Green		
	Long-tailed tit	31	197	Green		
	Chiffchaff	1	3	Green		
	Goldcrest	2	11	Green		
	Wren	19	90	Amber		
	Nuthatch	1	3	Green		
	Treecreeper	0	5	Green		
	Starling	4,350	7,579	Red	Section 41	
	Song thrush	19	300	Amber	Section 41	

Taxonomic group	Species	Monthly peak count recorded in 2022/23	Monthly peak count recorded in 2023/24	UK BOCC5 status	Conservation status	Designated site feature
	Mistle thrush	4	22	Red		
	Redwing	192	196	Amber		
	Blackbird	8	221	Green		
	Fieldfare	1,170	1,325	Red		
	Robin	0	255	Green		
	Whinchat	3	0	Red		
	Stonechat	6	20	Green		SSSI
	Tree sparrow	20	18	Red	Section 41	
	House sparrow	0	40	Red	Section 41	
	Dunnock	3	43	Amber	Section 41	
	Grey wagtail	6	2	Amber		
	Pied wagtail	50	31	Green		
	Meadow pipit	61	147	Amber		
	Chaffinch	36	82	Green		
	Brambling	0	3	Green		
	Bullfinch	7	9	Amber	Section 41	
	Greenfinch	34	77	Red		
	Twite	0	3	Red	Section 41	
	Linnet	304	730	Red	Section 41	
	Lesser redpoll	1	0	Red	Section 41	

Taxonomic group	Species	Monthly peak count recorded in 2022/23	Monthly peak count recorded in 2023/24	UK BOCC5 status	Conservation status	Designated site feature
	Goldfinch	58	134	Green		
	Siskin	14	24	Green		
	Snow bunting	1	0	Amber		
	Yellowhammer	9	3	Red	Section 41	
	Reed bunting	14	56	Amber	Section 41	

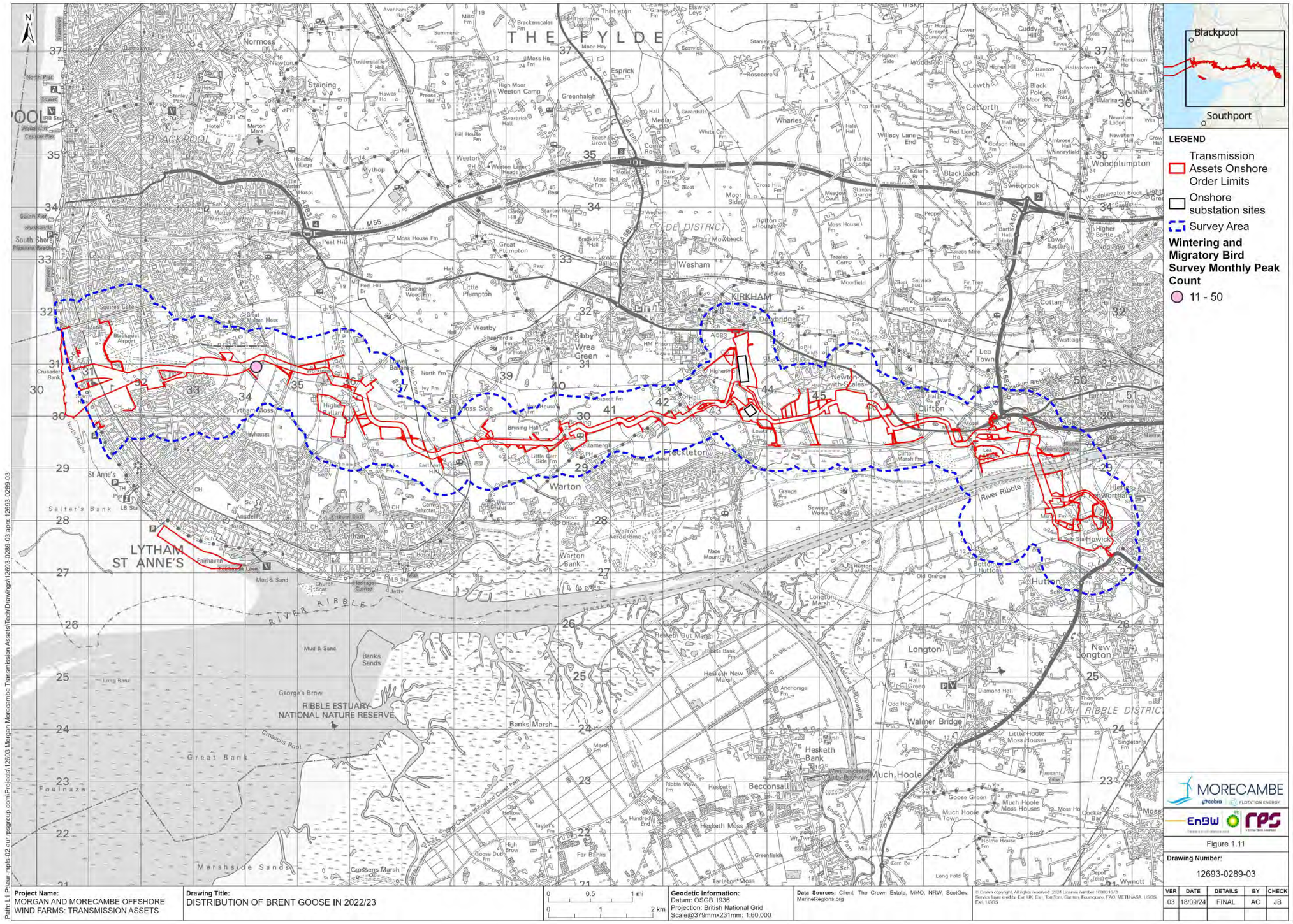


Figure 1.11: Distribution of brent goose in 2022/23

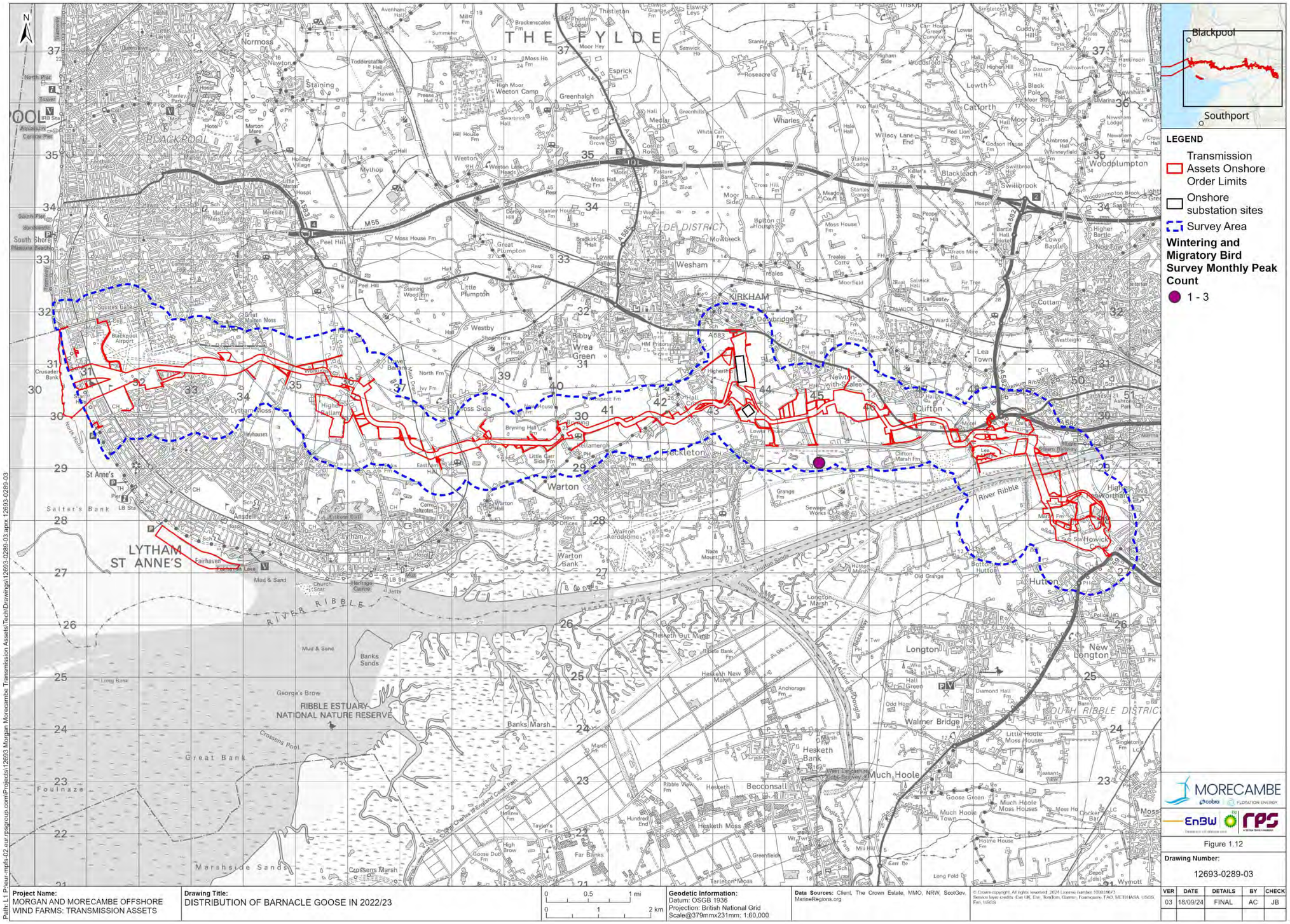


Figure 1.12: Distribution of barnacle goose in 2022/23

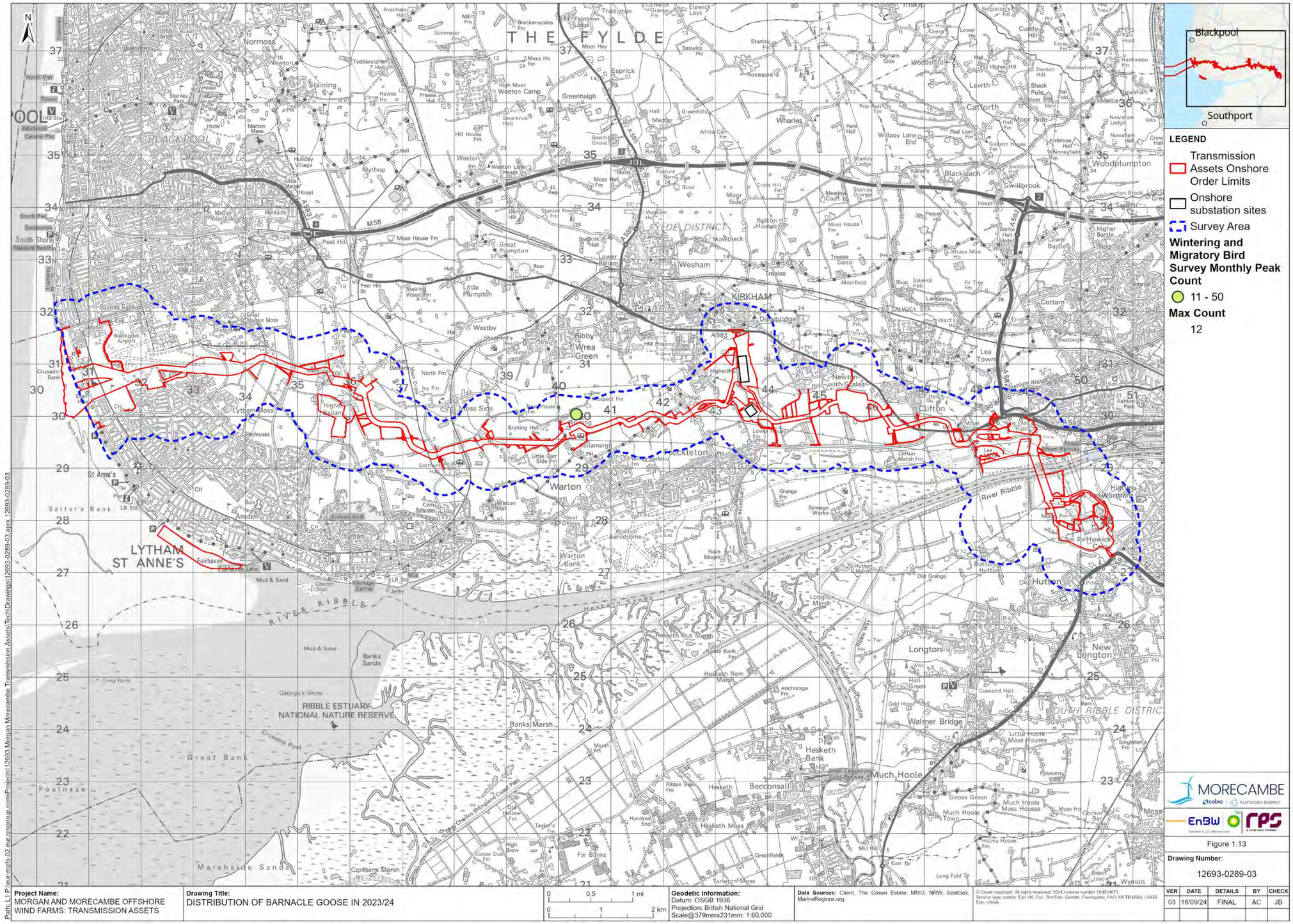


Figure 1.13: Distribution of barnacle goose in 2023/24

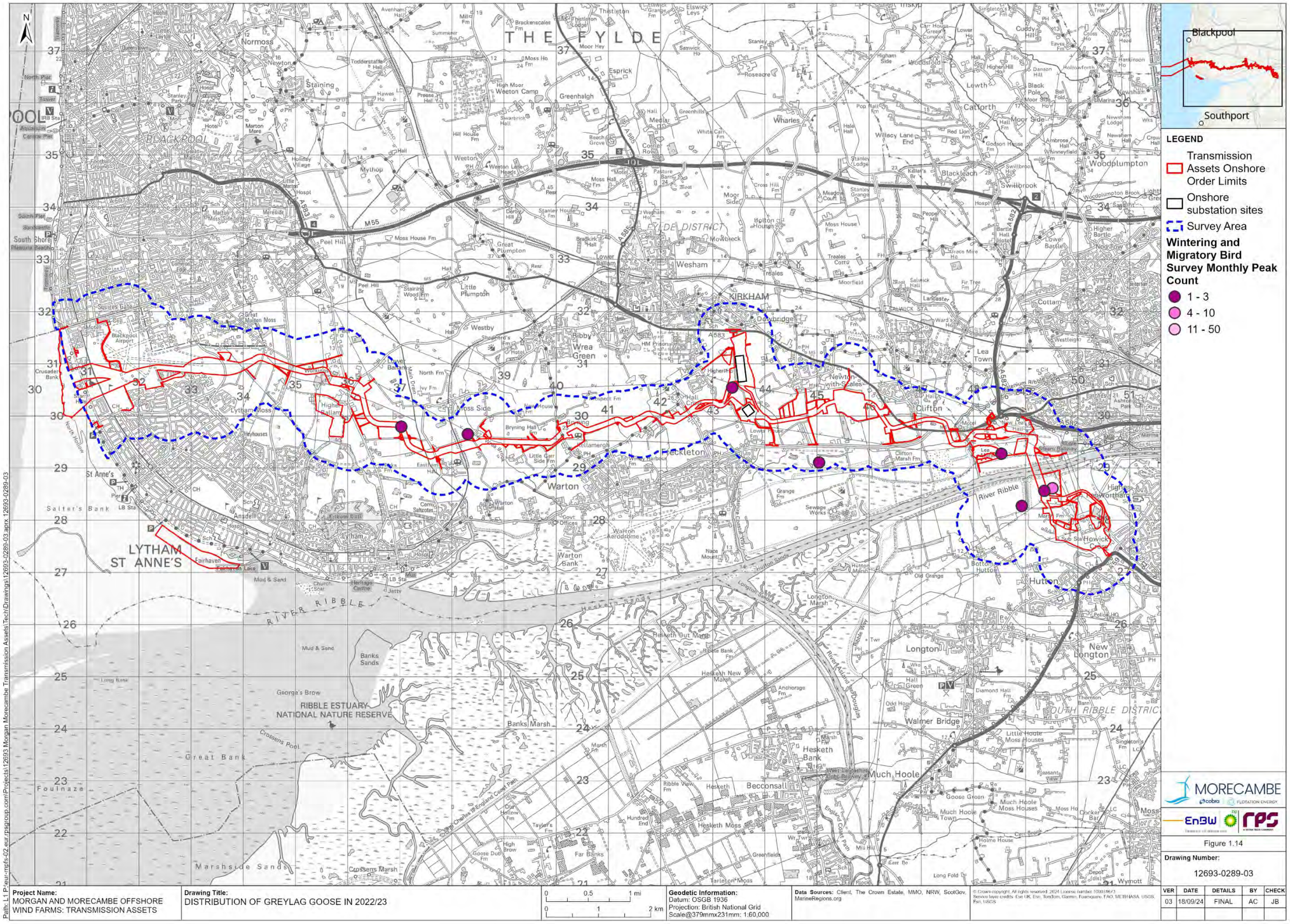


Figure 1.14: Distribution of greylag goose in 2022/23

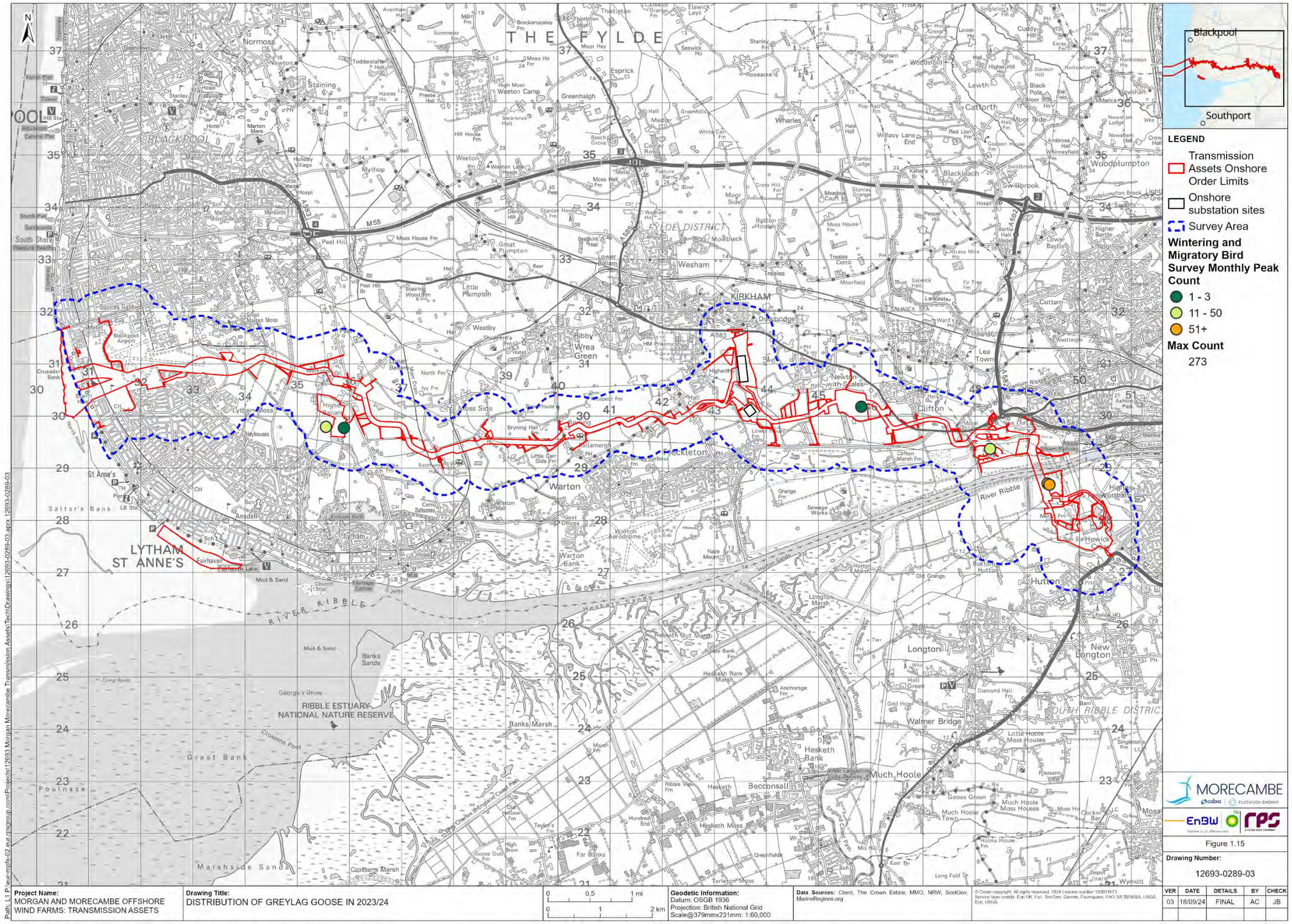


Figure 1.15: Distribution of greylag goose in 2023/24

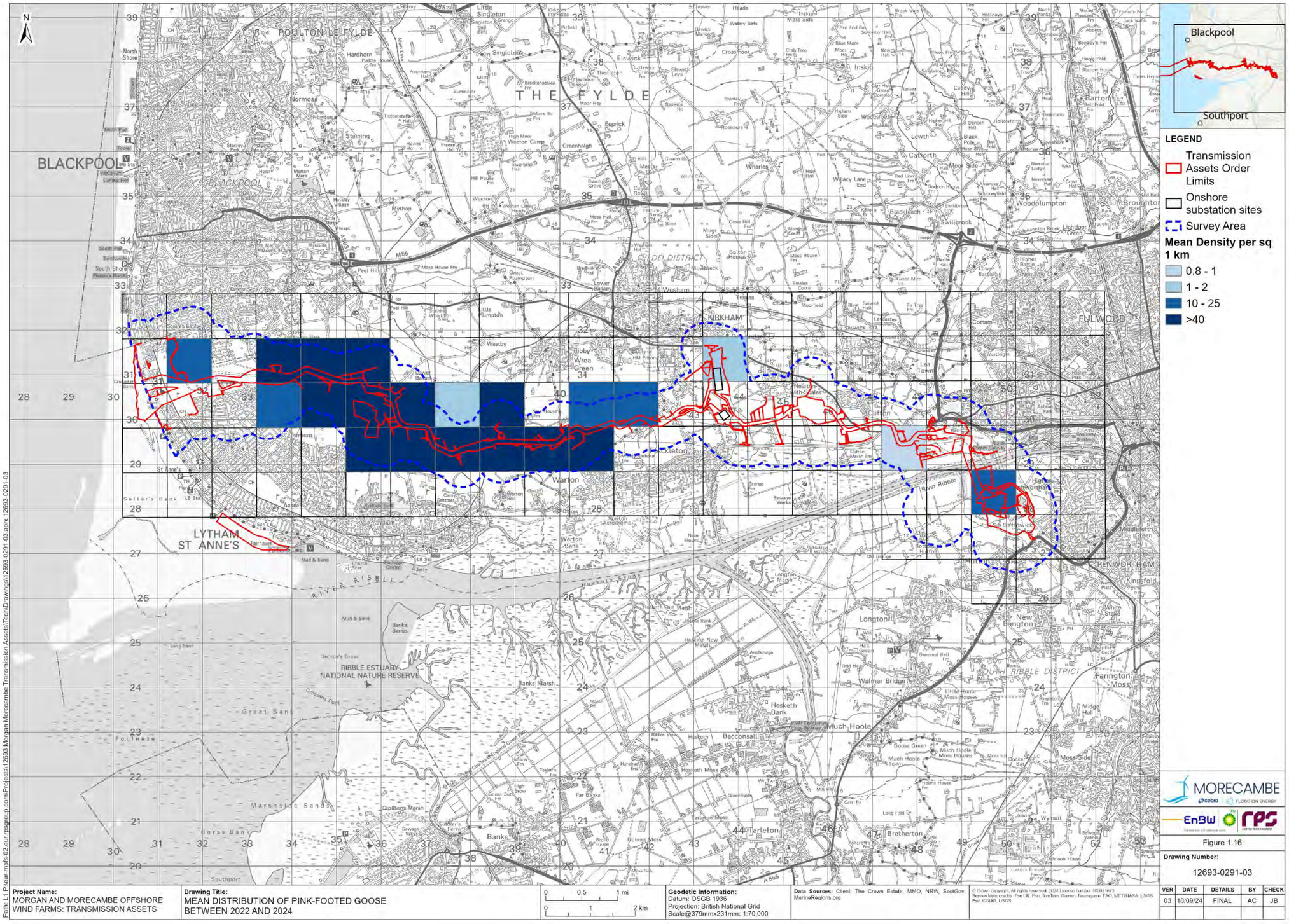


Figure 1.16: Mean distribution of pink-footed goose between 2022 and 2024

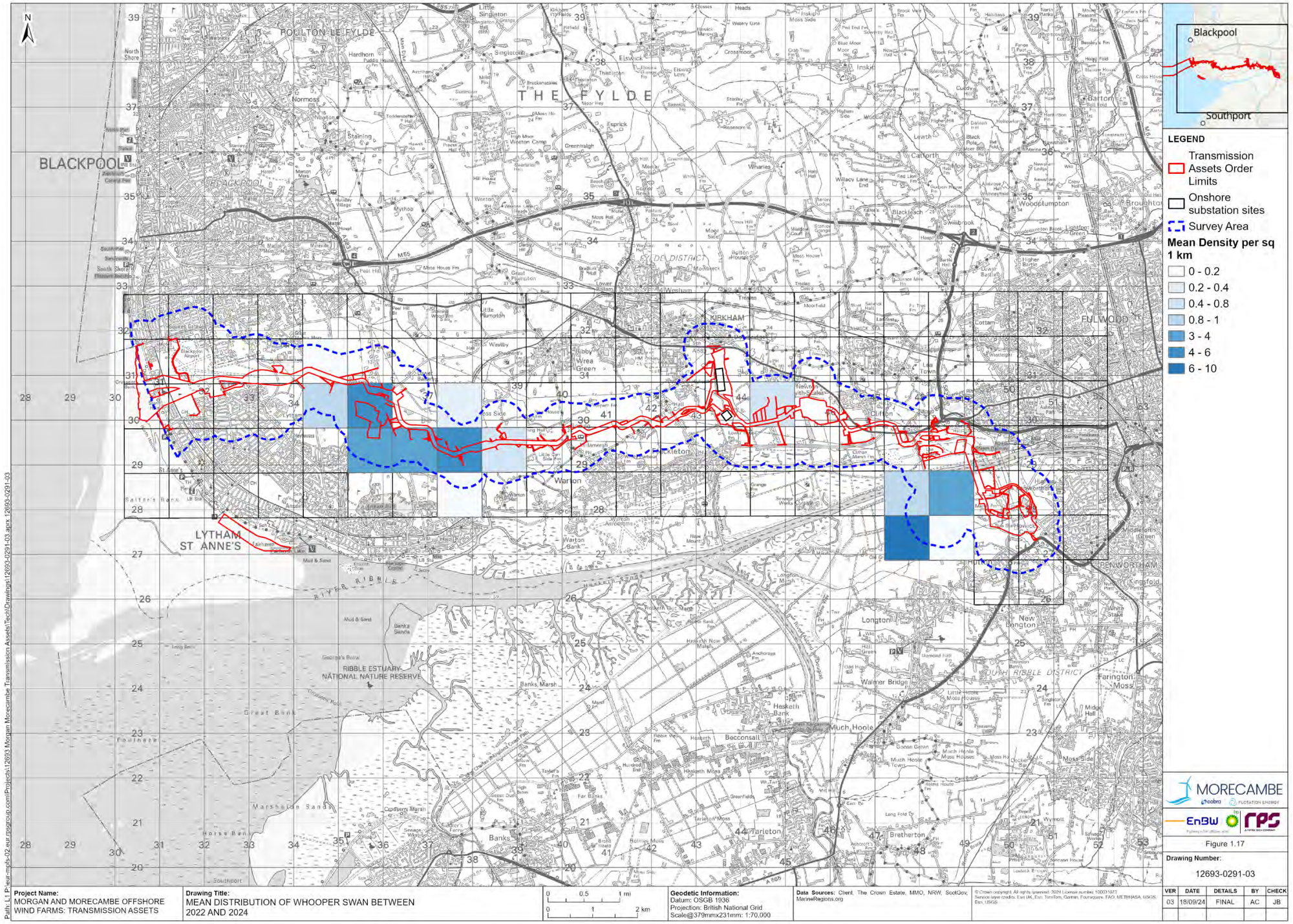
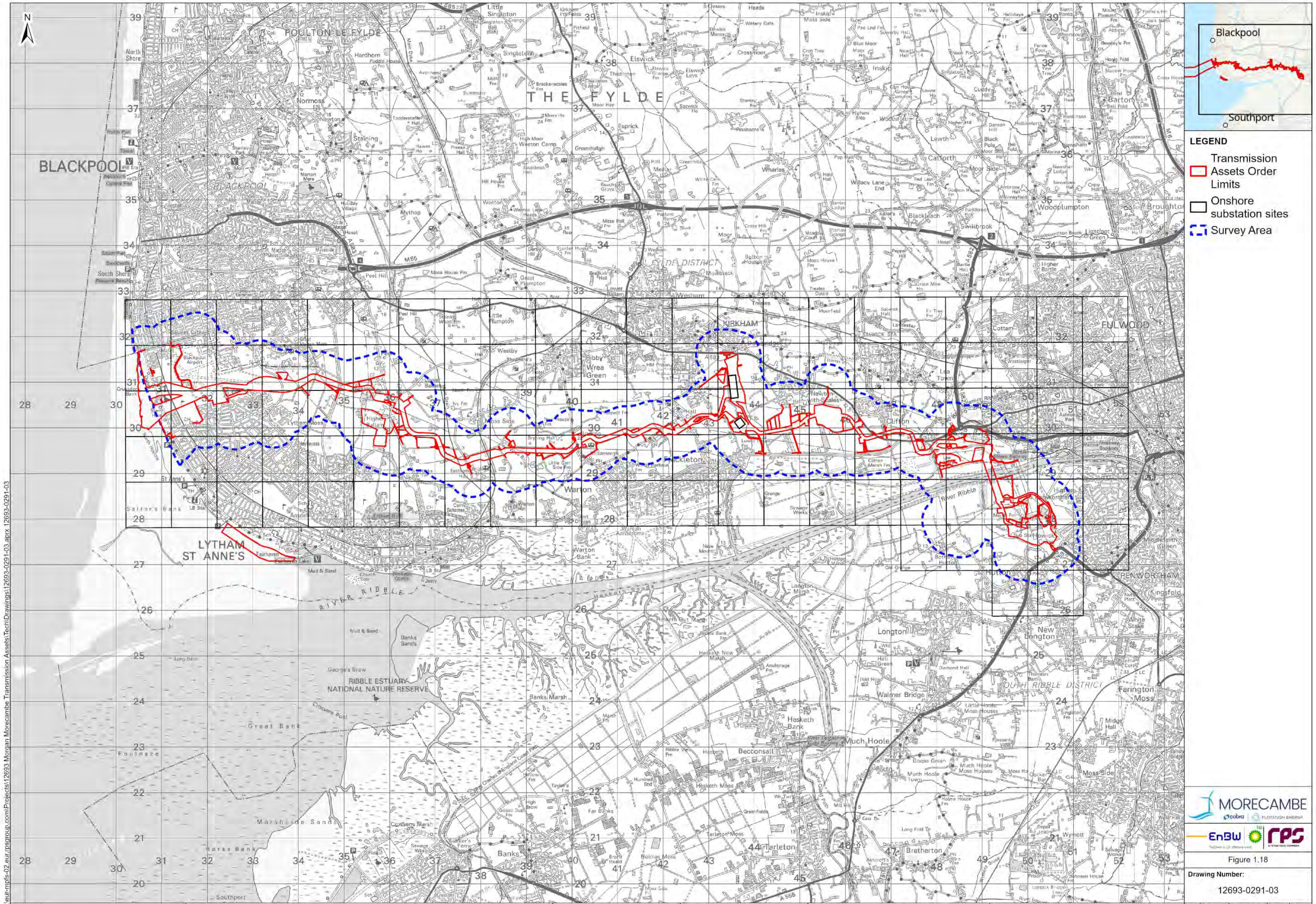


Figure 1.17: Mean distribution of whooper swan between 2022 and 2024



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Project Name:	Drawing Title:	Scale	Geodetic Information:	Data Sources:	
MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	MEAN DISTRIBUTION OF SHELDUCK BETWEEN 2022 AND 2024	0 0.5 1 mi; 0 1 2 km	Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:70,000	Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org	© Crown copyright. All rights reserved. 2024 License number 100031673 Service layer credits: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, USGS

Figure 1.18

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Figure 1.18: Mean distribution of shelduck between 2022 and 2024

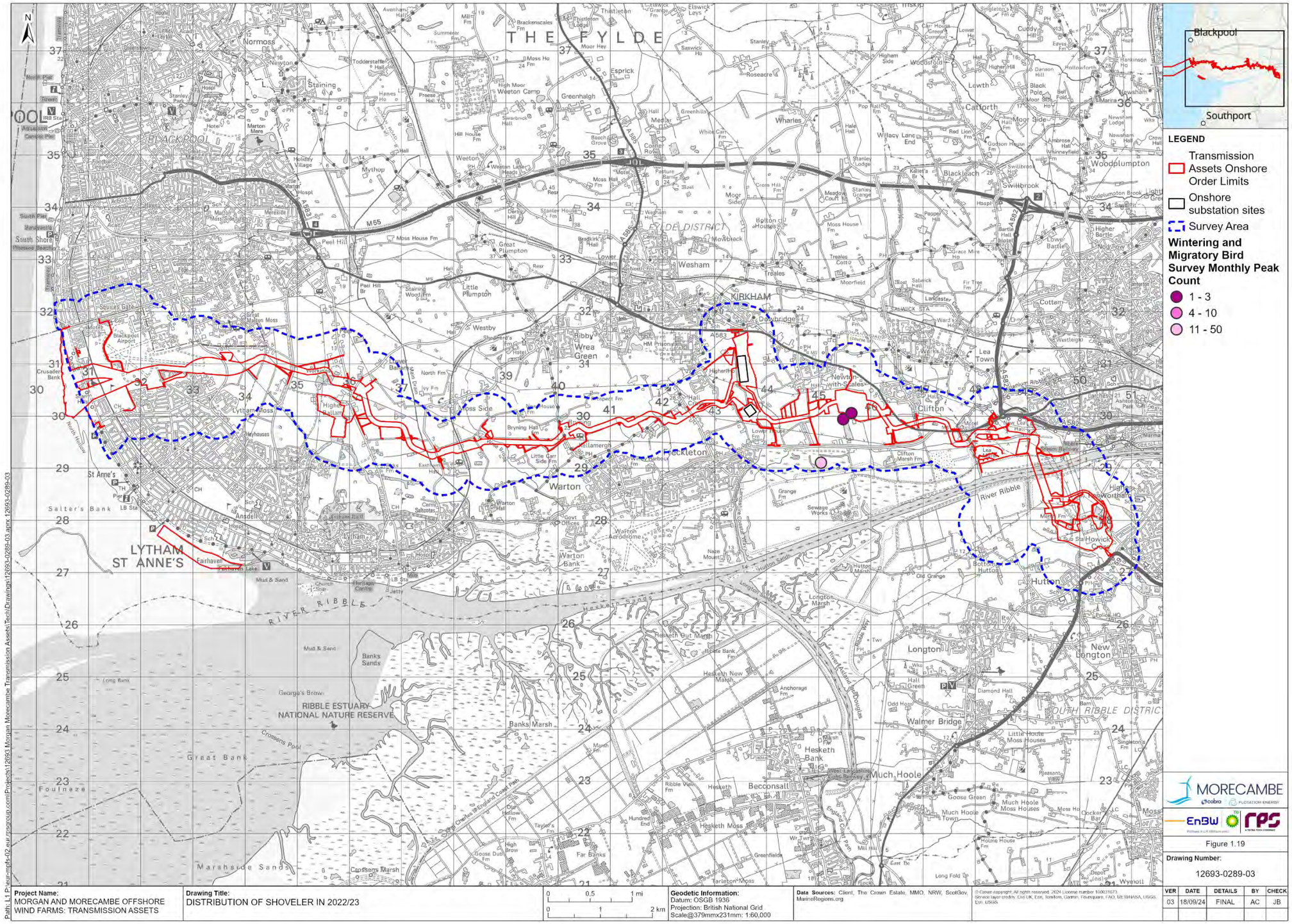


Figure 1.19: Distribution of shoveler in 2022/23

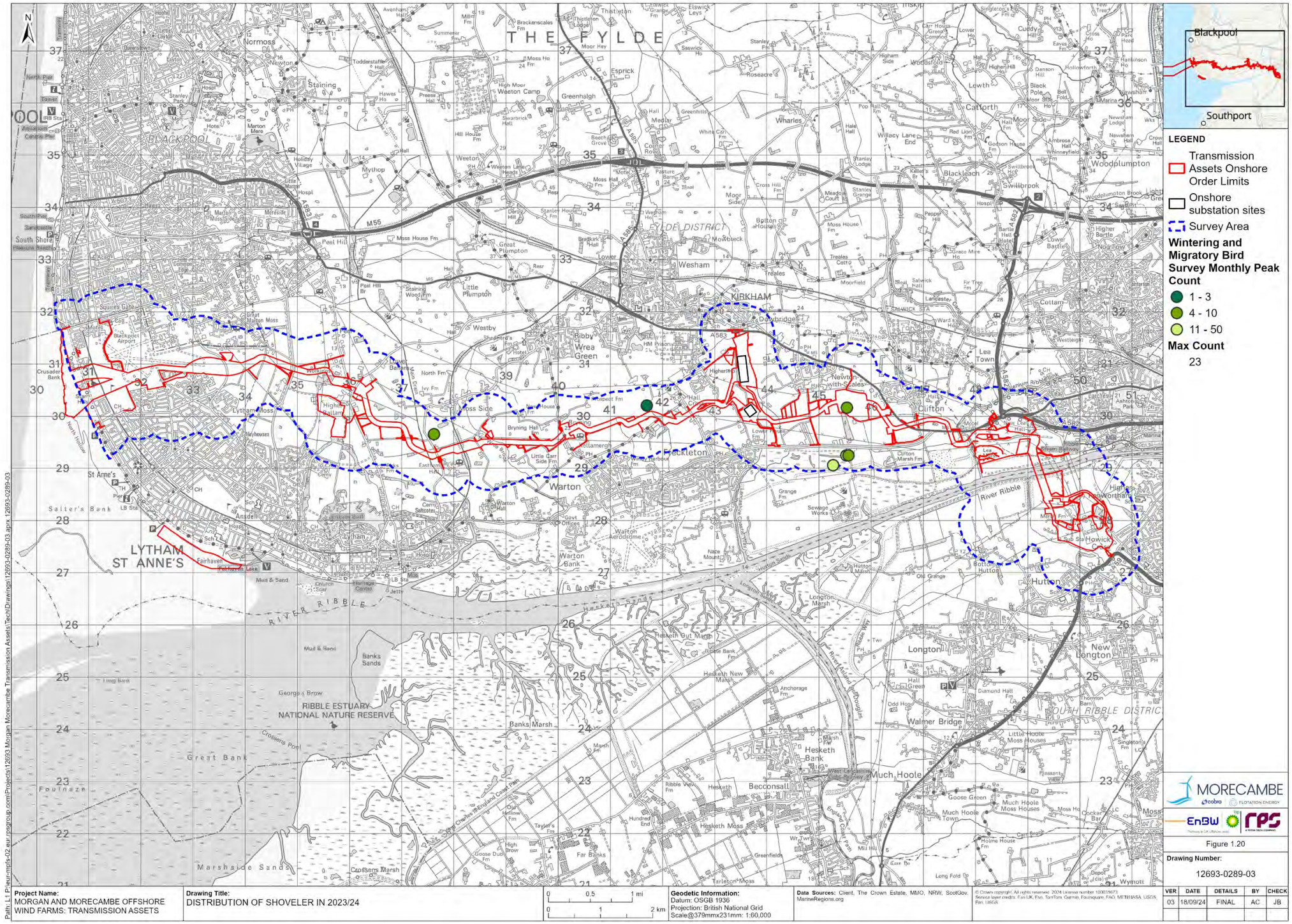


Figure 1.20: Distribution of shoveler in 2023/24

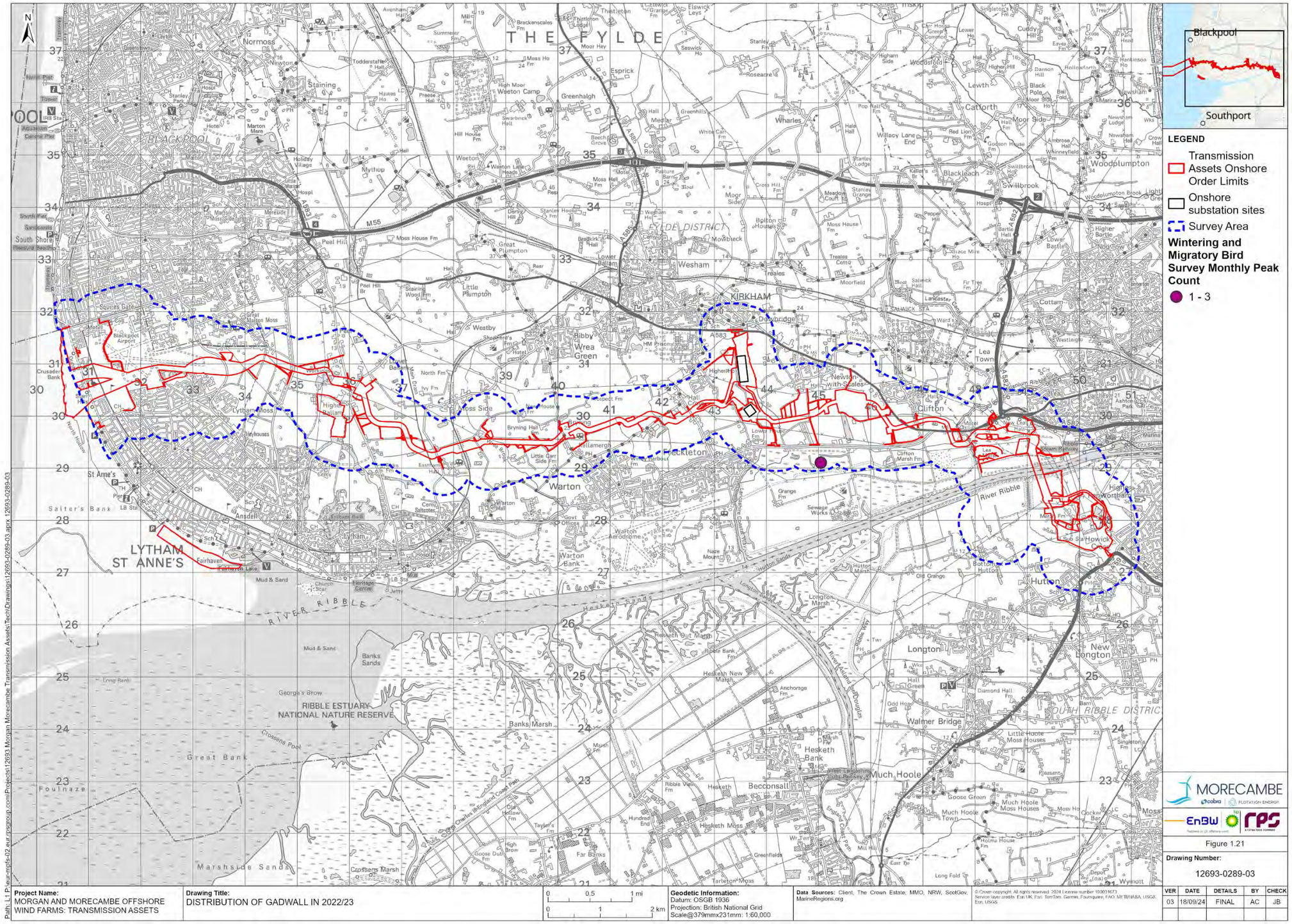


Figure 1.21: Distribution of gadwall in 2022/23

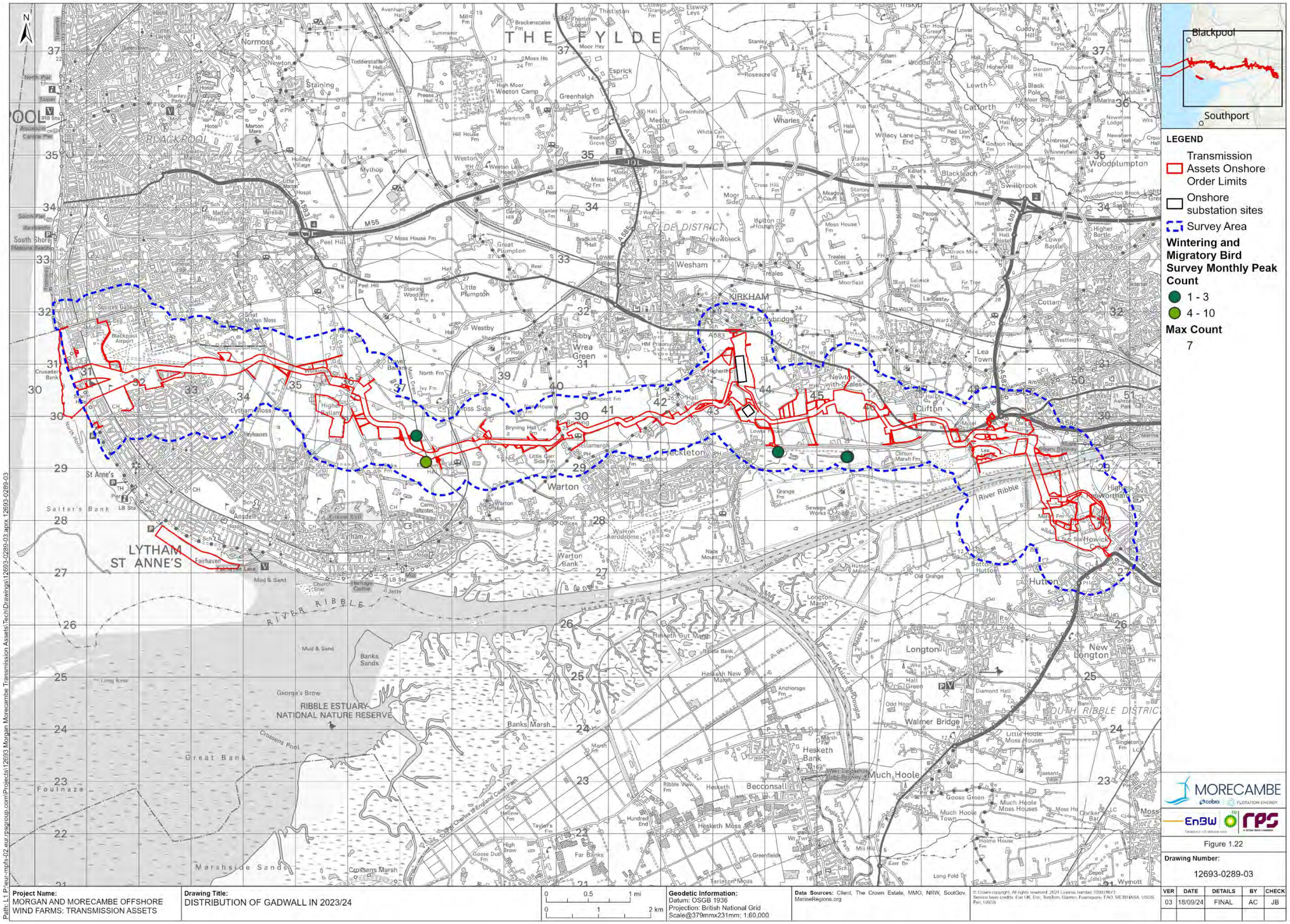


Figure 1.22: Distribution of gadwall in 2023/24

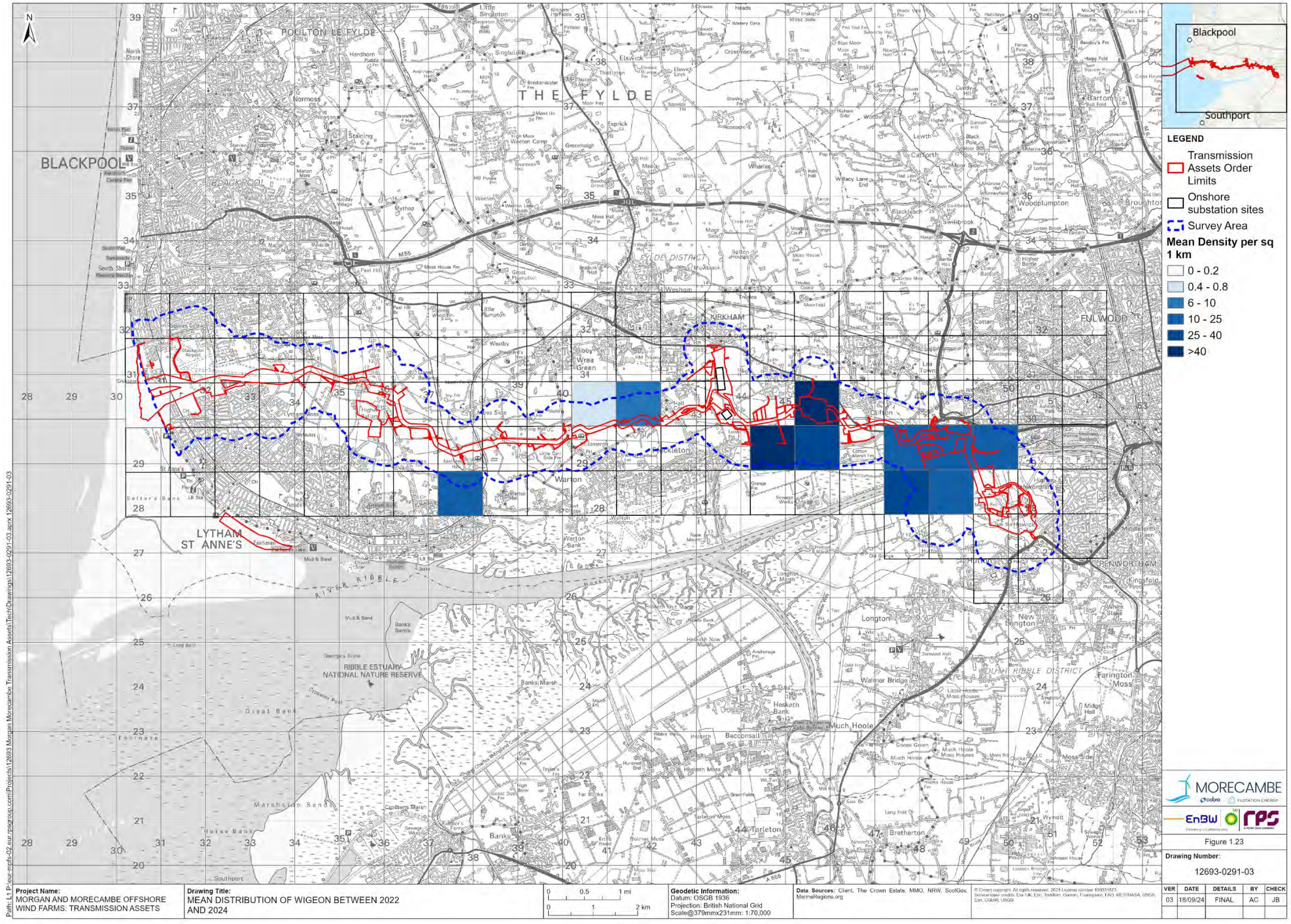


Figure 1.23: Mean distribution of wigeon between 2022 and 2024

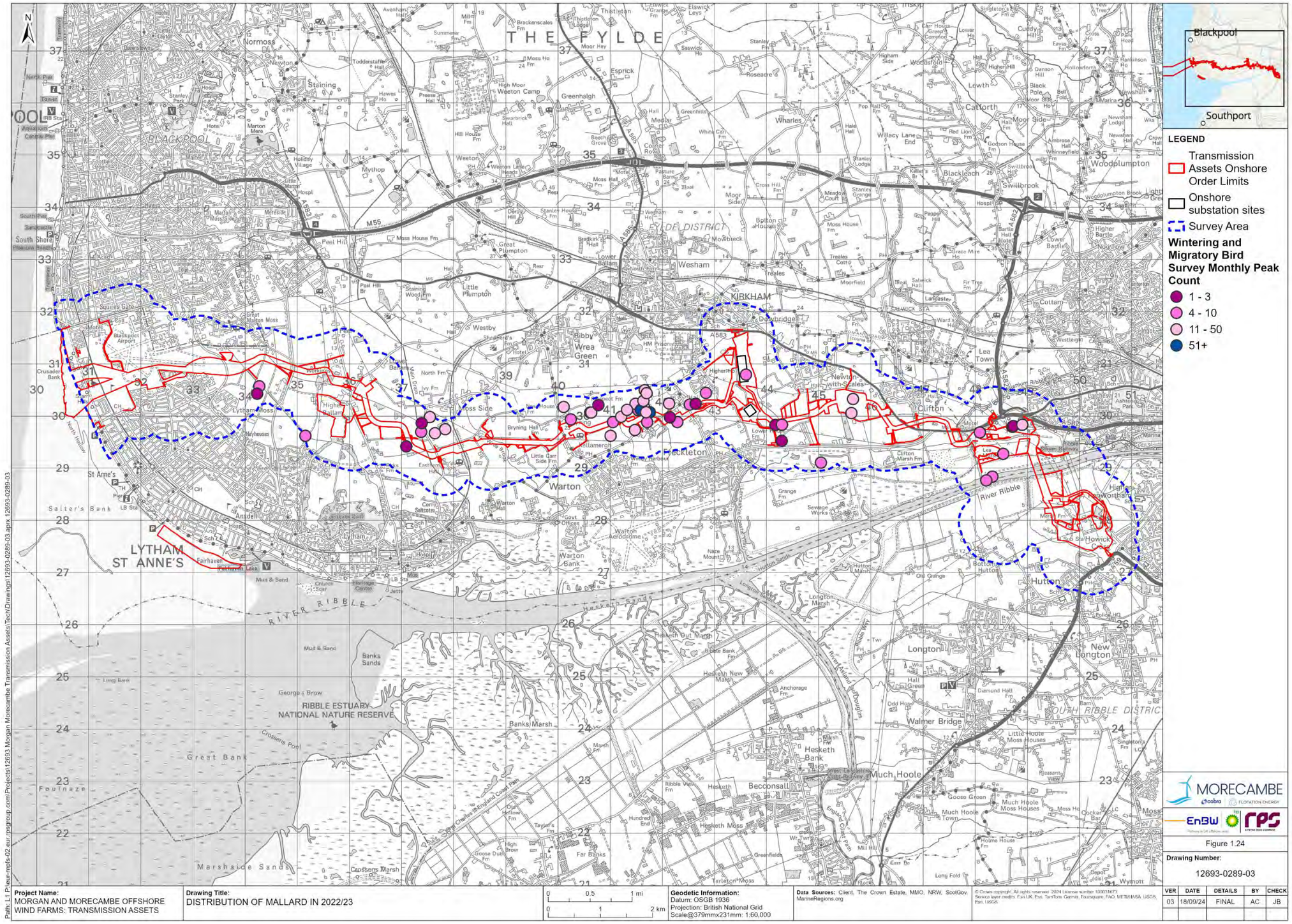


Figure 1.24 Distribution of mallard in 2022/23

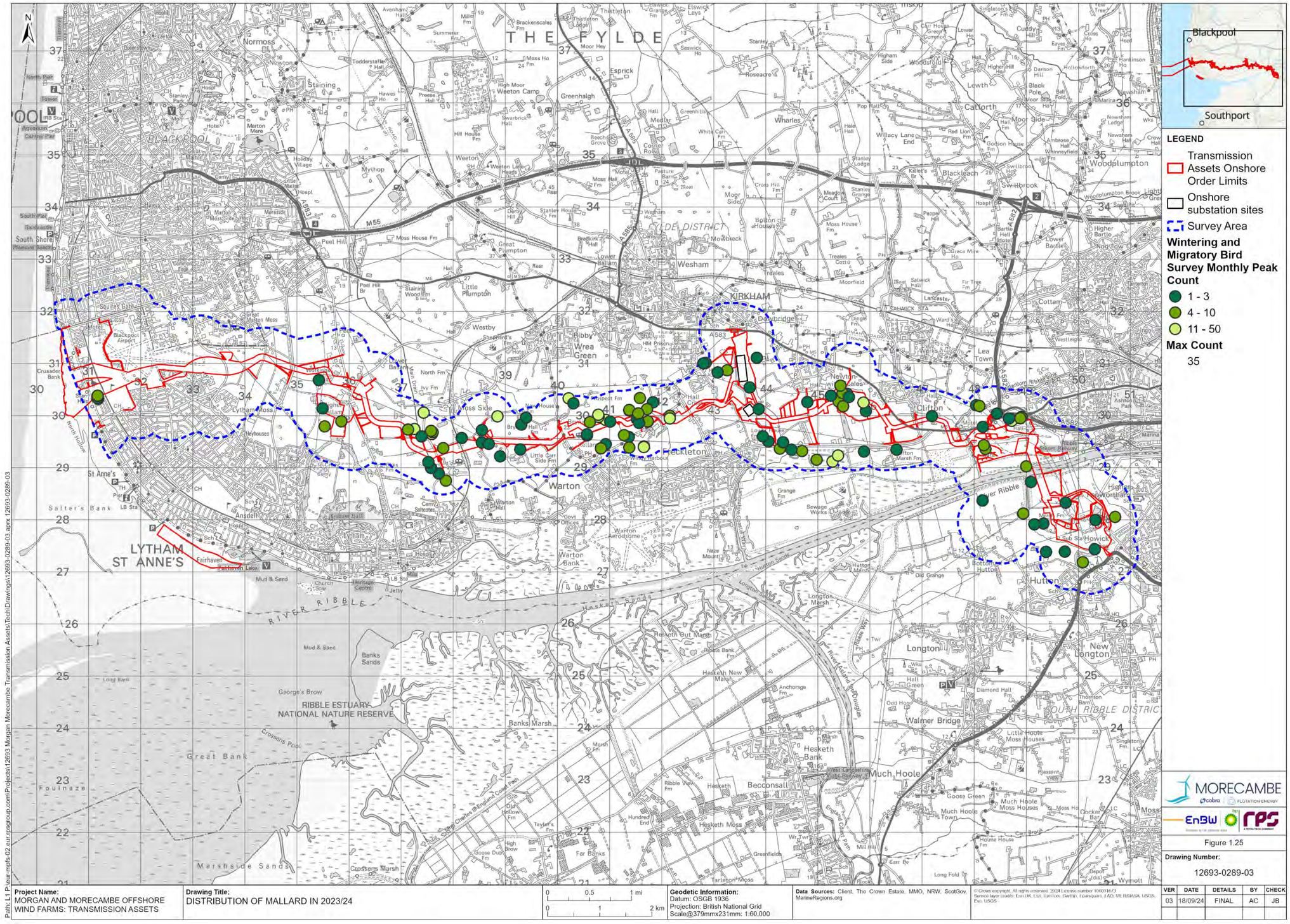


Figure 1.25: Distribution of mallard in 2023/24

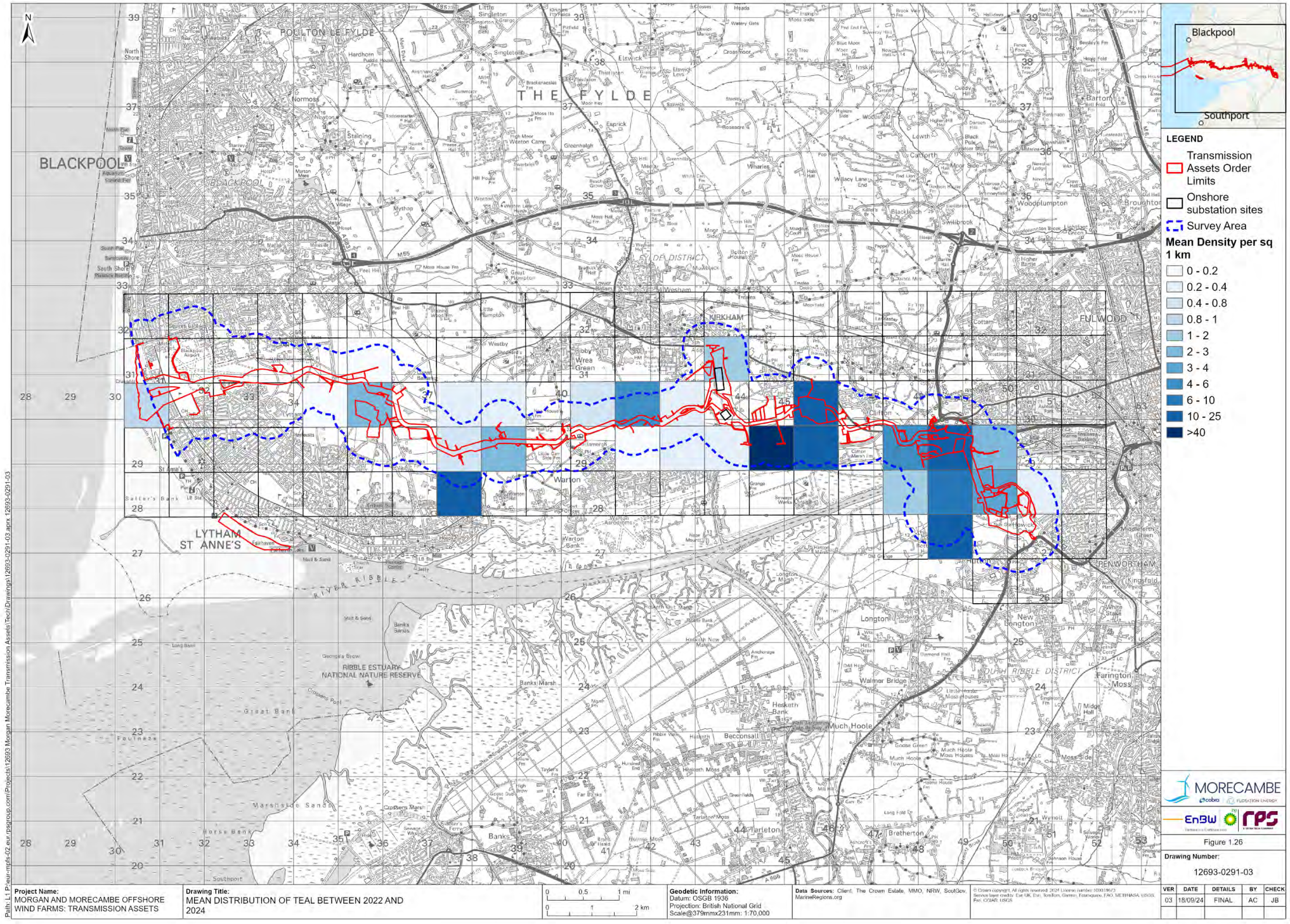


Figure 1.26: Mean distribution of teal between 2022 and 2024

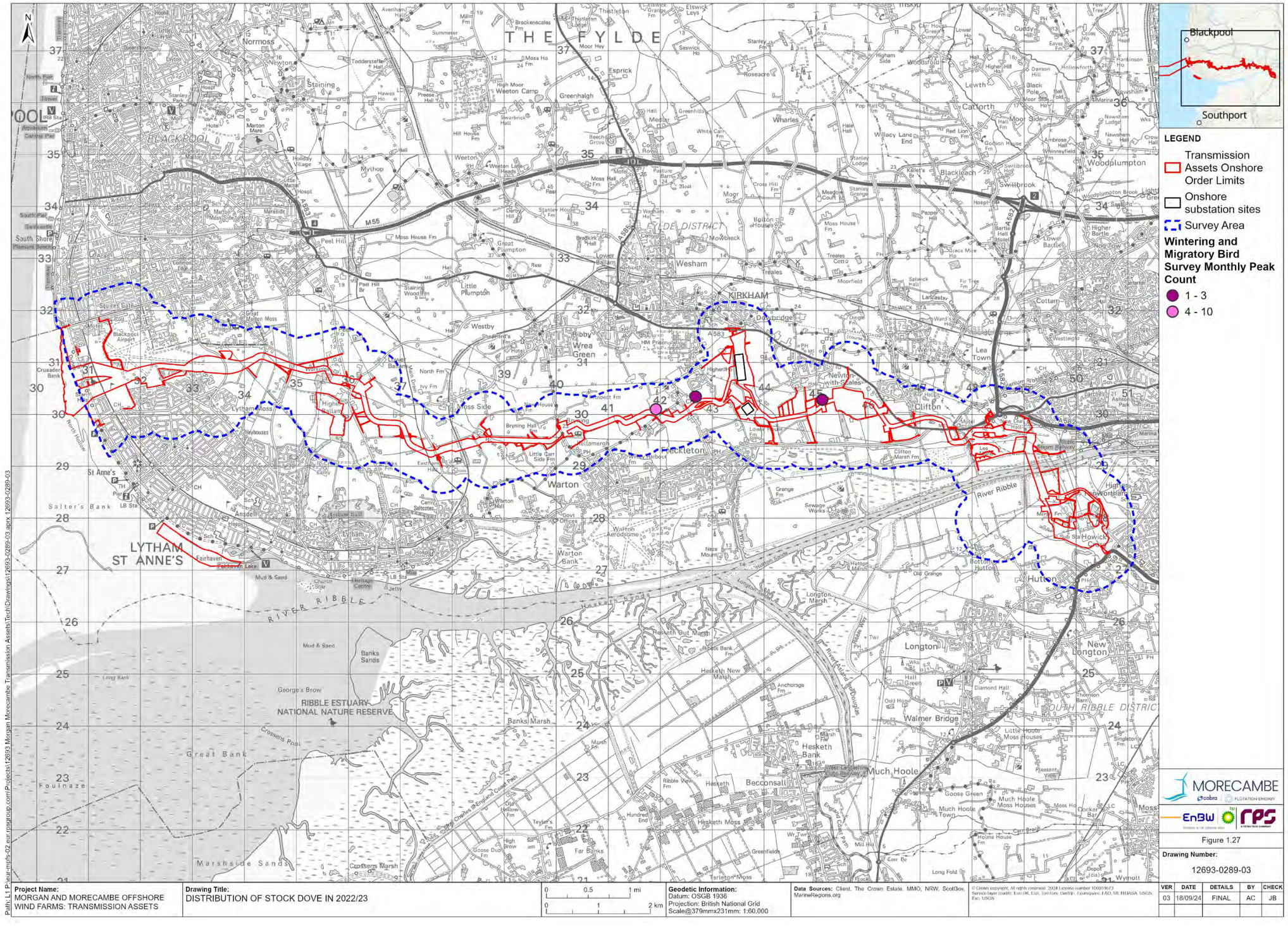


Figure 1.27: Distribution of stock dove in 2022/23

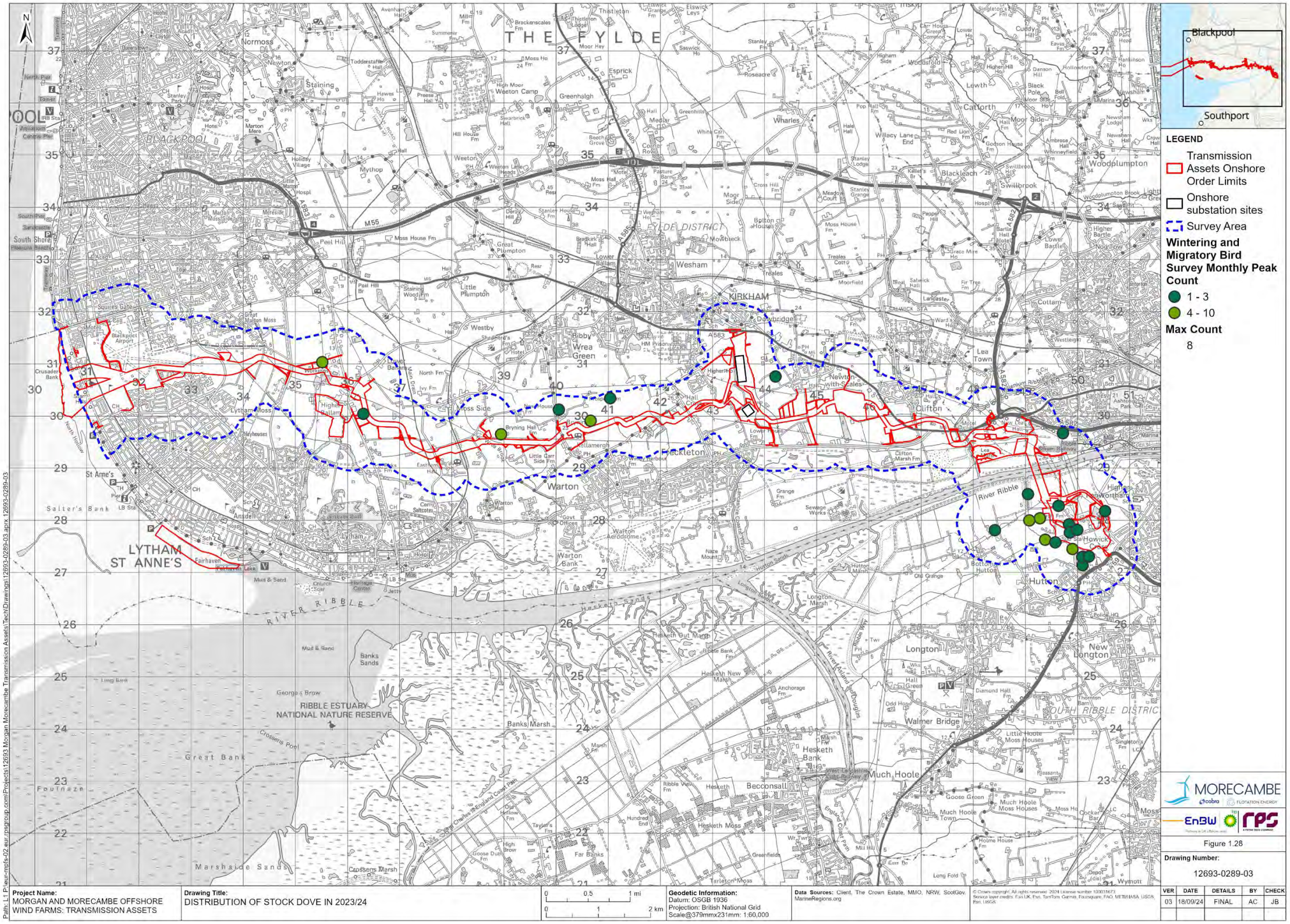


Figure 1.28: Distribution of stock dove in 2023/24

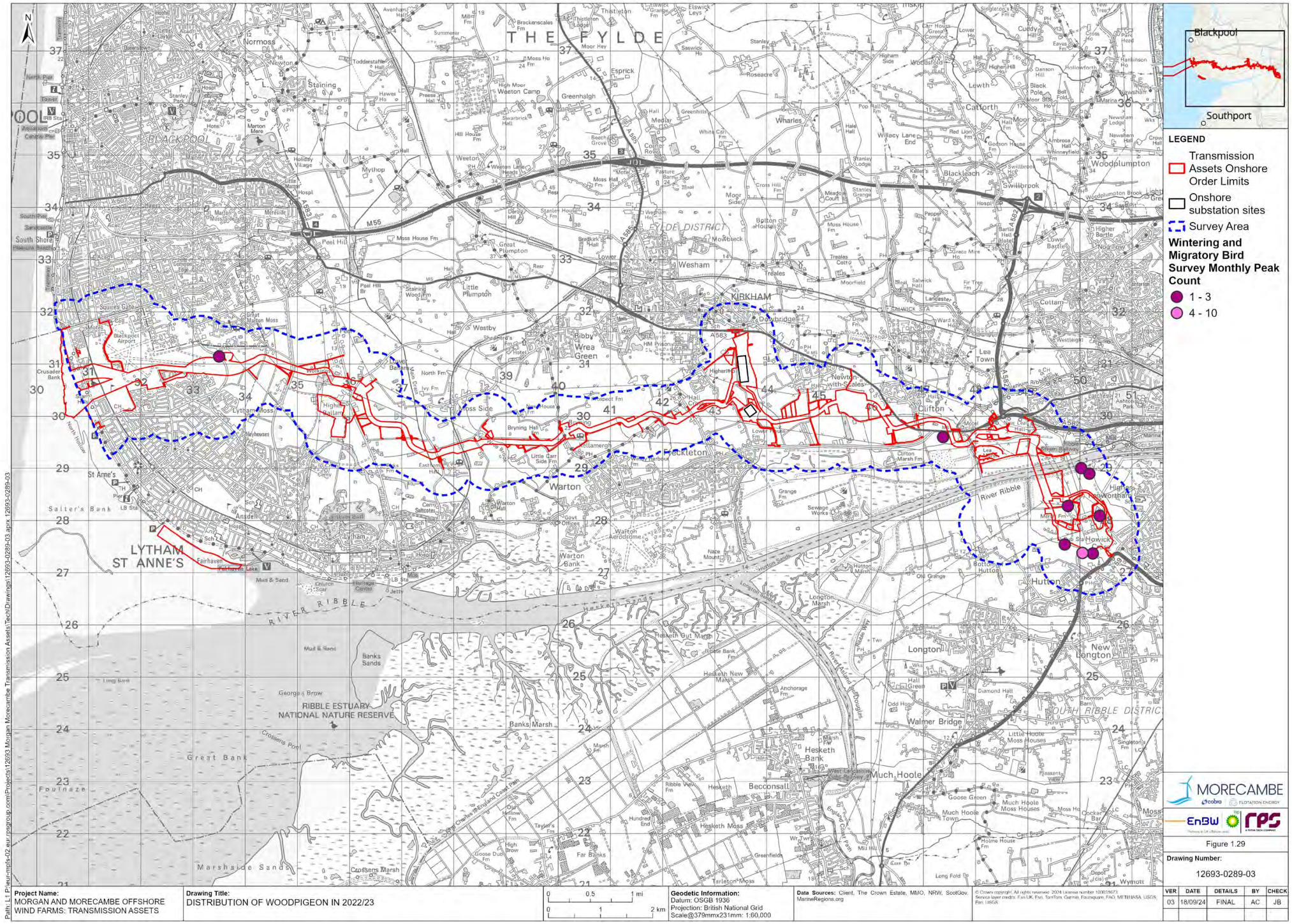
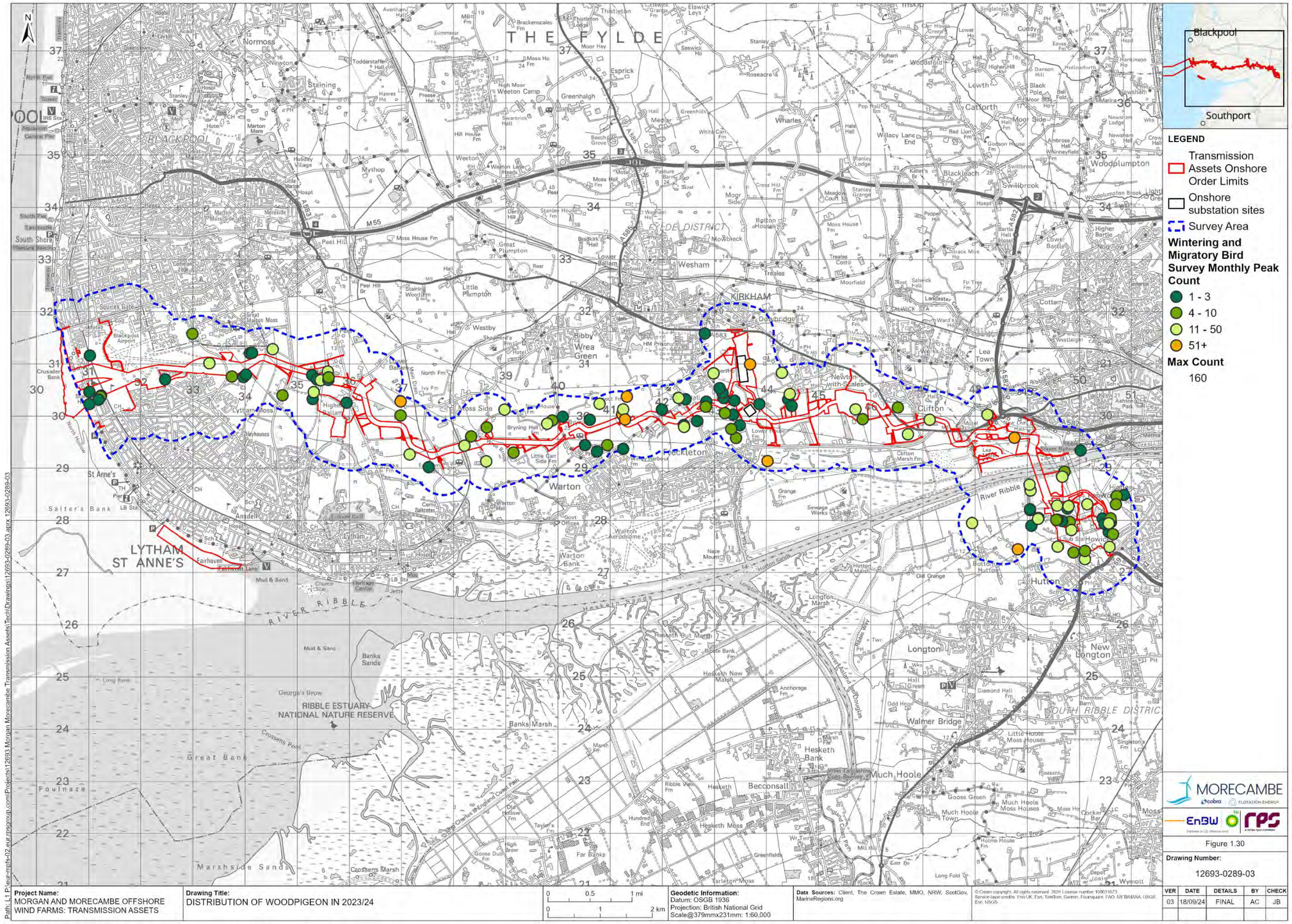


Figure 1.29: Distribution of woodpigeon in 2022/23



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Project Name: MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	**Drawing Title:** DISTRIBUTION OF WOODPIGEON IN 2023/24	0 0.5 1 mi / 0 1 2 km	**Geodetic Information:** Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:60,000	**Data Sources:** Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org

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Figure 1.30

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Figure 1.30: Distribution of woodpigeon in 2023/24

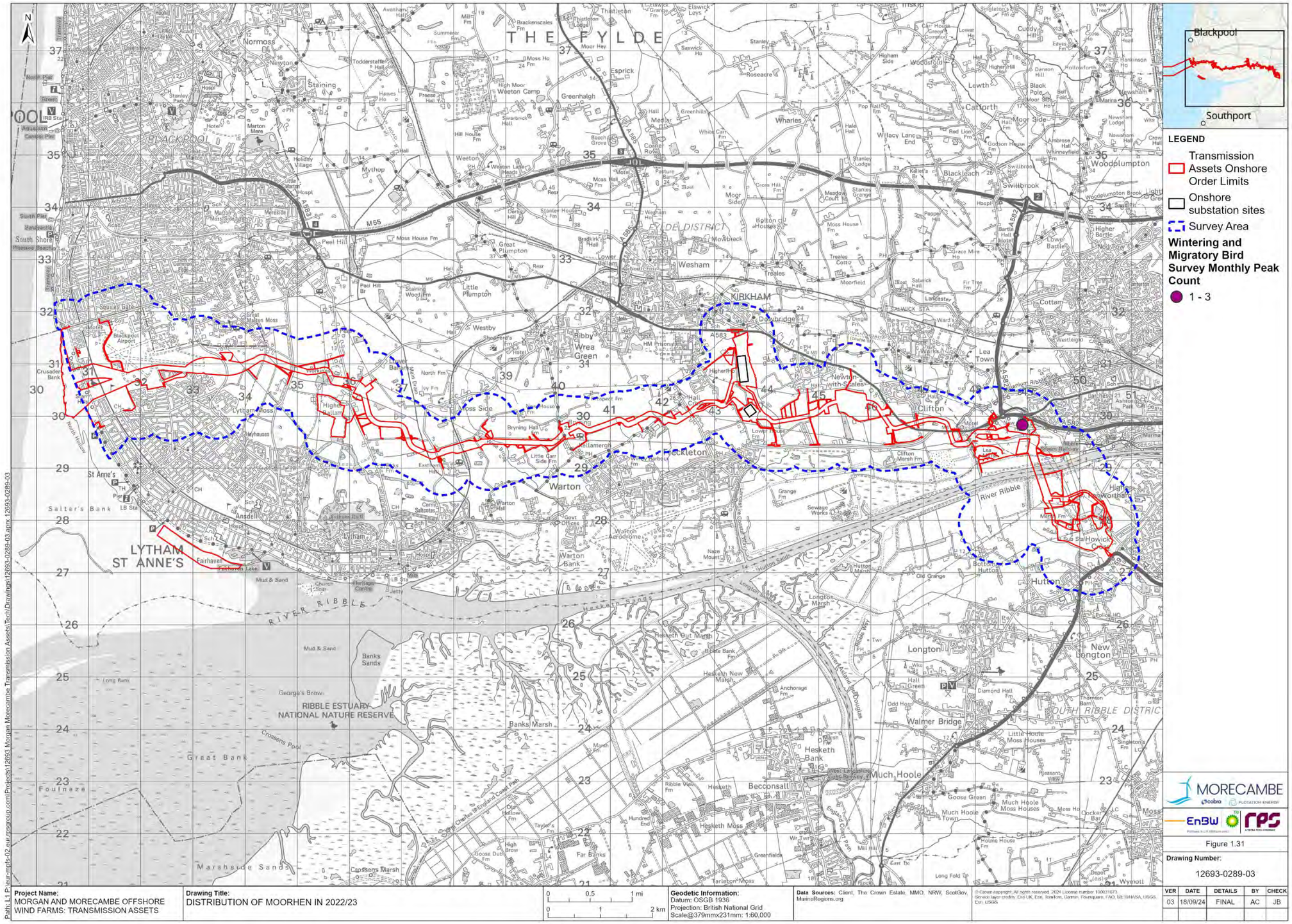


Figure 1.31: Distribution of moorhen in 2022/23

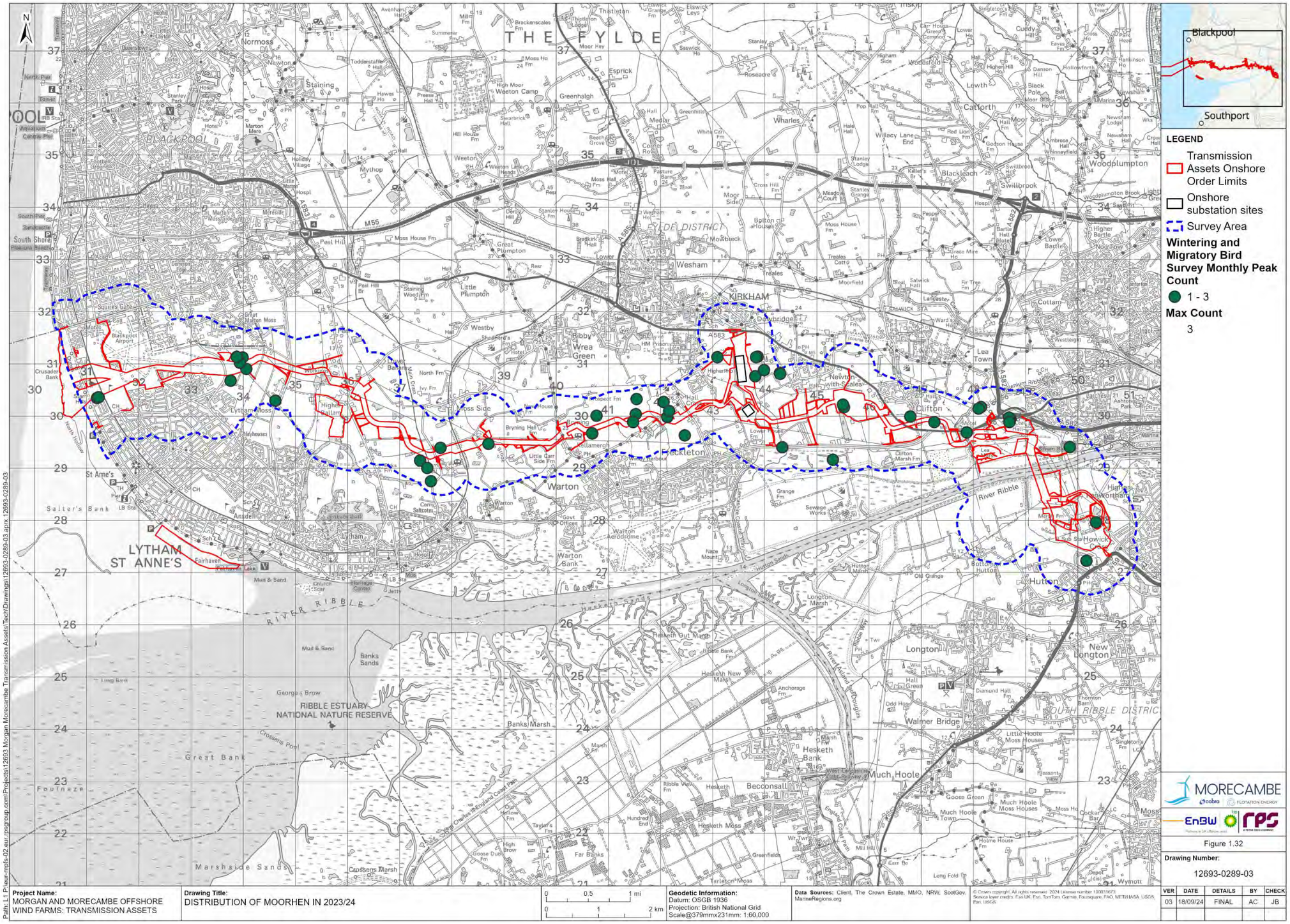


Figure 1.32: Distribution of moorhen in 2023/24

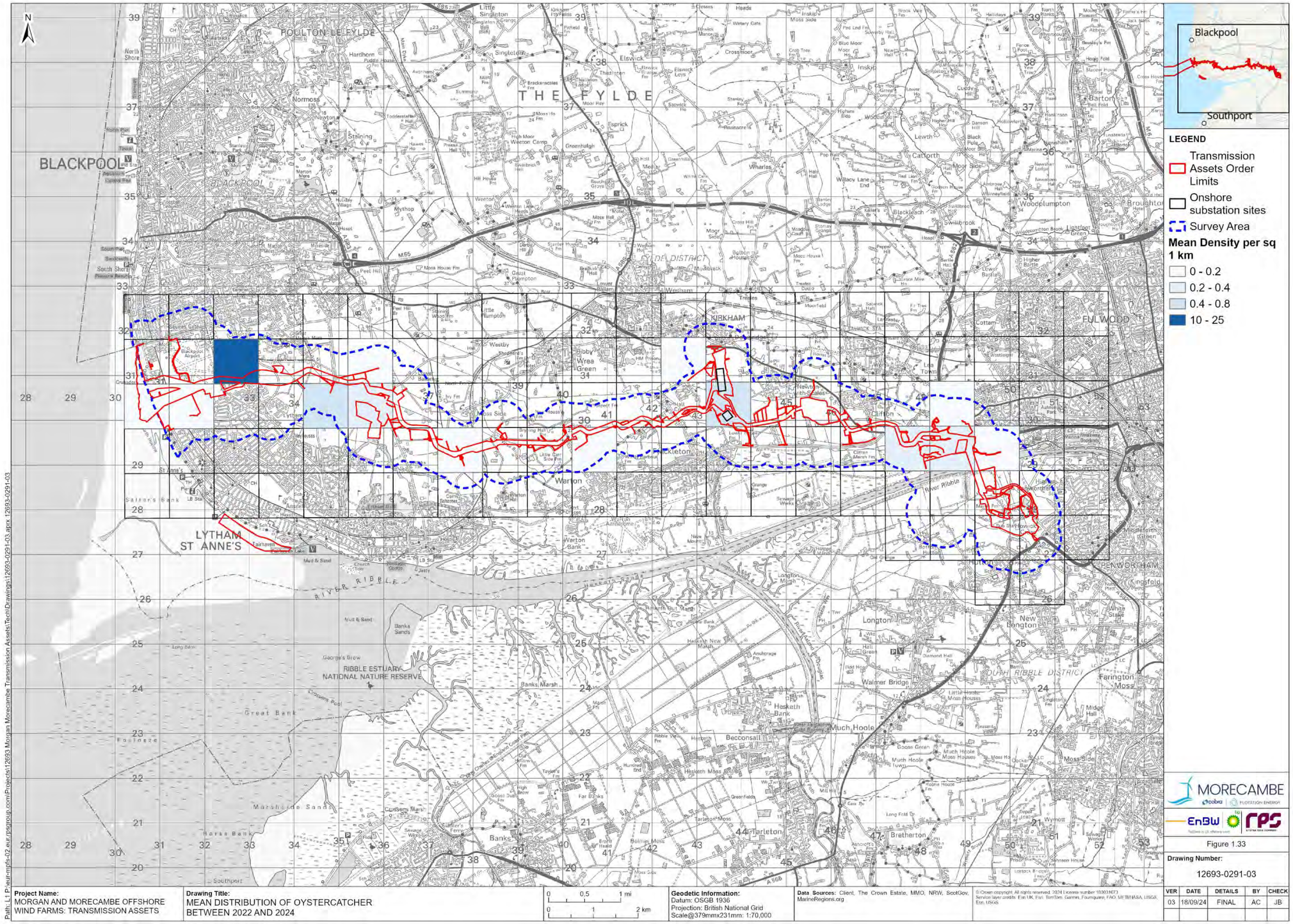


Figure 1.33: Mean distribution of oystercatcher between 2022 and 2024

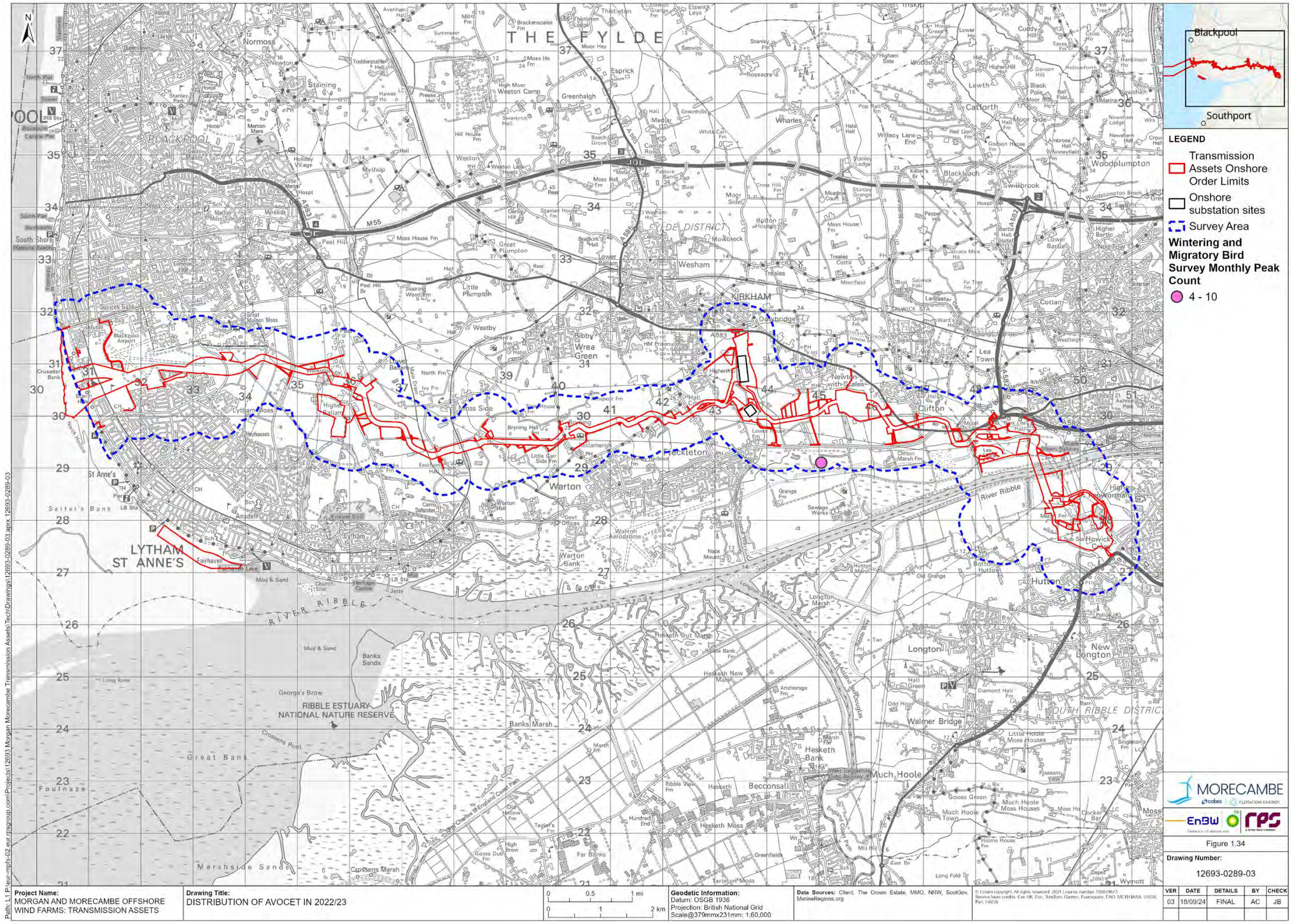


Figure 1.34: Distribution of avocet in 2022/23

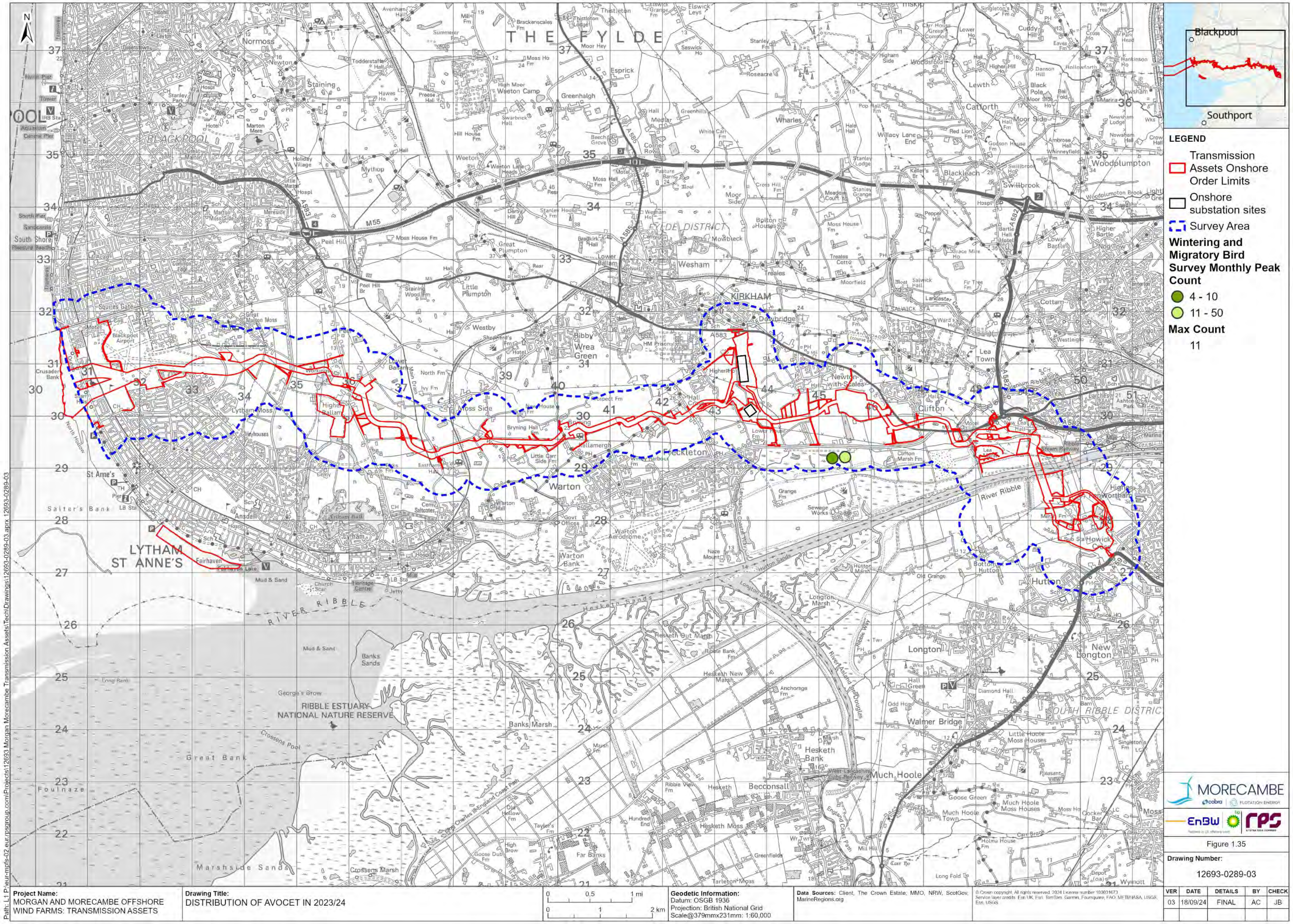


Figure 1.35: Distribution of avocet in 2023/24

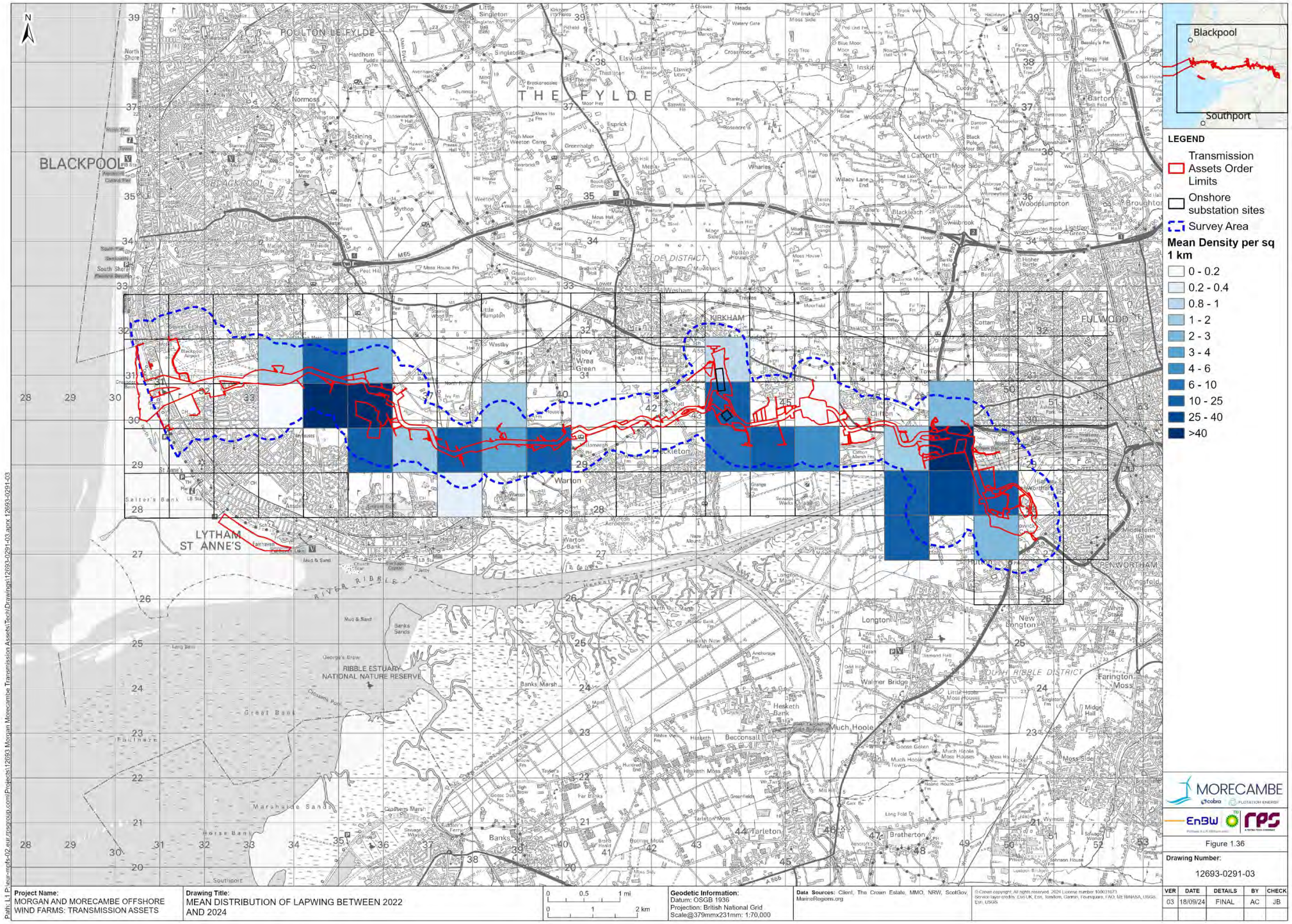


Figure 1.36: Mean distribution of lapwing between 2022 and 2024

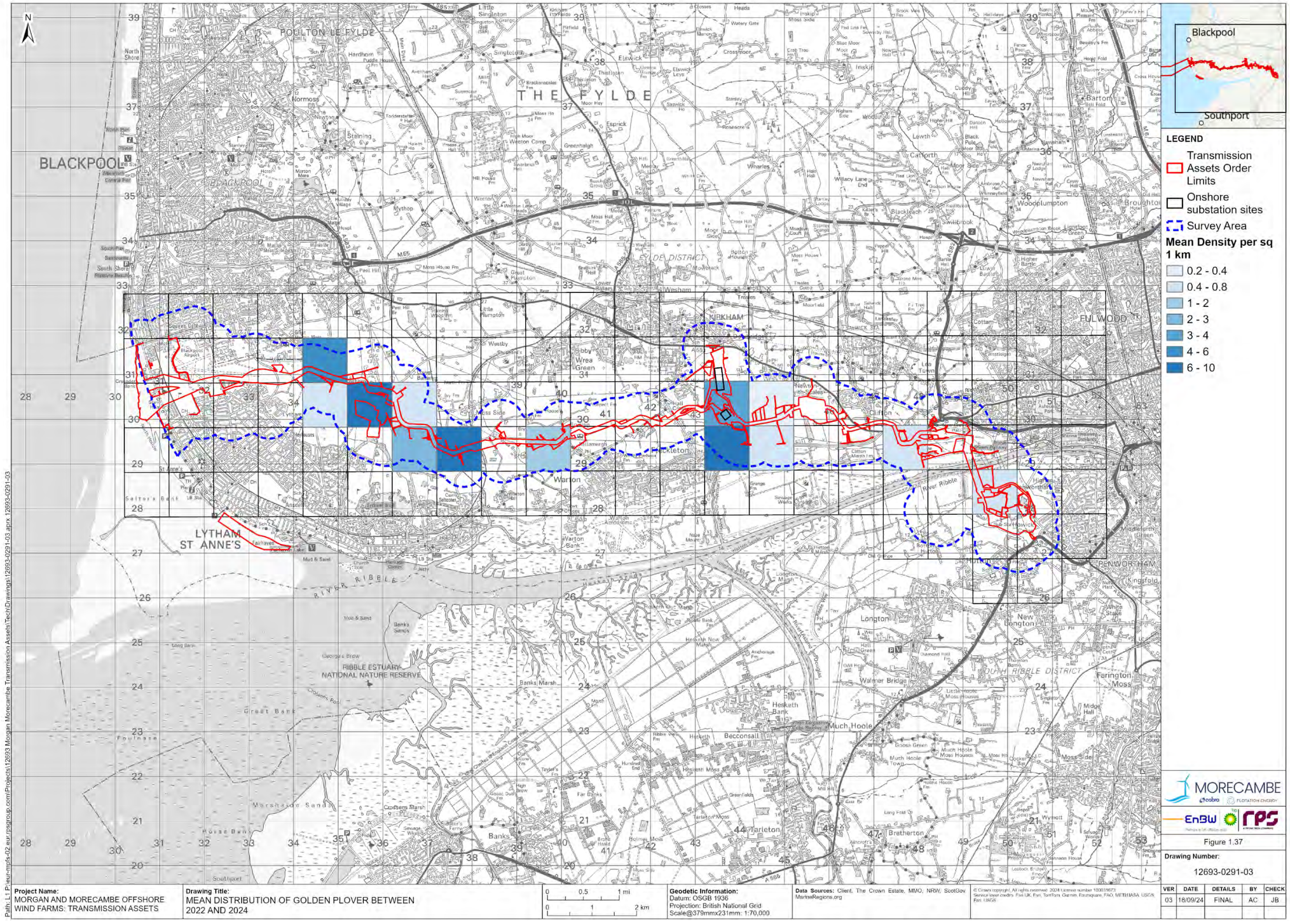


Figure 1.37: Mean distribution of golden plover between 2022 and 2024

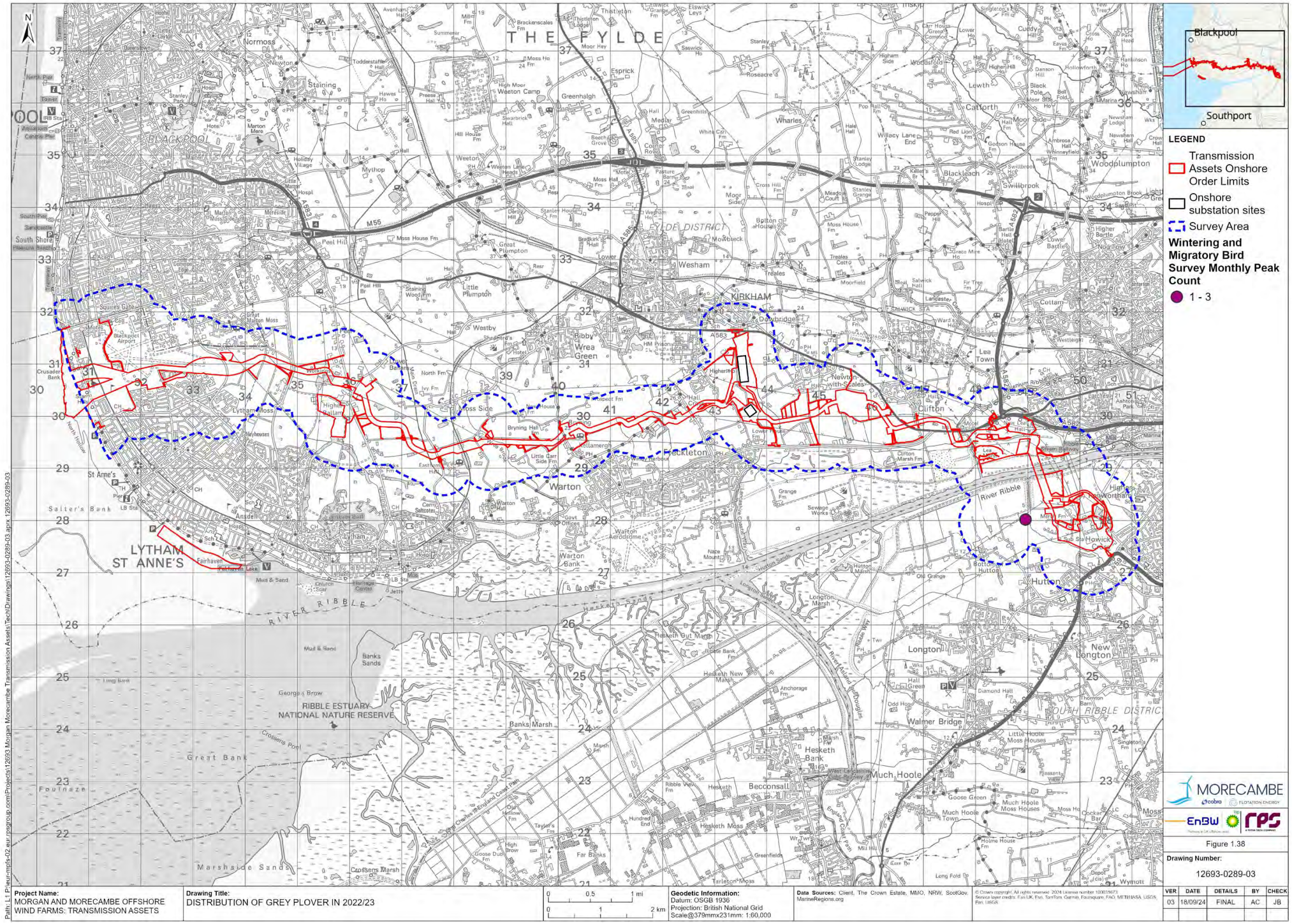


Figure 1.38: Distribution of grey plover in 2022/23

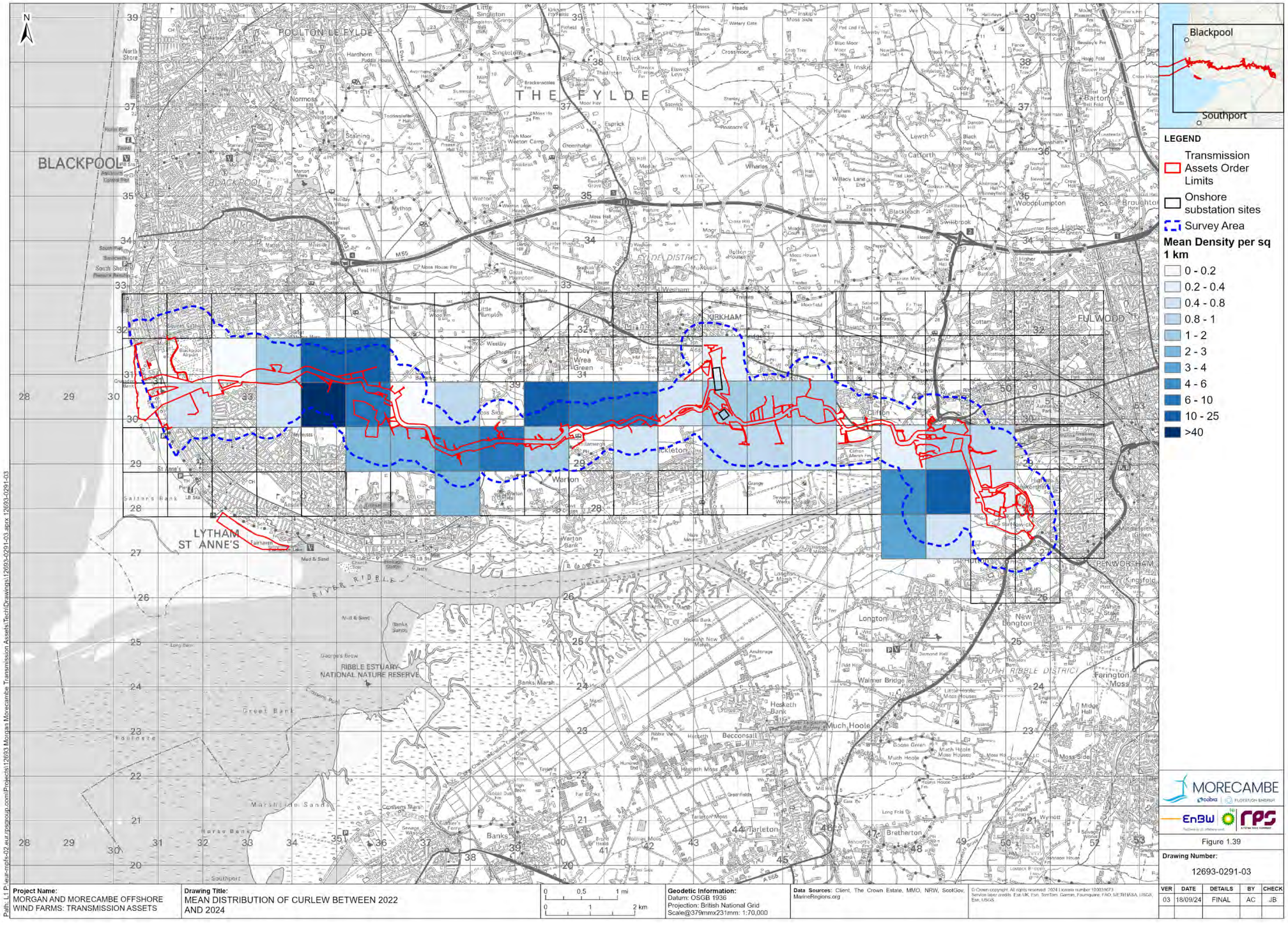
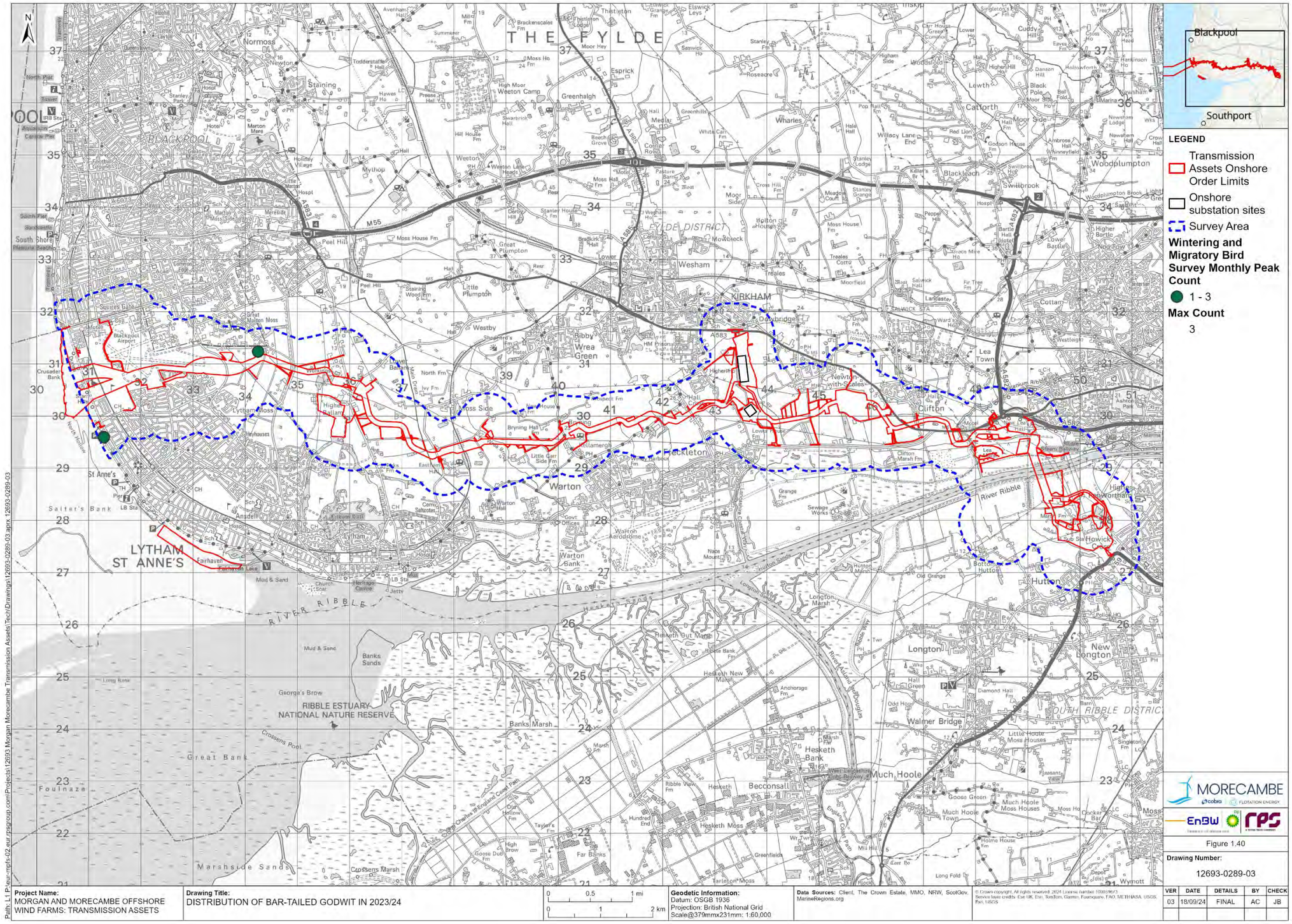


Figure 1.39: Mean distribution of curlew between 2022 and 2024



Project Name: MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	**Drawing Title:** DISTRIBUTION OF BAR-TAILED GODWIT IN 2023/24	0 0.5 1 mi / 0 1 2 km	**Geodetic Information:** Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:60,000	**Data Sources:** Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org

Figure 1.40

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Figure 1.40: Distribution of bar-tailed godwit in 2023/24

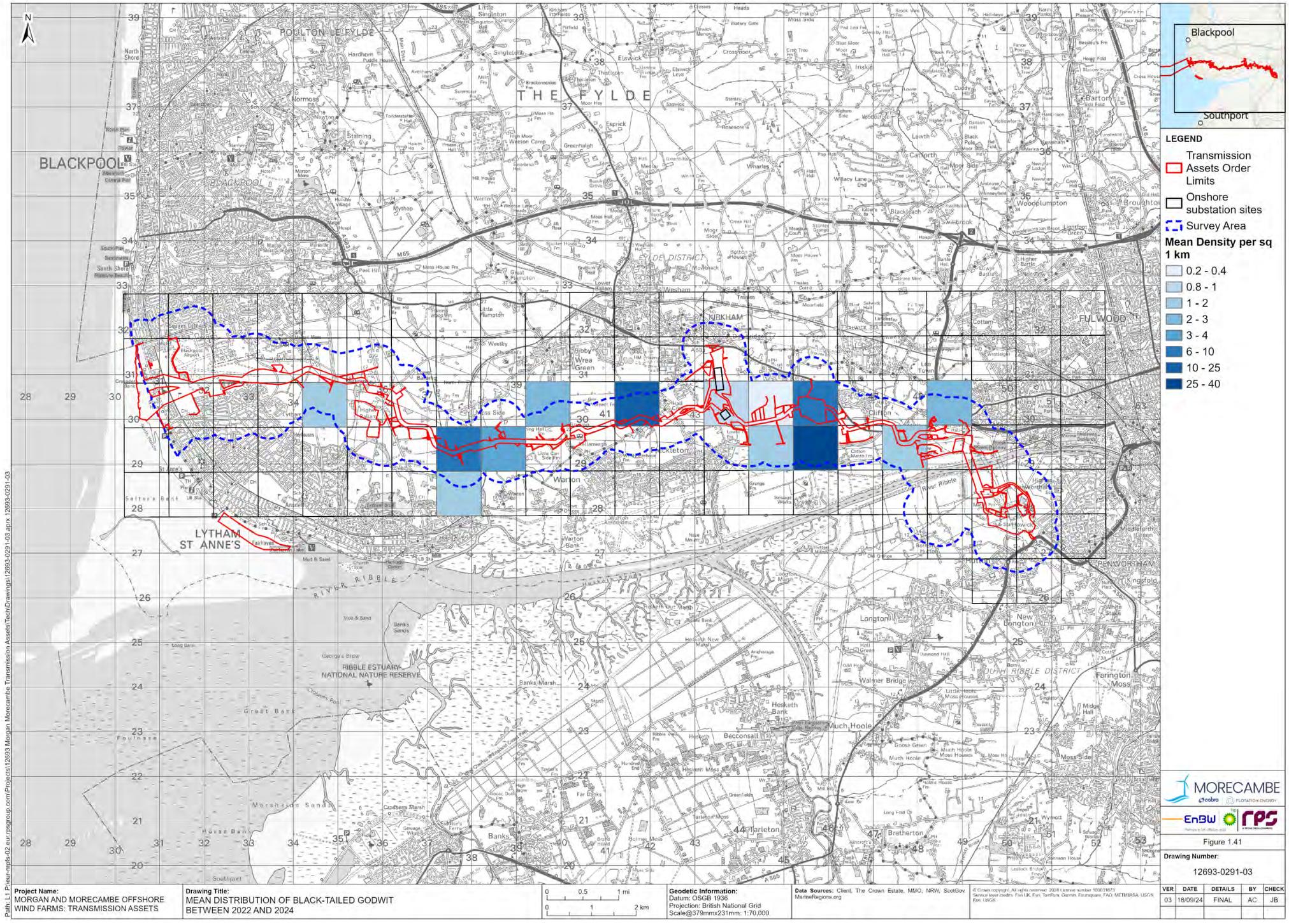


Figure 1.41: Mean distribution of black-tailed godwit between 2022 and 2024

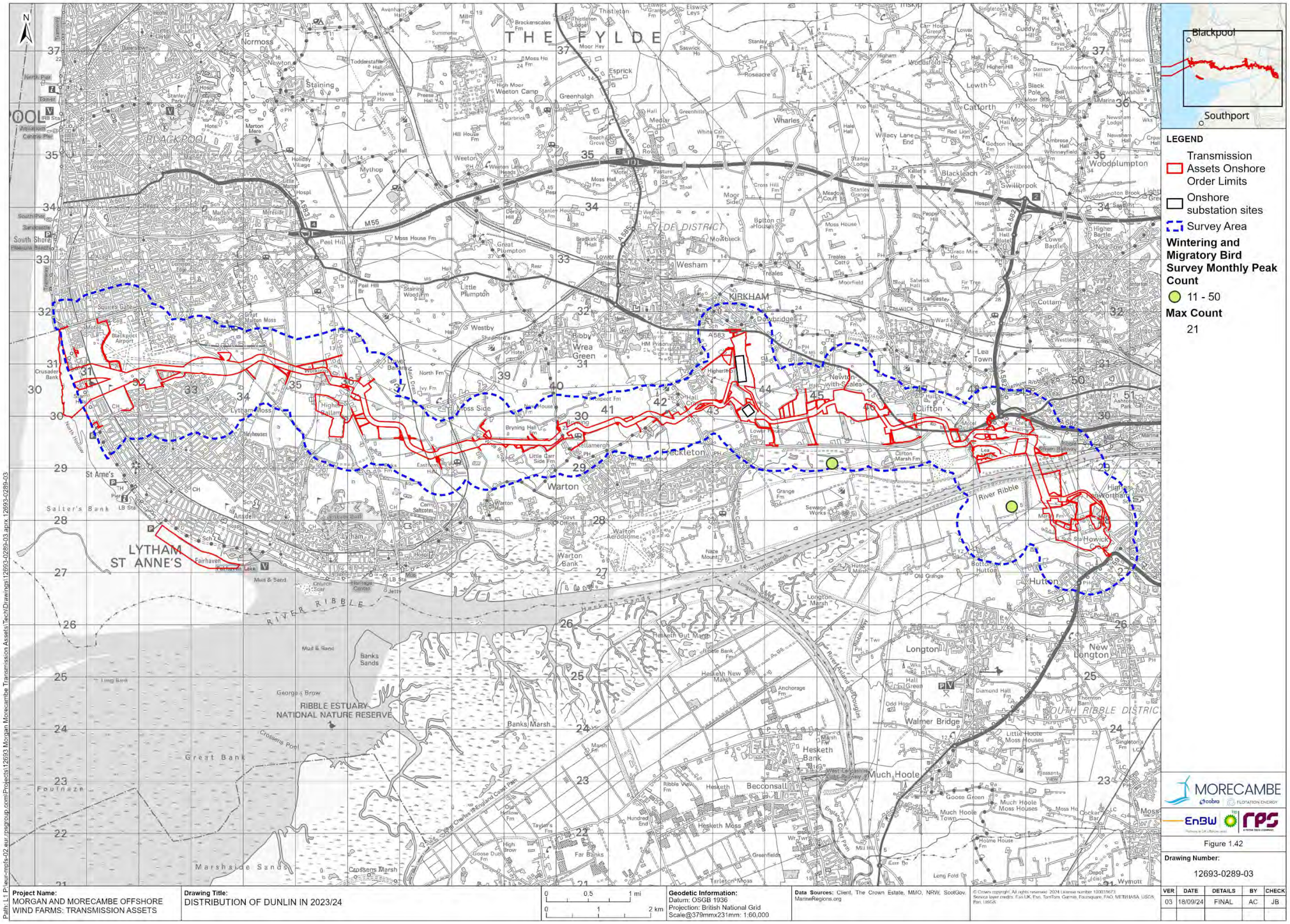


Figure 1.42: Distribution of dunlin in 2023/24

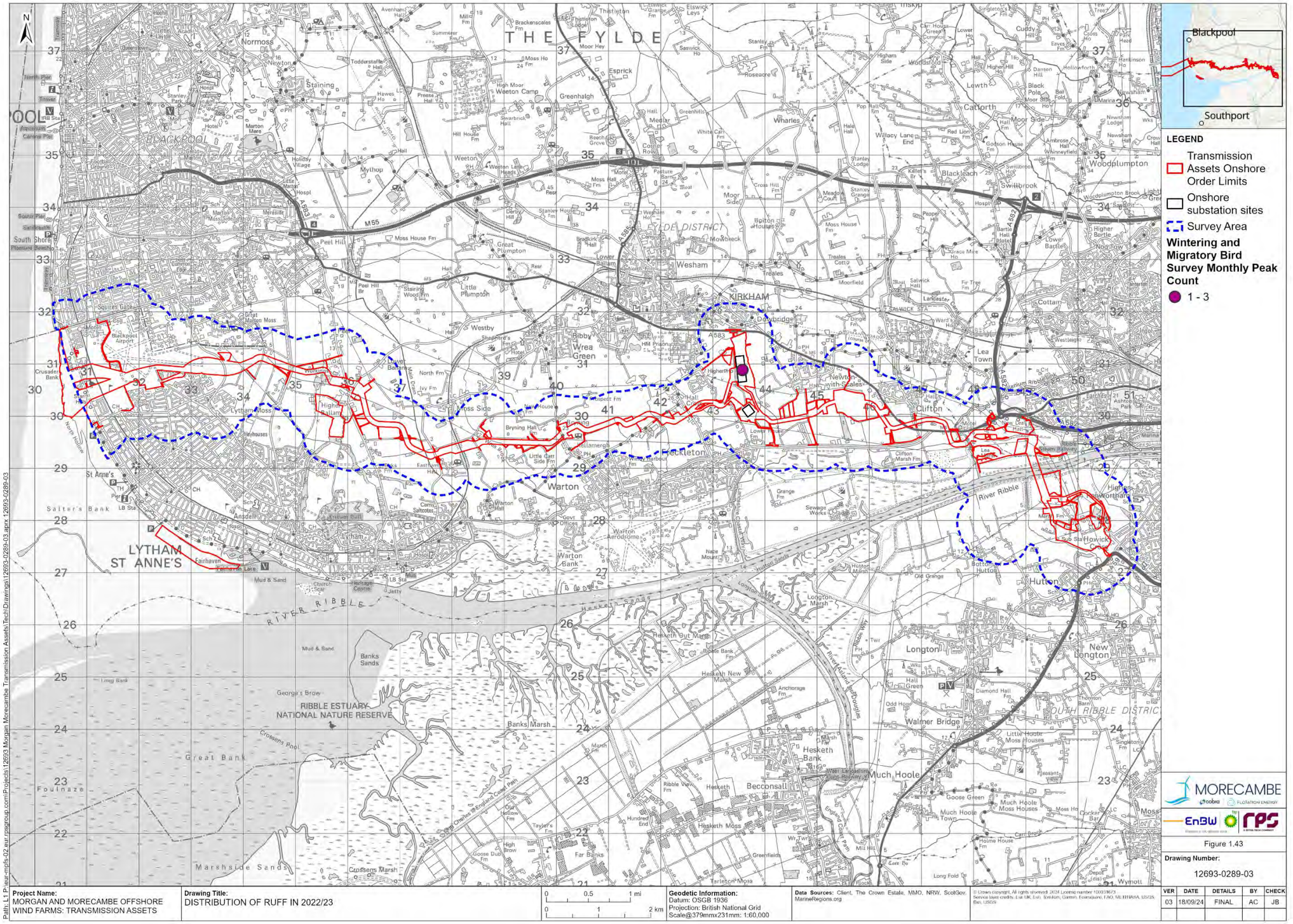
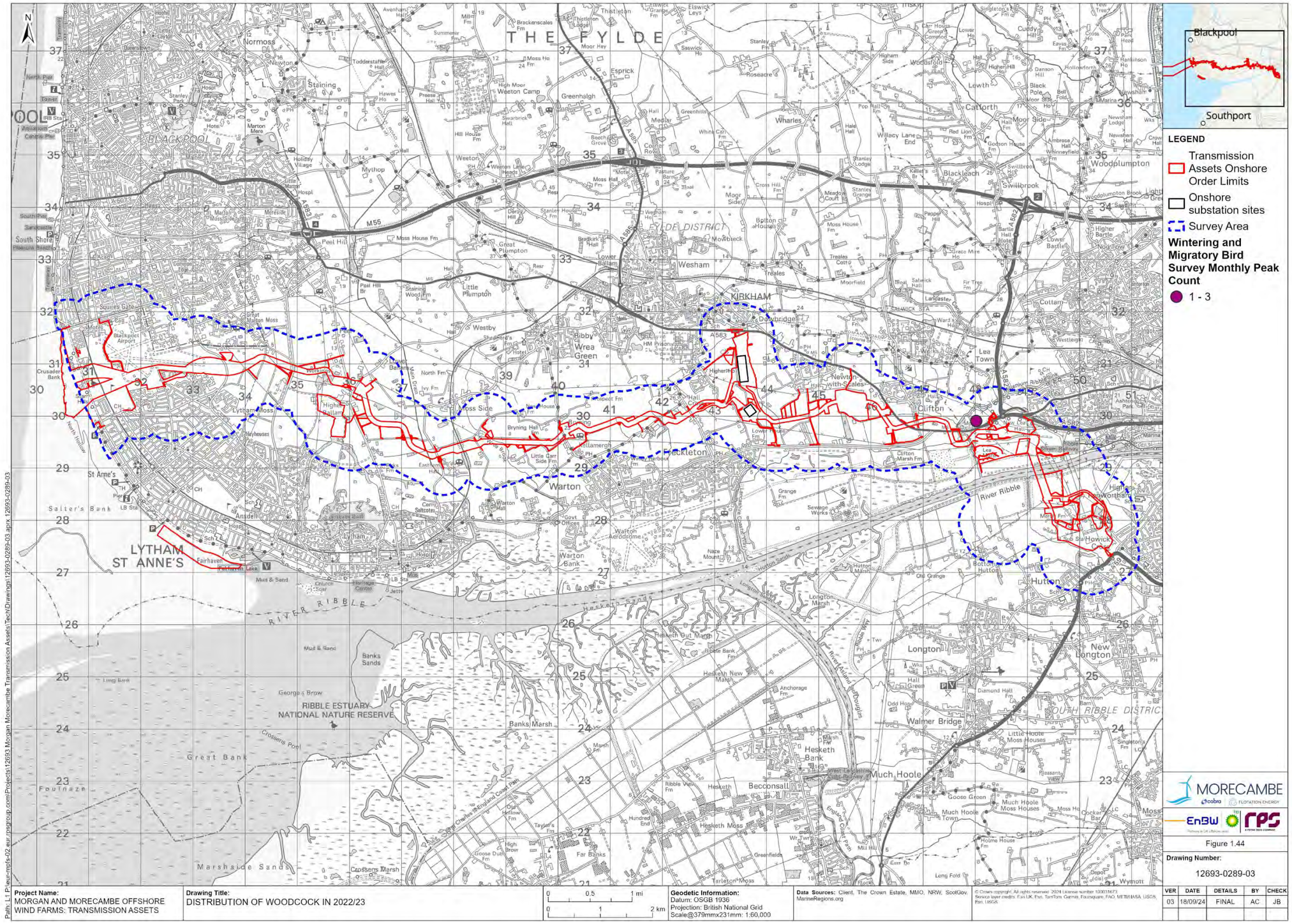


Figure 1.43: Distribution of ruff in 2022/23



Project Name: MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	**Drawing Title:** DISTRIBUTION OF WOODCOCK IN 2022/23	0 0.5 1 mi / 0 1 2 km	**Geodetic Information:** Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:60,000	**Data Sources:** Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org

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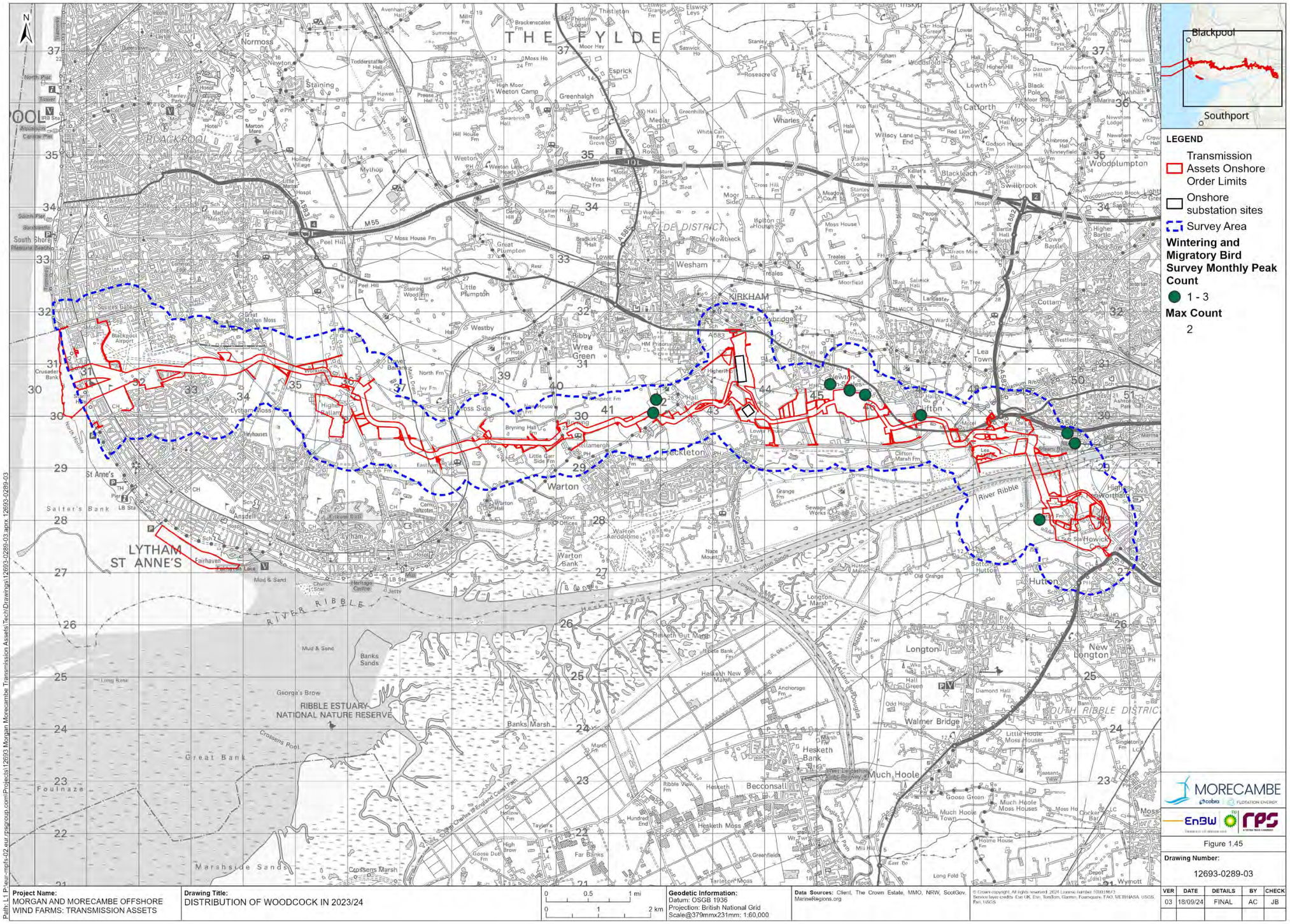
Figure 1.44: Distribution of woodcock in 2022/23



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Project Name: MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	**Drawing Title:** DISTRIBUTION OF WOODCOCK IN 2023/24	0 0.5 1 mi / 0 1 2 km	**Geodetic Information:** Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:60,000	**Data Sources:** Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org	© Crown copyright. All rights reserved 2024 License number 100031673. Service layer credits: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, USGS

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Figure 1.45

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Figure 1.45: Distribution of woodcock in 2023/24

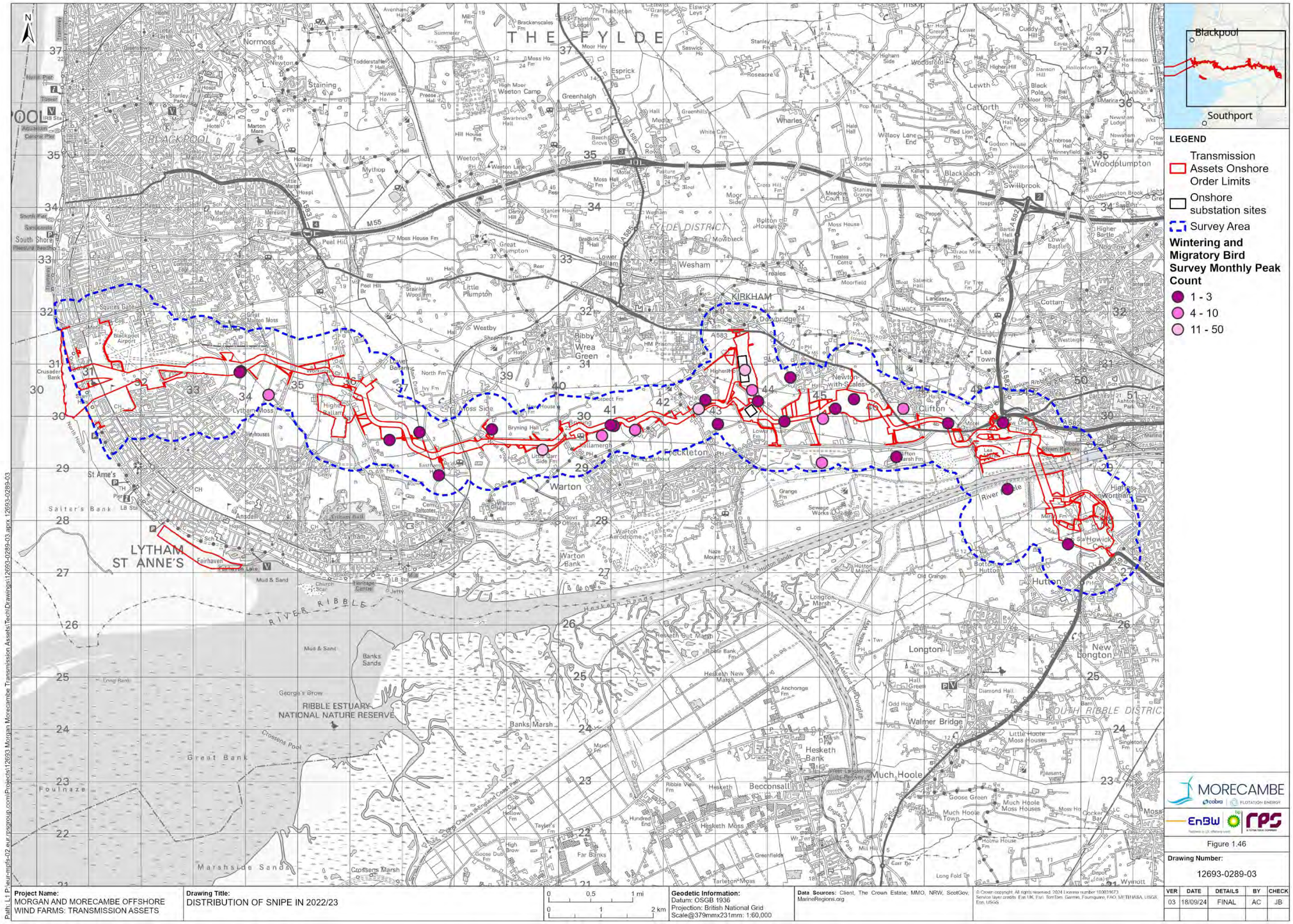

Figure 1.46: Distribution of snipe in 2022/23

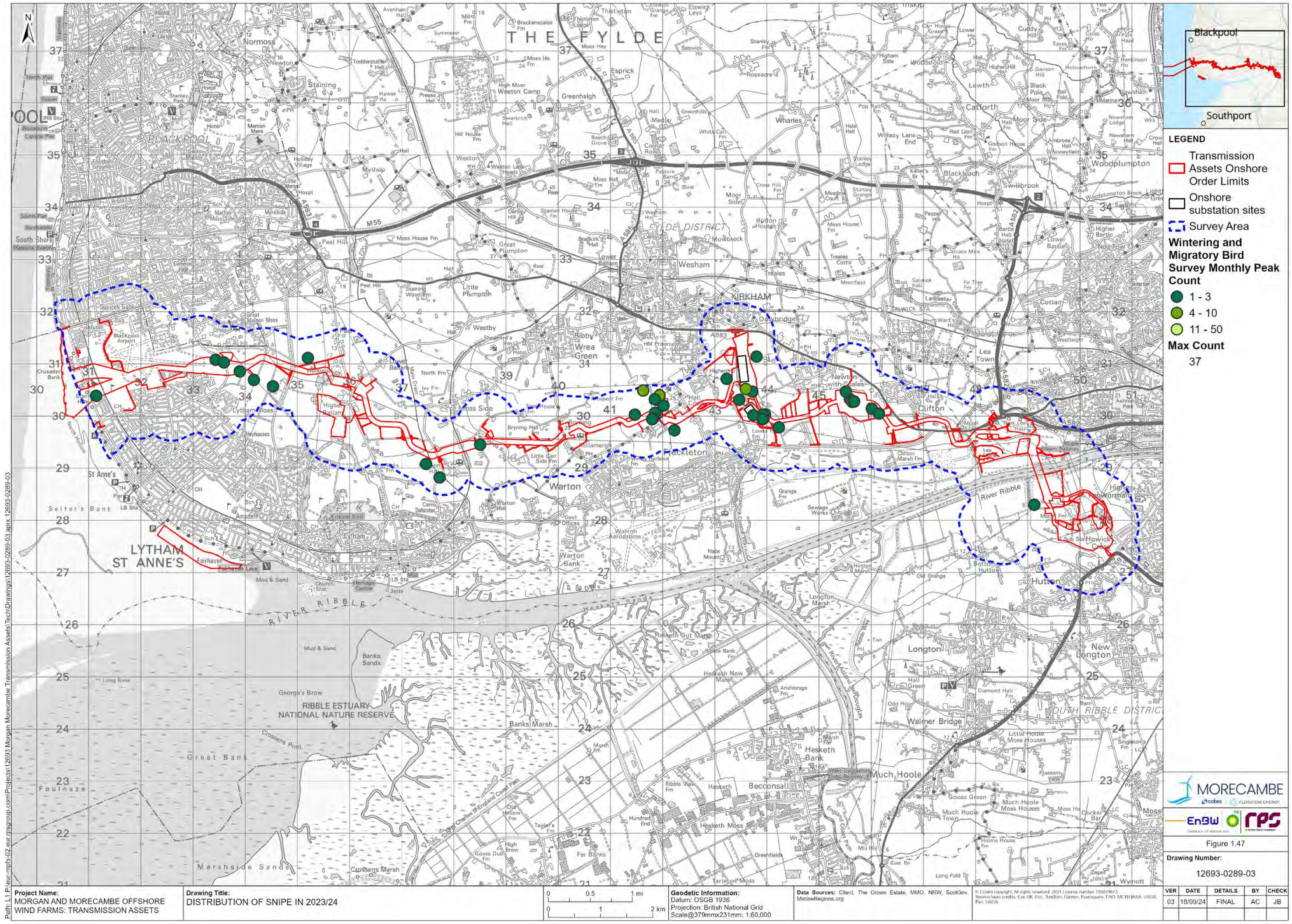

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Figure 1.47: Distribution of snipe in 2023/24

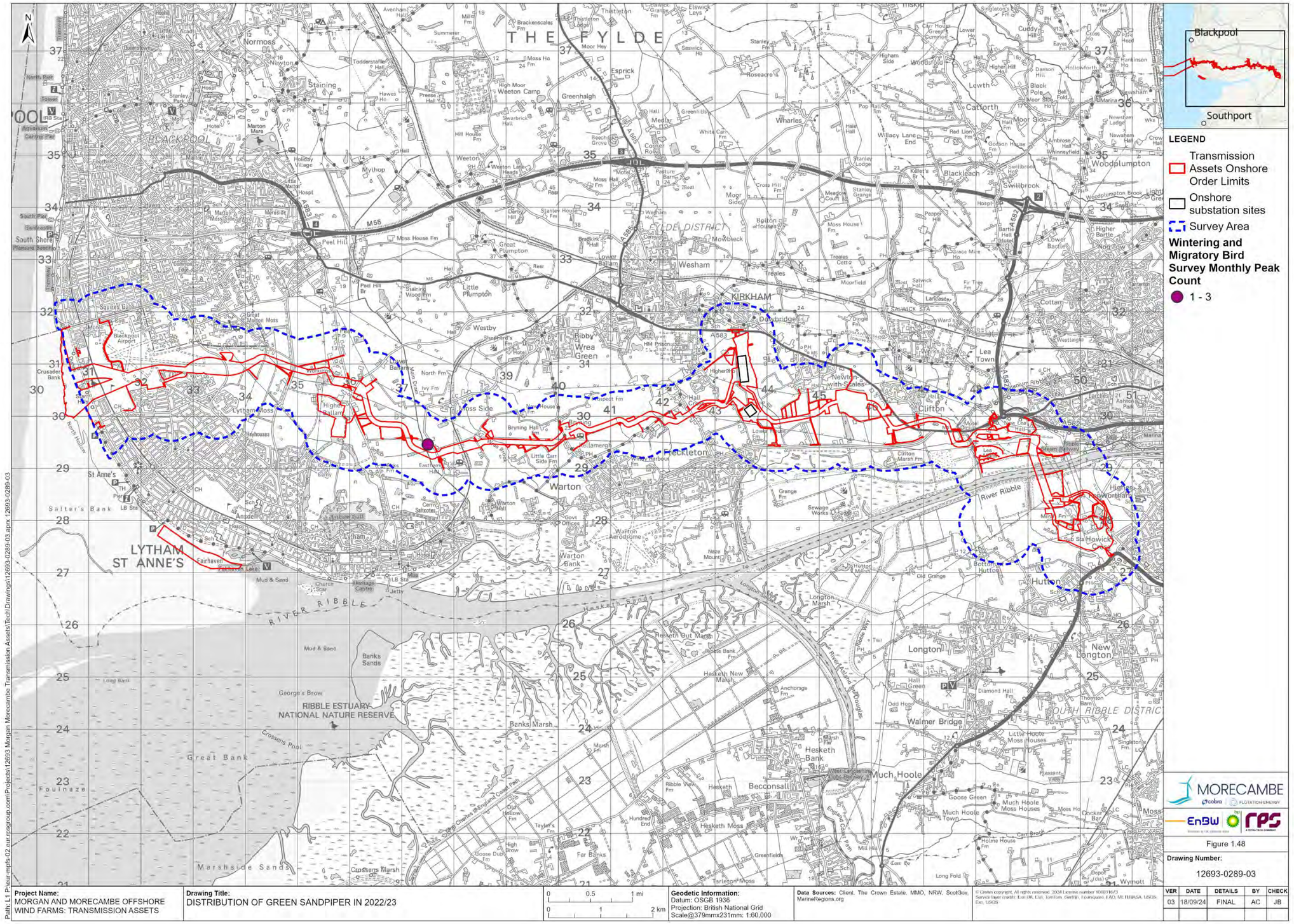

Figure 1.48: Distribution of green sandpiper in 2022/23

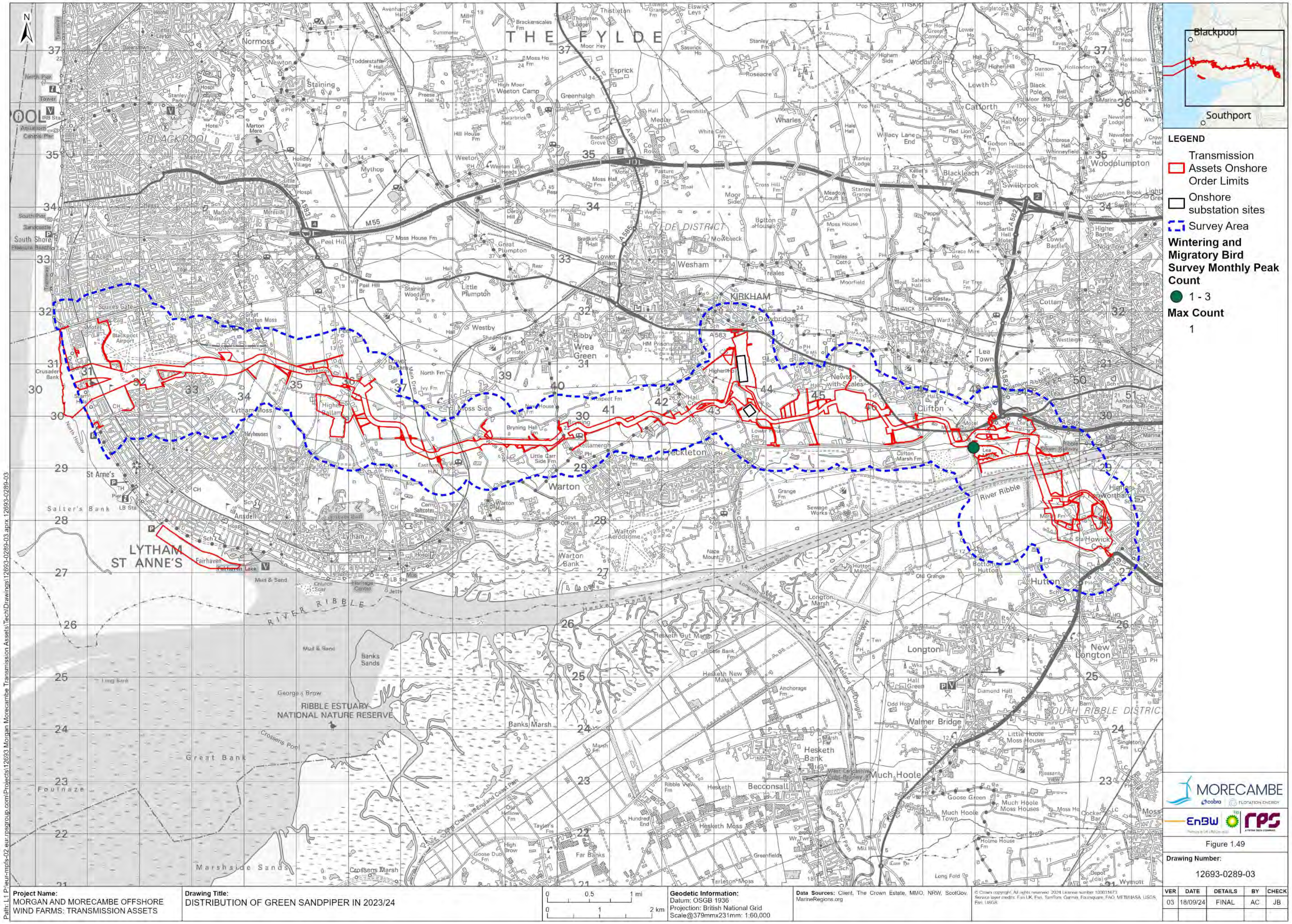

Figure 1.49: Distribution of green sandpiper in 2023/24

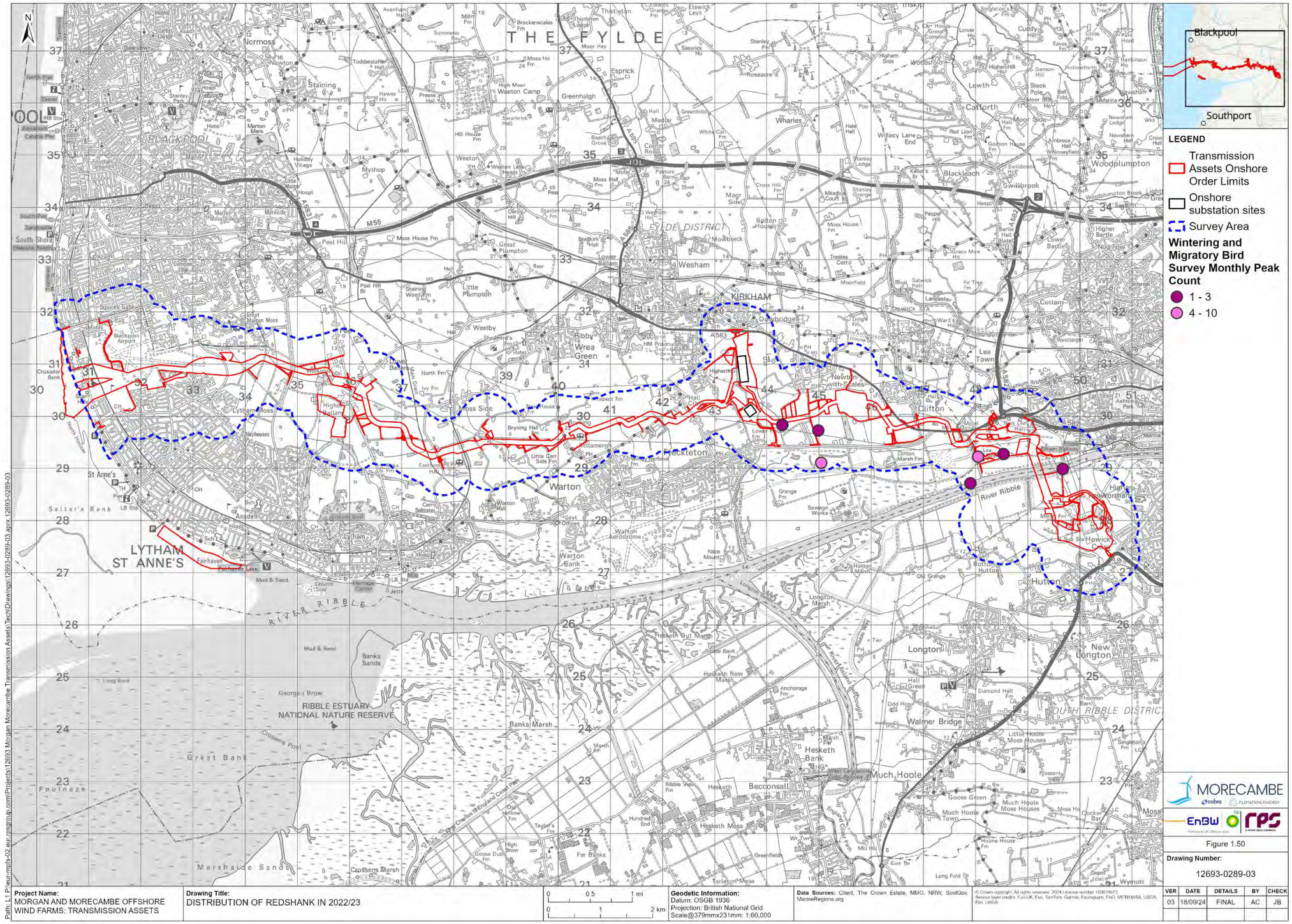

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Figure 1.50: Distribution of redshank in 2022/23