MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 3, Annex 4.3: Intertidal birds technical report

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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.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 (as amended) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended).
Intertidal area	The area between Mean High Water Springs and Mean Low Water Springs.
Intertidal Infrastructure Area	The temporary and permanent areas between MLWS and MHWS.
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 bay inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Local Nature Reserve	Local Nature Reserves are a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949 by principal local authorities. Local Nature Reserves comprise areas with wildlife or geological features that are of special interest locally.
Mean High Water Springs	The height of mean high water during spring tides in a year.
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore export cables, landfall and onshore infrastructure for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. 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.
National Nature Reserve	A National Nature Reserve is the land declared under the National Parks and Access to the Countryside Act 1949 or Wildlife and Countryside Act (1981) as amended. In England, National Nature Reserves were designated as important places for wildlife and natural features and were established in order to protect areas of habitat and of geological formations.
Onshore Order Limits	See Transmission Assets Order Limits: Onshore (below).

Term	Meaning
Potential Special Protection Areas	A site identified as potentially qualifying for Special Protection Area classification and for which a decision to classify has yet to be taken pending consultation.
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.
Special Protection Areas	A site designation specified in the Conservation of Habitats and Species Regulations 2017, classified for rare and vulnerable birds, and for regularly occurring migratory species. Special Protection Areas contribute to the national site network.
Special Site of Scientific Interest	A Site of Special Scientific Interest is the land notified as such under the Wildlife and Countryside Act (1981), as amended. These site are designated as the finest sites for wildlife and natural features in England, supporting many characteristic, rare and endangered species, habitats and natural features.
Study area	This is an area which is defined for each environmental topic which includes the Transmission Assets Order Limits 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.
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	The fifth review of Birds of Conservation Concern
BTO	British Trust for Ornithology
ES	Environmental Statement
EWG	Expert Working Group
GB	Great Britain

Acronym	Meaning
HAT	Highest Astronomical Tide
HPAI	Highly Pathogenic Avian Influenza
LNR	Local Nature Reserve
MLWS	Mean Low Water Springs
NNR	National Nature Reserve
PEIR	Preliminary Environmental Information Report
RSPB	Royal Society for the Protection of Birds
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom
VPs	Vantage Point
WeBS	Wetland Bird Survey

Units

Unit	Description
%	Percentage
hrs	Hours
ha	Hectares
km	Kilometres
kV	Kilovolt
m	Metre

1 Intertidal birds technical report

1.1 Introduction

1.1.1.1 This document forms Annex 4.3: Intertidal 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 intertidal bird assemblage and presents the results of the desk-based studies and site-specific surveys undertaken between 2021 and 2024.

1.1.1.2 This annex should be read in conjunction with Volume 3, Annex 4.1: Breeding birds technical report (document reference F3.4.1), Volume 3, Annex 4.2: Wintering and migratory birds technical report (document reference F3.4.2) and Volume 3, Annex 4.4: Onshore and intertidal ornithology survey methodologies of the ES (document reference F3.4.4).

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 (document reference F3.4) and Information to Support Appropriate Assessment part 3 (document reference E2.3.C).

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, these are the Transmission Assets intertidal ornithology study area (referred to hereafter as the ‘study area’) and the Transmission Assets intertidal ornithology survey area.

1.2.1.2 The survey area has been split in to two discrete areas for the purpose of the site-specific intertidal surveys: the coastal survey area (**Figure 1.5**) and the estuarine survey area (**Figure 1.6**).

The study area

1.2.1.3 The study area has been used to identify the following designated sites with connectivity within 20 kilometres (km) of the Transmission Assets Order Limits: Onshore, hereafter referred to as the Onshore Order Limits, and the Intertidal Infrastructure Area, which may be impacted by the works. The 20 km buffer is based on the maximum foraging range of pink-footed goose *Anser brachyrhynchus* (Scottish Natural Heritage, now NatureScot, 2016).

- Internationally designated ornithological sites, specifically Special Protection Areas (SPAs), potential SPAs and Ramsar sites with intertidal habitats (**Figure 1.1**).
- Nationally designated sites, specifically Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) with intertidal habitats (**Figure 1.2**).

- Locally designated sites, specifically Local Nature Reserves (LNRs) and Biological Heritage Sites (BHSs) were identified (**Figure 1.3**).

The survey area

1.2.1.4 The survey area was defined as a 500 m buffer around the Intertidal Infrastructure Area and Onshore Order Limits containing supratidal, intertidal, and subtidal habitats and extending alongshore to the south and north of the Onshore Order Limits and Intertidal Infrastructure Area. This has been added to consider disturbance effects upon the waterbird species present. This distance is based on the maximum potential disturbance distances of key non-breeding species expected to be found as part of the bird assemblage associated with the Ribble Estuary (Goodship and Furness, 2022).

1.2.1.5 As there are two areas of distinct intertidal habitats within the survey areas, each area is named and described separately. There is a section of intertidal habitat at the coast (where the landfall is proposed) and there is also a section of intertidal habitat along the Ribble Estuary (which the 400 kV grid connection cable corridor will pass through). These areas have been termed the coastal survey area and the estuarine survey area, respectively, and can be viewed in **Figure 1.4**, **Figure 1.5** and **Figure 1.6**.

The coastal survey area

1.2.1.6 The coastal survey area comprises the area below Highest Astronomical Tide (HAT) surrounding the landfall (**Figure 1.5**). The coastal survey area extends approximately 2.5 km in length including a buffer of 500 m either side of the Intertidal Infrastructure Area and Onshore Order Limits. The survey area extends 1.5 km seawards from HAT. The area consists of supratidal, intertidal and subtidal habitats dominated by sandflats.

1.2.1.7 The coastal survey area is a busy beach area between Blackpool and Lytham St Annes which is characterised by high levels of anthropogenic disturbance. It used by numbers of holidaymakers during the summer, and by high numbers of recreational walkers and dog walkers during the winter months. There is also an airport directly to the east with low flying planes and helicopters frequently passing over and is used by a number of anglers and bait fishers (e.g., cockles).

The estuarine survey area

1.2.1.8 The estuarine survey area comprises a section of the intertidal habitats of the Ribble Estuary, extending approximately 2.79 km in length (**Figure 1.6**). Intertidal habitats are dominated by mudflats with saltmarsh on the upper shore. The estuarine survey area focuses on the point at which the 400kV cable is due to cross the River Ribble. A 500m buffer was applied upstream and downstream of the Onshore Order Limits.

1.2.1.9 The estuarine survey area is characterised on its southern bank by high levels of sheep grazing with a busy footpath running along its extent. The northern bank is not used by sheep and has no public access so is relatively undisturbed.

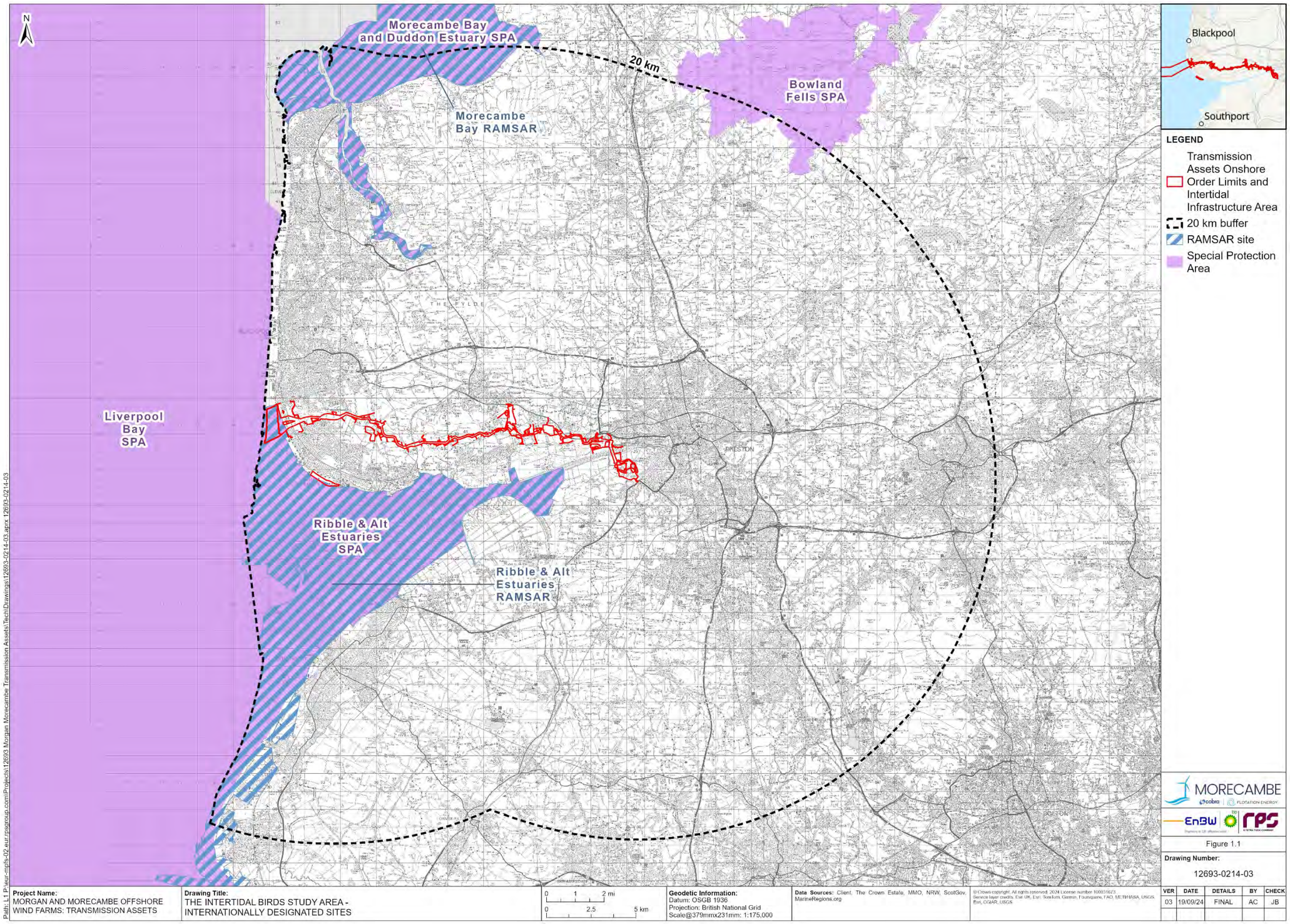


Figure 1.1: Intertidal birds study area - Internationally designated sites

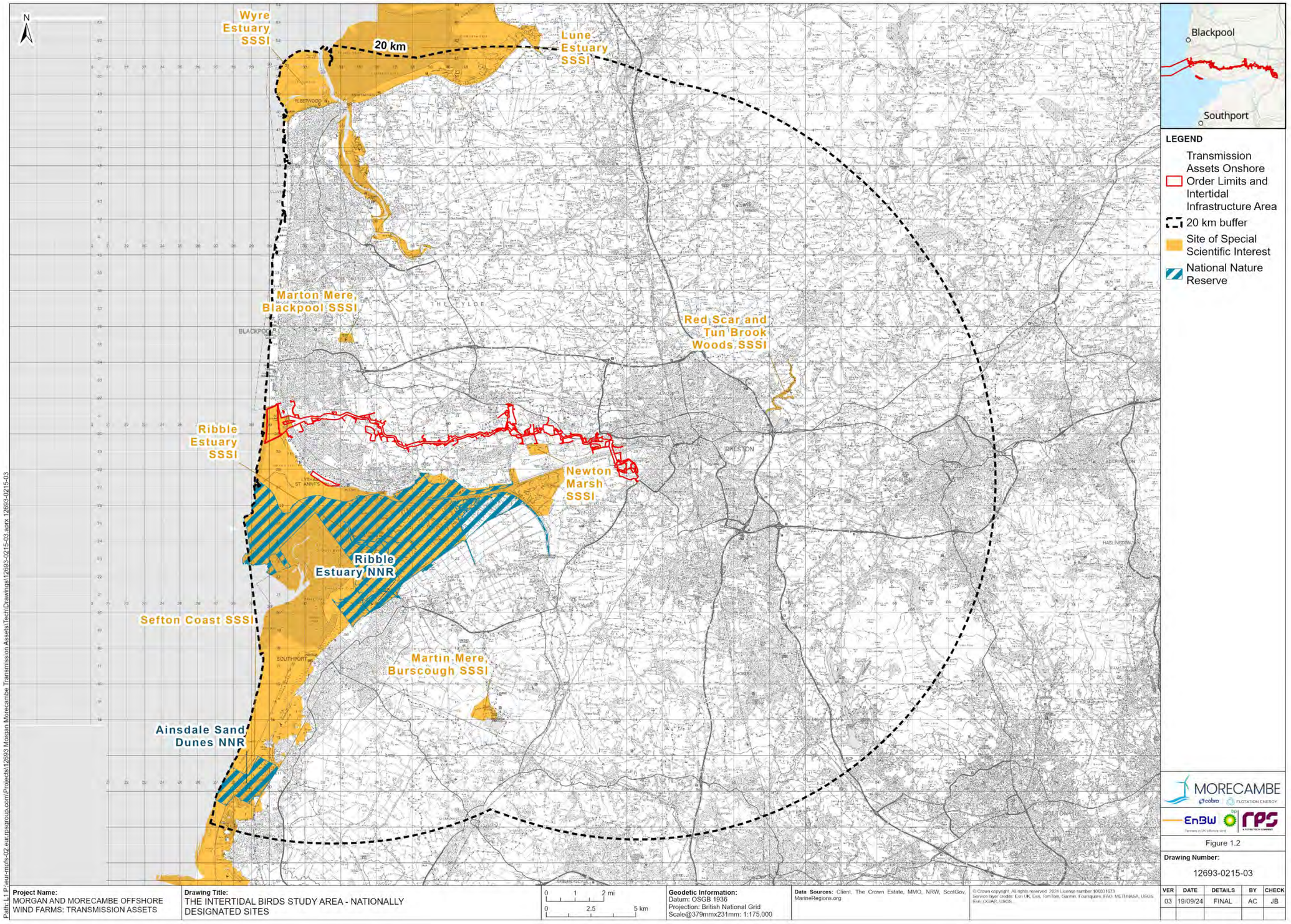


Figure 1.2: Intertidal birds study area - Nationally designated sites

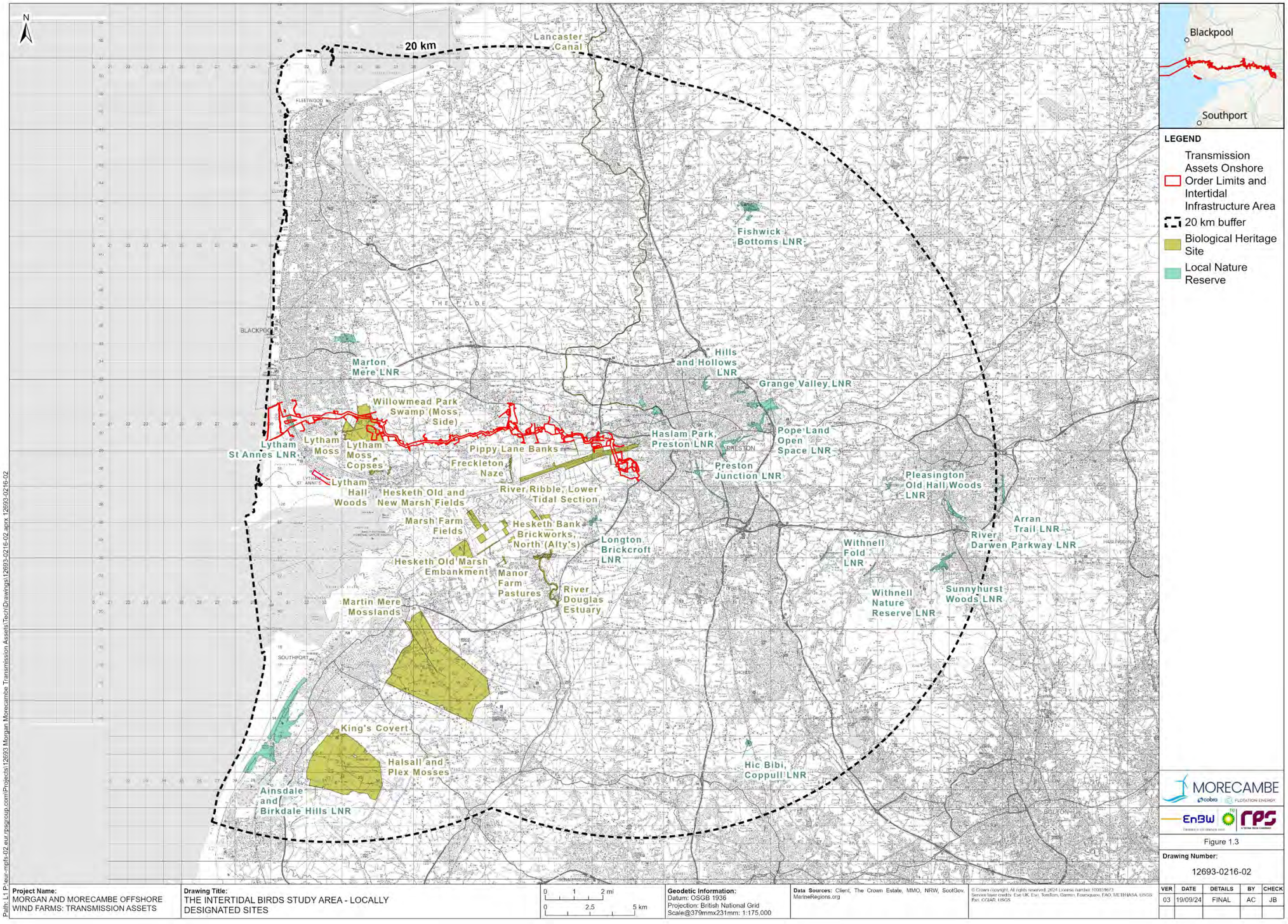


Figure 1.3: Intertidal birds study area – Locally designated sites

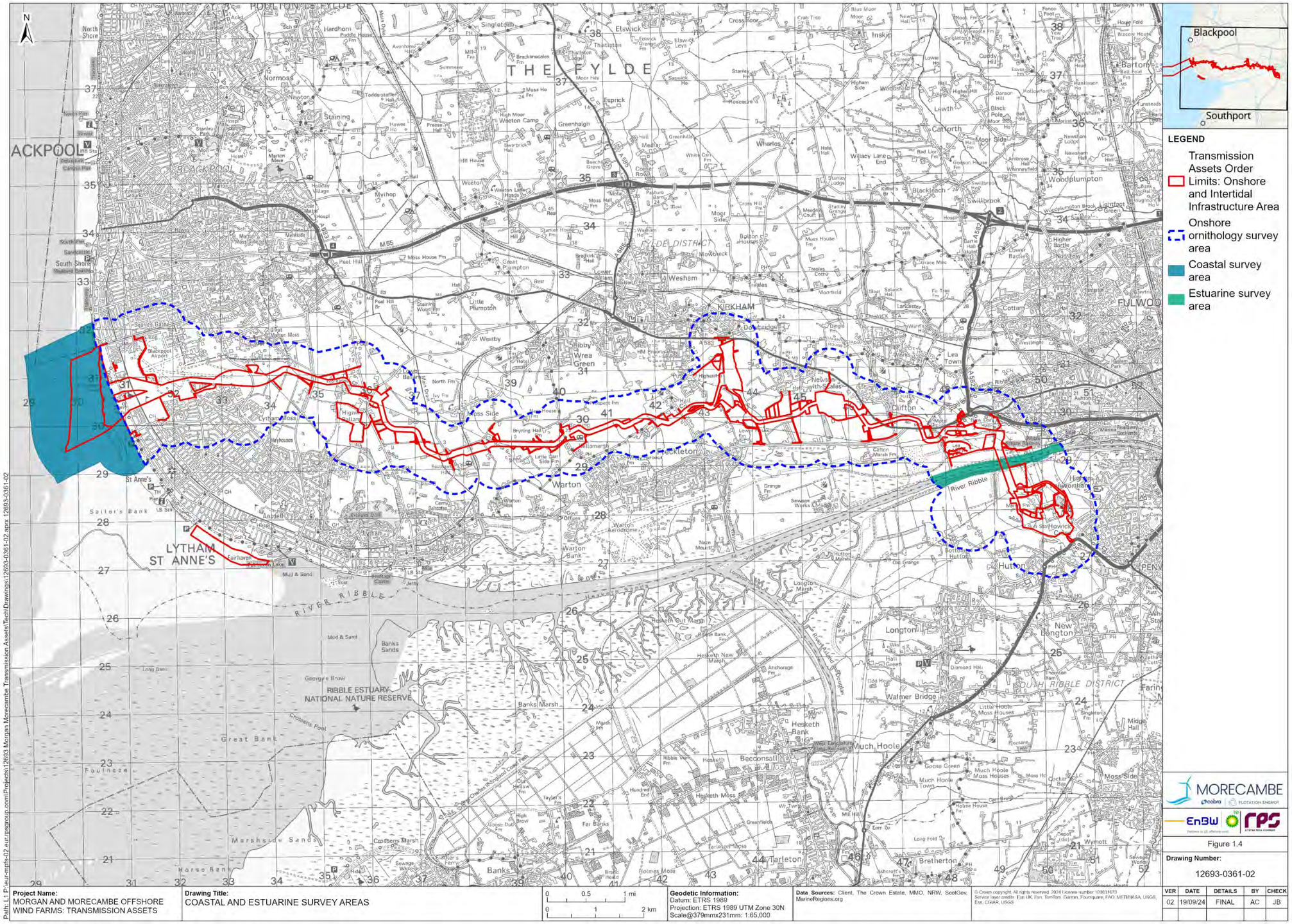


Figure 1.4: Coastal and estuarine survey areas

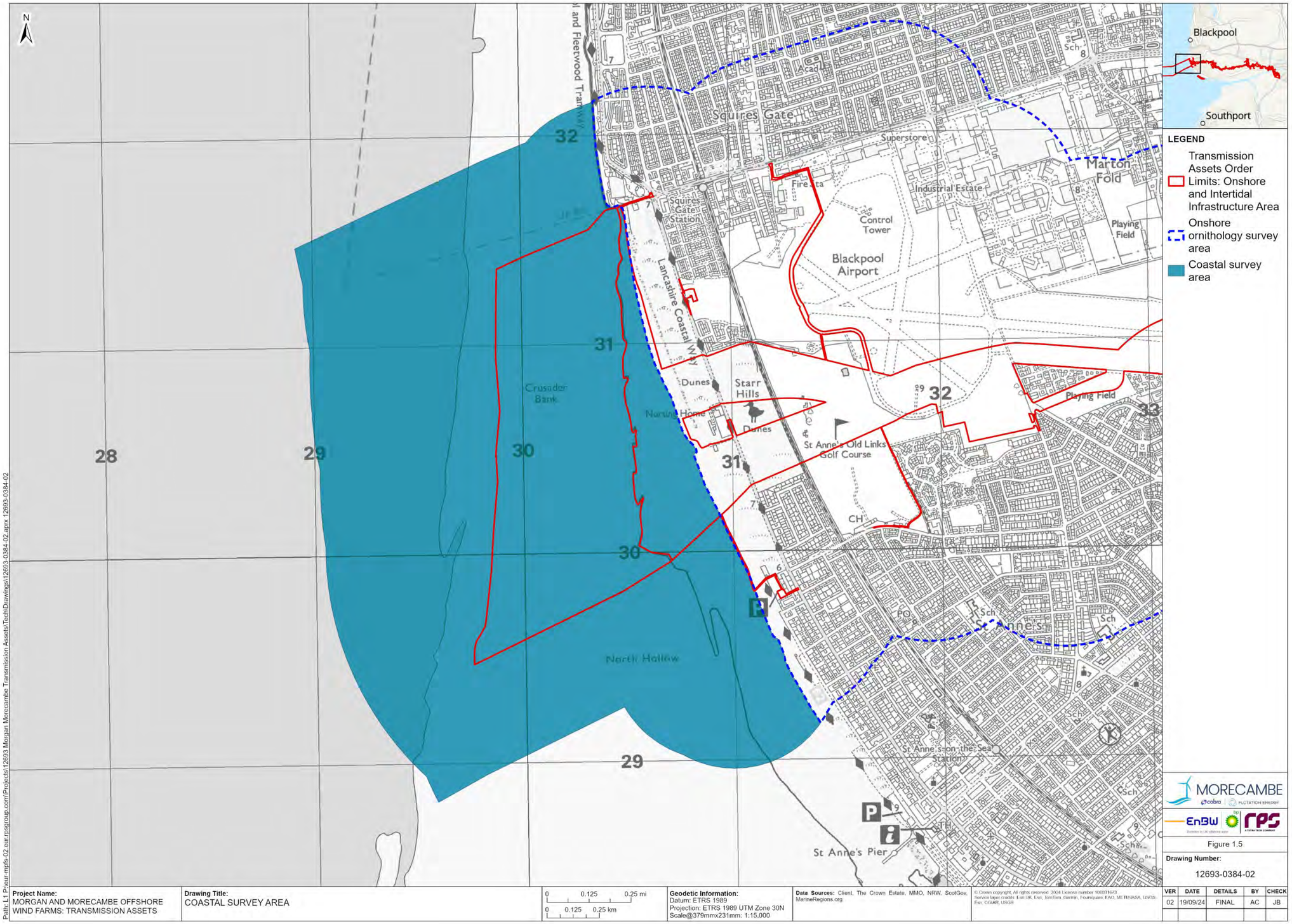


Figure 1.5: Coastal survey area

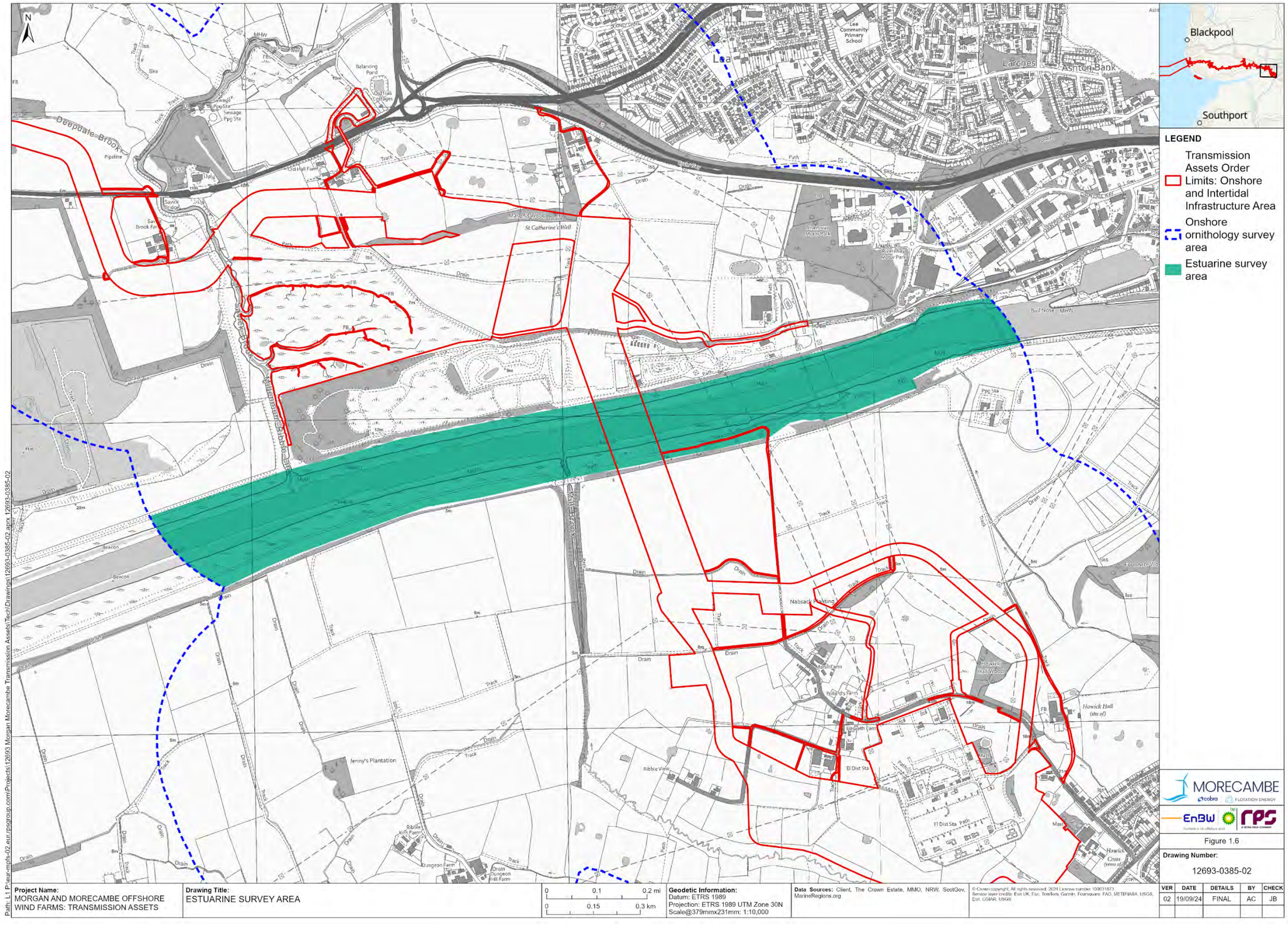


Figure 1.6: Estuarine survey area

1.2.2 Relevant legislation and guidance

1.2.2.1 There are two main pieces of legislation that protect birds under United Kingdom (UK) law, namely the Conservation of Habitats and Species Regulations 2017, as amended (the Conservation of Habitats and Species Regulations 2017) and the Wildlife and Countryside Act 1981, as amended (the Wildlife and Countryside Act 1981).

1.2.2.2 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 Habitats Regulations. This has created a national site network to ensure continued protection for existing SPAs and to any new sites designated under these Regulations.

1.2.2.3 All wild birds, their nests and their eggs 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 subject to an offence.

1.2.2.4 In addition, for birds listed in Schedule 1 of the Wildlife and Countryside Act 1981, it is also an offence to intentionally or recklessly:

- disturb any species listed under Schedule 1 of the Act whilst it is building a nest or is in, on or near a nest containing eggs or young; or
- disturb the dependent young of any species listed under Schedule 1.

1.2.2.5 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.

1.2.2.6 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).

1.2.3 Consultation

1.2.3.1 The proposed intertidal bird survey methodology and findings to date were presented at the first Expert Working Group (EWG) in March 2023.

1.2.3.2 The overarching methodologies presented have been agreed by all consultees following the presentation, and comments on detailed methodologies were provided in September 2023. Minor amendments to the survey methodologies, in relation to the feedback provided by Natural England, are reflected in Volume 3, Annex 4.4: Onshore and intertidal ornithology survey methodologies of the ES.

1.2.3.3 More details regarding consultation relevant to onshore and intertidal ornithology can be found in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.

1.2.4 Approach to establishing the baseline

1.2.4.1 In order to establish a baseline of intertidal ornithological receptors within the study and survey areas a combination of site-specific surveys and review of existing data sources have been undertaken. The methodology followed during the site-specific surveys is described in **section 1.4.3**. The detailed methodology is presented in Volume 3, Annex 4.4: Onshore and intertidal ornithology survey methodologies of the ES (document reference F3.4.4).

1.2.4.2 The results of the desk-based study undertaken are described in **section 1.3** and the results of the surveys in **section 1.4.5**.

1.2.5 Desk-based study data sources

1.2.5.1 Information on intertidal waterbirds within the survey area was collected through a desk-based review of existing data sources. These sources are summarised in **Table 1.1** below.

Table 1.1: Summary of key sources for the desk-based study

Title	Source	Year published	Author	Year data obtained
Wetland Bird Survey (WeBS), Core count 5-Year summary: • River Ribble – Bull Nose-Clifton Marsh (2017/18 to 2021/22); and • St. Annes Beach (2017/18 to 2021/22).	British Trust for Ornithology (BTO) data request of WeBS core count data.	2022	BTO/RSPB/Joint Nature Conservation Committee (JNCC).	2023
Fylde Bird Club records.	Fylde Bird Club	2023	Ellis, P.	2023
Fylde – Sand Extraction, Lytham St. Annes 2020/2021 Wintering Bird Report.	Golder Associates UK Ltd.	2021	Brookes, F.	2023
Morecambe Offshore Windfarm Fylde Export Cable Route: Coastal and Estuarine Wintering Bird Survey Report-2021/2022.	Avian Ecology Ltd.	2022	Hinchcliffe, Z.	2022

Wetland Bird Survey (WeBS) records

1.2.5.2 WeBS core count data were obtained for two WeBS sectors that overlap with the intertidal survey areas at the coastal survey area and the estuarine survey area. Data was provided by WeBS, a Partnership jointly funded by the British Trust for Ornithology, Royal Society for the Protection of Birds and Joint Nature Conservation Committee, in association with The Wildfowl & Wetlands Trust, with fieldwork conducted by volunteers.

1.2.5.3 Records provided detail of annual peak counts for waterbird species and the five-year mean of peaks. Data is split into the WeBS year (running July to June) giving annual data between 2017/18 through to 2021/2022 (**Figure 1.7**, **Table 1.1).**

1.2.5.4 It should be noted that during WeBS core count surveys the recording of gulls and terns is optional for those conducting the surveys. Therefore, there is a possibility that these species are underreported within this dataset. Counts are made on a once per month over a high tide period on predetermined dates, where possible. This is to reduce the possibility of double counting or missing individual birds.

Fylde Bird Club data

1.2.5.5 Fylde Bird Club records were provided for a total of 26 tetrad squares (2 km by 2 km squares) within or partly within the survey area. In terms of spatial coverage, the Fylde Bird Club data provided complete coverage of the survey area.

1.2.5.6 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).

1.2.5.7 The Fylde Bird Club data records provide a wealth of valuable data, in particular providing evidence of a species presence within the survey area. However, the records do not necessarily represent an accurate relative abundance of all species present in the area due to the non-systematic nature of the field data collection (although it is noted that some Fylde Bird Club members may systematically count sectors or contribute to WeBS counts). Local records often include notable ornithological records of rarities but not necessarily regularly submitted records of common species within defined survey areas. It should be noted that surveyors for the Fylde Bird Club do not access the south bank of the River Ribble but may record birds from the north bank.

1.2.5.8 The annual peak counts are presented to indicate the highest number of records held by the Fylde Bird Club in one of the latest five years. The five-year peak count represents the maximum abundance recorded by the Fylde Bird Club between 2018 and 2023.

Processing the Fylde Bird Club data records

1.2.5.9 As outlined above, data was provided for abundance of birds within 26 tetrads. To consider which species may be using the habitats within the coastal and estuarine survey areas, data was filtered for any tetrads that overlap with these areas.

1.2.5.10 The resulting data was then filtered to exclude any tetrads within which waterbird species were not recorded. Any remaining non-waterbirds were then filtered out of the remaining data. Data was split into the WeBS year (running from July to June).

1.2.5.11 It is noted that the Fylde Bird Club data includes count data from sea watches which inherently include records of birds in flight. It must be noted that most of the birds in flight will only be passing through the survey area.

Fylde Sand Extraction data

1.2.5.12 Wintering bird surveys of land associated with sand extraction for commercial purposes at Lytham St. Annes were conducted by Turnstone Ecology UK Ltd on behalf of Golder Associates UK Ltd under commission from Fylde Borough Council. The surveys took place on the beach at Lytham St. Annes from the low tide to high tide line (i.e., the intertidal zone) and extended from the Ribble Estuary in the south to Squires Gate Lane, Blackpool to the north (Brookes, 2021). Six survey visits were conducted between October 2020 and March 2021 with the aim of gaining an understanding of the value of the area to ornithological receptors, and wetland birds in particular.

Morecambe Offshore Windfarm Fylde export cable route data

1.2.5.13 Intertidal vantage point and nocturnal surveys were undertaken by Avian Ecology Ltd that overlap with the coastal survey area.

1.2.5.14 Two types of survey were conducted, vantage point surveys and nocturnal surveys. Twice monthly diurnal surveys were undertaken at each vantage point between October 2021 and April 2022 giving a total of 14 visits and 28

hours of observation time. Nocturnal surveys were carried out monthly between February 2022 and April 2022. The data is presented in Hinchcliffe (2022).

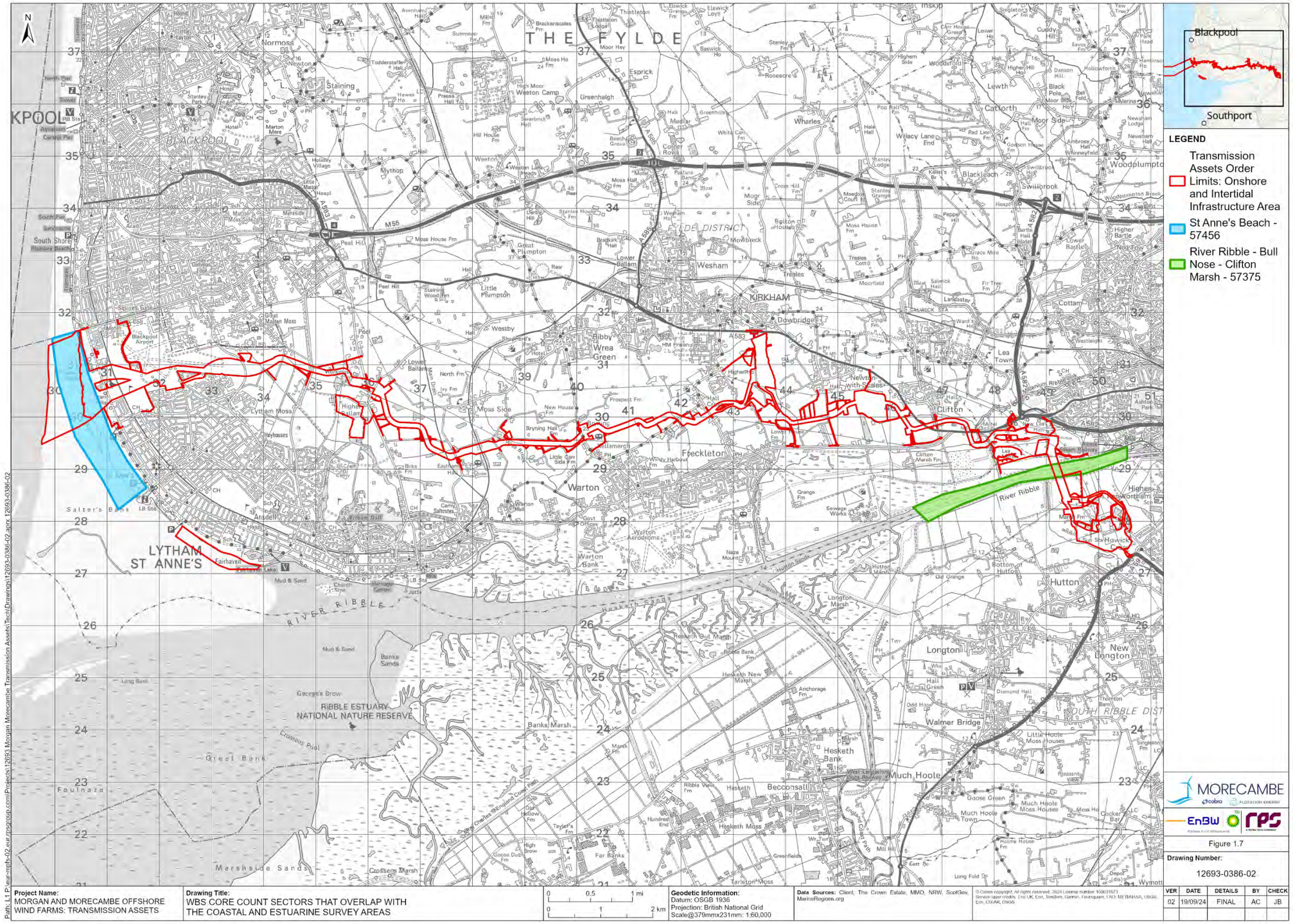


Figure 1.7: WeBS core count sectors that overlap with the coastal and estuarine survey areas

1.2.6 Designated sites

1.2.6.1 As noted in **section 1.2.1.3**, all internationally and nationally designated sites with intertidal habitats and all locally designated sites were identified within the study area. The distances set out are based on the home range of pink-footed goose as stated in the Scottish Natural Heritage, now NatureScot, guidance document (Scottish National Heritage, 2016). Citations for each site were reviewed to identify those waterbirds which may use intertidal habitats and nearshore waters.

1.2.6.2 Within this annex, reference is only made to designated sites which have supratidal, intertidal or subtidal habitats, or have connectivity to the study area (i.e., inland wetland sites, or breeding bird sites within the foraging range of said species).

1.2.7 Conservation status

1.2.7.1 For the species considered likely to be present, consideration was also given to their conservation status, specifically whether the species were listed on Annex 1 under the Birds Directive or on Schedule 1 under the Wildlife and Countryside Act 1981.

1.2.7.2 Consideration was given to species listed as priority species by the Secretary of State under Section 41 of the Natural Environment and Rural Communities Act 2006 or species listed as either red or amber-listed species on the Birds of Conservation Concern 5 (hereafter BOCC5 UK) (Stanbury *et al.,* 2021). 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 with intertidal habitats

SPAs

1.3.1.1 There are four SPAs with intertidal habitats and/or connectivity to the survey area within or partly within the study area. These are the Ribble and Alt Estuaries SPA, Morecambe Bay and Duddon Estuary SPA, Bowland Fells SPA, and Liverpool Bay/Bae Lerpwl SPA. A summary of the designated features is provided below. Some species may be designated for the breeding and/or non-breeding seasons.

- Liverpool Bay/Bae Lerpwl SPA is designated for a total of five seabird species including two breeding features as well as three non-breeding features. The site also supports a non-breeding bird assemblage.
- Morecambe Bay and Duddon Estuary SPA is designated for a total of 24 species including 20 non-breeding features and five breeding features. The site also supports a bird assemblage consisting of a range of species in addition to the species listed.

- The Ribble and Alt Estuaries SPA is designated for a total of 20 species including 17 non-breeding features and three breeding features. The area also supports a waterbird assemblage and a seabird assemblage in addition to the individually named species.
- Bowland Fells SPA is designated for breeding lesser black-backed gulls. The other upland breeding features have no connectivity with Transmission Assets.

Table 1.2: Ornithological features of SPAs within or partly within the study area

SPA	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features	Designated season	SPA population from citation (dates in brackets)
Ribble and Alt Estuaries UK9005103	Partly within Intertidal Infrastructure Area and Onshore Order Limits	Pink-footed goose	Non-breeding	11,764 (1993/94 to 1997/98)
		Bewick's swan *Cygnus columbianus bewickii*	Non-breeding	276 (1993/94 to 1997/98)
		Whooper swan *Cygnus cygnus*	Non-breeding	182 (1993/94 to 1997/98)
		Shelduck *Tadorna tadorna*	Non-breeding	4,925 (1993/94 to 1997/98)
		Wigeon *Anas penelope*	Non-breeding	85,259 (1993/94 to 1997/98)
		Pintail *Anas acuta*	Non-breeding	2,731 (1993/94 to 1997/98)
		Teal *Anas crecca*	Non-breeding	7,157 (1993/94 to 1997/98)
		Scaup *Aythya marila*	Non-breeding	Assemblage feature
		Common scoter *Melanitta nigra*	Non-breeding	Assemblage feature
		Oystercatcher *Haematopus ostralegus*	Non-breeding	18,535 (1993/94 to 1997/98)
		Lapwing *Vanellus vanellus*	Non-breeding	Assemblage feature
		Golden plover *Pluvialis apricaria*	Non-breeding	3,598 (1993/94 to 1997/98)
		Grey plover *Pluvialis squatarol*	Non-breeding	9,355 (1993/94 to 1997/98)

SPA	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features	Designated season	SPA population from citation (dates in brackets)
		Ringed plover *Charadrius hiaticula*	Non-breeding	1,657 (1993 to 1997)
		Whimbrel *Numenius phaeopus*	Non-breeding	Assemblage feature
		Curlew *Numenius arquata*	Non-breeding	Assemblage feature
		Bar-tailed godwit *Limosa lapponica*	Non-breeding	20,086 (1993/94 to 1997/98)
		Black-tailed godwit *Limosa limosa*	Non-breeding	1,273 (1993/94 to 1997/98)
		Knot *Calidris canutus*	Non-breeding	68,922 (1993/94 to 1997/98)
		Ruff *Calidris pugnax*	Breeding	1 pair (late 1980s count)
		Sanderling *Calidris alba*	Non-breeding	6,535 (passage, 1993 to 1997) 2,882 (wintering, 1993/94 to 1997/98)
		Dunlin *Calidris alpina*	Non-breeding	39,376 (1993/94 to 1997/98)
		Redshank *Tringa totanus*	Non-breeding	3,247 (passage, 1993 to 1997) 2,505 (wintering, 1993/94 to 1997/98)
		Black-headed gull *Chroicocephalus ridibundus*	Breeding	Assemblage feature
		Lesser black-backed gull *Larus fuscus*	Breeding	1,800 (1993 count)
		Common tern *Sterna hirundo*	Breeding	182 pairs (1996 count)
		Cormorant *Phalacrocorax carbo*	Non-breeding	Assemblage feature

SPA	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features	Designated season	SPA population from citation (dates in brackets)
Liverpool Bay/Bae Lerpwl UK9020294	0.00	Common scoter	Non-breeding	56,679 (2004/05 to 2010/11)
		Little gull *Hydrocoloeus minutus*	Non-breeding	319 (2004/05 to 2010/11)
		Little tern *Sternula albifrons*	Breeding	260 (2010 to 2014, Seabird Monitoring Programme)
		Common tern	Breeding	360 (2010 to 2014, Seabird Monitoring Programme)
		Red-throated diver *Gavia stellata*	Non-breeding	1,171 (2004/05 to 2010/11)
Morecambe Bay and Duddon Estuary UK9020326	9.5	Light-bellied brent goose (Nearctic origin) *Branta bernicla*	Any season	Assemblage feature
		Pink-footed goose	Non-breeding	15,648 (2009/10 to 2013/14)
		Whooper swan	Non-breeding	113 (2009/10 to 2013/14)
		Shelduck	Non-breeding	5,878(2009/10 to 2013/14)
		Wigeon	Any season	Assemblage feature
		Mallard *Anas platyrhynchos*	Any season	Assemblage feature
		Pintail	Non-breeding	2,498 (2009/10 to 2013/14)
		Teal	Any season	Assemblage feature
		Green-winged teal *Anas carolinensis*	Any season	Assemblage feature
		Ring-necked duck *Aythya collaris*	Any season	Assemblage feature
		Eider *Somateria mollissima*	Non-breeding	Assemblage feature

SPA	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features	Designated season	SPA population from citation (dates in brackets)
		Goldeneye *Bucephala clangula*	Any season	Assemblage feature
		Red-breasted merganser *Mergus serrator*	Any season	Assemblage feature
		Oystercatcher	Non-breeding	55,888 (2009/10 to 2013/14)
		Lapwing	Any season	Assemblage feature
		Golden plover	Non-breeding	1,900 (Morecambe Bay SPA citation value 1991)
		Grey plover	Non-breeding	2,000 (Morecambe Bay SPA citation value 1991)
		Ringed plover	Non-breeding	1,049 (2009/10 to 2013/14)
		Curlew	Non-breeding	12,209 (2009/10 to 2013/14)
		Bar-tailed godwit	Non-breeding	3,046 (2009/10 to 2013/14)
		Black-tailed godwit	Non-breeding	2,413 (2009/10 to 2013/14)
		Turnstone *Arenaria interpres*	Non-breeding	1,359 (2009/10 to 2013/14)
		Knot	Non-breeding	32,739 (2009/10 to 2013/14)
		Ruff	Non-breeding	8 (2009/10 to 2013/14)
		Sanderling	Non-breeding	3,600 (Morecambe Bary SPA citation value 1991)
		Dunlin	Non-breeding	26,982 (2009/10 to 2013/14)
		Little stint *Calidris minuta*	Any season	Assemblage feature
		Little egret *Egretta garzetta*	Non-breeding	134 (2009/10 to 2013/14)

SPA	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features	Designated season	SPA population from citation (dates in brackets)
		Redshank	Non-breeding	11,133 (2009/10 to 2013/14)
		Spotted redshank *Tringa erythropus*	Any season	Assemblage feature
		Greenshank *Tringa nebularia*	Any season	Assemblage feature
		Black-headed gull	Any season	Assemblage feature
		Mediterranean gull *Larus melanocephalus*	Non-breeding	18 (2009/10 to 2013/14)
		Common gull *Larus canus*	Any season	Assemblage feature
		Herring gull *Larus argentatus*	Breeding Non-breeding	20,000 (Morecambe Bay SPA citation value 1991) Assemblage feature
		Lesser black-backed gull	Breeding Non-breeding	9,720 (2011 to 2015) 9,450 (2009/10 to 2013/14)
		Sandwich tern *Sterna sandvicensis*	Breeding	1,608 (1988 to 1992)
		Little tern	Breeding	84 (2010 to 2014)
		Common tern	Breeding	570 570 (Morecambe Bay SPA citation value 1991)
		Cormorant	Any season	Assemblage feature
		Eurasian spoonbill *Platalea leucorodia*	Any season	Assemblage feature
		Great white egret *Ardea alba*	Any season	Assemblage feature
Bowland Fells UK9005151	17.6	Lesser black-backed gull	Non-breeding	4,575 pairs (2009 to 2012)

Ramsar sites

1.3.1.2 There are two Ramsar sites within the study area with intertidal habitats: the Ribble and Alt Estuaries Ramsar site, and Morecambe Bay Ramsar site**.**

1.3.1.3 A summary of the designated features is listed below, and a complete list of the wintering and migratory feature species for each Ramsar site is detailed in **Table 1.3**.

- Morecambe Bay Ramsar site is designated for a total of 21 species including seabirds, waders, wildfowl, swan and geese. The site also supports a breeding assemblage of seabirds and a wintering assemblage of waterbirds.
- The Ribble and Alt Estuaries Ramsar site is designated for 18 species including wildfowl, swan and geese, waders and gulls. The site also supports an assemblage of breeding wetland birds and an assemblage of non-breeding waterbirds.

Table 1.3: Designated features of Ramsar sites within or partly within the study area

Ramsar site	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest feature	Designated season	Population size at designation (dates in brackets)
Ribble and Alt Estuaries UK11057	Partly within Intertidal Infrastructure Area and Onshore Order Limits	Pink-footed goose	Wintering	6,552 (1998/99 to 2002/03)
		Bewick's swan	Wintering	230 (1998/99 to 2002/03)
		Whooper swan	Wintering	211 (1998/99 to 2002/03)
		Shoveler	Wintering	200 (1998/99 to 2002/03)
		Wigeon	Wintering	69,841 (1998/99 to 2002/03)
		Pintail	Wintering	1,497 (1998/99 to 2002/03)
		Teal	Wintering	5,107 (1998/99 to 2002/03)
		Common scoter	Wintering	691 (1998/99 to 2002/03)
		Oystercatcher	Wintering	18,926 (1998/99 to 2002/03)
		Golden plover	Wintering	3,588 (1998/99 to 2002/03)
		Grey plover	Passage	11,021 (1998/99 to 2002/03)

Ramsar site	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest feature	Designated season	Population size at designation (dates in brackets)
		Ringed plover	Passage	3,761 (1998/99 to 2002/03)
		Curlew	Passage	2,502 (1998/99 to 2002/03)
		Bar-tailed godwit	Wintering	13,935 (1998/99 to 2002/03)
		Black-tailed godwit	Passage	3,323 (1998/99 to 2002/03)
		Knot	Passage	42,692 (1998/99 to 2002/03)
		Ruff	Passage	60 (1998/99 to 2002/03)
		Sanderling	Passage	7,401 (1998/99 to 2002/03)
		Dunlin	Passage	38,196 (1998/99 to 2002/03)
		Redshank	Passage	4,465 (1998/99 to 2002/03)
		Spotted redshank	Wintering	2 (1998/99 to 2002/03)
		Greenshank	Passage	9(1998/99 to 2002/03)
		Black-headed gull	Wintering Breeding	16,849 (1998/99 to 2002/03) 14,888 (Seabird 2000 Census)
		Common tern	Breeding	364 (1996)
		Red-throated diver	Wintering	56 (1998/99 to 2002/03)
		Cormorant	Wintering	463 (1998/99 to 2002/03)
Morecambe Bay UK11045	9.5	Pink-footed goose	Wintering	2,475 (1991/92 to 1995/96)
		Shelduck	Wintering	6,372 (1991/92 to 1995/96)
		Wigeon	Wintering	5,838 (1991/92 to 1995/96)
		Pintail	Wintering	2,804 (1991/92 to 1995/96)

Ramsar site	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest feature	Designated season	Population size at designation (dates in brackets)
		Eider	Wintering	6,400 (1991/92 to 1995/96)
		Goldeneye	Wintering	445 (1991/92 to 1995/96)
		Red-breasted merganser	Wintering	292 (1991/92 to 1995/96)
		Great crested grebe *Podiceps cristatus*	Wintering	318 (1991/92 to 1995/96)
		Oystercatcher	Wintering	47,572 (1991/92 to 1995/96)
		Lapwing	Wintering	17,669 (1991/92 to 1995/96)
		Golden plover	Wintering	4,097 (1991/92 to 1995/96)
		Grey plover	Wintering	1,813 (1991/92 to 1995/96)
		Ringed plover	Passage	693 (1991/92 to 1995/96)
		Curlew	Wintering	13,620 (1991/92 to 1995/96)
		Bar-tailed godwit	Wintering	2,611 (1991/92 to 1995/96)
		Turnstone	Wintering	1,583 (1991/92 to 1995/96)
		Knot	Wintering	29,426 (1991/92 to 1995/96)
		Sanderling	Passage	2,466 (1991/92 to 1995/96)
		Dunlin	Wintering	52,671 (1991/92 to 1995/96)
		Redshank	Wintering	6,336 (1991/92 to 1995/96)
		Cormorant	Wintering	879 (1991/92 to 1995/96)

SSSIs

1.3.1.4 A total of eight SSSIs with ornithological features within or partly within the study area have intertidal habitats or potential connectivity. These SSSIs and

the relevant features for which they are designated for are described in **Table 1.4**.

1.3.1.5 The Intertidal and Onshore Infrastructure Areas overlap two SSSIs at the landfall. Lytham St Annes Dunes SSSI is composed entirely of sand dune habitats that lie directly above HAT, and the Ribble Estuary SSSI that underpins large extents of the Ribble and Alt Estuaries SPA and Ramsar includes all intertidal and supratidal habitats between MLWS and HAT.

Table 1.4: SSSIs with intertidal habitats or potential connectivity within the study area

SSSI	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features
Lytham St. Annes Dunes	Partly within Onshore Order Limits	Stonechat *Saxicola rubicola*
Ribble Estuary	Partly within Intertidal Infrastructure Area and Onshore Order Limits	Pink-footed goose
		Bewick's swan
		Whooper swan
		Shelduck
		Shoveler
		Wigeon
		Mallard
		Pintail
		Teal
		Oystercatcher
		Lapwing
		Golden plover
		Grey plover
		Ringed plover
		Curlew
		Bar-tailed godwit
		Black-tailed godwit
		Knot
		Ruff
		Sanderling
		Dunlin
		Snipe
		Redshank

SSSI	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features
		Black-headed gull
		Common tern
		Skylark *Alauda arvensis*
		Lowland damp grasslands - assemblages of breeding birds
		Sand-dunes and saltmarshes - assemblages of breeding birds
		More than 20,000 non-breeding waterbirds
Newton Marsh	0.02	Mute swan *Cygnus olor*
		Shelduck
		Wigeon
		Mallard
		Teal
		Moorhen *Gallinula chloropus*
		Coot
		Little grebe
		Oystercatcher
		Lapwing
		Golden plover
		Bar-tailed godwit
		Black-tailed godwit
		Sanderling
		Dunlin
		Snipe
		Common sandpiper
		Redshank
		Spotted redshank
		Greenshank
		Skylark
		Yellow wagtail *Motacilla flava*
		Meadow pipit *Anthus pratensis*
		Corn bunting *Emberiza calandra*
		Reed bunting *Emberiza schoeniclus*

SSSI	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features
Marton Mere	3.78	Shoveler
		Mallard
		Pochard *Aythya ferina*
		Tufted duck *Aythya fuligula*
		Coot *Fulica atra*
		Little grebe *Tachybaptus ruficollis*
		Great crested grebe
		Oystercatcher
		Curlew
		Ruff
		Redshank
		Greenshank
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
Lune Estuary	16.7	Pink-footed goose
		Shelduck
		Wigeon
		Mallard
		Oystercatcher

SSSI	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest features
		Grey plover
		Ringed plover
		Curlew
		Turnstone
		Knot
		Sanderling
		Dunlin
		Redshank
		Common tern
Bowland Fells	17.6	Oystercatcher
		Lapwing
		Golden plover
		Curlew
		Snipe
		Common sandpiper *Actitis hypoleucos*
		Redshank
		Lesser black-backed gull
		Merlin *Falco columbarius*

NNRs

1.3.1.6 Two NNRs have ornithological features that may use intertidal habitats within the study area, details of which can be seen in **Table 1.5**.

Table 1.5: NNRs within the study area with intertidal habitat

NNR	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)	Interest feature from NNR site description
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 Saltmarsh - breeding birds Annex 1 species Saltmarsh breeding birds of conservation concern and Biodiversity Action Plan (BAP) species Saltmarsh - nationally important breeding bird populations
Ainsdale Sand Dunes	15.6	Supralittoral sediment: Aggregations of non-breeding birds Supralittoral sediment: Sand dune breeding birds

LNRs

1.3.1.7 There are 17 LNRs within or partly within the study area. A list of these LNRs and their distance from the Intertidal Infrastructure Area and Onshore Order Limits are provided in **Table 1.6**. LNRs do not have qualifying features in the same way SPAs/SSSIs do, so specific species cannot be identified. All LNRs and BHSs within 20 km have been included for this reason.

Table 1.6: LNRs within the study area

LNR	Distance from Intertidal Infrastructure Area and Onshore Order Limits (km)
Lytham St. Annes	Partly within Onshore Order Limits
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
Withnell Nature Reserve	13.54
Hic Bibi, Coppull	15.62
River Darwen Parkway	16.72
Sunnyhurst Woods	16.84
Arran Trail	19.19

BHS

1.3.1.8 There are 17 BHSs within (see **section 1.3.1.7** for explanation on why no species have been listed), or partly within, the study area. A list of the BHSs and their distances to the Transmission Assets Order Limits is provided in **Table 1.7.**

Table 1.7: BHSs within, or partly within, the study area

BHS	Distance from Transmission Assets Order Limits (km)
Lytham Moss	Partly within Onshore Order Limits
River Ribble, Lower Tidal Section	Partly within Onshore Order Limits
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 WeBS core count five-year summary

1.3.2.1 WeBS core count data was obtained for two sectors that overlap with the intertidal survey areas at landfall (the coastal survey area) and at the river Ribble crossing point (the estuarine survey area), these are titles St Annes Beach and River Ribble-Bull Nose-Clifton Marsh respectively. Records provided detail of annual peak counts for waterbird species and the five-year mean of peaks. Data is split into the WeBS year (running July to June) giving annual data between 2017/18 through to 2021/22**.** The five-year mean of peaks provides the mean of each annual peak over five years of data.

1.3.2.2 A short summary of the species recorded is documented below with all species recorded at each section listed in **Table 1.8.**

St. Annes Beach

1.3.2.3 Species from a total of four taxonomic groups were recorded at the St. Annes Beach sector including cormorant and shag, geese, duck and swan, gull and tern and wader.

1.3.2.4 The most abundant groups were wader with a sum of five-year peak counts of 6,448 individuals. This group was followed by gull and tern (2,312 individuals), geese, duck and swan (199 individuals) and cormorant and shag (113 individuals).

Geese, duck and swan

1.3.2.5 A total of six goose, duck and swan species were recorded at St Annes beach. The most abundant species were pink-footed goose with a five-year peak count of 67 and a five-year mean of peaks of 34. Whooper swan had a five-year peak count of 41 and a five-year mean of peaks of 14. Common scoter were the third most abundant species with a five-year peak count of five and a five-year mean of peaks of three individuals. This was followed by shelduck, pintail and eider.

Wader

1.3.2.6 A total of 12 species of wader were recorded at St. Annes beach. The most abundant of these species was sanderling (five-year peak count of 2,385 and five-year mean of peaks of 1,163), this was followed by dunlin (1,550 and 676) and knot (1,500 and 626). Oystercatcher, grey plover, turnstone and ringed plover were also recorded on at least one occasion in each of the five analysed years.

Gull and tern

1.3.2.7 Seven species of gull and tern were recorded at St. Annes beach despite the recording of the group being optional.

1.3.2.8 The most abundant species were herring gull with a five-year peak count of 1,700 and a five-year mean of peaks of 662. This was followed by sandwich tern with a five-year peak count of 370 and a five-year mean of peaks of 123. Black-headed gull, common gull and great black-backed gull were also recorded on at least one occasion in each of the five analysed years.

Cormorant and shag

1.3.2.9 Cormorant were recorded with a five-year peak count of 113 individuals and a five-year mean of peaks of 43.

River Ribble-Bull Nose-Clifton Marsh

1.3.2.10 Species from a total of seven taxonomic groups were recorded within the River Ribble-Bull Nose-Clifton Marsh sector, including cormorant and shag, geese, duck and swan, grebe, gull and tern, heron, rail, crake and coot and wader.

1.3.2.11 The most abundant taxonomic group were waders with a five-year peak counts totalling 6,314 individuals. This was followed by geese, duck and swan (3,314 individuals) and gull and tern (1,536 individuals).

Geese, duck and swan

1.3.2.12 A total of 15 goose, duck and swan species were recorded. The most abundant species were wigeon with a five-year peak count of 995 individuals and a five-year mean of peaks of 748. The was followed by Canada goose with a five-year peak count of 870 and a five-year mean of peaks of 462. A five-year peak count of 381 was made for teal and a five-year mean of peaks of 205.

1.3.2.13 Mallard and shelduck were also recorded in each of the five years of analysed data.

Rail, crake and coot

1.3.2.14 Two species from this taxonomic group were recorded at River Ribble-Bull Nose-Clifton Marsh, moorhen and coot.

1.3.2.15 Coot were the most abundant of the two species with a five-year peak count of two and a five-year mean of peaks of one. Moorhen also have a five-year mean of peaks of one but a five-year peak count of three.

Grebe

1.3.2.16 One species of grebe, great crested grebe was recorded. The five-year peak count was one and the five-year mean of peaks was one.

Wader

1.3.2.17 A total of 14 species of wader were recorded at River Ribble-Bull Nose-Clifton Marsh. The most abundant species were lapwing with a five-year peak count of 2,800 and a five-year mean of peaks of 1,582. This was followed by black-tailed godwit (five-year peak of 1,900 and five-year mean of peaks of 382) and dunlin (five-year peak of 760 and a five-year mean of peaks of 203).

1.3.2.18 Lapwing, redshank and oystercatcher were the only species to be recorded in each of the five years of data.

Gull and tern

1.3.2.19 Six species of gull and tern were recorded at River Ribble-Bull Nose-Clifton Marsh. This comprised of five gull species and one species of tern. All five gull species were recorded on at least one occasion in each of the five analysed years, whereas common tern were recorded in two of the five years.

1.3.2.20 The most abundant species were black-headed gull with a five-year peak count of 680 and a five-year mean of peaks of 402. This was followed by herring gull (five-year peak of 350 and five-year mean of peaks of 223) and lesser black-backed gull (five-year peak of 223 and five-year mean of peaks of 118).

Cormorant and shag

1.3.2.21 Cormorant were recorded with a five-year peak count of 58 and a five-year mean of peaks of 24.

Heron

1.3.2.22 Two species of heron, little egret and grey heron *Ardea cinerea*, were recorded at River Ribble-Bull Nose-Clifton Marsh. Both species were recorded on at least one occasion over the five years of analysed data.

1.3.2.23 The most abundant of the two species were little egret with a five-year peak count of 23 and a five-year mean of peaks of 10. Grey heron had a five-year peak count of six and a five-year mean of peaks of three.

Table 1.8: Summary of WeBS core count data for sectors overlapping with the intertidal survey areas for years 2017/18 through to 2021/22

Taxonomic group	Species	Minimum five-year peak (2017/18 to 2021/22)	Maximum five-year peak (2017/18 to 2021/22)	Five-year mean of peaks (2017/18 to 2021/22)
St Annes Beach				
Geese, duck and swan	Pink-footed goose	0	67	34
	Whooper swan	0	41	14
	Shelduck	0	3	2
	Common scoter	0	5	3
	Pintail	0	2	1
	Eider	0	1	1
Wader	Oystercatcher	232	440	319
	Curlew	0	4	2
	Golden plover	0	10	5
	Grey plover	127	290	189
	Ringed plover	17	50	38
	Bar-tailed godwit	0	60	34
	Black-tailed godwit	0	45	23
	Knot	84	1500	626
	Turnstone	11	71	32
	Sanderling	340	2385	1163
	Dunlin	220	1550	676
	Redshank	0	43	22
Gull and tern	Black-headed gull	35	118	84

Taxonomic group	Species	Minimum five-year peak (2017/18 to 2021/22)	Maximum five-year peak (2017/18 to 2021/22)	Five-year mean of peaks (2017/18 to 2021/22)
	Common gull	7	80	33
	Great black-backed gull	5	20	11
	Herring gull	49	1700	662
	Lesser black-backed gull	0	21	7
	Sandwich tern	0	370	123
	Common tern	0	3	1
Cormorant and shag	Cormorant	0	113	43
River Ribble-Bull nose-Clifton Marsh				
Geese, duck and swan	Canada goose *Branta canadensis*	65	870	462
	Barnacle goose *Branta leucopsis*	0	1	1
	Greylag goose (British/Irish)	0	263	146
	Domestic greylag goose	0	11	5
	Pink-footed goose	0	125	36
	Hybrid goose	0	3	1
	Mute swan	0	19	9
	Whooper swan	0	340	90
	Egyptian goose *Alopochen aegyptiaca*	0	3	1
	Shelduck	18	108	70
	Wigeon	247	995	748
	Mallard	16	181	100
	Domestic mallard	0	3	1
	Teal	25	381	205
	Goosander *Mergus merganser*	2	11	6
Rail, crake and coot	Coot	0	2	1
	Moorhen	0	3	1

Taxonomic group	Species	Minimum five-year peak (2017/18 to 2021/22)	Maximum five-year peak (2017/18 to 2021/22)	Five-year mean of peaks (2017/18 to 2021/22)
Grebe	Great crested grebe	0	1	1
Wader	Oystercatcher	23	86	49
	Avocet	0	8	2
	Lapwing	190	2800	1582
	Golden plover	0	80	20
	Ringed plover	0	2	0
	Whimbrel	0	52	11
	Curlew	2	428	227
	Black-tailed godwit	0	1900	382
	Ruff	0	8	2
	Dunlin	0	760	203
	Common sandpiper	0	2	1
	Redshank	18	178	66
	Greenshank	0	4	1
	Snipe	0	6	3
Gull and tern	Black-headed gull	131	680	402
	Common gull	2	188	59
	Great black-backed gull	9	62	37
	Herring gull	71	350	223
	Lesser black-backed gull	35	223	118
	Common tern	0	33	8
Cormorant and shag	Cormorant	6	58	24
Heron, and storks	Little egret	3	23	10
	Grey heron	1	6	3

1.3.3 Summary of Fylde Bird club data species records

Coastal survey area

1.3.3.1 Following the data processing described in **section 1.2.5**, a total of 91 species were recorded as present within tetrads overlapping with the coastal survey area on at least one occasion during the most recent available five years of complete data (2018/19 through to 2022/23).

1.3.3.2 Of the 91 species recorded the most abundant taxonomic group were geese, ducks and swans (22,340 individuals) when looking at the sum of five-year peak counts. This was followed by gull and tern (18,624 individuals) and waders (16,886). An additional 5,168 individual birds (five-year peak counts) were recorded from seven other taxonomic groups: cormorant and shag, diver, grebe, heron and stork, rail, crake and coot, seabird and skua. A total of 256 unidentified auk species (five-year peak counts) and one unidentified skua species were also recorded.

1.3.3.3 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, duck and swan

1.3.3.4 A total of 27 goose, duck and swan species were recorded as present within tetrads overlapping with the coastal survey area.

1.3.3.5 When analysing the five-year peak count, the most abundant species were common scoter (16,345 individuals), pink-footed goose (4,569 individuals), Canada goose (343 individuals), pintail (257 individuals) and whooper swan (235 individuals). As Canada goose is an introduced species, abundance is not presented in this taxonomic group account. Excluding Canada goose, the fifth most abundant species were wigeon (145 individuals).

1.3.3.6 The five-year mean of peaks shows the same five species as the most abundant but whooper swan displayed higher counts than pintail with a mean of 128 (rounded up to a whole number) compared to 86. Wigeon had a five-year mean of peaks of 83, pink-footed goose was 1,993 and common scoter was still the most abundant species with a five-year mean of peaks of 7,155.

Rail, crake and coot

1.3.3.7 One species from this taxonomic group was recorded within tetrads overlapping with the coastal survey area, moorhen.

1.3.3.8 The species was recorded in each of the five most recent years and have a five-year peak count of six and a five-year mean of peaks of three.

Grebe

1.3.3.9 Two species of grebe were recorded within tetrads overlapping with the coastal survey area, great crested grebe and red-necked grebe *Podiceps grisegena*.

1.3.3.10 The most abundant species were great crested grebe with a five-year peak count of 48 and a five-year mean of peaks of 26. The species was recoded in each of the five most recent years.

1.3.3.11 Red-necked grebe were recorded in two of the most recent years (2019 /20 and 2020/21). They were recorded on one occasion in each of those two years and therefore have a five-year peak count and five-year mean of peaks of one.

Wader

1.3.3.12 A total of 22 wader species were recorded as present within tetrads overlapping with the coastal survey area.

1.3.3.13 The most abundant species were consistent when comparing the five-year peak counts and five-year mean of peaks. In order this was knot (five-year peak count of 10,000 and five-year mean of peaks of 5,929), dunlin (2,635 and 1,444), sanderling (2,427 and 1,149) and oystercatcher (825 and 438).

1.3.3.14 Of note were sanderling, with peak counts of 2,427 and 1,560 in 2021/22 and 2022/23 respectively.

Gull and tern

1.3.3.15 A total of 16 gull and tern species were recorded within tetrads overlapping with the coastal survey area over the most recent five years of Fylde Bird Club data. This comprised of nine gull species and six species of tern. It is noted that some of these species are rare visitors to the British Isles coast, for example the pelagic Sabine's gull *Xema sabini,* and Iceland gull *Larus glaucoides*.

1.3.3.16 The most abundant species were herring gull with a five-year peak count of 15,000 from 2021/22. This figure is significantly higher than any other across the five most recent years, with the second highest peak count being 1,000. The five-year mean of peaks for herring gull was 3,438.

1.3.3.17 Sandwich tern had a five-year peak count of 2,150 and a five-year mean of peaks of 772. The five-year peak, occurring in the 2021/22 year was significantly higher than other annual peaks, with the second highest being 830. This peak may have been a seawatch count of migrating birds.

1.3.3.18 Black-headed gull had a five-year peak count of 495 and a five-year mean of peaks of 245.

1.3.3.19 Kittiwake *Rissa tridactyla* had a five-year peak count of 429 and five-year mean of peaks of 186. Kittiwake were the third most abundant species. These are likely to have been recorded in flight on seawatches.

1.3.3.20 Arctic tern *Sterna paradisaea* had a five-year peak count of 354 and a five-year mean of peaks of 198. The most recent two years of complete data, 2021/22 and 2022/23, had peak counts that were significantly lower than the three years prior to this. This peak may have been a seawatch count of migrating birds.

1.3.3.21 Lesser black-backed gull had a five-year peak count of 212 and a five-year mean of peaks of 82. The two most recent years of data, 2021/22 and 2022/23, had peak counts that were much higher than the three years prior.

1.3.3.22 Common gull, common tern, little gull, great black-backed gull, little tern and Mediterranean gull were also recorded in each of the five most recent years on at least one occasion.

1.3.3.23 Black tern *Chlidonias niger*, Iceland gull, roseate tern *Sterna dougallii* and Sabine's gull were recorded at least one of the five most recent years of data.

Skua

1.3.3.24 Four species of skua were recorded within tetrads overlapping with the coastal survey area.

1.3.3.25 Two species, Arctic skua *Stercorarius parasiticus* and great skua *Stercorarius skua* were recorded in each of the five most recent years. Arctic skua were the most abundant with a five-year peak count of nine and a five-year mean of peaks of six. Great skua had a five-year peak count of three and a five-year mean of peaks of two.

1.3.3.26 Pomarine skua *Stercorarius pomarinus* were recorded in 2018/19 and 2020/21 while long-tailed skua *Stercorarius longicaudus* were only recorded in 2020/21. Pomarine skua had a five-year peak count of three and a five-year mean of peaks of one. Long-tailed skua also had a five-year mean of peaks of one but the five-year peak for this species was one.

1.3.3.27 Most sightings of skuas are likely to have been of birds at sea, however skuas will sometimes forage over beach areas if there are lots of gulls present.

Seabird

1.3.3.28 A total of 10 species of seabird were recorded within tetrads overlapping with the coastal survey area within the five most recent years of complete data.

1.3.3.29 The most abundant of these species was Manx shearwater *Puffinus puffinus* with a five-year peak count of 1,017 and a five-year mean of peaks of 617.

1.3.3.30 Gannet *Morus bassanus* were the second most abundant species with a five-year peak count of 947 and a five-year mean of peaks of 337. The peak count occurred in 2021/22, the second highest annual peak for this species was 320.

1.3.3.31 An annual peak count of 139 was made for guillemot *Uria aalge*, with a five-year mean of peaks of 87.

1.3.3.32 An annual peak count of 107 was made for razorbill *Alca torda*, with a five-year mean of peaks of 65.

1.3.3.33 In addition to the five seabird species above, fulmar *Fulmarus glacialis*, puffin *Fratercula arctica* and black guillemot *Cepphus grylle* were also recorded in each of the five most recent years. Other species recorded on at least one occasion across the five most recent years were little auk *Alle alle*, Balearic shearwater *Puffinus mauretanicus* and Leach's petrel *Hydrobates leucorhous*.

Diver

1.3.3.34 Three species of diver were recorded within tetrads overlapping with the coastal survey area.

1.3.3.35 Both black-throated diver *Gavia arctica* and red-throated diver were recorded in each of the five most recent years. Great northern diver *Gavia immer* were recorded in three of the most recent five years, they were absent from the data set for 2018/19 and 2021/22.

1.3.3.36 The most abundant species were red-throated diver with a five-year peak count of 221 and a five-year mean of peaks of 132. This peak may have been a seawatch count of migrating birds. Black-throated diver and great northern diver each had a five-year peak count of one and a five-year mean of peaks of one.

Cormorant and shag

1.3.3.37 Cormorant and shag were both recorded in each of the five most recent years within tetrads overlapping with the coastal survey area.

1.3.3.38 Shag *Gulosus aristotelis* were recorded with a five-year peak count of seven and a five-year mean of peaks of four.

1.3.3.39 Cormorant were significantly more abundant than shag with a five-year mean of peaks of 781 and a five-year peak count of 2,151. The second highest annual peak count was 851.

Herons and storks

1.3.3.40 Four species of heron and stork species were recorded within tetrads overlapping with the coastal survey area in the five most recent complete years of Fylde Bird Club data.

1.3.3.41 Two species, little egret and grey heron, were recorded in each of the five most recent years. Little egret were the most abundant species with a five-year peak count of 21 and a five-year mean of peaks of 10. Grey heron had a five-year peak count of four and a five-year mean of peaks of three. It should be noted that low recorded numbers for this species may be due to the likelihood that not all observations of this BOCC5 UK green listed species were recorded.

1.3.3.42 Great white egret were recorded in the 2018/19 and 2019/20 years with one individual recorded in each of these two years. Therefore, the five-year peak count and five-year mean of peaks are both one.

1.3.3.43 White stork *Ciconia ciconia* were observed in one year, 2020/21, with one individual recorded. Therefore, the five-year peak count and five-year mean of peaks are both one.

Estuarine survey area

1.3.3.44 Following the data processing described in **section 1.2.5** above, a total of 41 species were recorded as present within tetrads overlapping with the estuarine survey area on at least one occasion during the most recent five years of complete data (2018/19 through to 2022/23).

1.3.3.45 Of the 41 species recorded the most abundant taxonomic groups by sum of five-year peak counts were gull and tern (3,827 individuals), geese, duck and swan (2,143 individuals) and wader (795 individuals) This order was maintained when considering the sum of five-year mean of peaks, gull and tern (2,246), geese, duck and swan (660) and wader (413). A total of 94 birds were also recorded from five additional taxonomic groups when summing

five-year peak counts. These species came from grebe, heron and stork, kingfisher, rail and cormorant and shag.

1.3.3.46 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, duck and swan

1.3.3.47 A total of 12 species of goose, duck and swan were recorded in tetrads overlapping with the estuarine survey area on at least one occasion in the five most recent years of complete data.

1.3.3.48 The most abundant species were wigeon with a five-year peak count of 1,500 and a five-year mean of peaks of 404. It is noted that this peak count for wigeon was significantly higher than other counts for the species with 500 being the second highest peak.

1.3.3.49 Teal had a five-year peak count of 312 and a five-year mean of peaks of 113.

1.3.3.50 Mallard had a five-year peak count of 164 and a five-year mean of peaks of 68. The second highest annual peak count for mallard was 64. It should be noted that low recorded numbers for this species may be due to the likelihood that not all observations of this BOCC5 UK green listed species were recorded.

1.3.3.51 Shelduck had a five-year peak count of 51 and a five-year mean of peaks of 29.

1.3.3.52 Greylag goose were the fifth most abundant species with a five-year peak count of 50 and a five-year mean of peaks of 20.

1.3.3.53 Goosander were the only other species recorded in each of the five most recent years. Mute swan, pink-footed goose, whooper swan, barnacle goose, brent goose and red-breasted merganser were each recorded in at least one of the five most recent years but were also absent from the record in at least one year.

Rail, crake and coot

1.3.3.54 Moorhen were the only species from this taxonomic group to be recorded. They were noted in each of the five most recent years and had a five-year peak count of 10 and a five-year mean of peaks of seven.

Grebe

1.3.3.55 Two species of grebe were recorded in tetrads overlapping with the estuarine survey area on at least one occasion in the five most recent years of complete data.

1.3.3.56 Great crested grebe were recorded in each of the five most recent years and had a five-year peak count of six and five-year mean of peaks of four.

1.3.3.57 Little grebe were recorded in two years, 2018/19 and 2022/23. The five-year peak count was one.

Wader

1.3.3.58 A total of 15 wader species were recorded in tetrads overlapping with the estuarine survey area on at least one occasion in the five most recent years of complete data.

1.3.3.59 The most abundant species by five-year peak count were black-tailed godwit. However, the peak count of 1,200, occurring in the year 2018/19, was the only record of the species. There was no further record of the species in the four following years.

1.3.3.60 Lapwing were recorded in each of the five most recent years of data and had a five-year peak count of 190. The five-year mean of peaks for lapwing was 45. The peak count of 190 was significantly higher than peak counts of other years with the second highest count being 21.

1.3.3.61 Dunlin were recorded in three of the five most recent years. They were the third most abundant waders with a five-year peak count of 112 and a five-year mean of peaks of 23.

1.3.3.62 Golden plover were only recorded in the year 2018 to 2019 with a peak count of 100.

1.3.3.63 Oystercatcher were recorded in each of the five most recent years and had a five-year peak count of 61 and a five-year mean of peaks count of 22.

1.3.3.64 Curlew, redshank and common sandpiper were the only other species to be recorded in each of the five most recent years. Whimbrel, snipe, greenshank, ruff, ringed plover, little ringed plover and sanderling were also recorded but were absent in at least one of the five most recent years.

Cormorant and shag

1.3.3.65 One species of seabird was recorded in tetrads overlapping with the estuarine survey area on at least one occasion in the five most recent years of complete data, cormorant. The five-year peak count of cormorant was 45 and the five-year mean of peaks was 28.

Kingfisher

1.3.3.66 Kingfisher *Alcedo atthis* were recorded in each of the five most recent complete years of data. The five-year peak count for the species was two and the five-year mean of peaks was one.

Table 1.9: Fylde Bird Club ornithological individual species records (2018/19 through to 2022/23) in tetrads overlapping with the coastal survey area and estuarine survey area

Taxonomic group	Species	Minimum five-year peak (2018/19 to 2022/23)	Maximum five-year peak (2018/19 to 2022/23)	Five-year mean of peaks (2018/19 to 2022/23)
Coastal survey area				
Geese, ducks and swans	Brent goose	1	5	3
	Canada goose	60	343	161
	Barnacle goose	0	8	3
	Greylag goose	3	41	20
	Pink-footed goose	790	4,569	1,992
	Mute swan	2	11	5
	Bewick's swan	0	1	0
	Whooper swan	77	235	128
	Shelduck	35	108	80
	Ruddy shelduck *Tadorna ferruginea*	0	4	1
	Garganey *Spatula querquedula*	0	2	0
	Shoveler	2	19	6
	Gadwall	0	8	4
	Wigeon	35	145	83
	Mallard	1	39	10
	Pintail	23	257	86
	Teal	18	104	43
	Pochard	0	1	0
	Tufted duck	2	6	3
	Scaup	0	4	1
	Eider	31	55	39
	Velvet scoter *Melanitta fusca*	1	2	1
	Common scoter	2,200	16,345	7,155
	Long-tailed duck *Clangula hyemalis*	1	2	2
	Goldeneye	0	5	2
	Goosander	1	5	3

Taxonomic group	Species	Minimum five-year peak (2018/19 to 2022/23)	Maximum five-year peak (2018/19 to 2022/23)	Five-year mean of peaks (2018/19 to 2022/23)
	Red-breasted merganser	7	16	10
Rails, crakes and coots	Moorhen	1	6	3
Grebes	Red-necked grebe	0	1	0
	Great crested grebe	10	48	26
Waders	Oystercatcher	107	825	437
	Avocet	0	1	0
	Lapwing	0	61	27
	Golden plover	4	85	27
	Grey plover	63	153	106
	Ringed plover	15	83	51
	Little ringed plover	0	1	0
	Whimbrel	17	27	21
	Curlew	14	90	45
	Bar-tailed godwit	6	236	129
	Black-tailed godwit	0	45	31
	Turnstone	10	107	51
	Knot	2,625	10,000	5929
	Ruff	0	1	0
	Sanderling	427	2,427	1,149
	Dunlin	613	2,635	1,444
	Purple sandpiper *Calidris maritima*	0	1	0
	Woodcock *Scolopax rusticola*	0	2	1
	Snipe	0	4	2
	Common sandpiper	0	2	1
	Redshank	24	99	48
	Greenshank	0	1	0
Gulls and terns	Kittiwake	40	429	186
	Sabine's gull	0	1	1
	Black-headed gull	46	495	245

Taxonomic group	Species	Minimum five-year peak (2018/19 to 2022/23)	Maximum five-year peak (2018/19 to 2022/23)	Five-year mean of peaks (2018/19 to 2022/23)
	Little gull	1	48	15
	Mediterranean gull	1	2	2
	Common gull	63	156	123
	Great black-backed gull	5	21	12
	Iceland gull	0	1	0
	Herring gull	60	15,000	3,437
	Lesser black-backed gull	20	212	82
	Sandwich tern	163	2,150	771
	Little tern	3	17	7
	Roseate tern *Sterna dougallii*	0	1	0
	Common tern	8	121	63
	Arctic tern	88	354	197
	Black tern	0	45	13
Skuas	Great skua	1	3	2
	Pomarine skua	0	3	1
	Arctic skua	4	9	6
	Long-tailed skua	0	1	0
Seabirds	Little auk	0	1	0
	Guillemot	38	139	87
	Razorbill	4	107	65
	Black guillemot	1	1	1
	Puffin	1	4	2
	Leach's petrel	0	11	5
	Fulmar	1	32	10
	Manx shearwater	365	1,017	617
	Balearic shearwater	0	1	0
	Gannet	74	947	336
Divers	Red-throated diver	64	221	132
	Black-throated diver	1	1	1
	Great northern diver	0	1	1

Taxonomic group	Species	Minimum five-year peak (2018/19 to 2022/23)	Maximum five-year peak (2018/19 to 2022/23)	Five-year mean of peaks (2018/19 to 2022/23)
Cormorants and shag	Cormorant	219	2,151	780
	Shag	1	7	4
Herons and stork	Little egret	2	21	10
	Grey heron	2	4	3
	Great white egret	0	1	0
	White stork	0	1	0
Estuarine survey area				
Geese, ducks and swans	Brent goose	0	1	0
	Barnacle goose	0	1	0
	Greylag goose	1	50	20
	Pink-footed goose	0	12	3
	Mute swan	0	21	6
	Whooper swan	0	10	3
	Shelduck	10	51	29
	Wigeon	1	1,500	404
	Mallard	12	164	67
	Teal	9	312	113
	Goosander	9	20	13
	Red-breasted merganser	0	1	0
Rails, crakes and coot	Moorhen	6	10	7
Grebes	Great crested grebe	1	6	4
	Little grebe	0	1	0
Waders	Oystercatcher	4	61	22
	Lapwing	1	190	45
	Golden plover	0	100	20
	Ringed plover	0	2	1
	Little ringed plover	0	1	0
	Whimbrel	0	35	17
	Curlew	2	50	23
	Black-tailed godwit	0	1,200	240

Taxonomic group	Species	Minimum five-year peak (2018/19 to 2022/23)	Maximum five-year peak (2018/19 to 2022/23)	Five-year mean of peaks (2018/19 to 2022/23)
	Ruff	0	5	1
	Sanderling	0	1	0
	Dunlin	0	112	23
	Common sandpiper	1	7	4
	Redshank	3	20	12
	Greenshank	0	5	2
	Snipe	0	6	2
Cormorants and shag	Cormorant	19	45	28
Kingfishers	Kingfisher	1	2	1

1.3.4 Fylde-sand extraction-Golder Associates UK Ltd

1.3.4.1 A total of 23 bird species were recorded during the wintering bird surveys. Sanderling, grey plover, dunlin and knot were recorded in notable numbers. Sanderling distribution ranged throughout the survey area and up to 2,500 individuals were recorded foraging along the shoreline. The highest numbers of grey plover, knot and dunlin mainly occurred during periods of low tide near the mouth of the Ribble Estuary.

1.3.5 Morecambe Offshore Windfarm-Fylde export cable route

1.3.5.1 Intertidal waterbird surveys were conducted by Avian Ecology Ltd. between October 2021 and April 2022.

1.3.5.2 During the vantage point surveys a high level of activity was noted in nearshore waters with flocks of common scoter exceeding 1,000 individuals noted between 1 km and 2 km from the coastline. The most abundant intertidal species were sanderling with a peak count of 172 individuals. Additional species noted were pintail, great crested grebe, red-throated diver, cormorant, oystercatcher, ringed plover, curlew, knot, dunlin, turnstone, redshank, black-headed gull, common gull, kittiwake, herring gull, great black-backed gull, lesser black-backed gull and gannet. Many of the seabird records were noted as foraging in the nearshore waters.

1.3.5.3 The nocturnal surveys indicated that the usage of the shoreline and intertidal habitats by bird species was lower than during daylight hours. A total of five species were recorded with sanderling being the most common with a peak count of 25 individuals. The other species recorded were oystercatcher, ringed plover, redshank and one unidentified gull species.

1.4 Site-specific surveys – baseline characterisation

1.4.1 Coastal survey area

1.4.1.1 Site-specific surveys within the coastal survey area aimed to characterise the waterbird usage (i.e., abundance and distribution) of the supratidal, intertidal and subtidal habitats below HAT.

1.4.1.2 Diurnal and nocturnal surveys use a 'through-the-tidal-cycle count' survey methodology. Diurnal surveys were undertaken twice per month, with visits between September 2021 and August 2023 (**Table 1.10**). Nocturnal surveys were undertaken monthly over the wintering periods only (November 2021 to March 2022 and November 2022 to March 2023).

1.4.1.3 A summary of the nocturnal and diurnal survey methodology is provided in **section 1.4.3** and the detailed methodologies can be found in Volume 3. Annex 4.4: Onshore and intertidal ornithology survey methodologies (document reference F3.4.4).

1.4.2 Estuarine survey area

1.4.2.1 Site-specific surveys aimed to characterise the waterbird usage (i.e., abundance and distribution) of the intertidal habitats along the River Ribble that the 400 kV grid connection cable will pass under.

1.4.2.2 Diurnal surveys use a 'through-the-tidal-cycle' survey methodology. Diurnal surveys were undertaken twice per month, with reported visits undertaken between October 2022 and March 2024 (**Table 1.10**). These surveys have been continued until September 2024 with results between April and September 2024 being available post application. No nocturnal surveys were undertaken within the estuarine survey area.

Table 1.10: Summary of site-specific surveys

Survey area	Species surveyed	Survey methodology	Survey frequency	Survey visits
Coastal survey area	Seabirds and waterbirds	Diurnal, through-the-tidal-cycle, counts (full tidal cycle) from vantage points	Twice monthly	48 visits (September 2021 to August 2023)
		Nocturnal, through-the-tidal-cycle, counts (half tidal cycle) from vantage points	Monthly	9 visits (November 2021 to April 2022 and November 2022 to March 2023).
Estuarine study area	Waterbirds	Diurnal, through-the-tidal-cycle, counts (full tidal cycle) from vantage points.	Twice monthly	48 visits (October 2022 to March 2023 and October 2023 to March 2024)

1.4.3 Survey methodology

Through-the-tidal-cycle count diurnal surveys

1.4.3.1 The programme comprised of a series of monthly intertidal and nearshore coastal waterbird surveys undertaken from vantage points located on the upper shore or the bank of the estuary (vantage point locations are displayed on the results maps, **Figure 1.8** to **Figure 1.97**).

1.4.3.2 The methodology followed accepted industry standard practice, using through-the-tidal-cycle counts to characterise bird usage over the course of a tidal cycle and is based on a methodology developed and recommended by Armitage et al. (2002). All survey methodologies were agreed in writing with Natural England.

1.4.3.3 Through-the-tidal-cycle counts have been undertaken for both the coastal survey area and the estuarine survey area, with the same methodology being used across both survey areas.

1.4.3.4 Surveys of the coastal survey area commenced in September 2021 and continued twice a month until August 2023. Surveys of the estuarine survey area commenced in October 2022 and continued until September 2024 (although only estuarine results up to March 2024 are presented within this ES).

1.4.3.5 The surveys were scheduled to cover a range of times of day and different tidal conditions (high, low, ebb and flow). Each month a count of all waterbirds present was made once per hour during the full tidal cycle period of 12 hours (-6 hrs to +5 hrs relative to low tide). This was split into two visits of six hours to reduce the impact of observer fatigue. As weather, or number of birds could impact upon the ability to make hourly counts, a minimum of four counts were undertaken per month to categorise the usage across the four tidal states (high tide, ebb tide, low tide and flood tide).

1.4.3.6 The surveyor mapped species and number of individuals from VPs along the coast or estuary using binoculars and a telescope. Bird behaviour, i.e., whether individuals are foraging or non-foraging (i.e., roosting, loafing etc) was also recorded. Spatial coverage of the diurnal surveys was 100%.

1.4.3.7 Weather conditions including wind speed (using the Beaufort Scale), cloud cover (estimated as eighths or octas of the sky) and visibility were also recorded.

1.4.3.8 Any source of disturbance to the birds at the time of the count was recorded under the following categories: walkers, dogs, anglers, bait diggers, shell fishers, vehicles, unpowered boats, powered boats, aircraft and ‘other’. The perceived effect of disturbance on abundance and behaviour of birds in the count section is scaled according to the following categories **Table 1.11.**

Table 1.11: Perceived effect of disturbance on abundance and behaviour of birds

Definition of effect	Notation
Weak e.g., change in behaviour, but birds not excluded	W
Moderate e.g., birds excluded from parts of the recording sector	M
Strong e.g., avoidance of the recording sector	S

Through-the-tidal-cycle nocturnal surveys

1.4.3.9 For the coastal survey area, a programme of nocturnal surveys has been undertaken between November 2021 and April 2022 and November 2023 and March 2024. The survey methodology used through-the-tidal-cycle counts to characterise bird usage over the course of a tidal cycle. The survey methodology has been developed for the site-specific surveys, but it uses some key principles from Armitage *et al*. (2002).

1.4.3.10 Whilst similar to the diurnal through-the-tidal-cycle surveys, the nocturnal through-the-tidal-cycle counts were undertaken on a reduced intensity (i.e., up to three counts over half a tidal cycle) and reduced survey area due to the technical limitations of using nocturnal equipment (thermal monocular and infra-red camcorders) versus daytime optical equipment (binoculars and scopes).

1.4.3.11 Due to the more limited range of nocturnal equipment, only the first 500 m of the intertidal zone (from MHWS) was surveyed. Each monthly through-the-tidal-cycle count was undertaken across a half tidal cycle of approximately 6 hrs (versus a full tidal cycle of approximately 12 hrs), equating to one visit per month.

1.4.3.12 The frequency of counts was adapted to the amount of bird activity in the section and survey effort required to effectively use nocturnal equipment. During a period of high level of activity, the frequency of counts over half tidal cycle was reduced from three to two (i.e., high or low and mid). Working in pairs, one observer located birds using a thermal monocular (e.g., Pulsar Axion XM30S or the Pulsar Quantum HD50S), whilst the second observer videoed and identified species or groups using an image-intensifying camera (or camcorder) coupled with an infra-red spotlight. This approach allowed the detection and identification of most waterbird species within 400 m from the observer's position.

1.4.3.13 The position of the birds was directly mapped using BTO codes (BTO, 2023) or alternatively marked with a labelled symbol and subsequently cross referenced to a data field form. Behaviour was recorded as foraging (actively looking for food) and non-foraging.

1.4.3.14 Ideally 10 survey visits would have been carried out during the November to March periods between 2021 and 2023. However, both periods of strong wind and precipitation, even slight rain, can interfere with nocturnal equipment and therefore surveys were planned to avoid these weather conditions as so far as possible. Inclement weather led to one survey being

carried out outside of the November to March period during the 2021/22 winter, and one survey being missed during the 2023/24 winter.

1.4.4 Mapping count data

1.4.4.1 Average bird density maps were produced for the most abundant waterbird species using biological seasons for each bird species group, as defined in **Table 1.12**.

1.4.4.2 All point data was firstly entered into an ArcGIS database complete with species, counts of birds and behaviour. A 5 ha grid was then overlain on the survey areas and all counts of birds recorded over the total survey period were averaged per season (i.e., breeding and non-breeding). This gave the mean number of birds (in birds per ha) present in any 5 ha square over the coastal survey area. Grid squares where no birds were recorded were left transparent.

1.4.4.3 Maps showing the seasonal distribution are presented in **Figure 1.8** to **Figure 1.47**.

Table 1.12: Table showing biological season of taxonomic groups recorded within the survey area

Taxonomic group	August	September	October	November	December	January	February	March	April	May	June	July
Geese duck and swan												
Wader												
Gull and tern												
Seabird												
Diver												
Cormorant and shag												

Key

- Non-breeding
- Breeding
- Core wintering
- Passage (autumn and spring)

1.4.5 Site-specific survey results

1.4.5.1 Peak monthly counts of all species can be found in **Table 1.15** and **Table 1.16** in **Appendix A**. These data have been used to inform Volume 4. Chapter 3: 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.

Coastal survey area results

Conservation status

1.4.5.2 A total of 35 waterbird species were recorded within the coastal survey area over the survey period (**Table 1.13**). Wader species were well represented with a total of twelve species. There were one skua, seven gull and three tern species. There were also three seaduck species, one diver and one grebe. The rest of the species were infrequently recorded seabirds (including auks) and geese.

1.4.5.3 Several species recorded during the survey are listed as Annex 1 species of the Birds Directive: golden plover, bar-tailed godwit, Manx shearwater, sandwich tern, common tern, little tern, Mediterranean gull, red-throated diver and little egret. Whimbrel, Mediterranean gull, red-throated diver and common scoter, also recorded during the survey are listed under Schedule 1 species of the Wildlife and Countryside Act 1981.

1.4.5.4 Curlew, herring gull, cormorant and common scoter, recorded during the survey, are listed under Section 41 of the Natural Environment and Rural Communities Act 2006. A total of nine species are red-listed in the BOCC5 UK and 19 species are amber-listed in the BOCC5 UK.

Taxonomic group and species accounts

Geese, ducks and swans

1.4.5.5 Two bar-headed geese were seen in June 2023 (**Table 1.13**). Bar-headed goose is not accepted as a naturally occurring British species (British Ornithologists Union, 2023) and these birds are likely escapees from a private collection.

1.4.5.6 A single shelduck was seen in both breeding seasons (**Table 1.13**).

1.4.5.7 Four scaup were seen in the nearshore waters during February 2023 but not seen again.

1.4.5.8 Eider were seen during both October and November 2022 with a peak of five birds in October 2022 (**Table 1.13**).

1.4.5.9 Common scoter were widely distributed across the nearshore waters, although the birds favoured the nearshore waters in the northern part of the coastal survey area during the non-breeding season **(Figure 1.8**). A peak count of 4,000 birds was recorded in August 2022 (**Table 1.13, Figure 1.9**)

with the count presumably composed of migratory birds as well as returning overwintering birds to the Liverpool Bay area.

1.4.5.10 There was a further peak of 3,934 in January 2023. In total common scoter were present in numbers exceeding the Great Britain (GB) threshold of national importance (1,300) on three out of the 24 months.

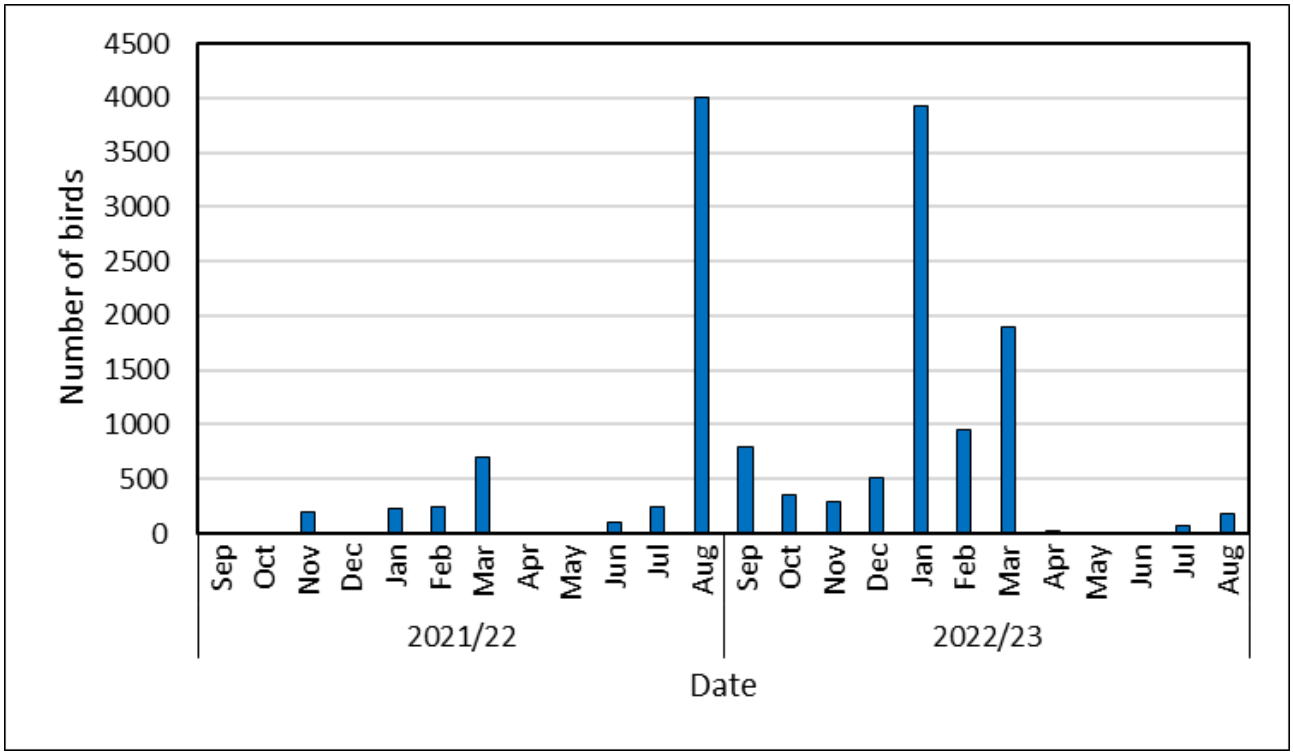


Diagram 1.1: Monthly peak maximum count of common scoter

Waders

1.4.5.11 Oystercatcher were present year around albeit with a larger overwintering population (November to March) which peaked during the first winter in January 2022 with up to 822 birds (**Table 1.13, Diagram 1.2**) and February 2023 with 1,073 birds. Up to 136 birds were recorded during the passage periods as birds migrate to/from their Icelandic breeding grounds. Oystercatcher were widely distributed across the coastal survey area with slightly higher densities recorded at both the north and the south of the survey area during the winter period (**Figure 1.10**) and slightly higher densities concentrated in the middle of the coastal survey area during the passage periods (**Figure 1.11**).

1.4.5.12 Although a regular feature of the coastal survey area, oystercatcher were not present in nationally significant numbers.

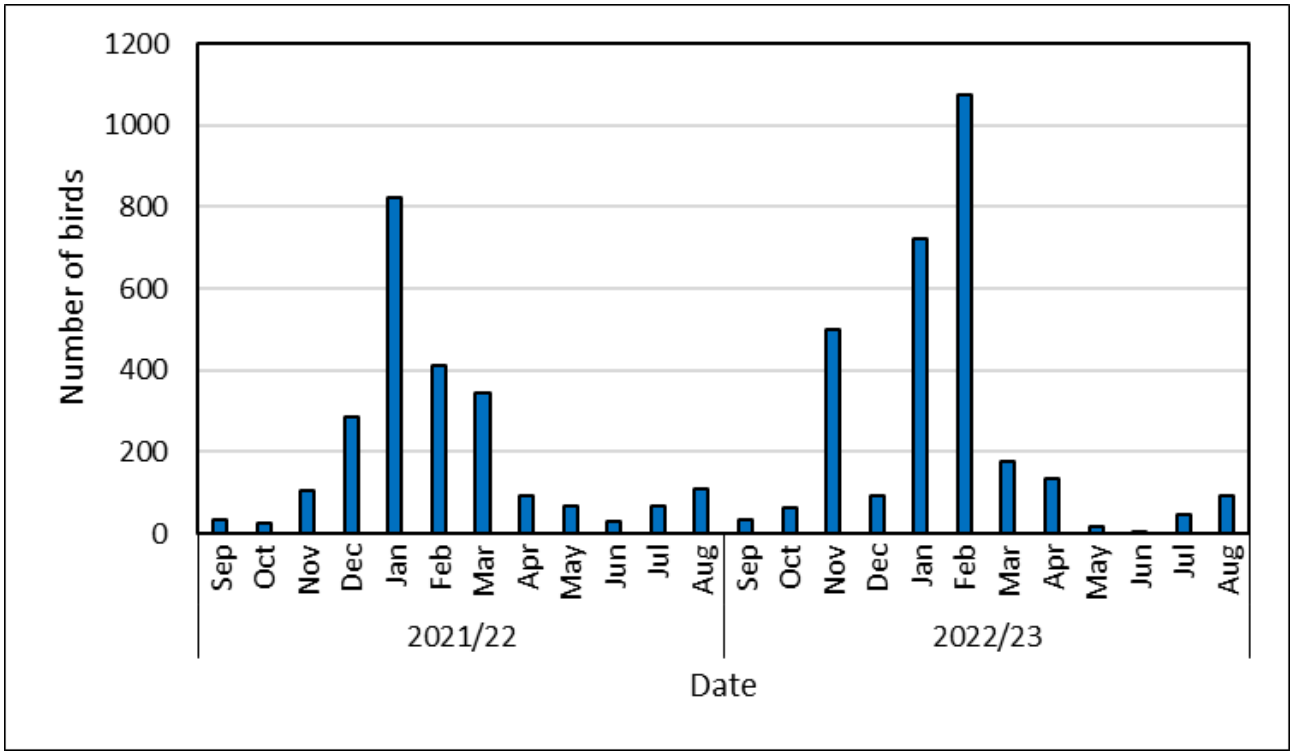


Diagram 1.2: Monthly peak maximum count of oystercatcher

1.4.5.13 One golden plover was recorded within the coastal survey area in November 2021 (**Table 1.13**).

1.4.5.14 There was a small overwintering population of grey plover in the coastal survey area peaking at 62 birds in both November 2021 and February 2023 (**Table 1.13, Diagram 1.3**). The passage peak was much higher peaking at 118 in April 2022 although they were absent during all other passage months barring September 2022 when one bird was present. Grey plover were mostly distributed in the southern part of the coastal survey area (**Figure 1.12** and **Figure 1.13**).

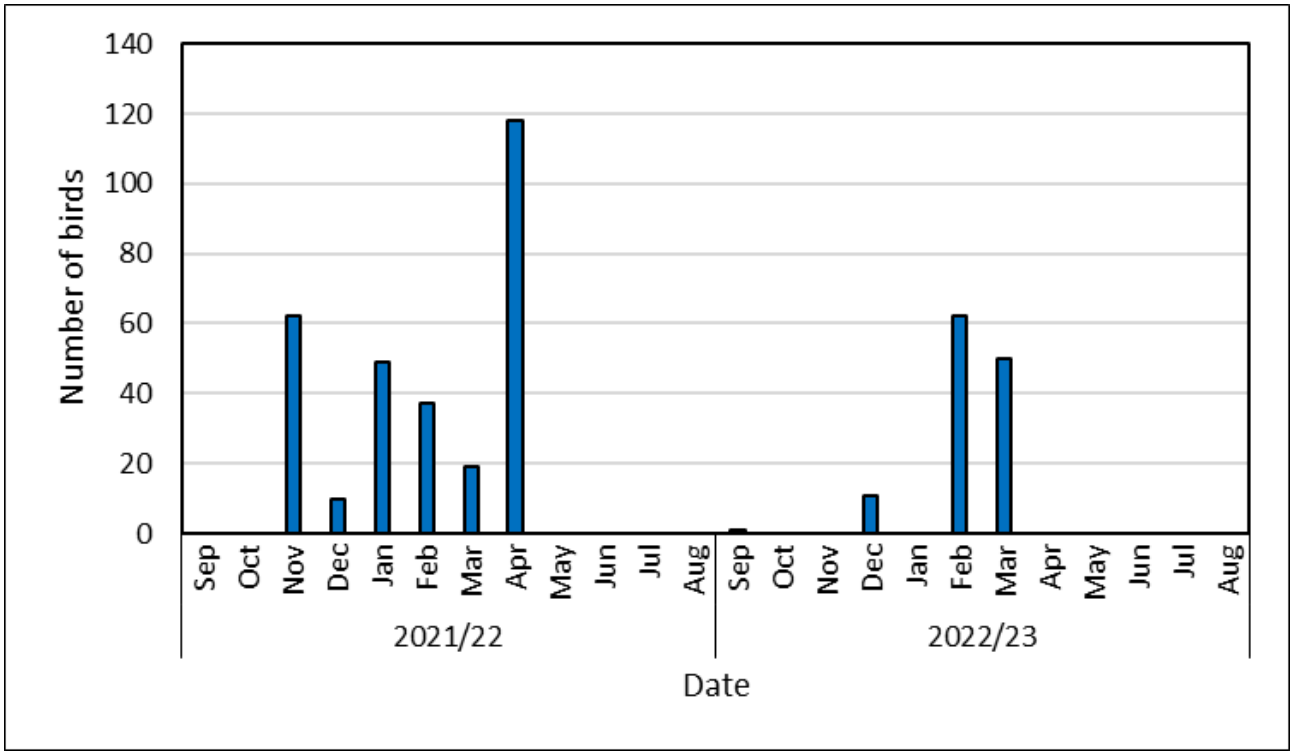


Diagram 1.3: Monthly peak maximum count of grey plover

1.4.5.15 Ringed plover were present during both the winter and the passage periods normally peaking anywhere between two and 37 birds (**Table 1.13, Diagram 1.4**). The exception to this was during August 2023 when a peak of 93 birds was recorded.

1.4.5.16 The Ribble and Alt Estuaries SPA is of international importance to passage ringed plover and it is likely that these were post-breeding birds returning to their wintering grounds. There were higher densities of ringed plover found roosting on the upper beach just south of the centre of the coastal survey area (**Figure 1.14** and **Figure 1.15**).

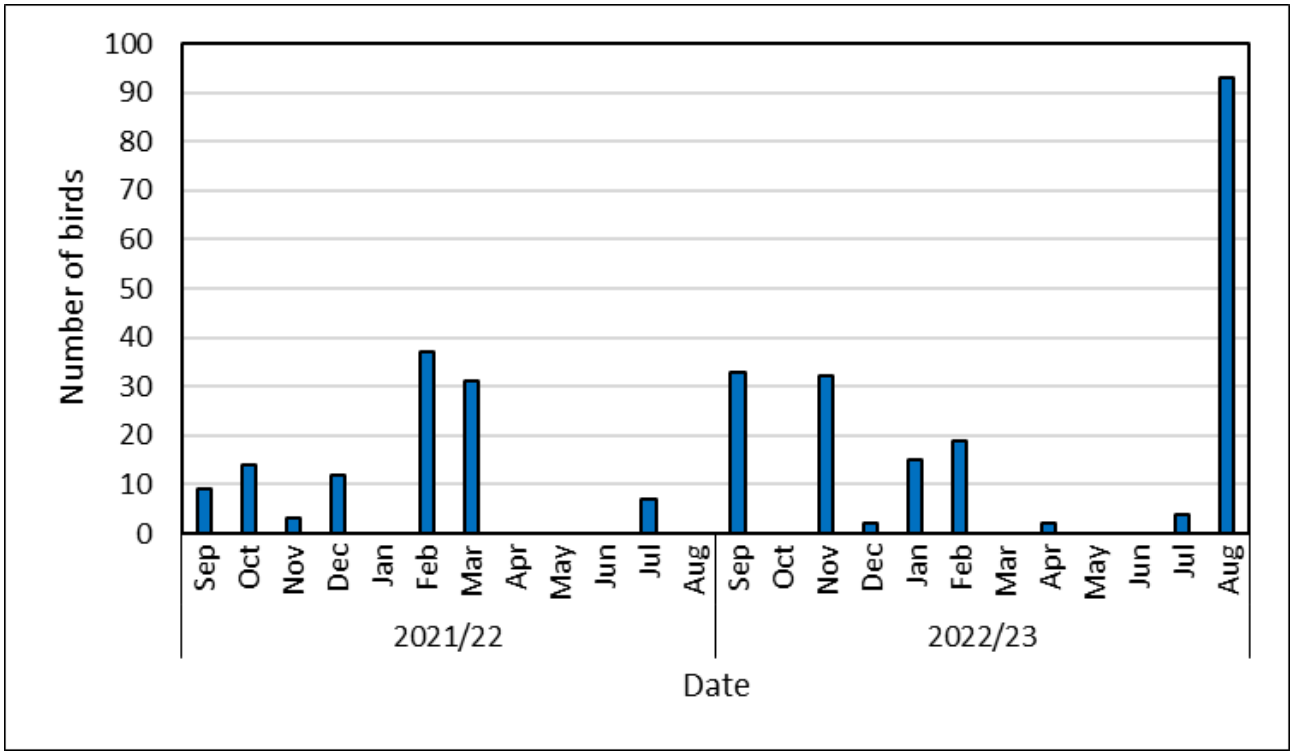


Diagram 1.4: Monthly peak maximum count of ringed plover

1.4.5.17 Four whimbrels were recorded in April 2022 and a further six whimbrels were recorded in May 2023 (**Table 1.13**) when they migrate to their breeding grounds in northern Scotland and Iceland. Whimbrel were not recorded at any other point during the survey period.

1.4.5.18 Curlew were present in low numbers through the wintering and passage periods (**Table 1.13**, **Diagram 1.5)** with a peak of nine birds present during the first winter period (2021/22). This dropped to just one bird for the second winter period (2022/23). As the result, individuals were thinly distributed across the coastal survey area (**Figure 1.16** and **Figure 1.17**).

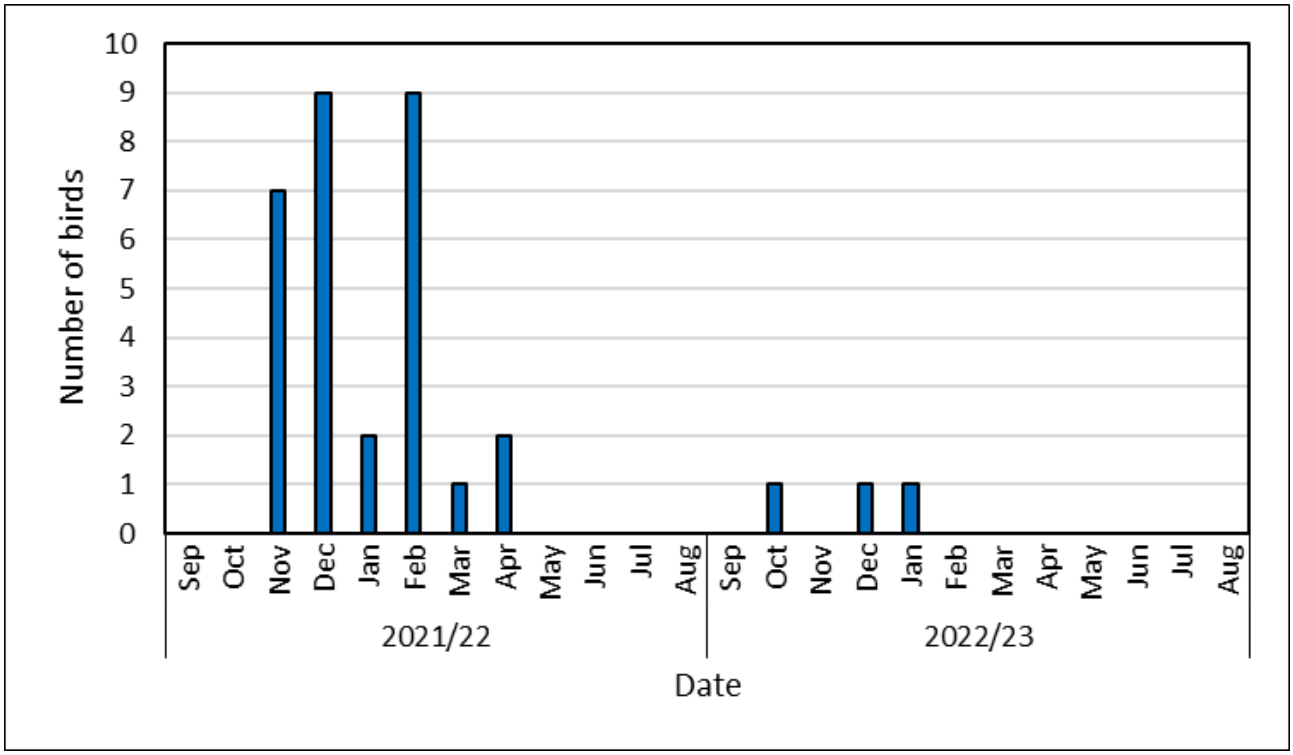


Diagram 1.5: Monthly peak maximum count of curlew

1.4.5.19 Bar-tailed godwit peaked during November in both winter periods with 625 during 2021/22 and 500 during 2022/23 (the 2022/23 peak was recorded at night, see **Table 1.13, Diagram 1.5**).

1.4.5.20 Birds were found in highest densities to the southern part of the coastal survey area during the winter period whilst the highest densities were found at the centre of the survey area during the passage period (**Figure 1.18** and **Figure 1.19**). During both seasons the birds were generally found at higher densities around the low tide period. Occasionally birds were found roosting on the upper beach at night-time.

1.4.5.21 Bar-tailed godwit were present in numbers equalling or exceeding the GB national threshold (500 birds) during both winter periods. The GB threshold of national importance is 1 %, or more, of the estimated British population.

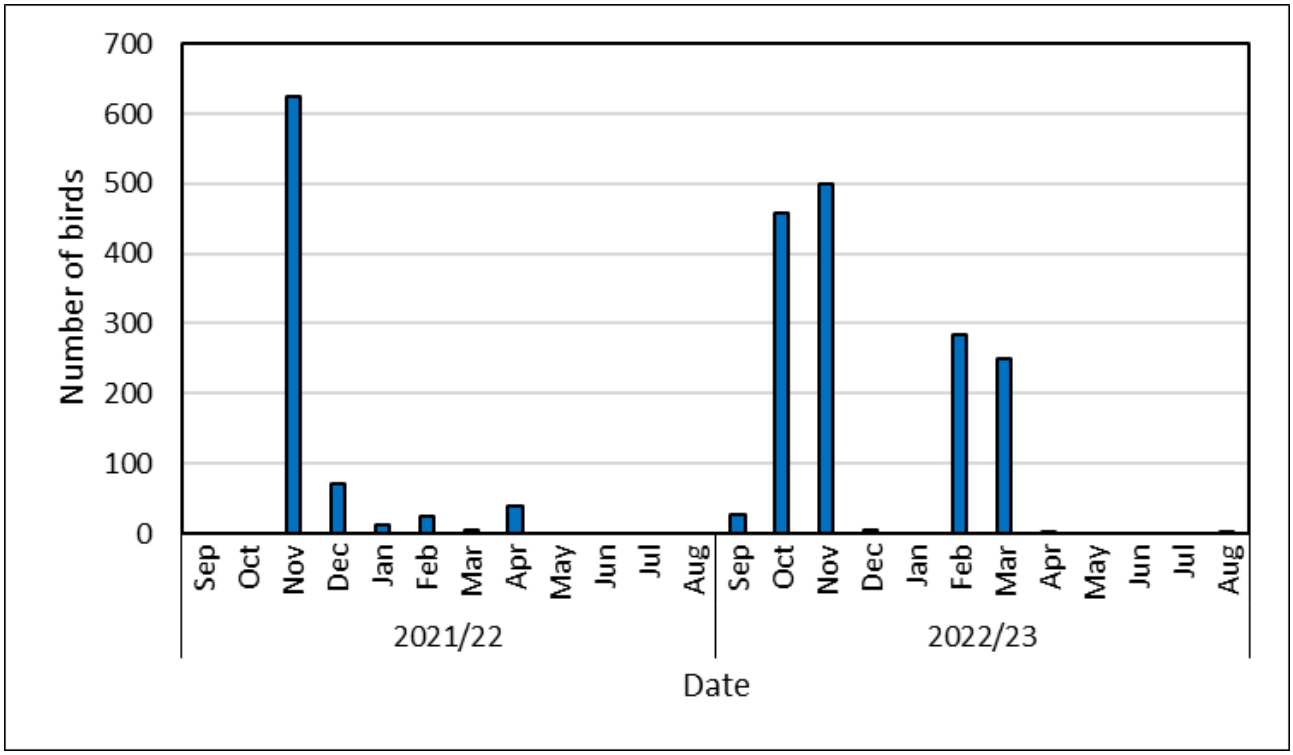


Diagram 1.6: Monthly peak maximum count of bar-tailed godwit

1.4.5.22 Turnstone were observed to winter in the coastal survey area and peaked at 142 birds during the 2021/22 winter (February peak) and 143 birds during the 2022/23 winter (January peak) (**Table 1.13**, **Diagram 1.7**), although they were much less frequent during the second winter.

1.4.5.23 The highest densities were found at the northern part of the coastal survey area near Blackpool where turnstone were regularly observed roosting on the sea defences (**Figure 1.20** and **Figure 1.21**) although smaller numbers of birds were recorded foraging on the sandflats, often with other small waders.

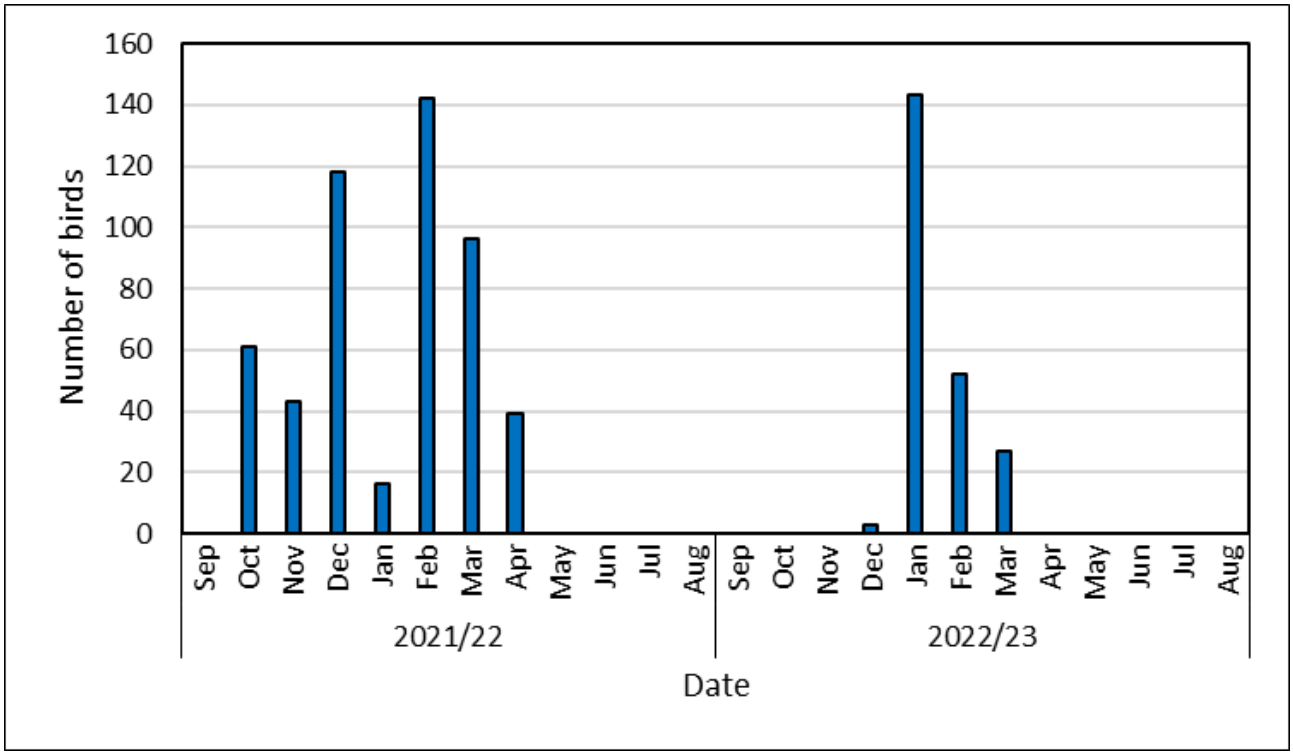


Diagram 1.7: Monthly peak maximum count of turnstone

1.4.5.24 Knot were recorded sporadically and in low numbers within the coastal survey area (**Figure 1.22** and **Figure 1.23**). Peak counts of 370 birds and 300 birds were recorded during December 2022 and March 2023 respectively (**Table 1.13, Diagram 1.8**). Reports from surveyors indicate that the muddy area between the coastal survey area and the Ribble estuary, holds large numbers of knot but that they are infrequent visitors to the sandier substrates in the coastal survey area.

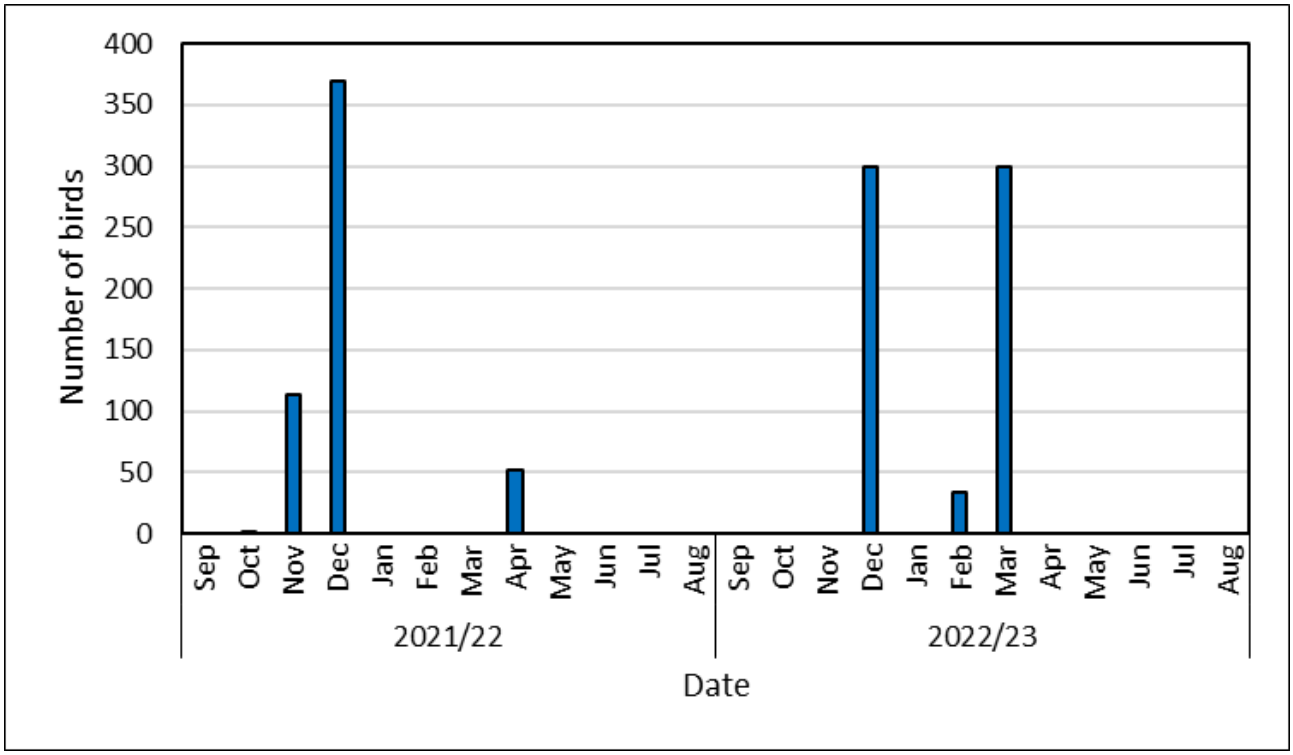


Diagram 1.8: Monthly peak maximum count of knot

1.4.5.25 Sanderling were one of the most frequently recorded waders and in the highest numbers (**Table 1.13**, **Diagram 1.9**). Sanderling favour intertidal sandflats to feed and congregated in large roosts on the mid to upper shore during tidal compression. Whilst there was a notable peak count of 4,702 individuals in February 2022, there were also large counts recorded during the passage period, with 2,134 in April 2022 and peaks of 2,000 birds during the second winter period in both January and February 2023.

1.4.5.26 Sanderling were evenly distributed across the coastal survey area in winter (**Figure 1.24**) and during the passage period (**Figure 1.25**).

1.4.5.27 Sanderling were present in numbers exceeding the GB threshold of national importance (200 birds) during 15 of the 24 months surveyed and they were present in internationally important numbers (2,000 birds) on four of the 24 months surveyed.

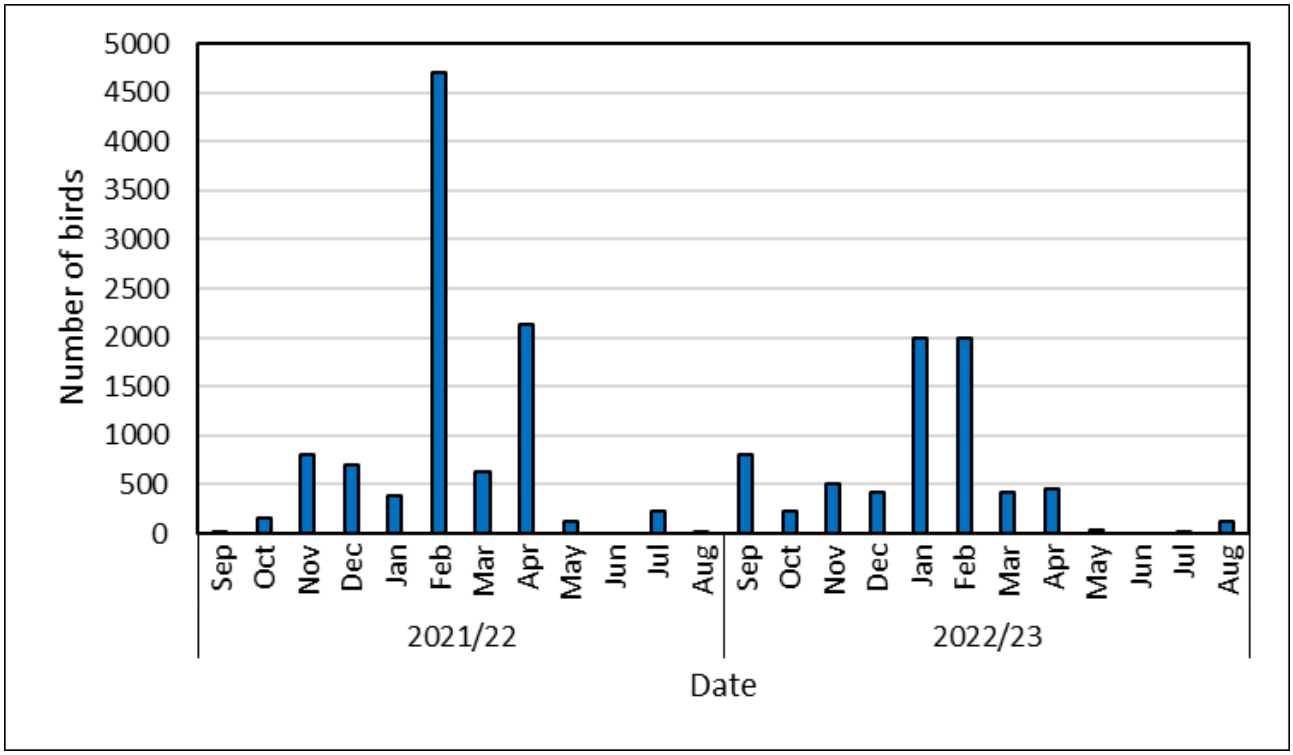


Diagram 1.9: Monthly peak maximum count of sanderling

1.4.5.28 Dunlin were present mostly during the winter period with the exception of April (**Diagram 1.10**). Whilst a maximum peak of 4,200 individuals was recorded in February 2022, numbers were sporadic over the winter.

1.4.5.29 The greatest densities were recorded at the southern part of the coastal survey area (**Figure 1.26**). Distribution was more restricted during the passage period (**Figure 1.27**) with less of a spread across the coastal survey area when compared to the winter records.

1.4.5.30 Dunlin were present in numbers exceeding the GB national threshold of 3,400 birds, although this was just once in February 2022 with much lower numbers recorded during the second winter (2022/23). Surveyors reported higher numbers of dunlin in the muddy substratum to the south of the coastal survey area.

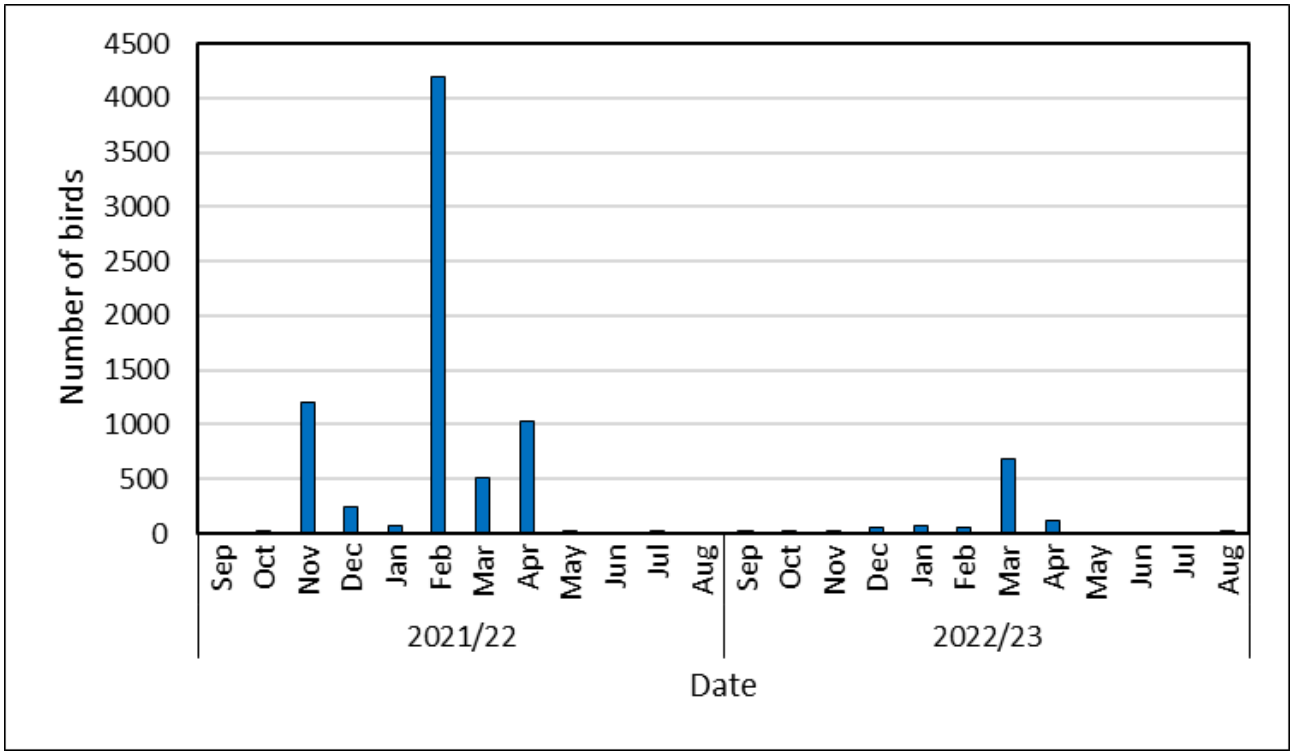


Diagram 1.10: Monthly peak maximum count of dunlin

1.4.5.31 Redshank were recorded in the highest numbers during the winter period with low numbers of birds recorded during the autumn and spring passage periods (**Diagram 1.11**). A peak of 70 birds was recorded during the first winter (January). Lower numbers of birds were recorded during the second winter with a peak of 33 birds in February 2023.

1.4.5.32 The species was distributed in low densities across the coastal survey area although they were occasionally found roosting on the sea defences with the turnstone (**Figure 1.28** and **Figure 1.29**).

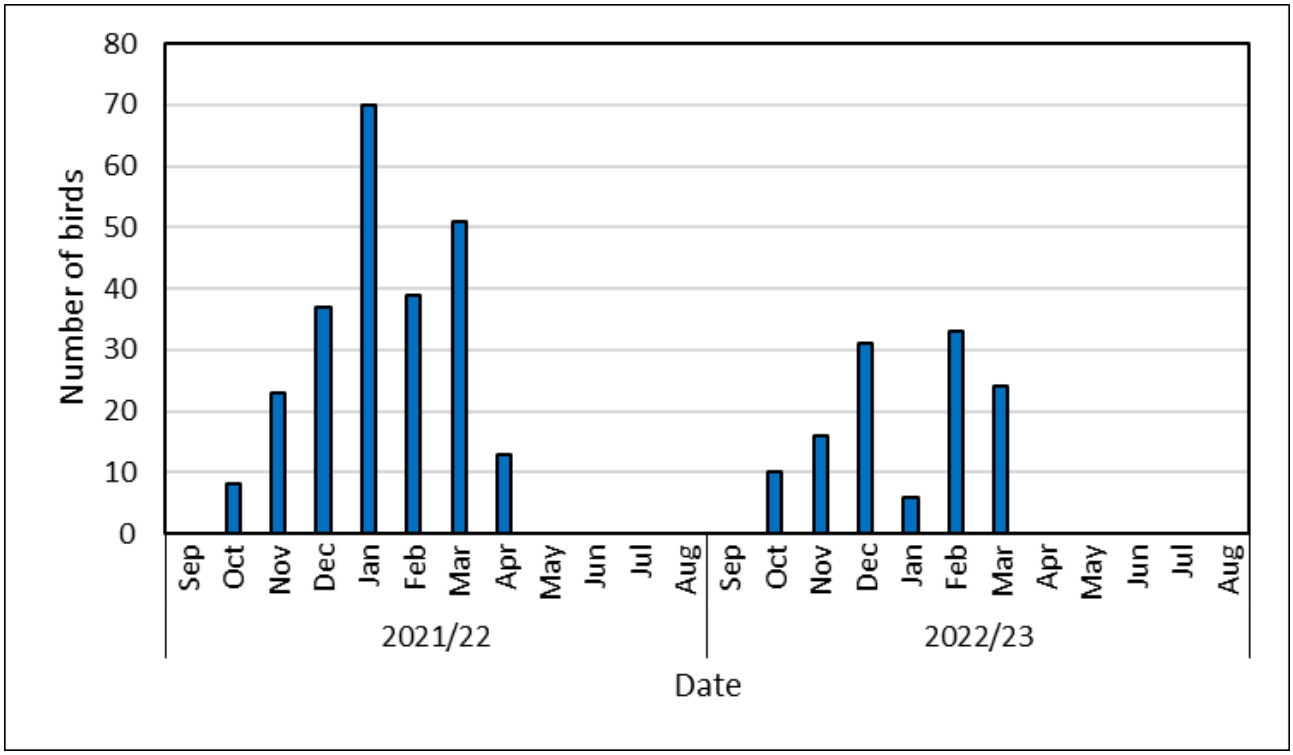


Diagram 1.11: Monthly peak maximum count of redshank

Gulls and terns

1.4.5.33 The site-specific surveys produced sightings of kittiwake in the summer months, with a monthly peak maximum count of four individuals in July 2022 (**Table 1.13**).

1.4.5.34 Although frequently recorded during the breeding and non-breeding seasons, black-headed gull were more abundant during the non-breeding season (**Table 1.13**, **Diagram 1.12**). Black-headed gull breed on inland waterbodies and the non-breeding peak in the coastal survey area represents British breeders and European birds migrating to coastal areas to winter.

1.4.5.35 The first winter peak count was recorded in February 2022 with 877 individuals (**Table 1.13**), with lower numbers recorded using the survey area over the second winter with a peak of 620.

1.4.5.36 Black-headed gull were widely distributed across the costal survey area during the non-breeding (**Figure 1.30**) and breeding season (**Figure 1.31**).

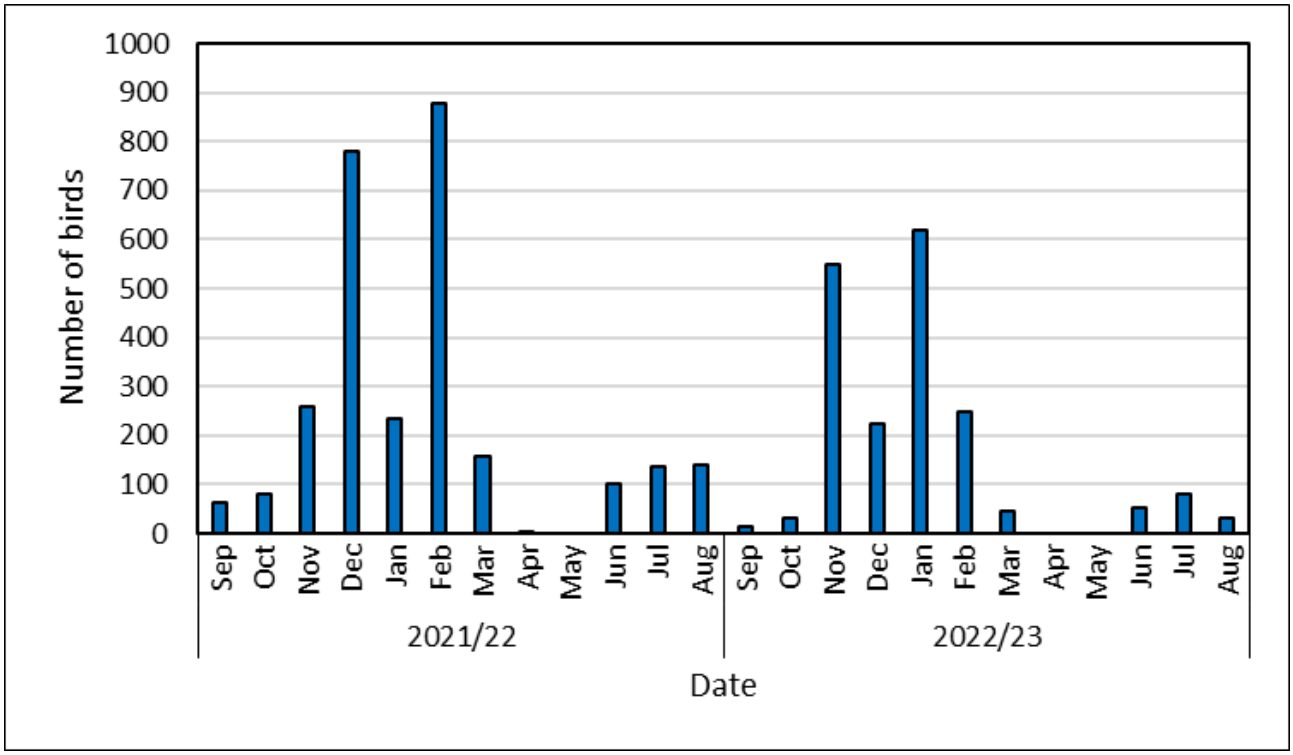


Diagram 1.12: Monthly peak maximum count of black-headed gull

1.4.5.37 One Mediterranean gull was recorded in December 2021 (**Table 1.13**). This was the only record of this species.

1.4.5.38 Common gull followed similar temporal variation to that of black-headed gull (**Diagram 1.13**) although with a higher maximum peak of 750 birds was recorded during the second winter period (**Table 1.13**). This species was widely distributed across the coastal survey area during the non-breeding season (**Figure 1.32**).

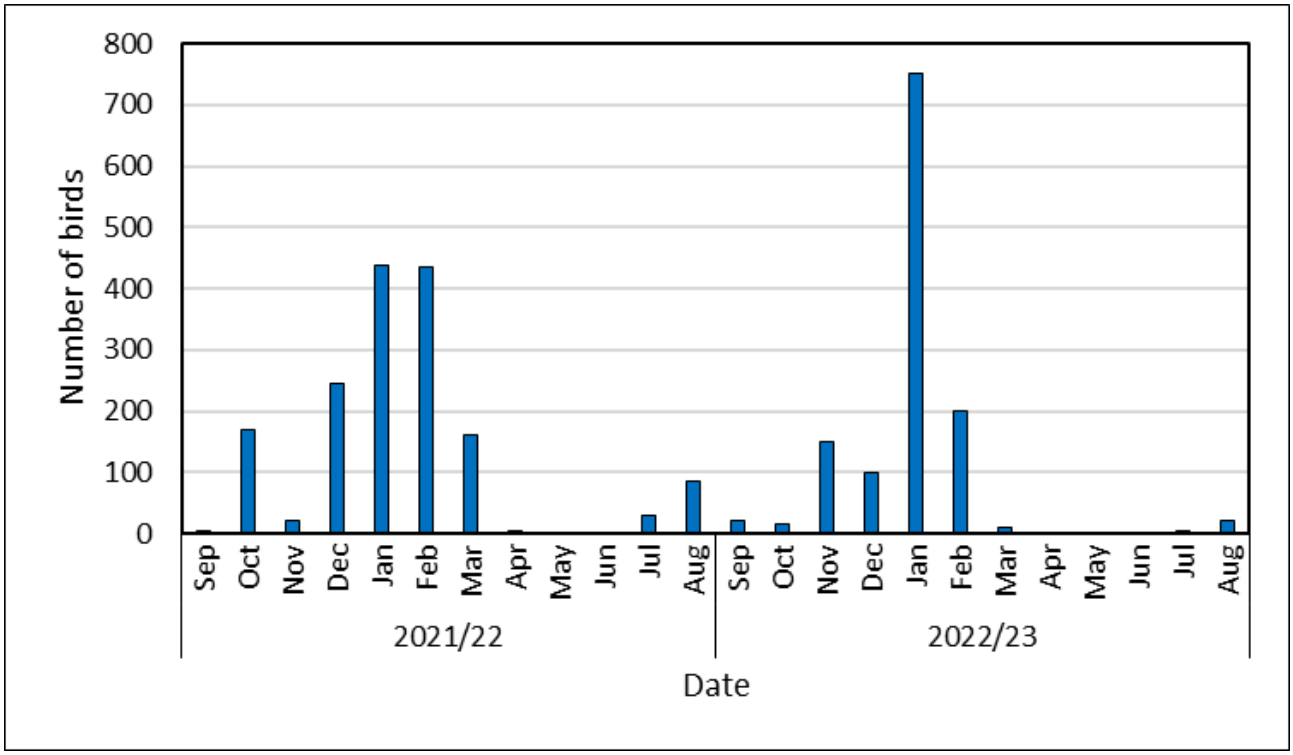


Diagram 1.13: Monthly peak maximum count of common gull

1.4.5.39 Although great black-backed gull were frequently recorded throughout the survey period they were recorded in low numbers. A monthly peak maximum count of 23 individuals was recorded.

1.4.5.40 Low densities of great black-backed gull were recorded throughout the coastal survey area (**Figure 1.34** and **Figure 1.35**) meaning that they were mobile.

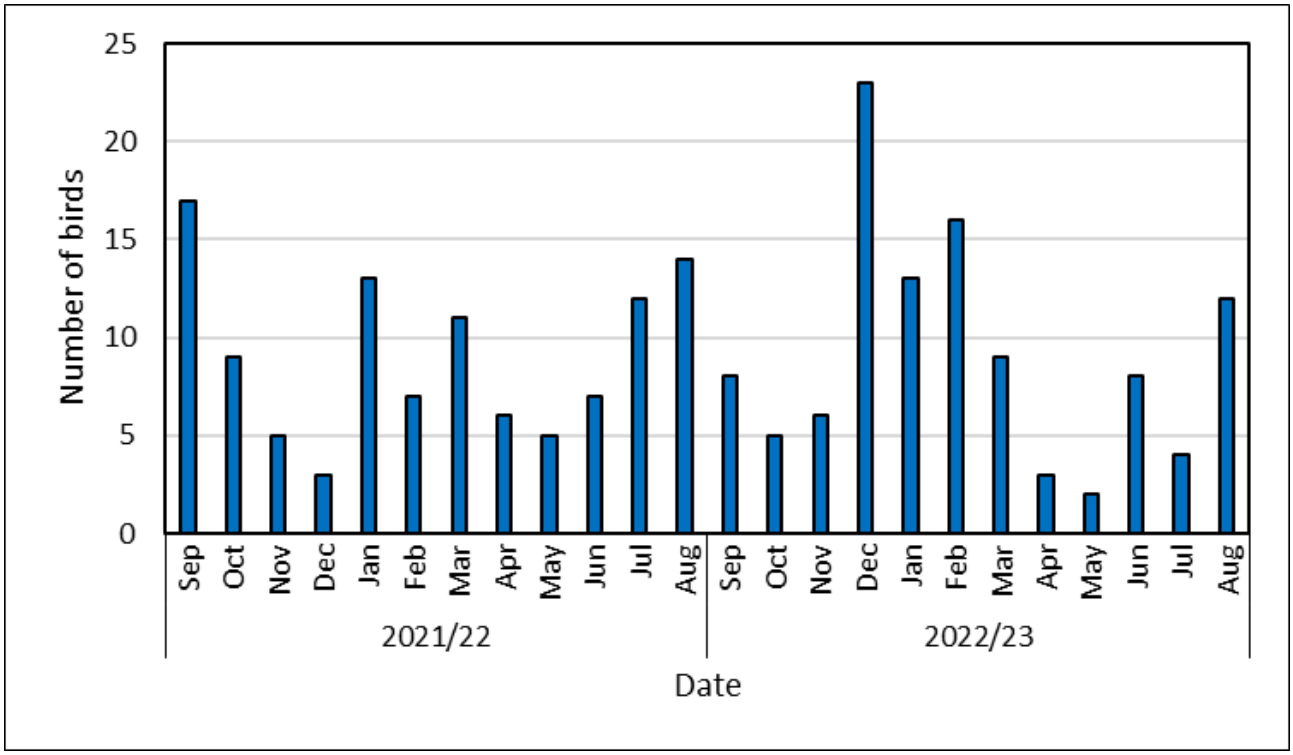


Diagram 1.14: Monthly peak maximum count of great black-backed gull

1.4.5.41 Herring gull were present as both a non-breeding and a breeding species (**Diagram 1.15**). Herring gull also breed in the nearby town of Blackpool. During the breeding season the peak maximum count of 1,543 birds was recorded in May 2022. During the non-breeding season, a peak of 1,600 was recorded in November 2022 (**Table 1.13**).

1.4.5.42 Herring gull were widely distributed across the survey area during the breeding (**Figure 1.37**) and the non-breeding season (**Figure 1.36**).

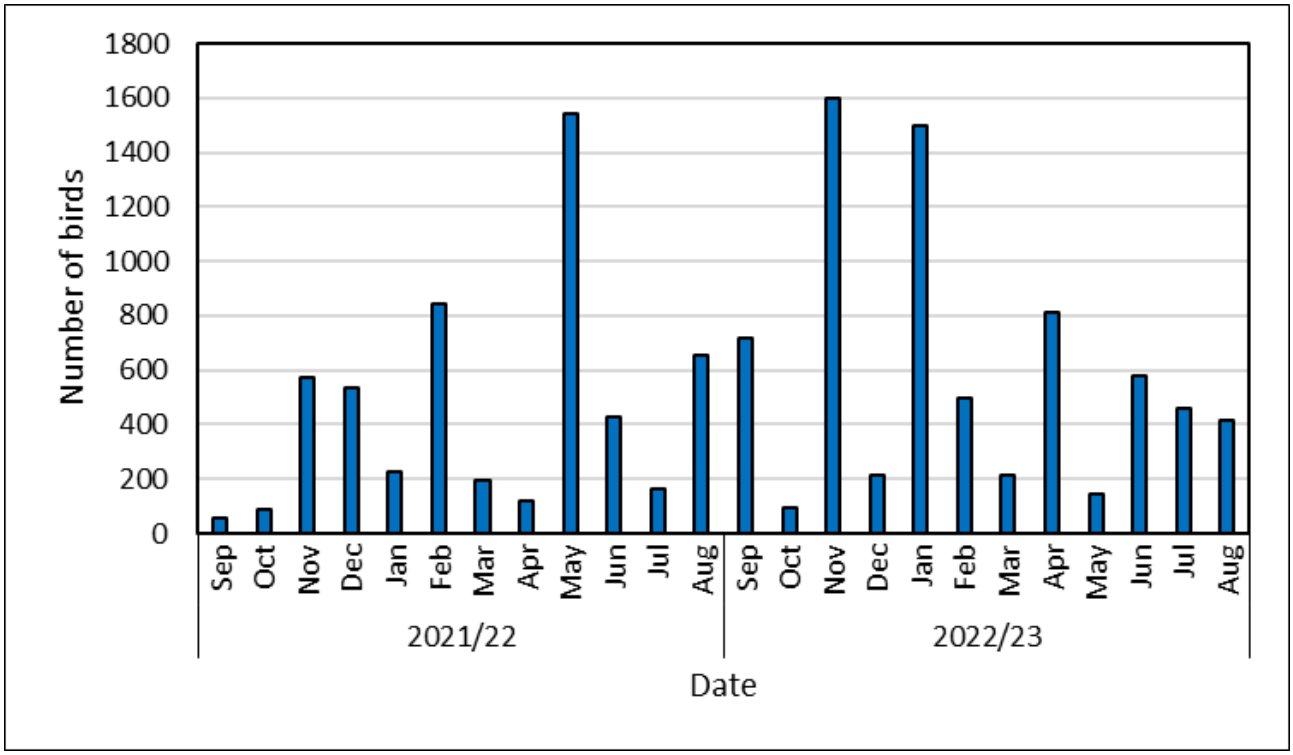


Diagram 1.15: Monthly peak maximum count of herring gull

1.4.5.43 Contrary to herring gull and common gull, lesser black-backed gull were predominantly present during the April to August period with a peak of 353 recorded in August 2022 (**Diagram 1.6**). Low numbers were recorded over winter. This species breeds locally with a Ribble and Alt Estuaries SPA colony located on the saltmarshes of the Ribble, and winter along the Atlantic seaboard southward from Britain to West Africa, with most in Iberia.

1.4.5.44 As with other gulls, the species was widely distributed across the coastal survey area (**Figure 1.38** and **Figure 1.39**).

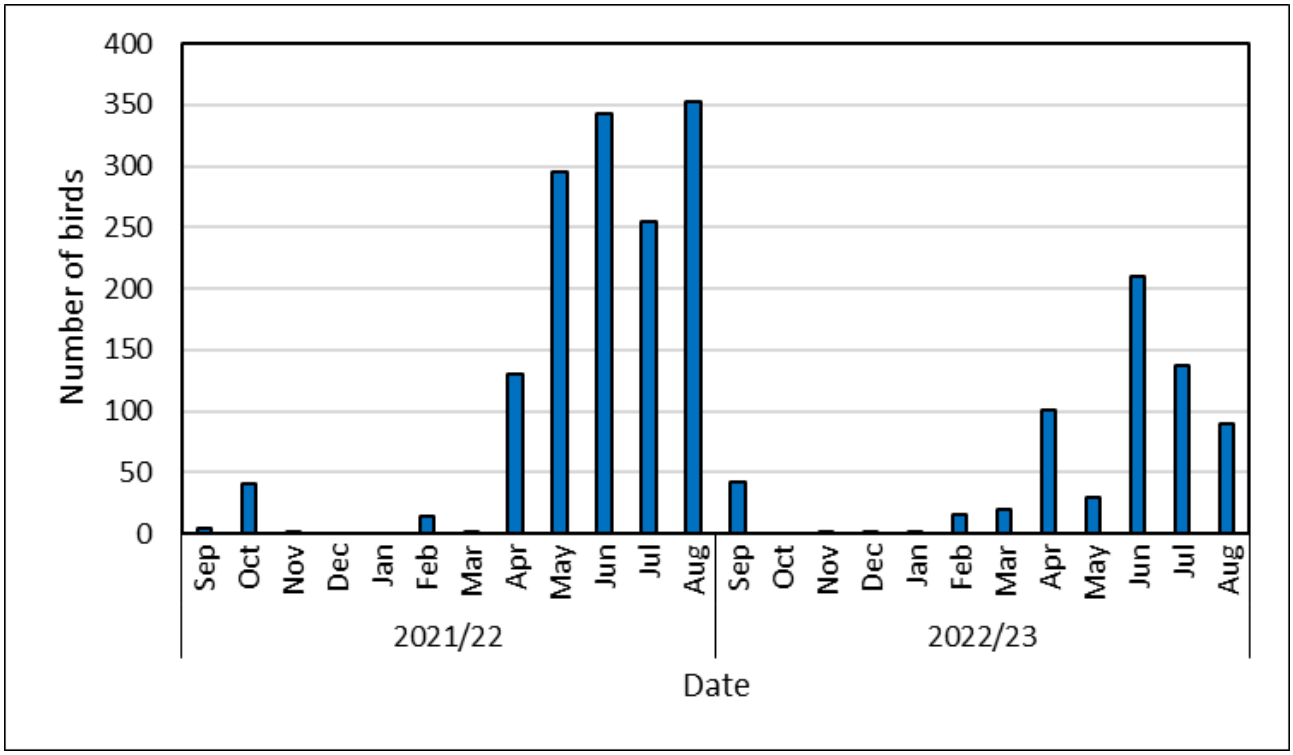


Diagram 1.16: Monthly peak maximum count of lesser black-backed gull

1.4.5.45 The monthly peak maximum count of sandwich tern was 427 individuals in August 2023 (**Table 1.13**) with individuals presumably dispersing from colonies and using the coastal survey area to feed or rest (**Diagram 1.17**).

1.4.5.46 The species was thinly distributed across the nearshore waters of the coastal survey area (**Figure 1.40** and **Figure 1.41**) with the peak representing a mid-beach roost, likely on migration.

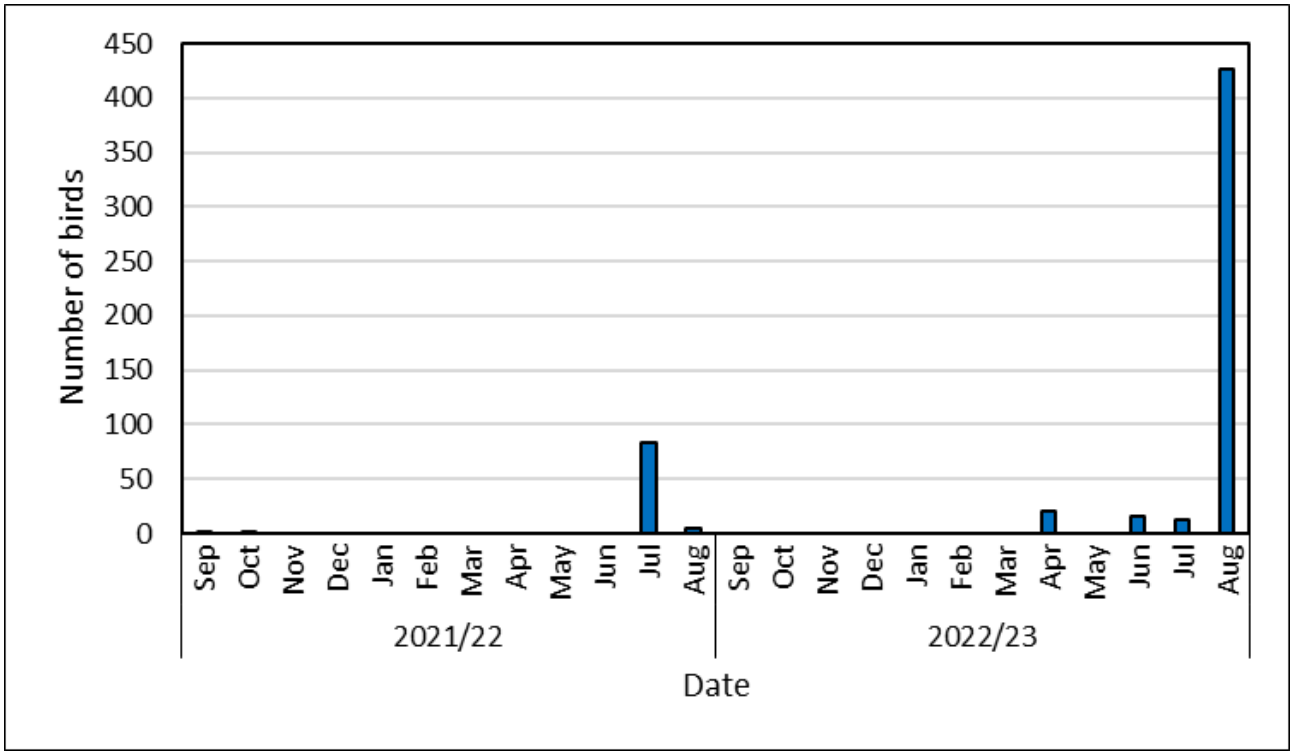


Diagram 1.17: Monthly peak maximum count of sandwich tern

1.4.5.47 Common tern were observed between June and July 2022 and between April and August 2023 with a peak 90 birds observed in August 2023 (**Table 1.13, Diagram 1.8**). Whilst there is a local Ribble colony, the August peak is probably composed of birds dispersing from colonies further north. During the core common tern breeding period (April to July), low numbers of birds were observed foraging in the nearshore waters.

1.4.5.48 Little tern were observed in very low numbers throughout the breeding season, with sightings made in May 2022 and June 2022. As the coastal survey area is well beyond the 5 km (as taken from Woodward, *et al*, 2019) foraging ranges for nearby (e.g., the Gronant Dunes) colonies, the peak count of one individual was presumably a non-breeder or failed breeder dispersing from colonies in the region (**Table 1.13**).

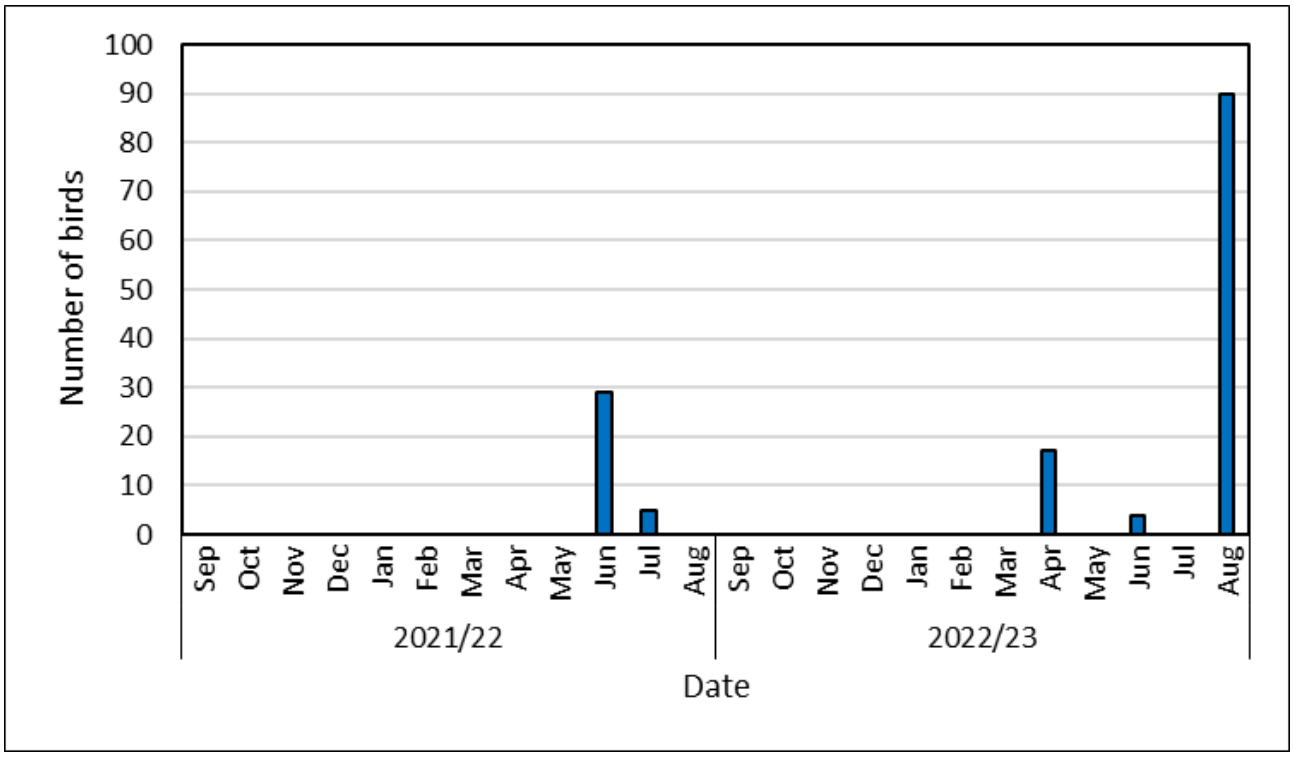


Diagram 1.18: Monthly peak maximum count of common tern

Auks

1.4.5.49 A single guillemot was recorded in August 2022, December 2022 and April 2023. Three birds were recorded in July 2023 (**Table 1.13**).

Divers

1.4.5.50 Red-throated diver were present in the nearshore waters infrequently in low numbers. More birds were seen during the second year of surveys with a peak of 14 in September 2023 (**Table 1.13**, **Diagram 1.19)**.

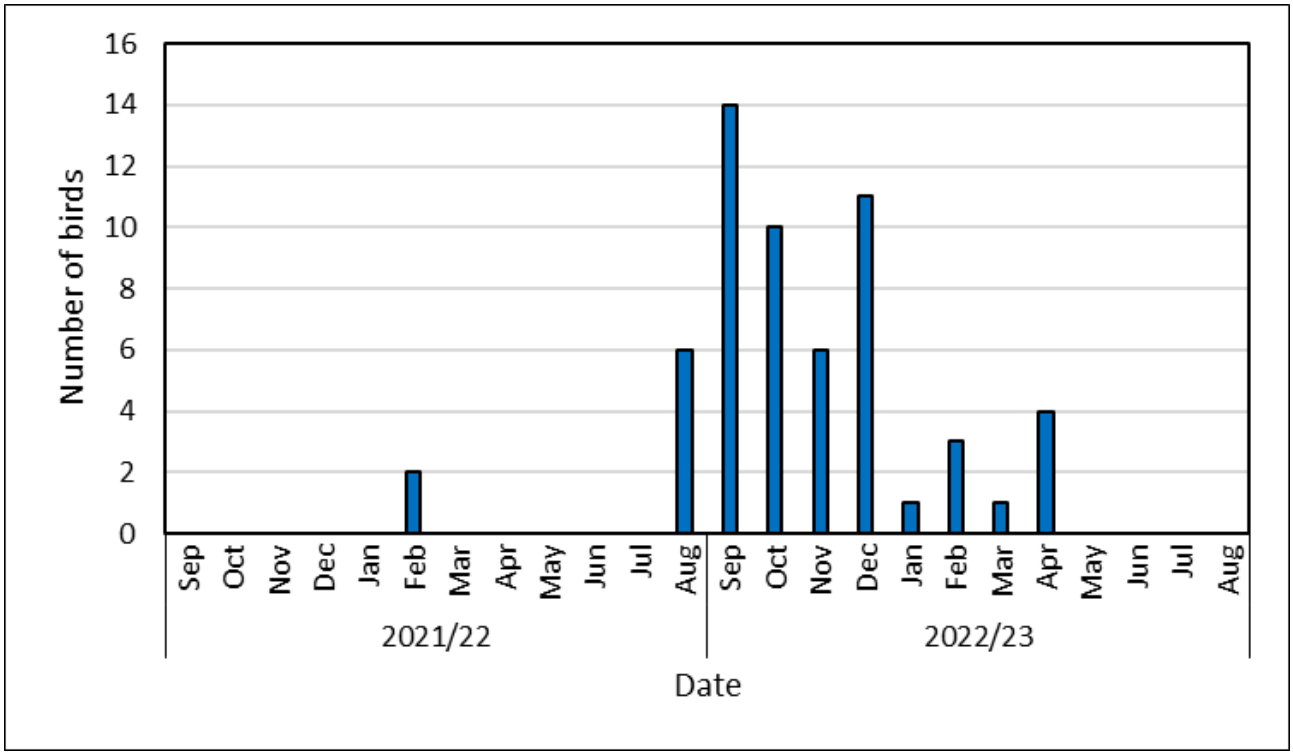


Diagram 1.19: Monthly peak maximum count of red-throated diver

Seabirds

1.4.5.51 Manx shearwater were recorded once in July 2023 where 77 birds were seen foraging in the nearshore waters.

Cormorants and shag

1.4.5.52 Aggregations of cormorant were regularly seen exhibiting non-foraging (e.g., preening) behaviour on the intertidal sandflats during the breeding and non-breeding season (**Diagram 1.20)**. There was a maximum peak count of 112 individuals recorded in December 2022 (**Table 1.13**).

1.4.5.53 The greatest densities were recorded at the southern part of the coastal survey area (**Figure 1.46** and **Figure 1.47**) with surveyors reporting that numbers were higher further to the south of the coastal survey area.

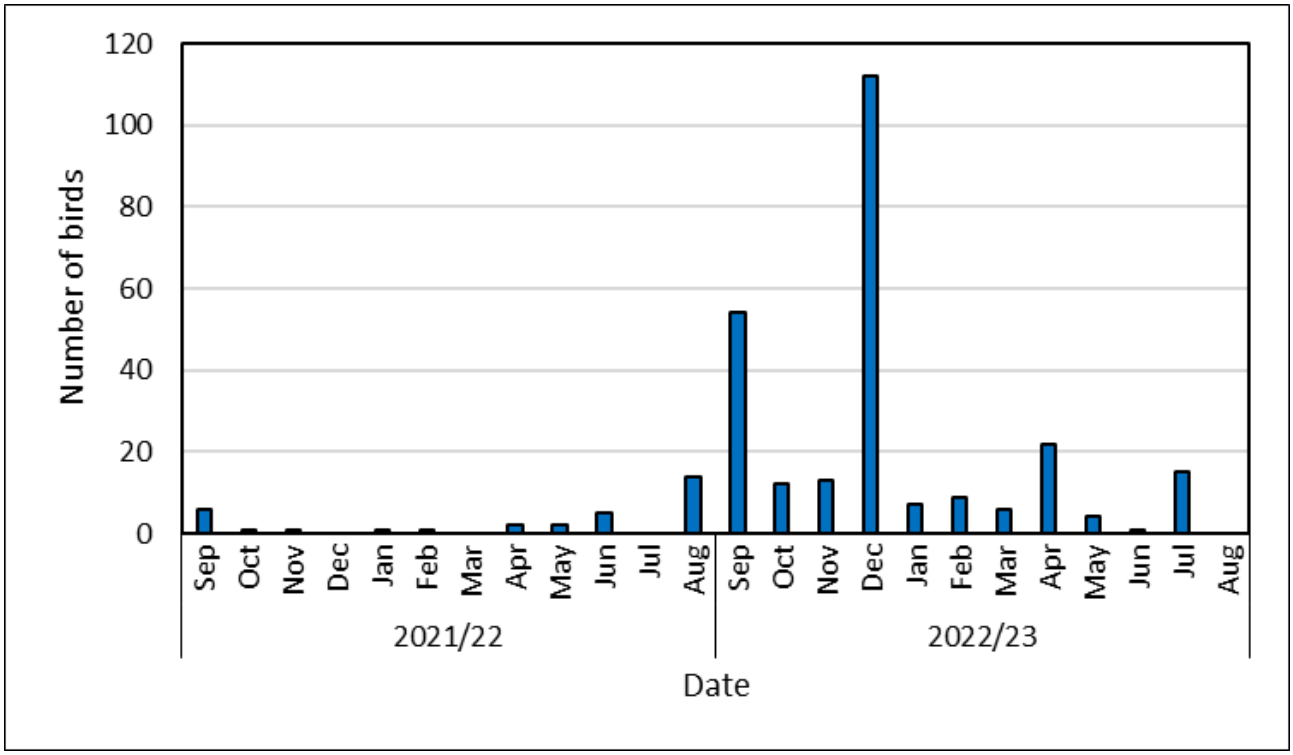


Diagram 1.20: Monthly peak maximum count of cormorant

Herons and storks

1.4.5.54 Grey heron were only recorded once. The single bird was sighted in October 2022 on the shore line to the south of the coastal survey area.

1.4.5.55 A total of four little egret were recorded within the coastal survey area with a peak in October 2022.

Table 1.13: Annual peak abundance of waterbirds recorded in the coastal survey area during the site-specific surveys (September 2021 to August 2023)

Group	Species	UK BOCC5 status	Annex 1 listed	Schedule 1 listed	Section 41 listed	Peak maximum count 2021/22	Peak maximum count 2022/23
Geese, ducks and swans	Bar-headed goose	No status	no	no	no	0	2
	Shelduck	Amber	no	no	no	One (May)	One (October, May, June)
	Scaup	Red	no	yes	no	0	Four (February)
	Eider	Amber	no	no	no	0	Five (October)
	Common scoter	Red	no	yes	yes	4,000 (August)	3,934 (January)
Grebes	Great crested grebe	Green	no	no	no	0	Two (September, February, March)
Waders	Oystercatcher	Amber	no	no	no	822 (January)	1073 (February)
	Golden plover	Green	yes	no	no	One (November)	0 (April)
	Grey plover	Amber	no	no	no	118 (April)	62 (February)
	Ringed plover	Red	no	no	no	37 (February)	93 (August)
	Whimbrel	Red	no	yes	no	Four (April)	Six (May)
	Curlew	Red	no	no	yes	Nine (December)	One (October, December, January)

Group	Species	UK BOCC5 status	Annex 1 listed	Schedule 1 listed	Section 41 listed	Peak maximum count 2021/22	Peak maximum count 2022/23
	Bar-tailed godwit	Amber	yes	no	no	625 (November)	500 (November)
	Turnstone	Amber	no	no	no	142 (February)	143 (January)
	Knot	Amber	no	no	no	370 (December)	300 (December, March)
	Sanderling	Amber	no	no	no	4,702 (February)	2,000 (January, February)
	Dunlin	Red	no	no	no	4,200 (February)	677 (March)
	Redshank	Amber	no	no	no	70 (January)	33 (February)
Gulls and terns	Kittiwake	Red	no	no	no	Two (July)	0
	Black-headed gull	Amber	no	no	no	877 (February)	620 (January)
	Mediterranean gull	Amber	yes	yes	no	One (December)	0
	Common gull	Red	no	no	no	438 (January, February)	750 (January)
	Great black-backed gull	Red	no	no	no	17 (September)	23 (December)
	Herring gull	Red	no	no	yes	1,543 (May)	1,600 (November)
	Lesser black-backed gull	Amber	no	no	no	353 (August)	210 (June)

Group	Species	UK BOCC5 status	Annex 1 listed	Schedule 1 listed	Section 41 listed	Peak maximum count 2021/22	Peak maximum count 2022/23
	Sandwich tern	Amber	yes	no	no	84 (July)	427 (August)
	Little tern	Amber	yes	no	no	One (July)	0
	Common tern	Amber	yes	no	no	29 (June)	90 (August)
Skuas	Arctic skua	Red	no	no	no	0	Three (August)
Auks	Guillemot	Amber	no	no	no	One (August)	Three (July)
Divers	Red-throated diver	Green	yes	yes	no	Six (August)	14 (September)
Seabirds	Manx shearwater	Amber	yes	no	no	0	77 (July)
Cormorants and shag	Cormorant	Green	no	no	yes	14 (August)	112 (December)
Herons and storks	Grey heron	Green	no	no	no	0	One (October)
	Little egret	Green	yes	no	no	Two (June)	Four (October)

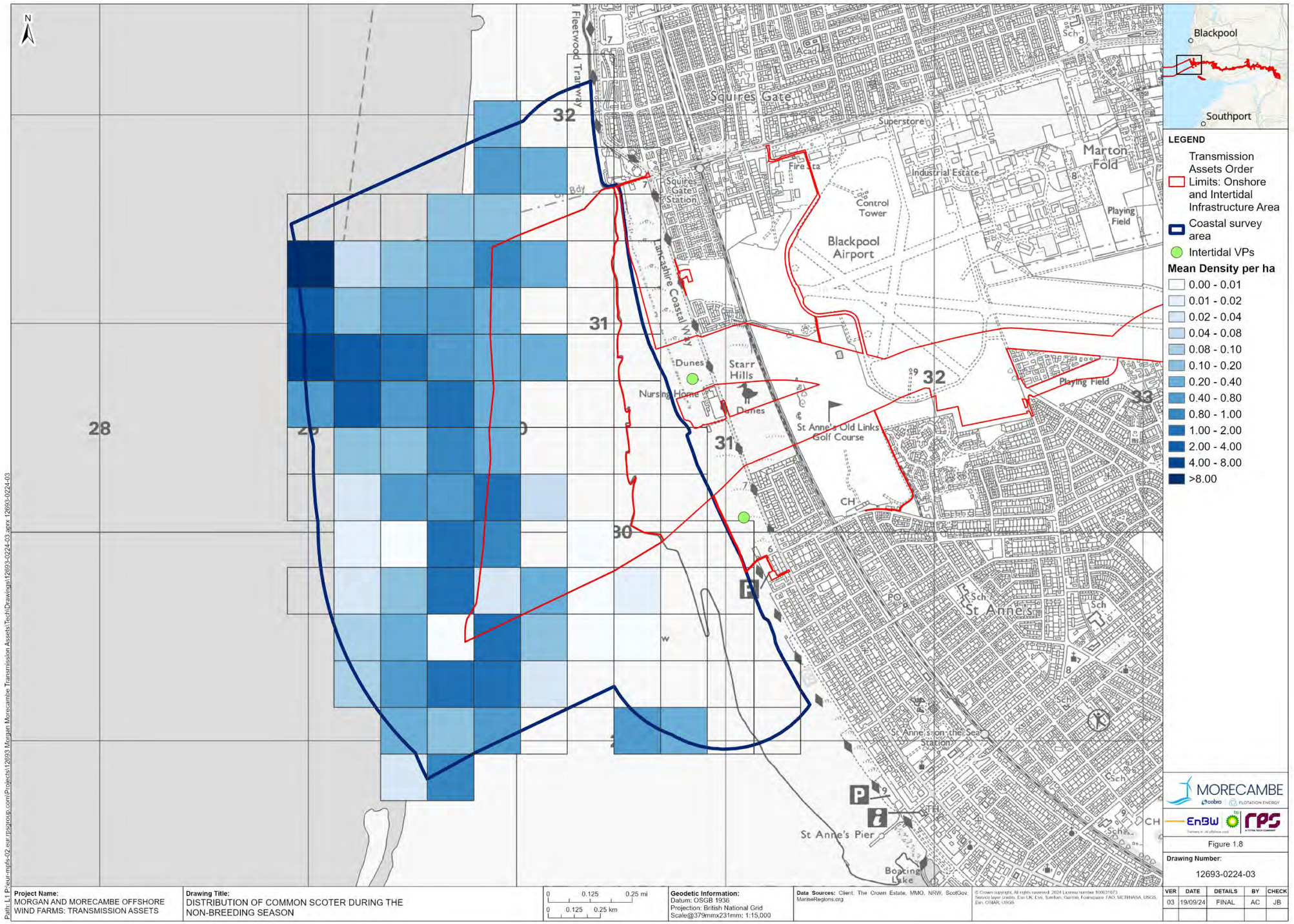


Figure 1.8: Distribution of common scoter during the non-breeding season

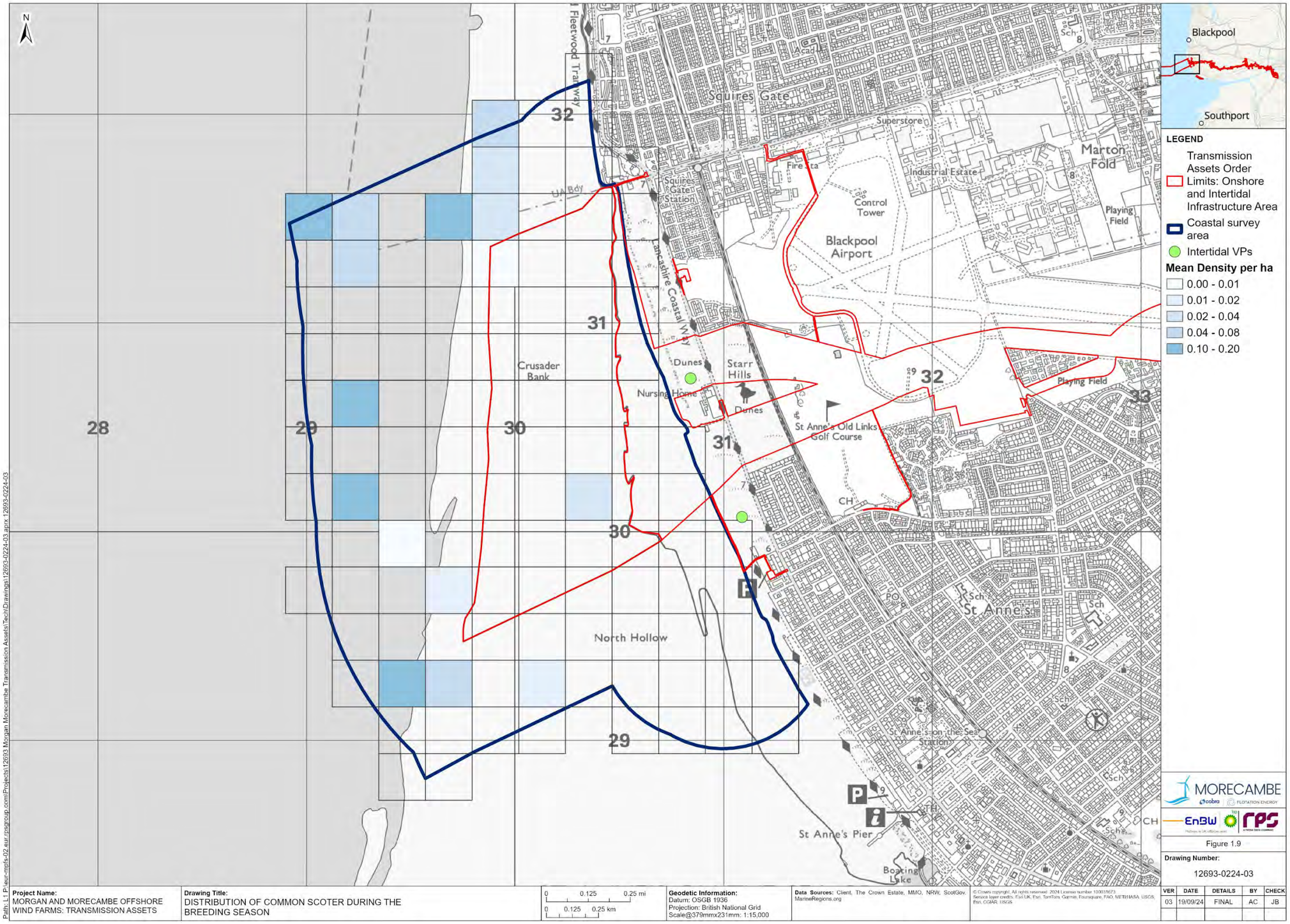


Figure 1.9: Distribution of common scoter during the breeding season

Figure 1.10: Distribution of oystercatcher in winter

Figure 1.11: Distribution of oystercatcher during passage

Figure 1.12: Distribution of grey plover in winter

Figure 1.13: Distribution of grey plover during passage

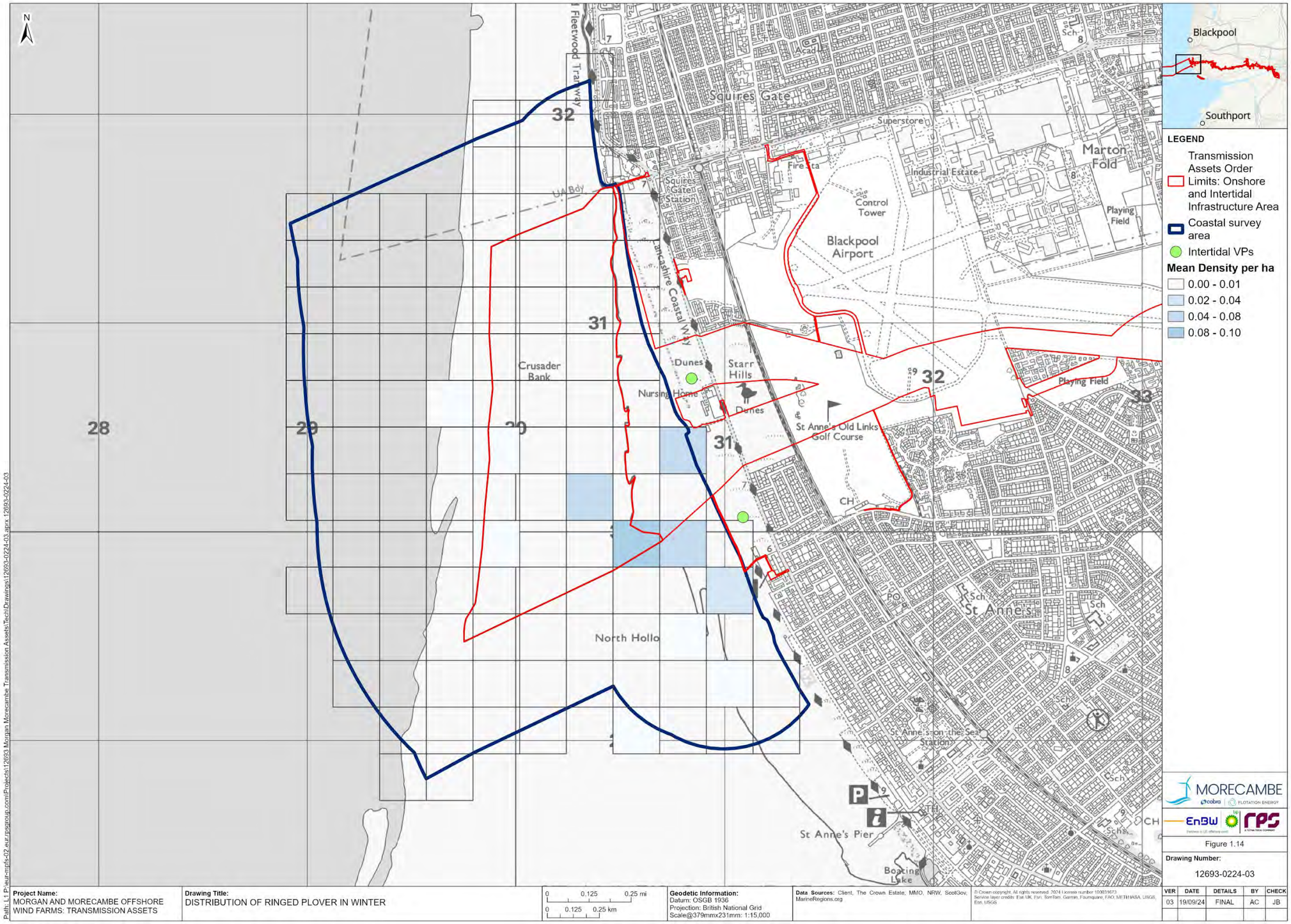


Figure 1.14: Distribution of ringed plover in winter

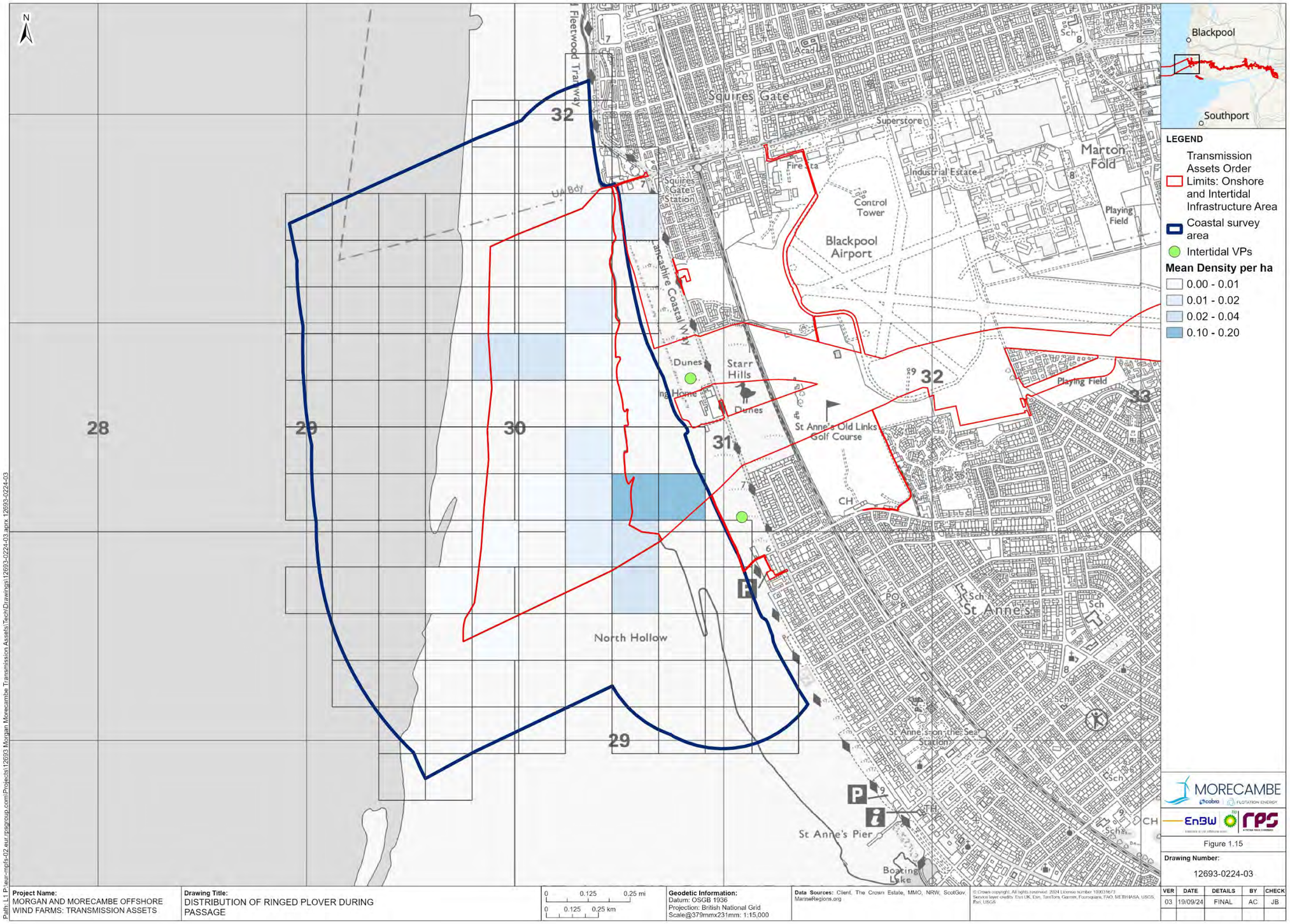


Figure 1.15: Distribution of ringed plover during passage

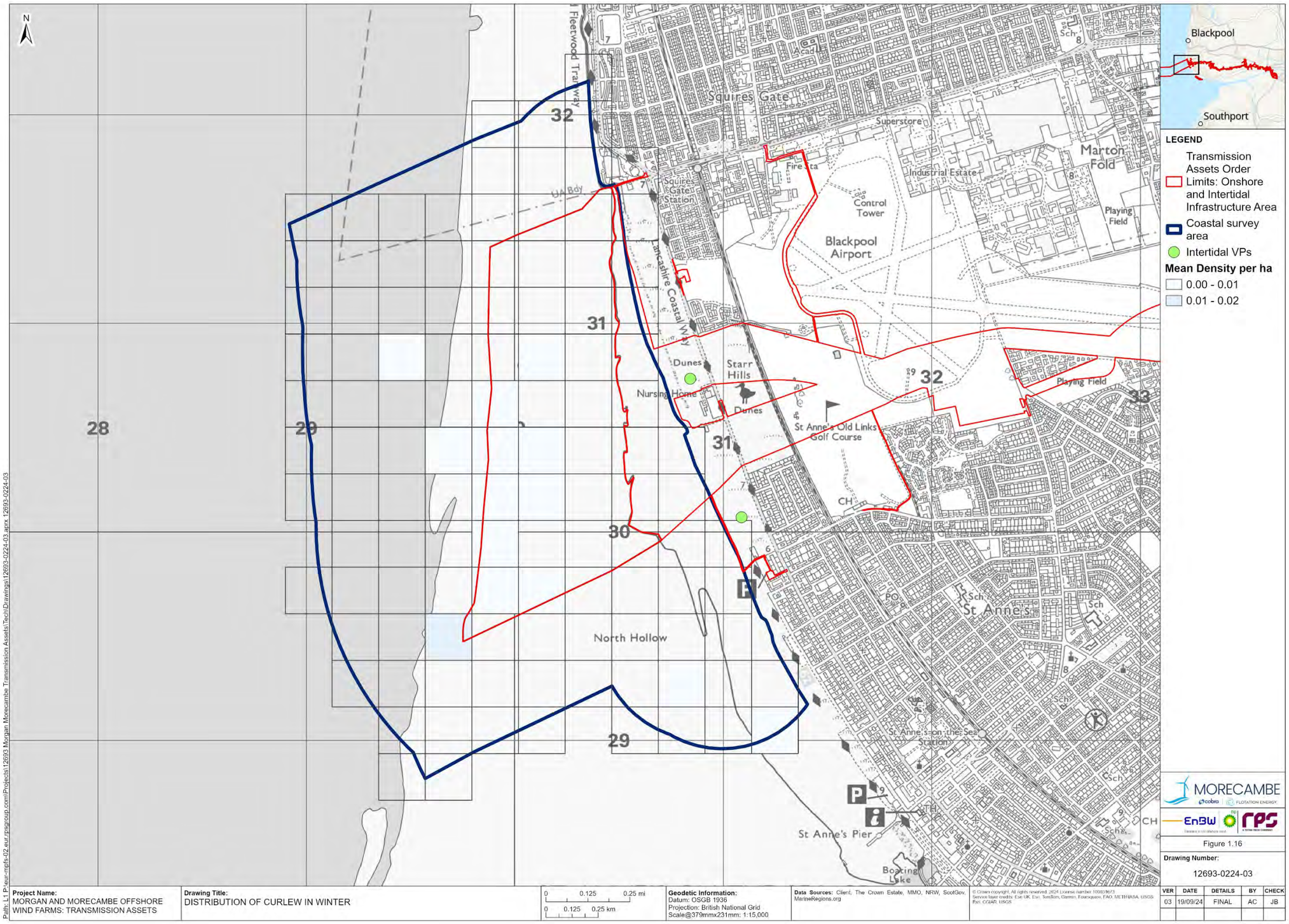


Figure 1.16: Distribution of curlew in winter

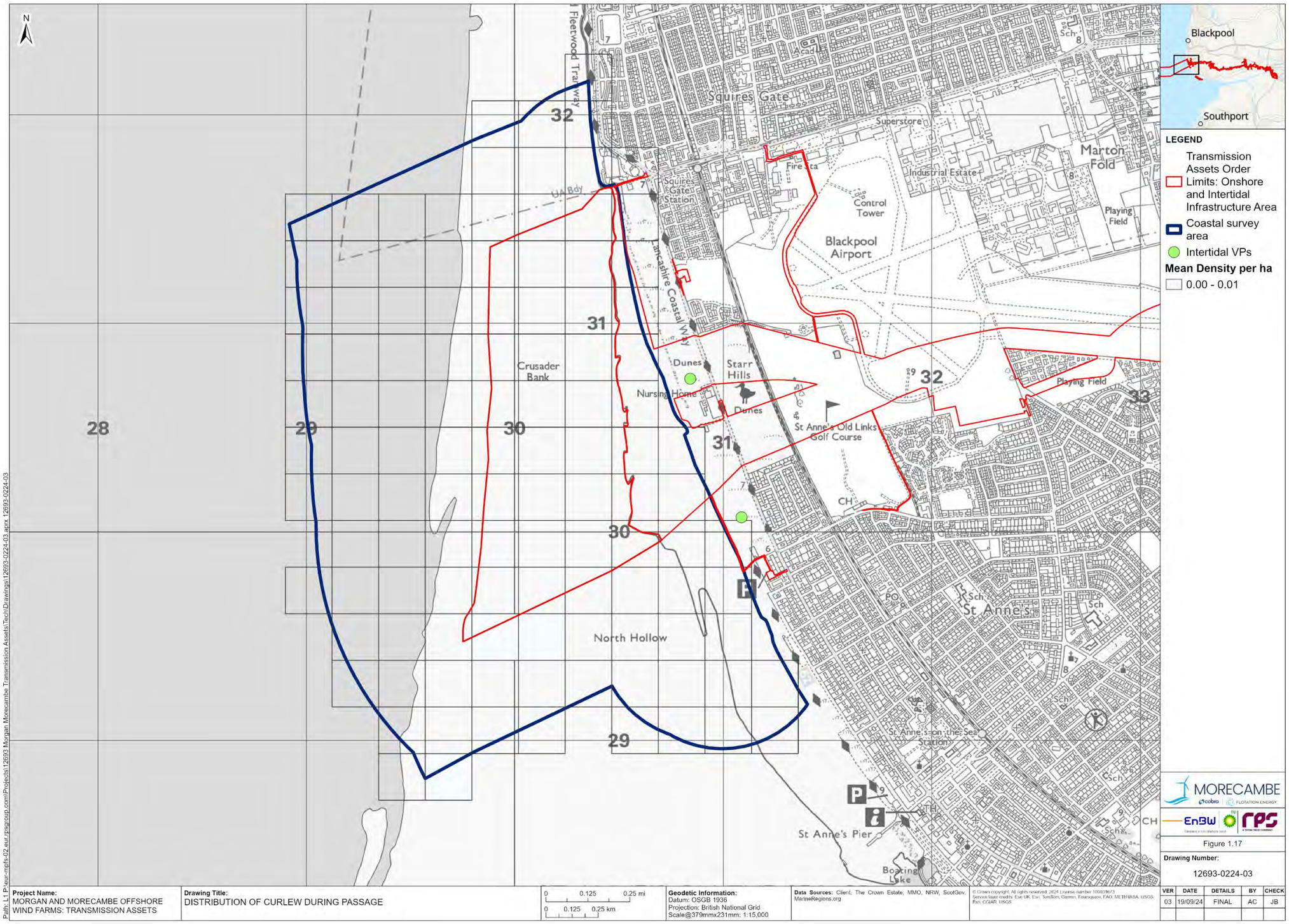


Figure 1.17: Distribution of curlew during passage

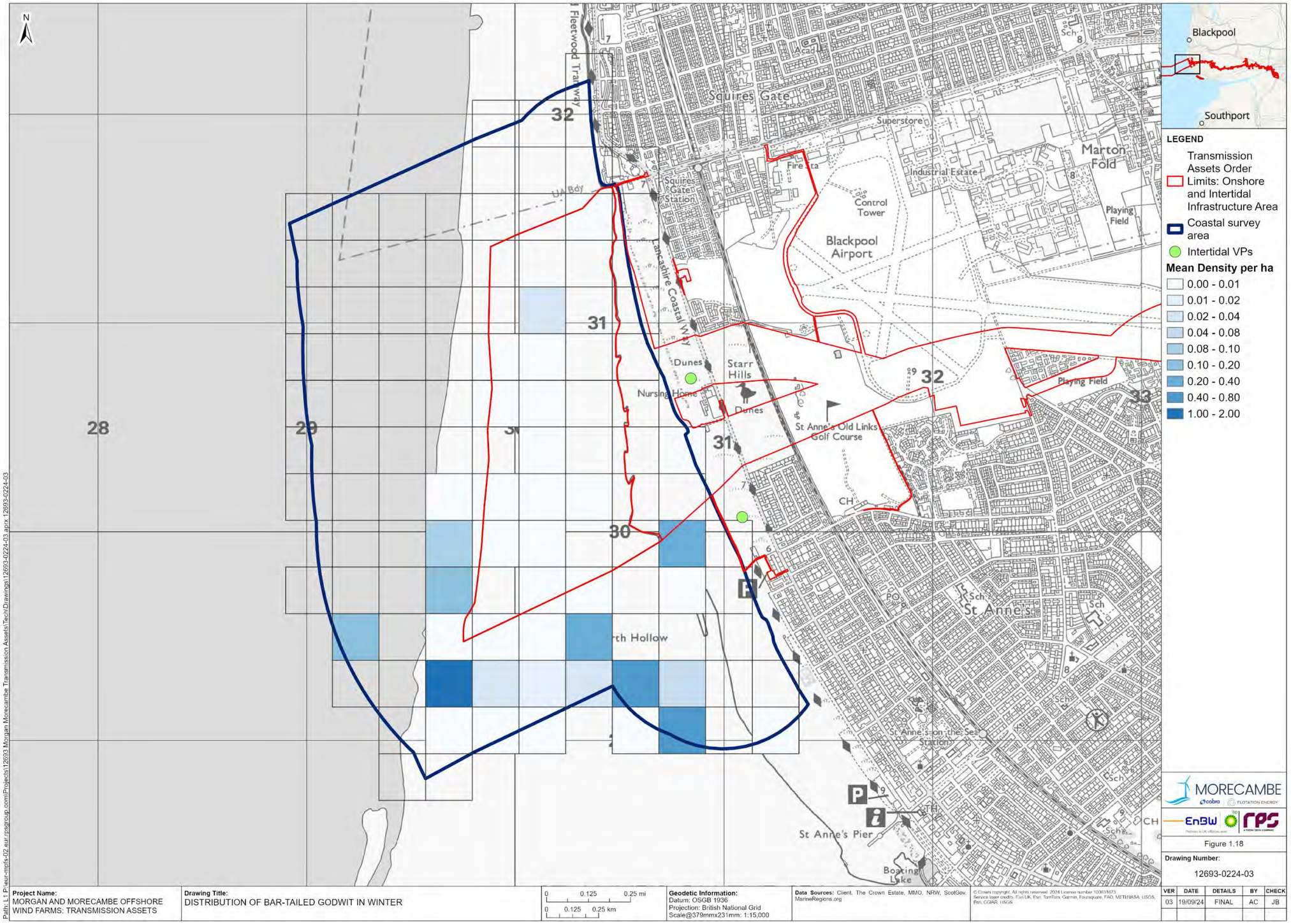


Figure 1.18: Distribution of bar-tailed godwit in winter

Figure 1.19: Distribution of bar-tailed godwit during passage

Figure 1.20: Distribution of turnstone in winter

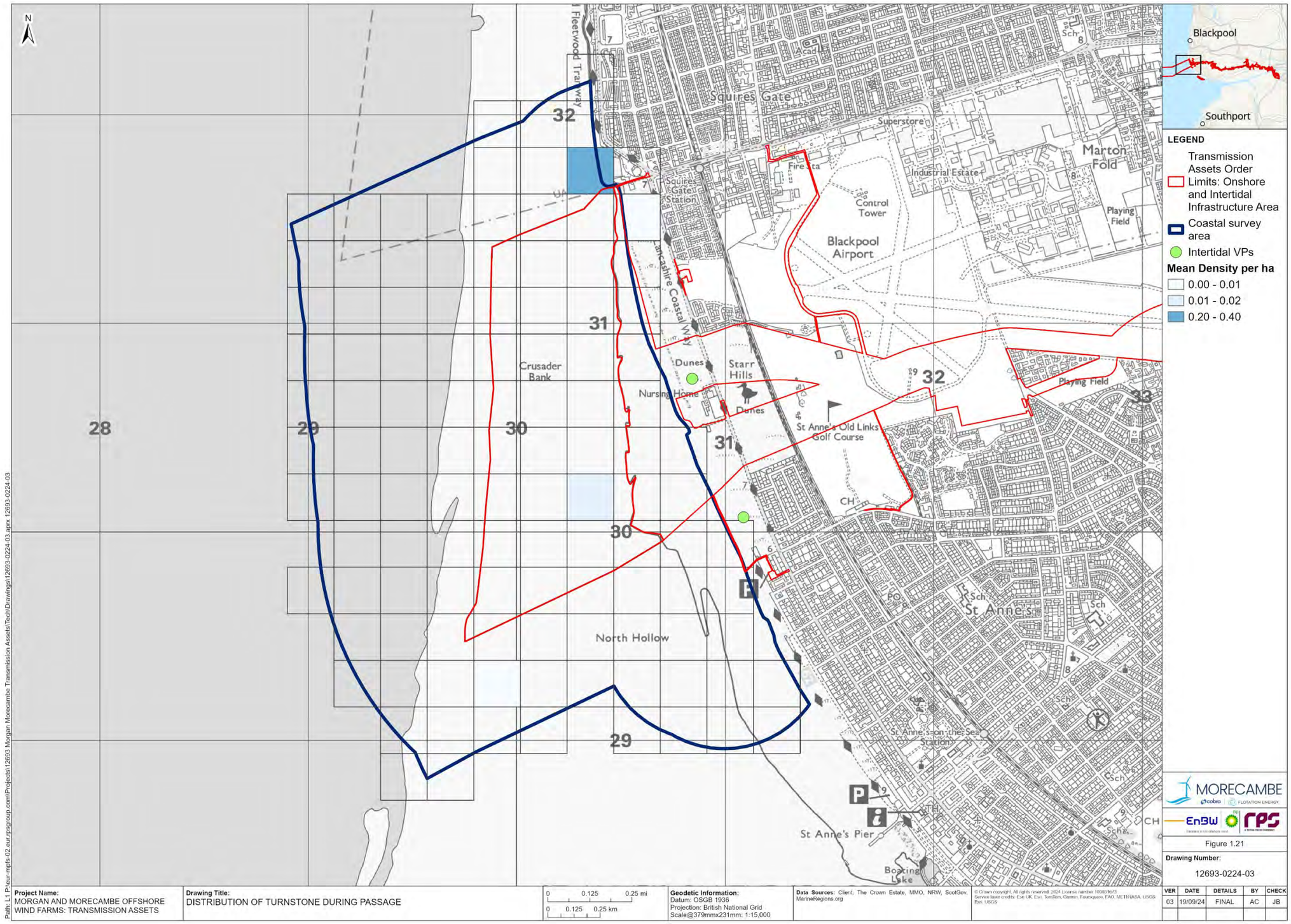


Figure 1.21: Distribution of turnstone during passage

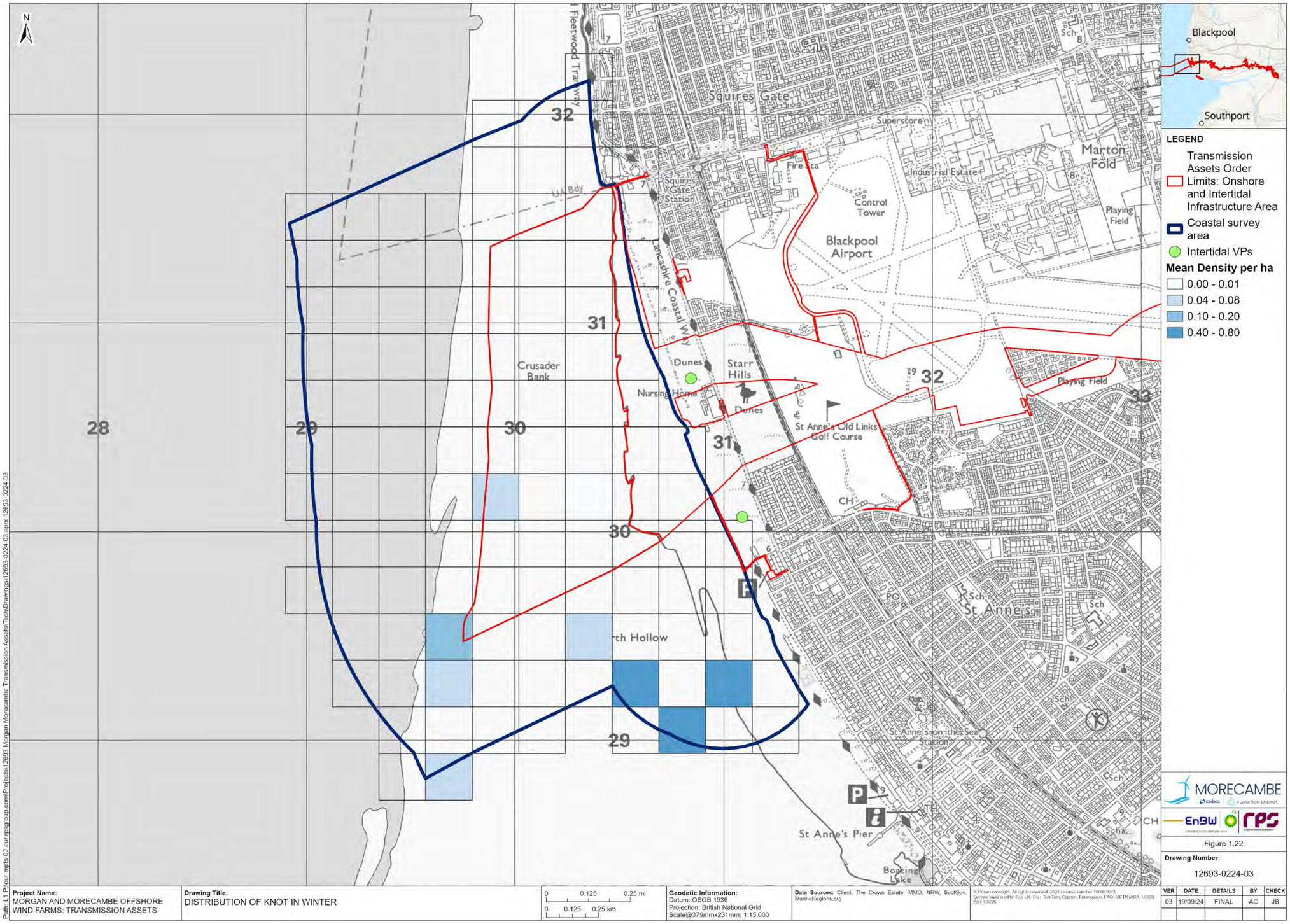


Figure 1.22: Distribution of knot in winter

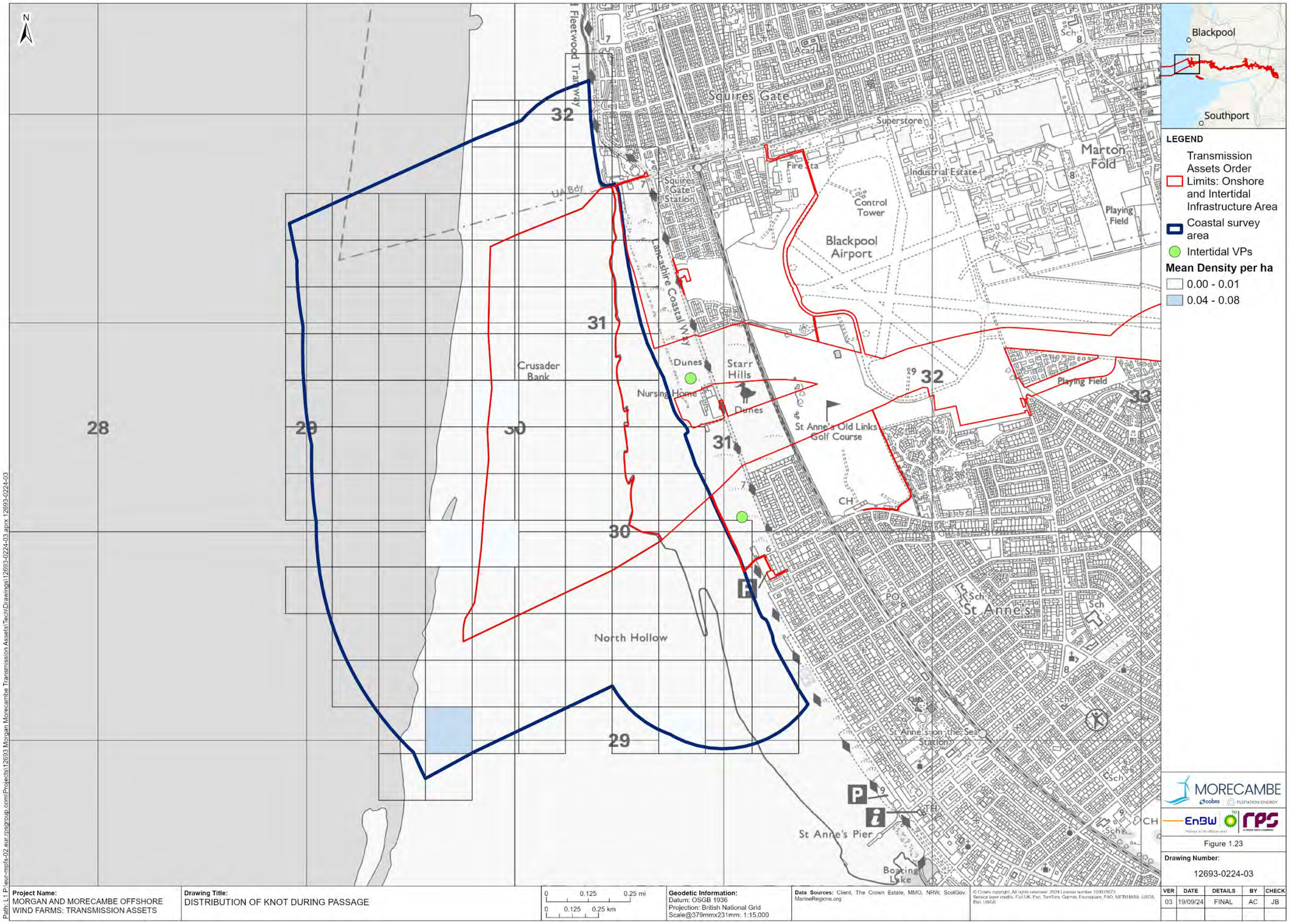


Figure 1.23: Distribution of knot during passage

Figure 1.24: Distribution of sanderling in winter

Figure 1.25: Distribution of sanderling during passage

Figure 1.26: Distribution of dunlin in winter

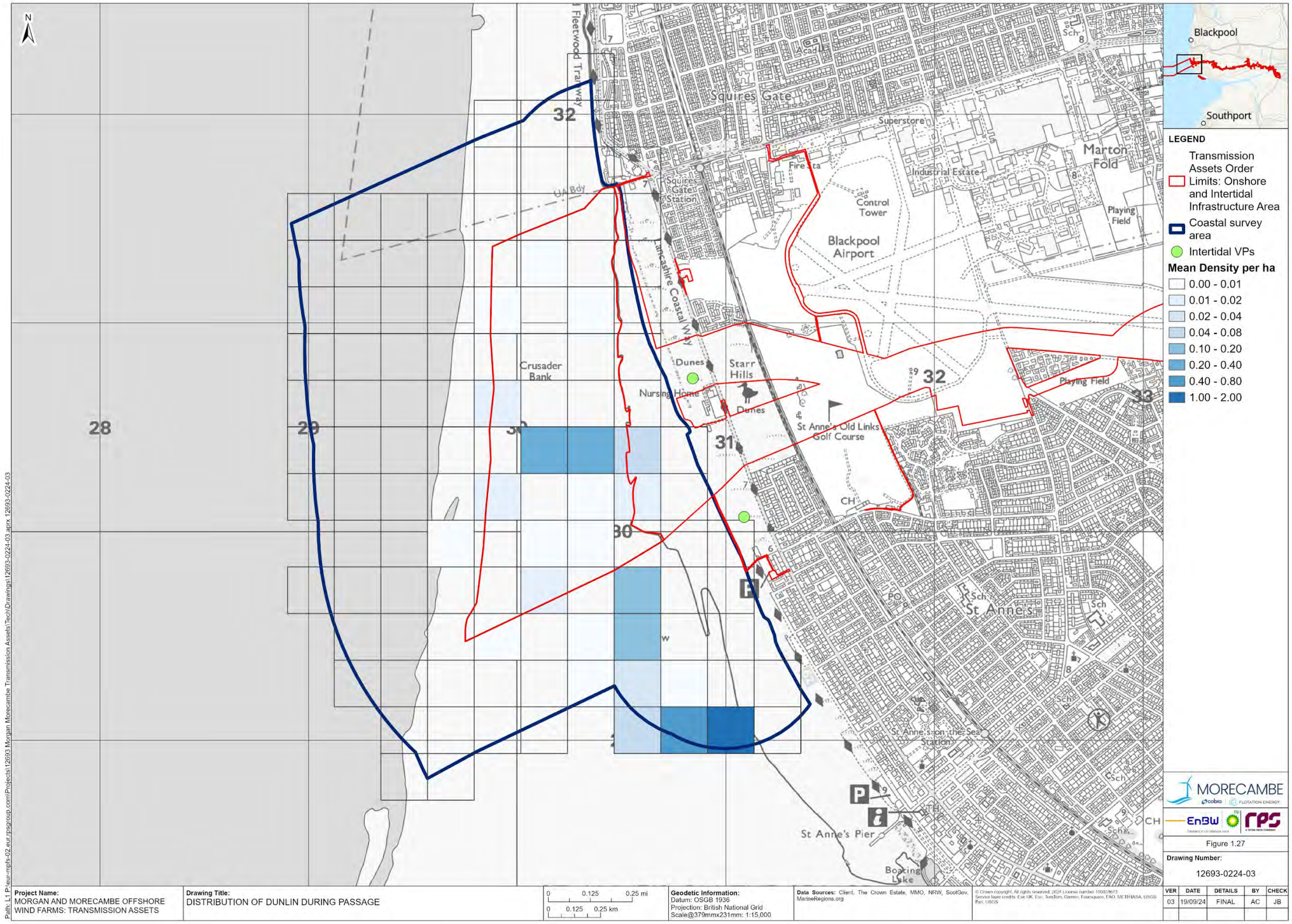


Figure 1.27: Distribution of dunlin during passage

Figure 1.28: Distribution of redshank in winter

Figure 1.29: Distribution of redshank during passage

Figure 1.30: Distribution of black-headed gull during the non-breeding season

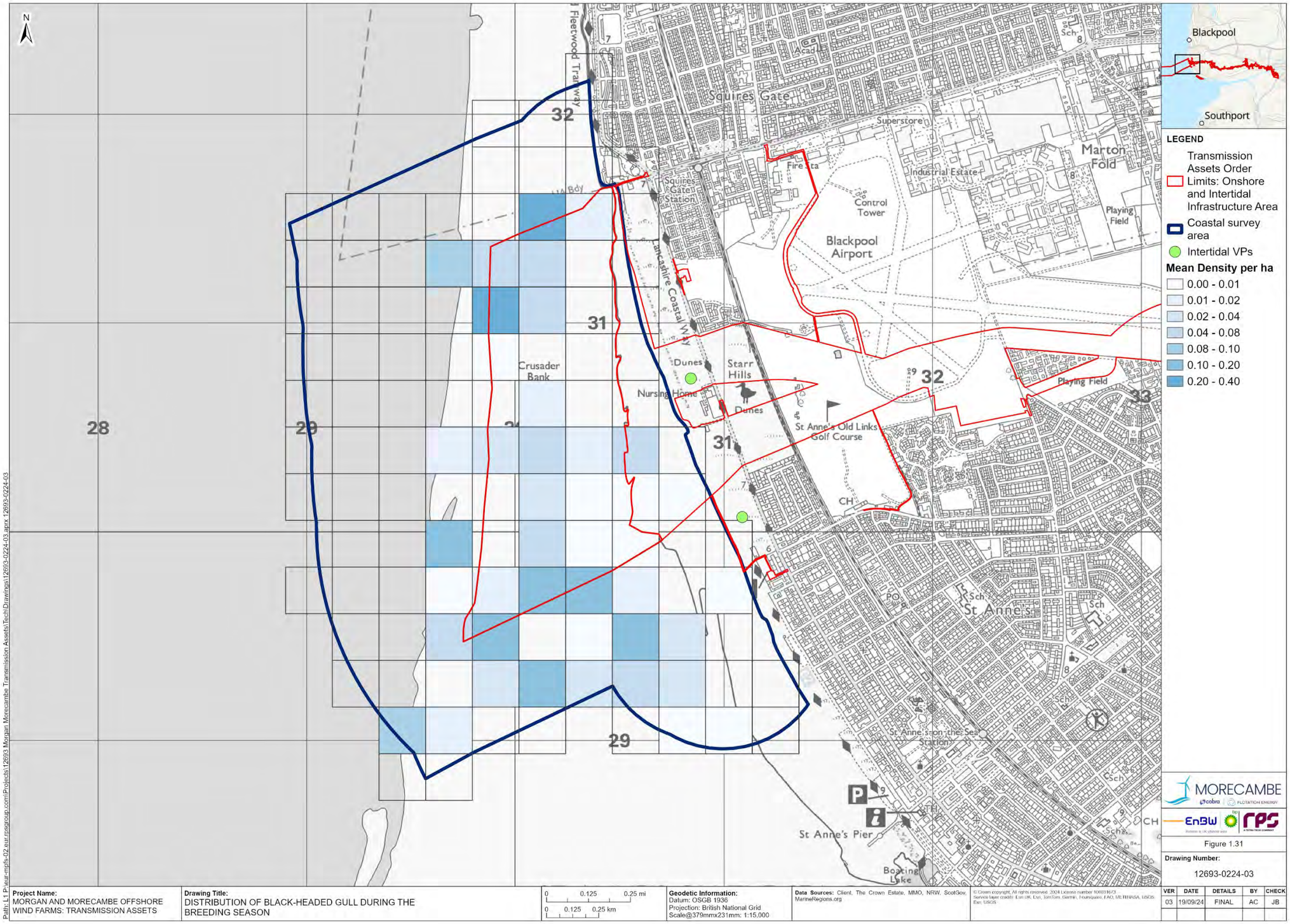


Figure 1.31: Distribution of black-headed gull during the breeding season

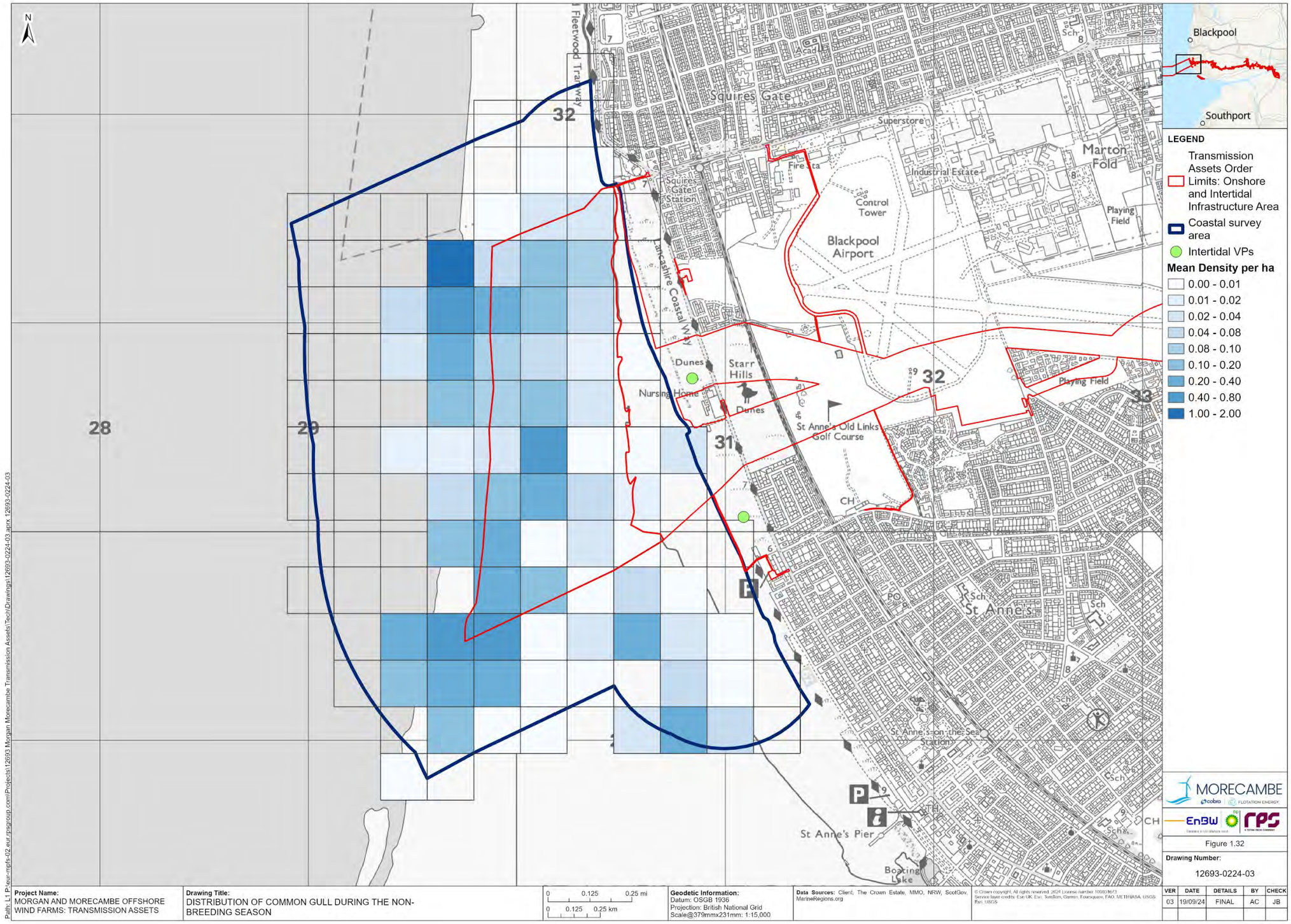


Figure 1.32: Distribution of common gull during the non-breeding season

Figure 1.33: Distribution of common gull during the breeding season

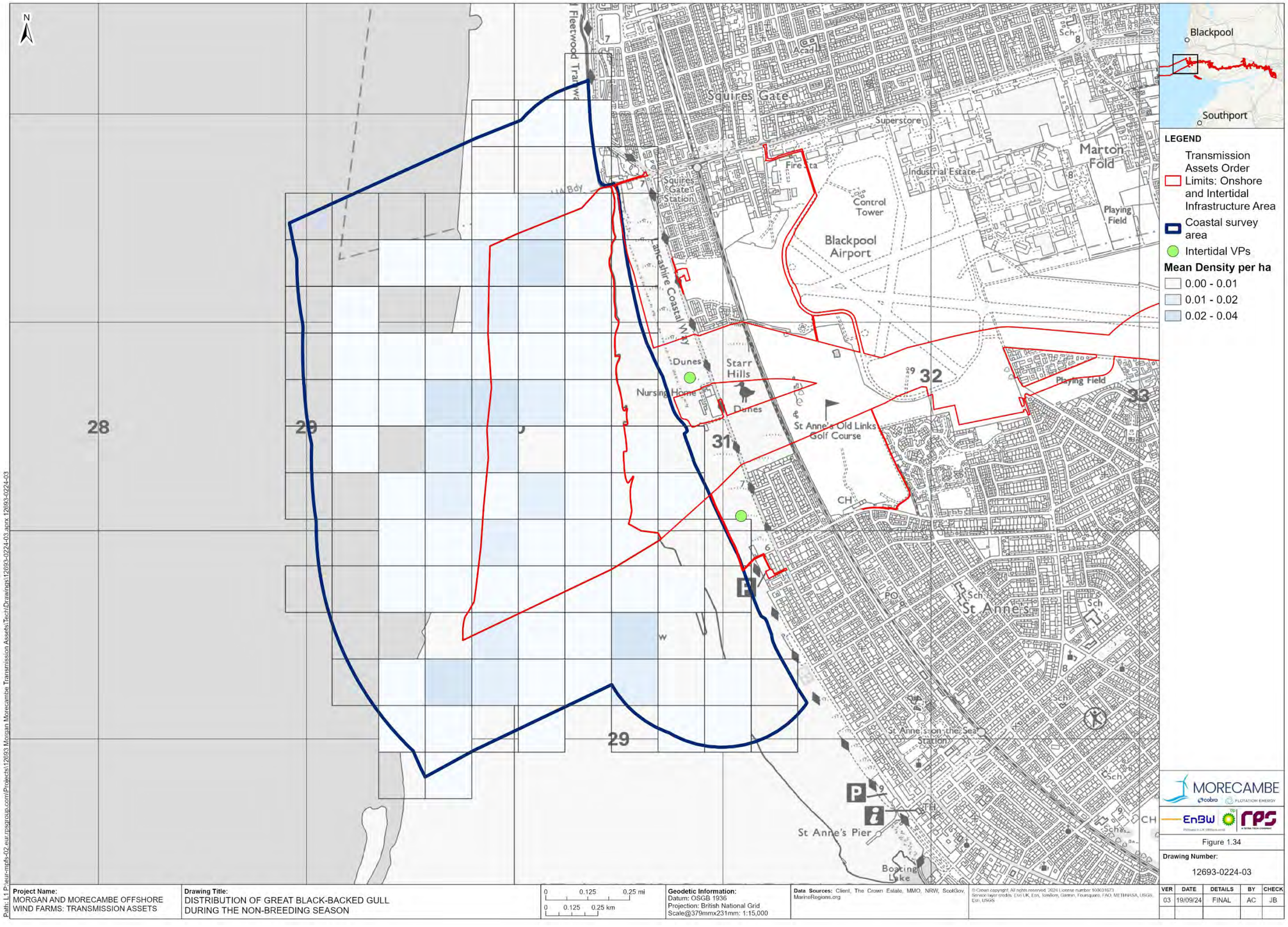


Figure 1.34: Distribution of great black-backed gull during the non-breeding season

Figure 1.35: Distribution of great black-backed gull during the breeding season

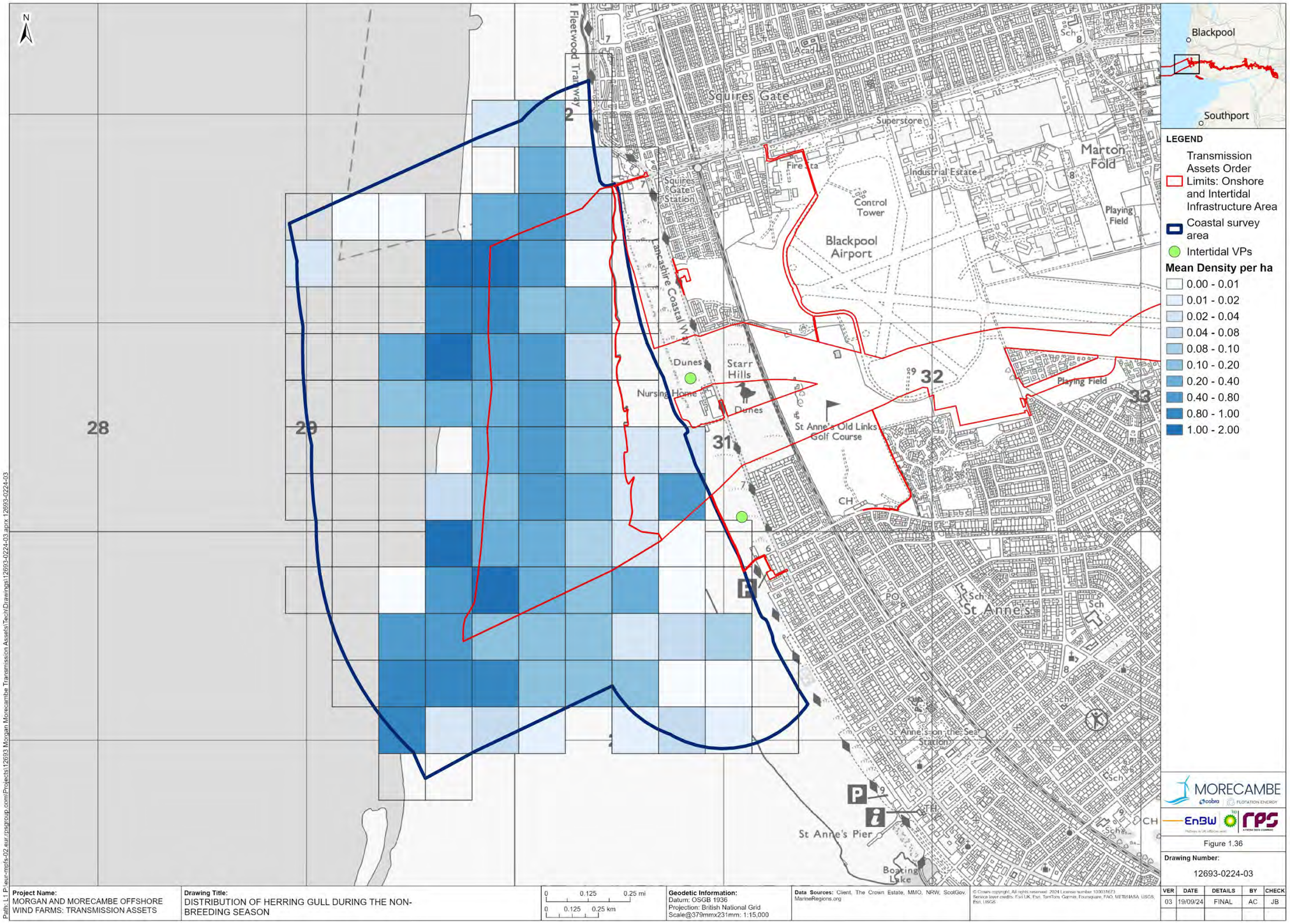


Figure 1.36: Distribution of herring gull during the non-breeding season

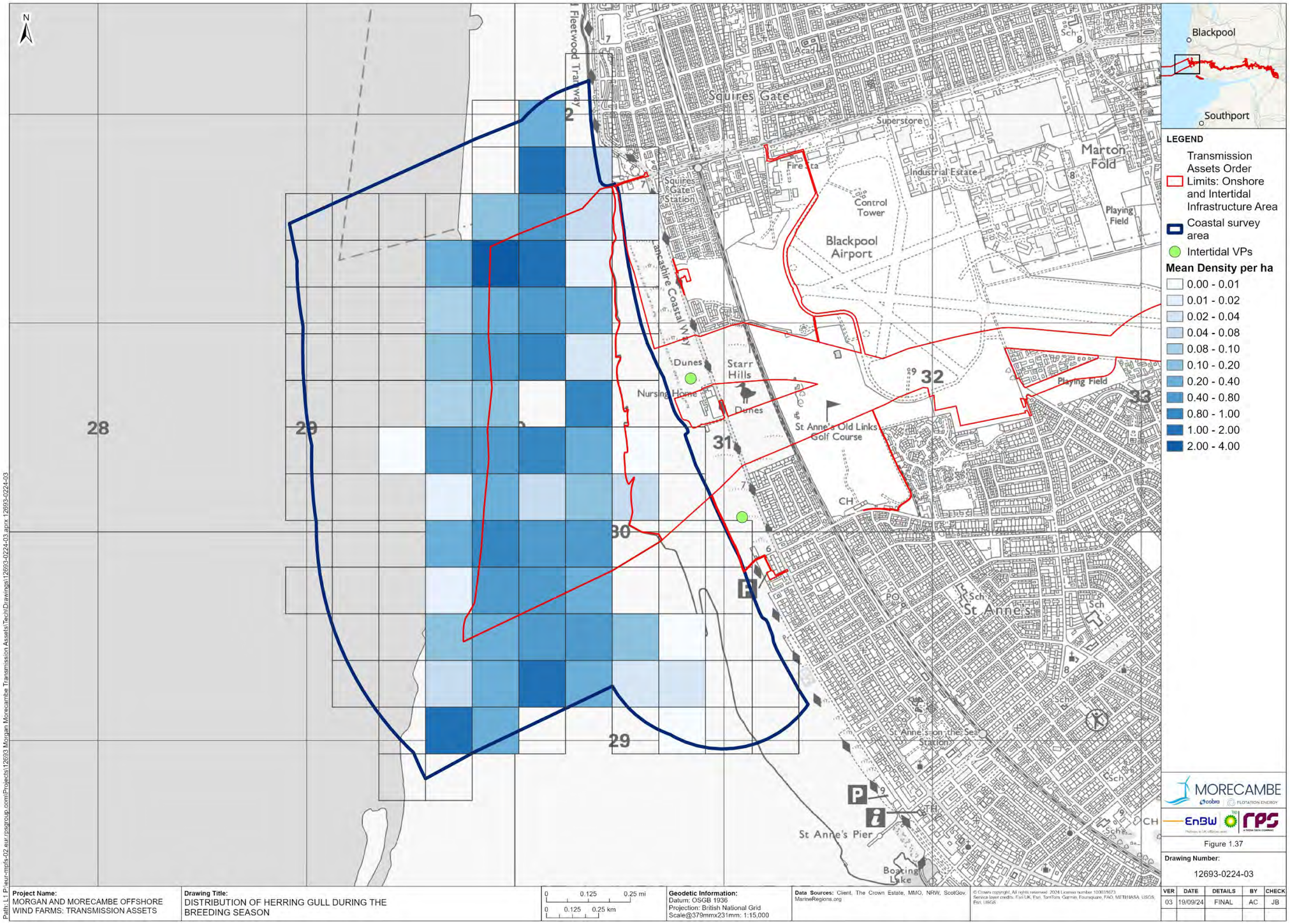


Figure 1.37: Distribution of herring gull during the breeding season

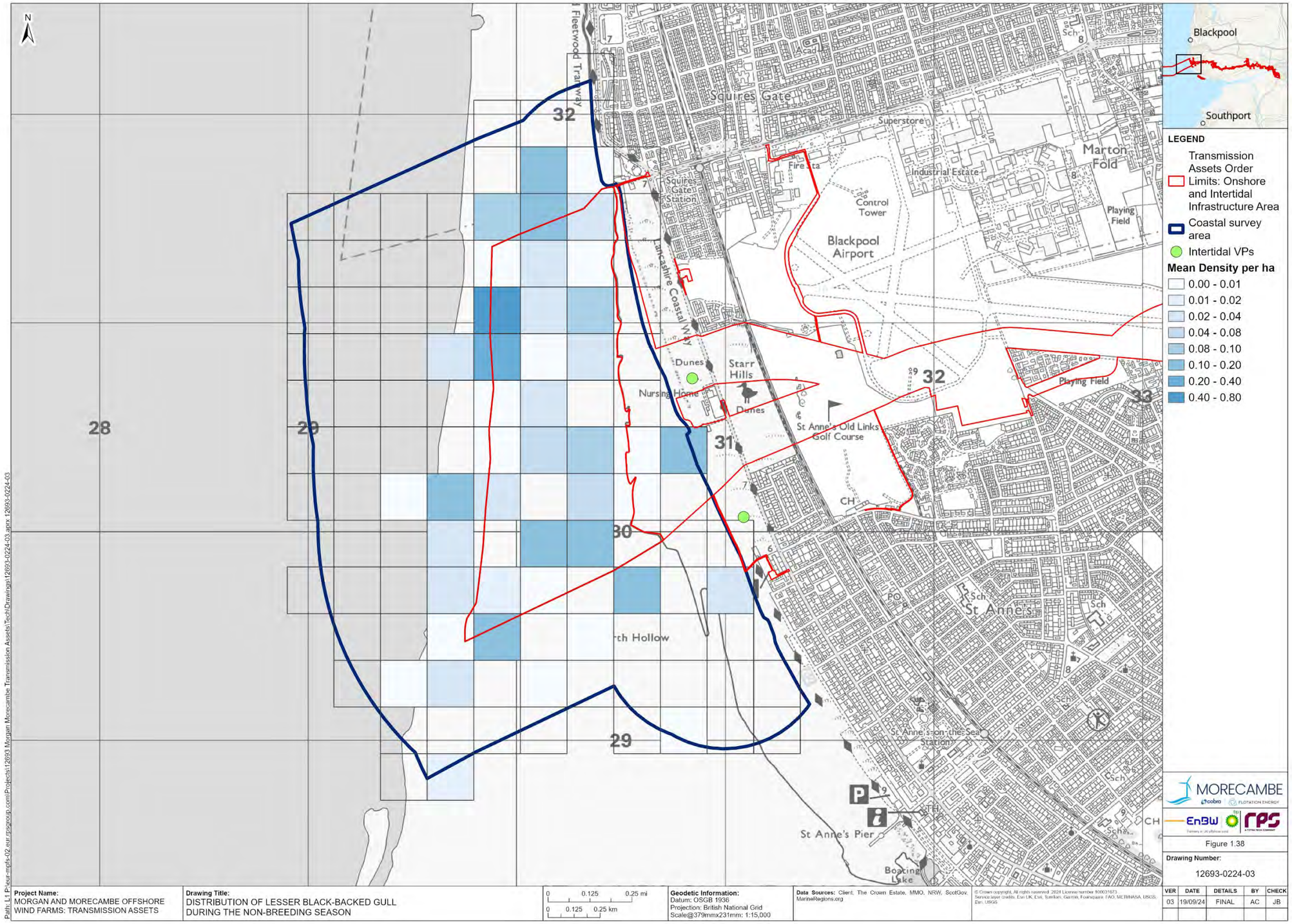


Figure 1.38: Distribution of lesser black-backed gull during the non-breeding season

Figure 1.39: Distribution of lesser black-backed gull during the breeding season

Figure 1.40: Distribution of sandwich tern during the non-breeding season

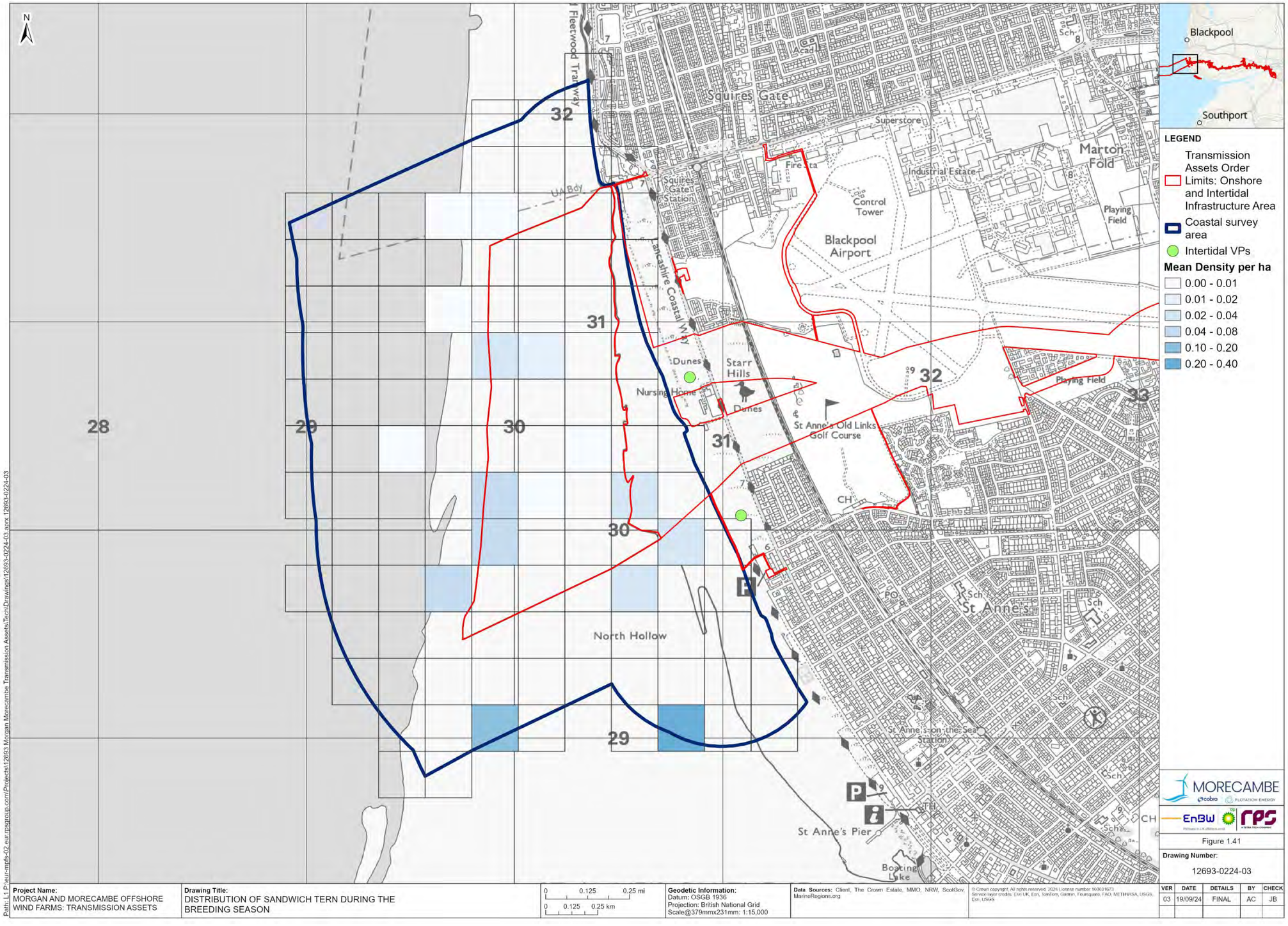


Figure 1.41: Distribution of sandwich tern during the breeding season

Figure 1.42: Distribution of common tern during the non-breeding season

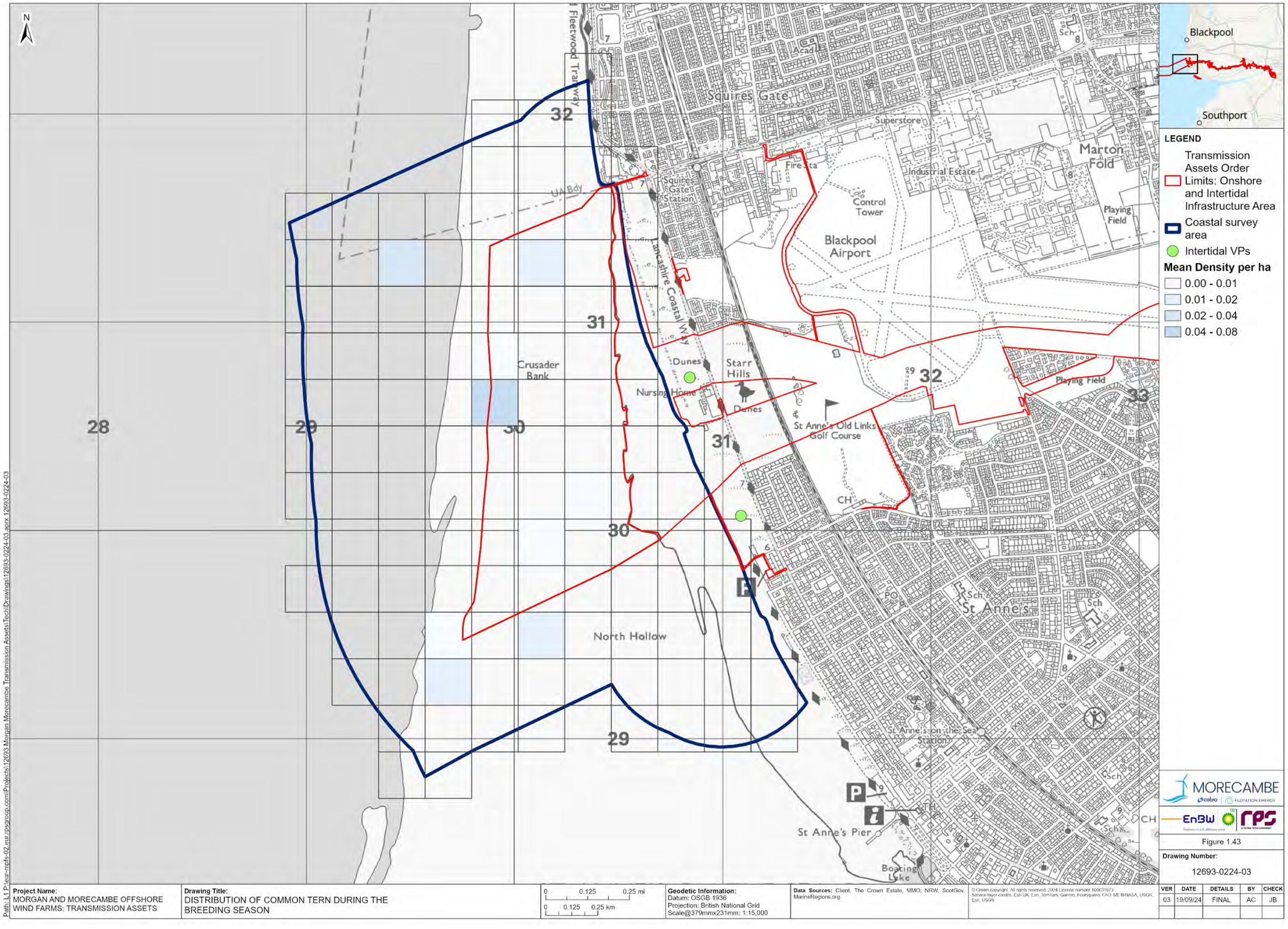


Figure 1.43: Distribution of common tern during the breeding season

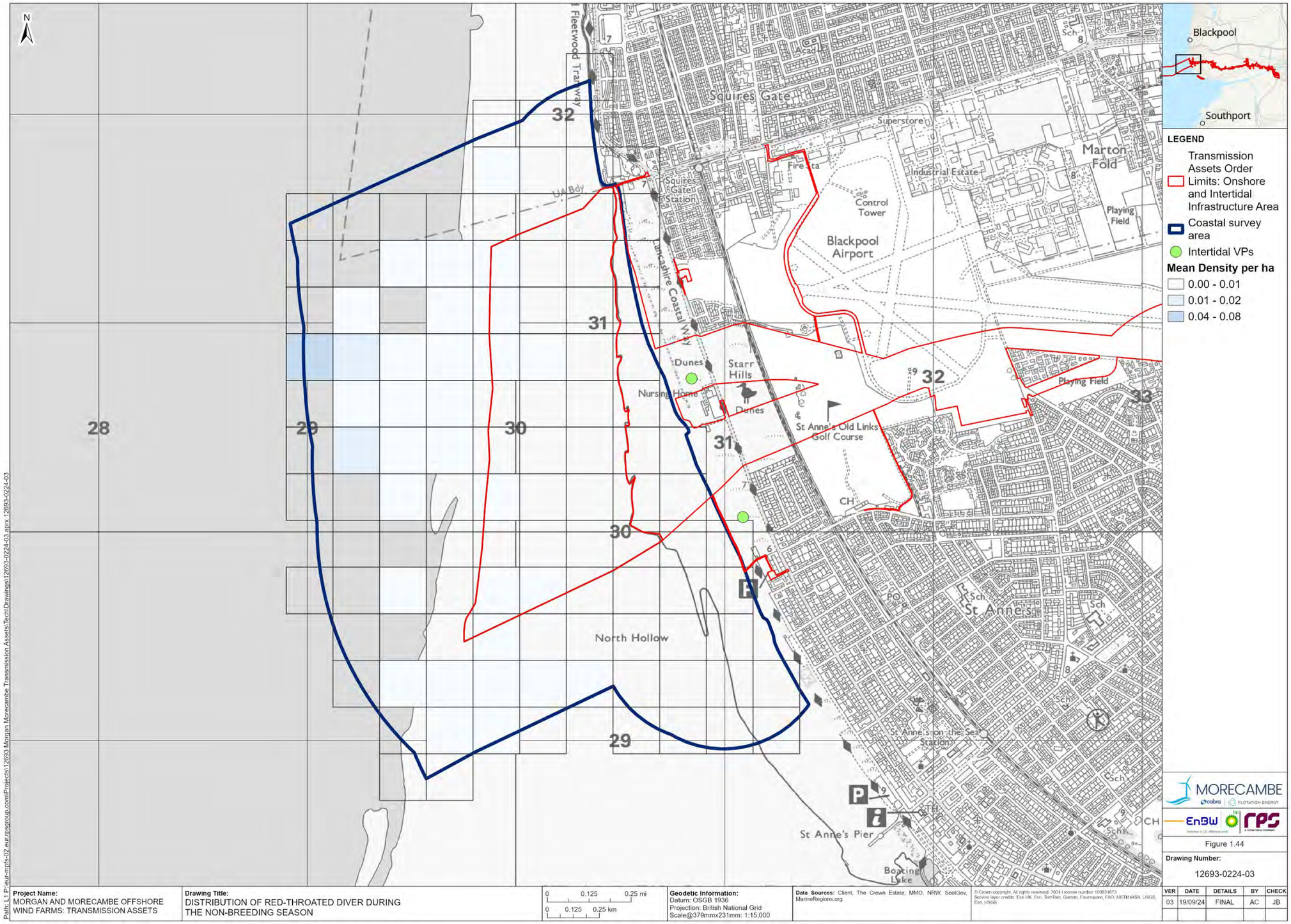
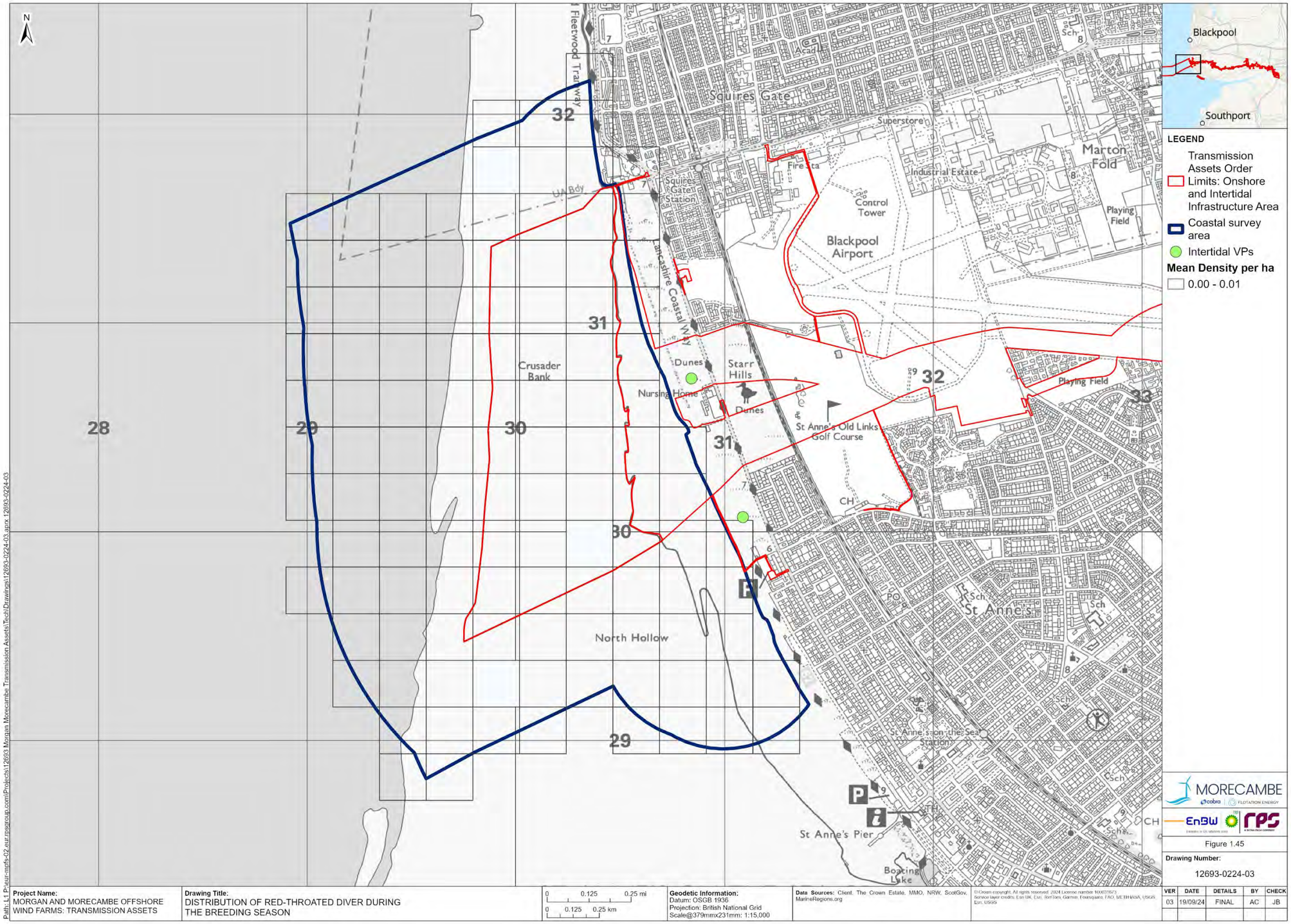


Figure 1.44: Distribution of red-throated diver during the non-breeding season



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Project Name: MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS	**Drawing Title:** DISTRIBUTION OF RED-THROATED DIVER DURING THE BREEDING SEASON	0 0.125 0.25 mi / 0 0.125 0.25 km	**Geodetic Information:** Datum: OSGB 1936 Projection: British National Grid Scale@379mmx231mm: 1:15,000	**Data Sources:** Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org	© Crown copyright. All rights reserved. 2024 License number 100037671 Service layer credits: Esri UK, Esri, HERE, Garmin, FoursSquare, FAO, METI/NASA, USGS, Esri, USGS	Figure 1.45 Drawing Number: 12693-0224-03		

VER	DATE	DETAILS	BY	CHECK
03	19/09/24	FINAL	AC	JB

Figure 1.45: Distribution of red-throated diver during the breeding season

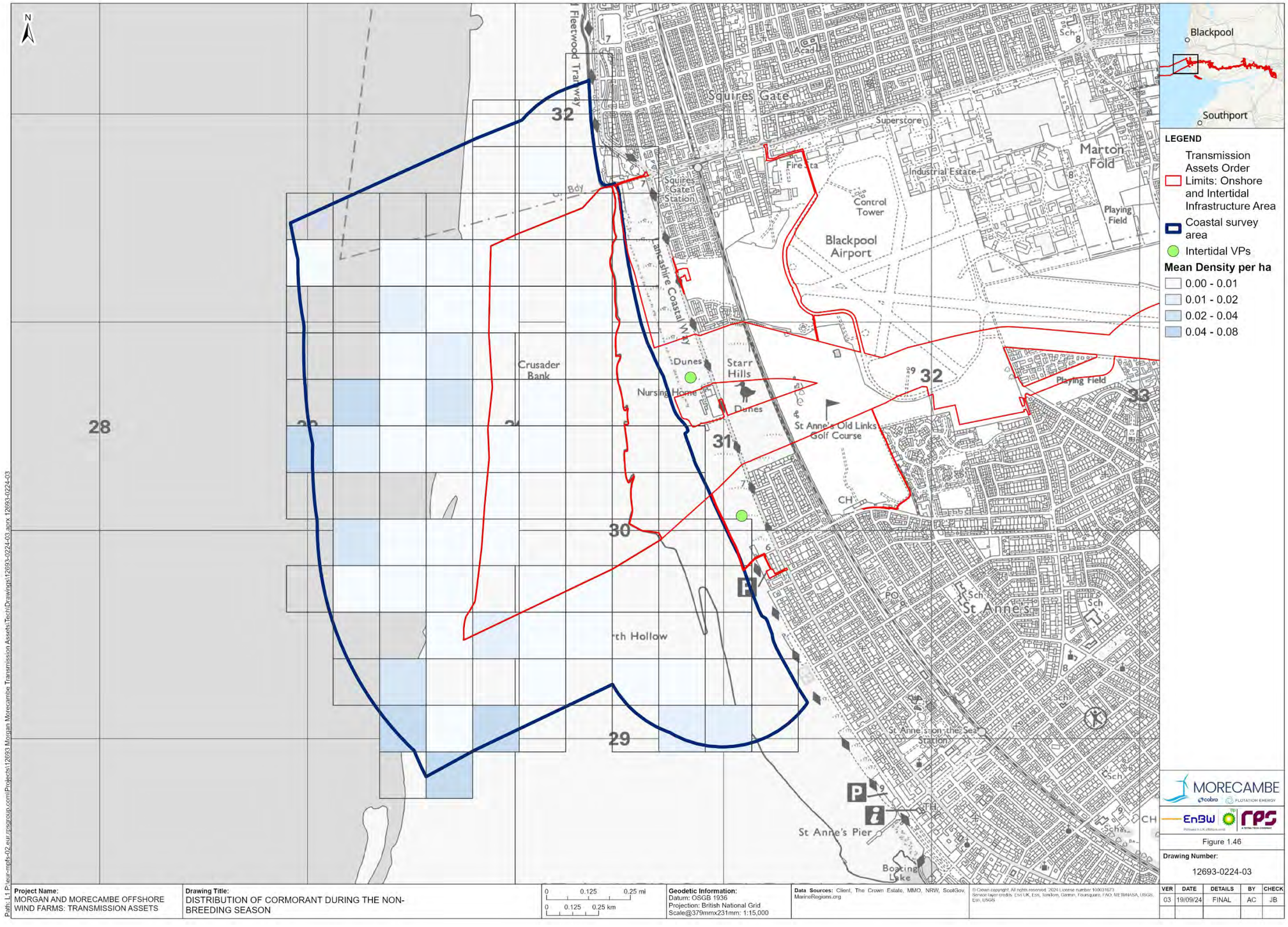


Figure 1.46: Distribution of cormorant during the non-breeding season

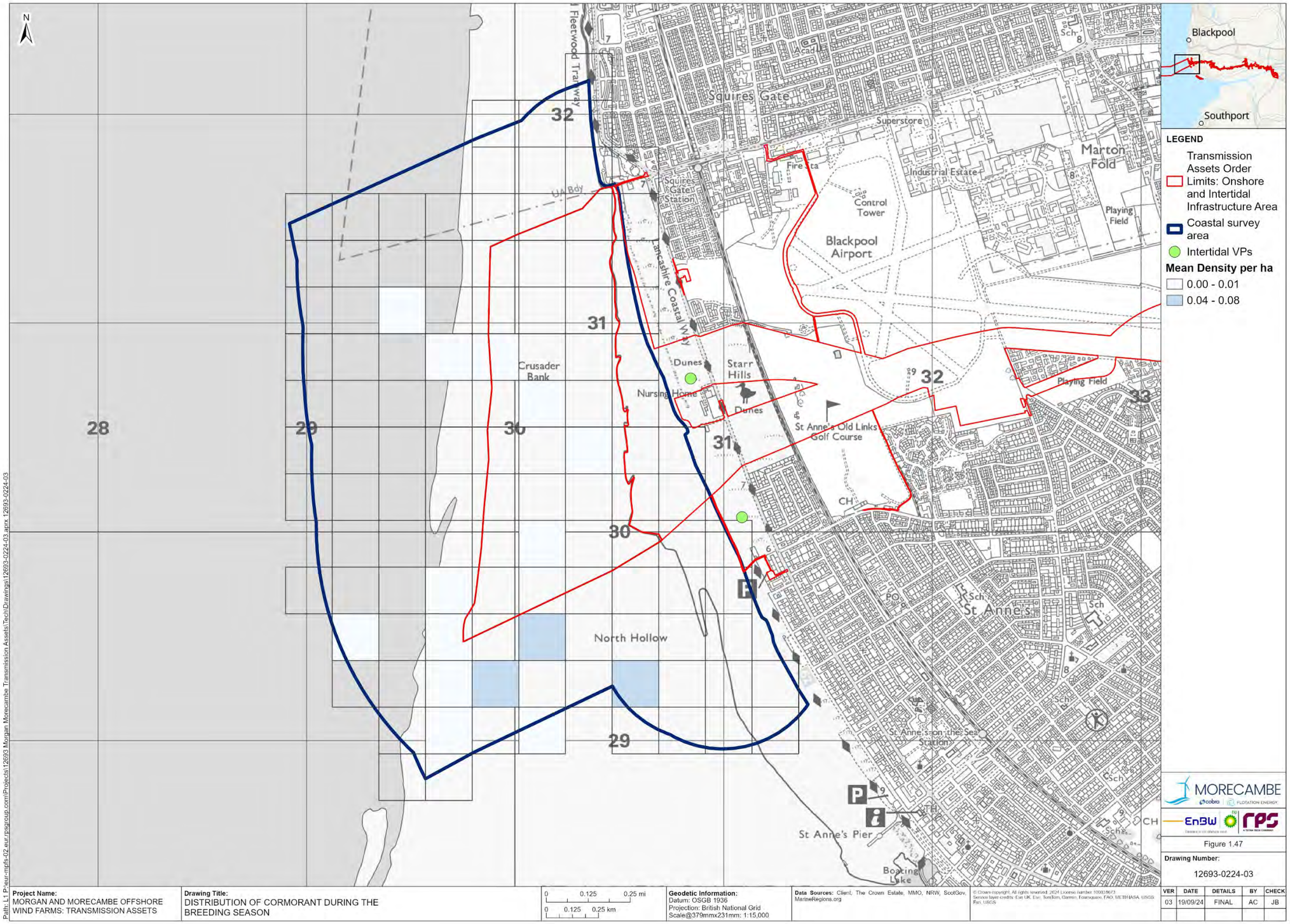


Figure 1.47: Distribution of cormorant during the breeding season

Estuarine survey area results

1.4.5.56 The estuarine survey area supports numbers of lapwing, curlew, oystercatcher, redshank, teal and wigeon in the intertidal habitats and channels alongside moderate numbers of naturalised Canada and greylag goose and large numbers of mallard. The most common gull species were black-headed gull and herring gull, the estuarine survey area was used by low numbers of lesser black-backed gull and common tern during the breeding season. In total there were 33 waterbird species recorded using the area between October 2022 and March 2023 with at least 3,031 individual waterbirds recorded. The annual abundance of waterbird species recorded during the surveys of the estuarine survey area is provided in **Table 1.14**.

Geese, ducks and swans

1.4.5.57 Several species of goose, duck and swan were observed in the estuarine survey area (**Table 1.14**).

1.4.5.58 Canada goose *Branta canadensis* were present during most months but more abundant during the non-breeding season with a peak of 282 (**Diagram 1.21**). They were distributed along the estuarine survey area during both seasons with higher concentrations found towards the west (**Figure 1.48** and **Figure 1.49**).

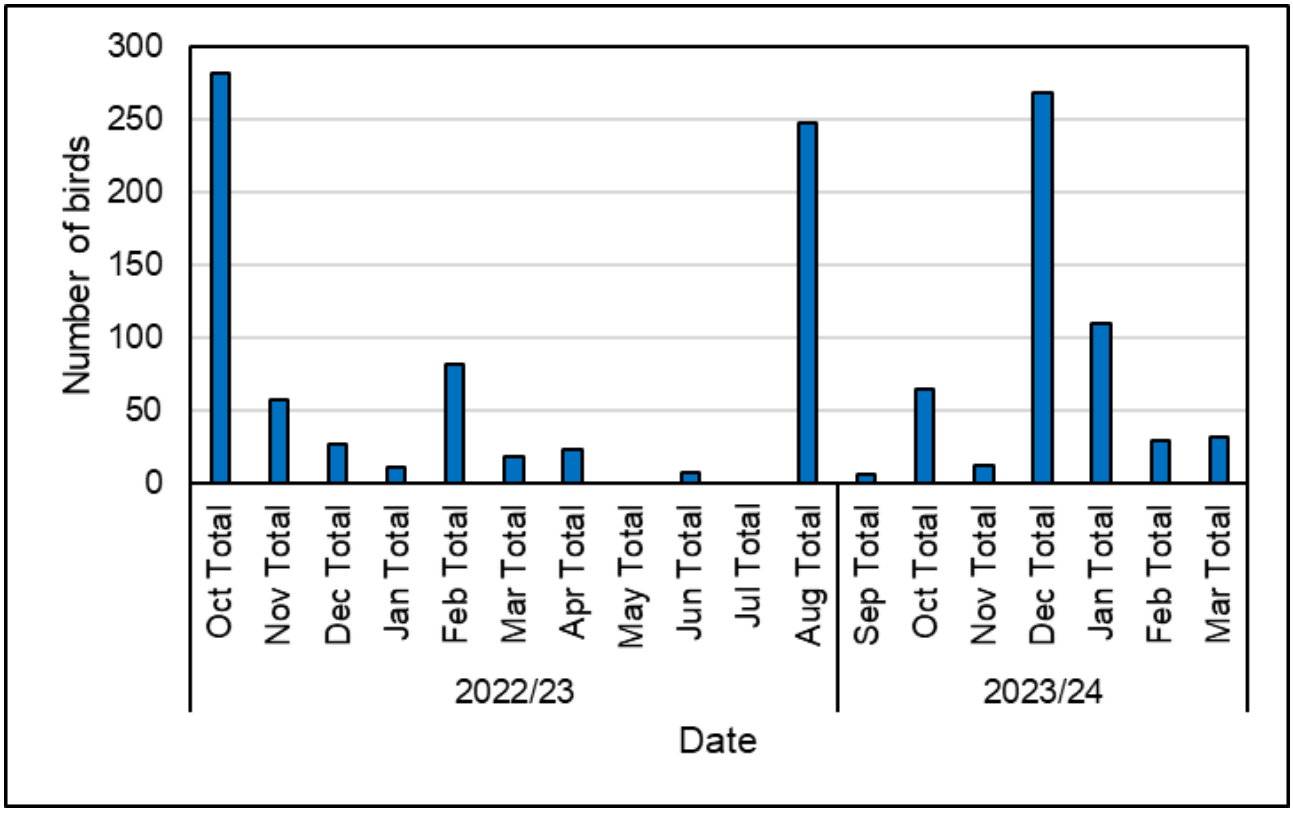


Diagram 1.21: Monthly peak maximum counts of Canada goose

Greylag goose *Anas anas* were also abundant (peak of 84) although in lower numbers than Canada (**Diagram 1.22**). They followed similar distribution patterns to

the Canada goose (**Figure 1.50** and **Figure 1.51**) another species of naturalised goose are of low conservation concern.

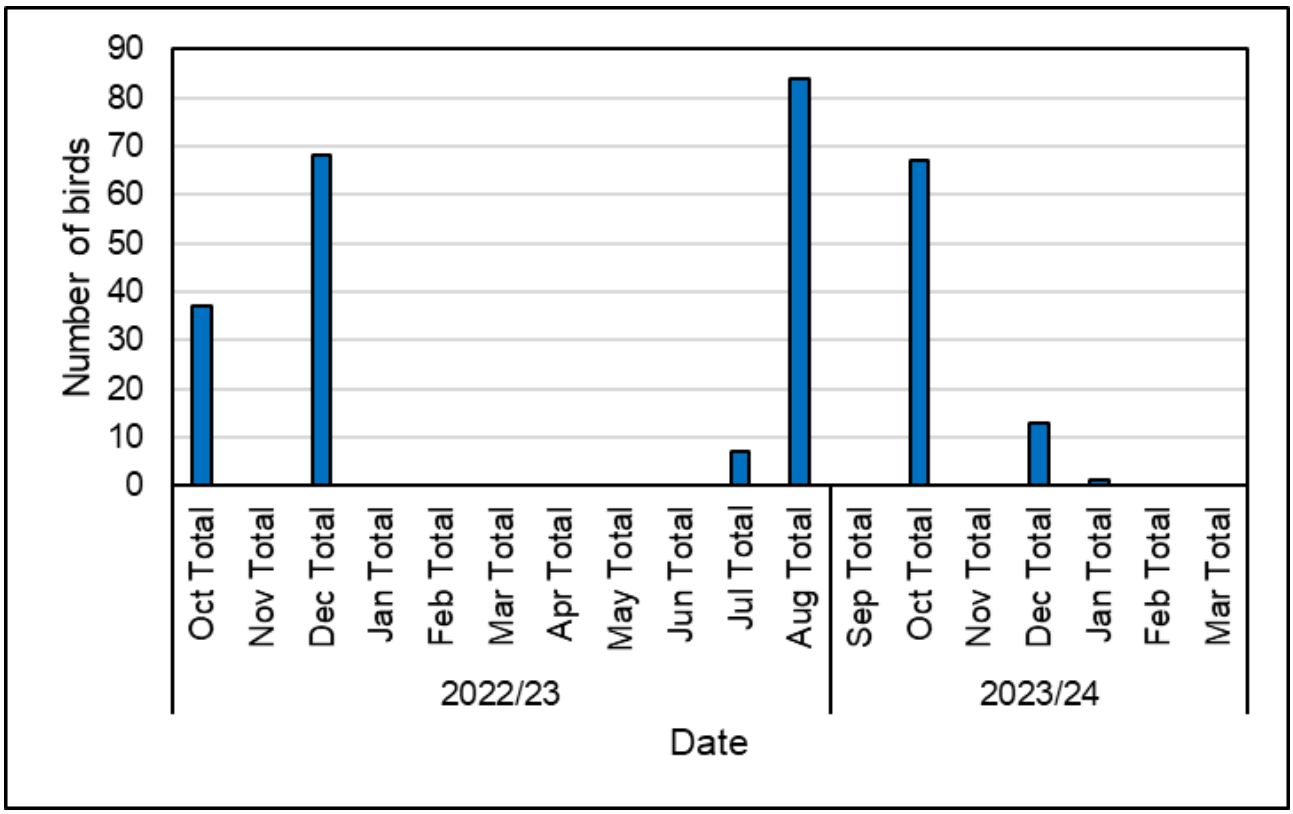


Diagram 1.22: Monthly peak maximum counts of greylag goose

1.4.5.59 Whooper swan (a Ribble and Alt SPA designated feature) were only recorded within the estuarine survey area once during the survey period with a count of 30 birds (**Diagram 1.23**) and this was during the non-breeding season (**Figure 1.52**). This species breeds further north but is found in the area during the wintering period. During this period, it roosts on the saltmarsh and feeds on local arable and pasture farmland.

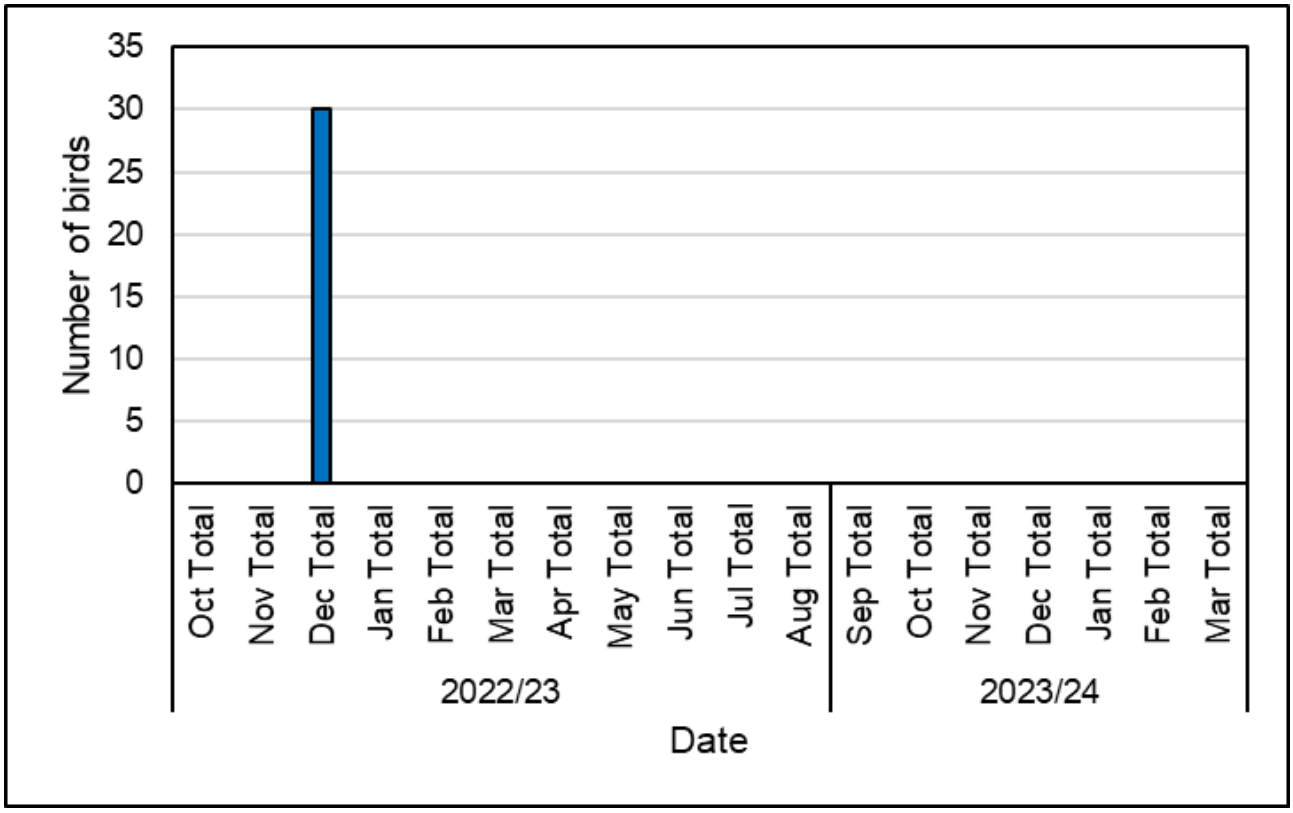


Diagram 1.23: Monthly peak maximum counts of whooper swan

1.4.5.60 During the 2022/23 winter and throughout the breeding season, shelduck were found in relatively low numbers (**Diagram 1.24**). However, there was a large influx of birds (66) during February 2024. Shelduck were distributed all along the river corridor in the estuarine survey area during both the breeding and non-breeding seasons (**Figure 1.53** and **Figure 1.54**).

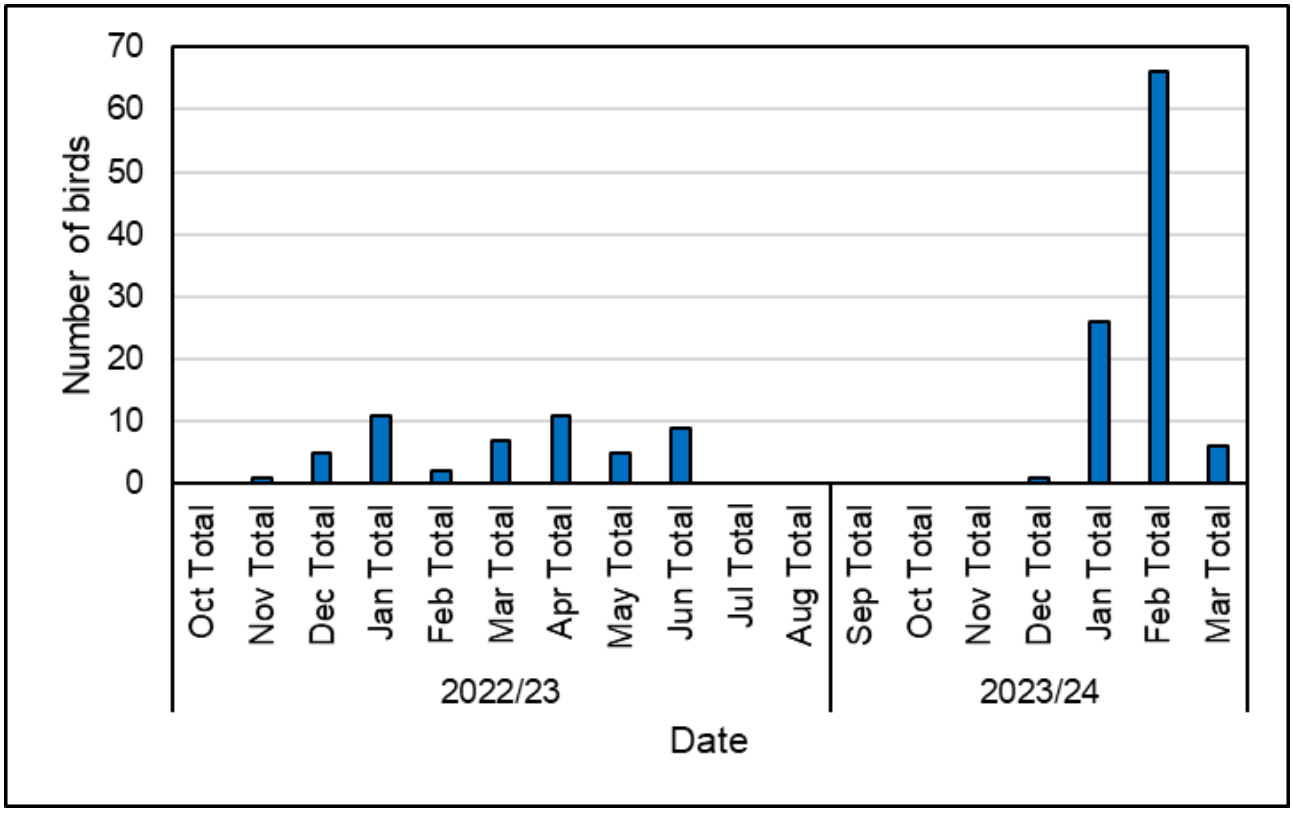


Diagram 1.24: Monthly peak maximum counts of shelduck

1.4.5.61 Large numbers of wigeon were observed in the channel within the estuarine survey area, predominantly loafing. Wigeon leave the river channel at night and graze on the nearby grasslands. Wigeon were primarily present during the non-breeding season with peaks of 822 in 2022/23 and 670 in 2023/24 (**Diagram 1.25**), with only low numbers found by April (**Figure 1.56**). During the non-breeding season, they were present in higher densities further to the west (**Figure 1.55**).

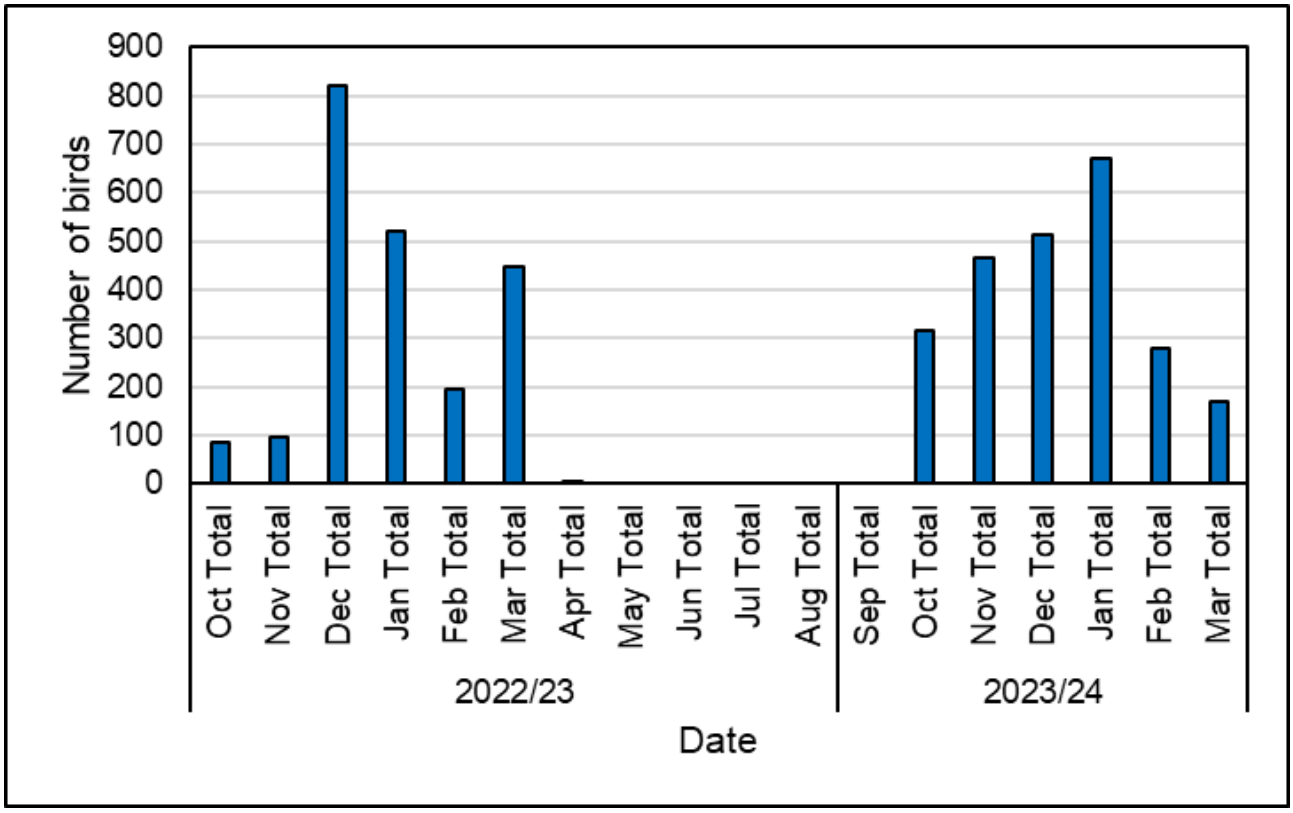


Diagram 1.25: Monthly peak maximum counts of wigeon

1.4.5.62 Mallard were present throughout the estuarine survey area (**Figure 1.57** and **Figure 1.58**) and during both seasons although they were more abundant during the non-breeding season (**Diagram 1.26**) with a peak of 88.

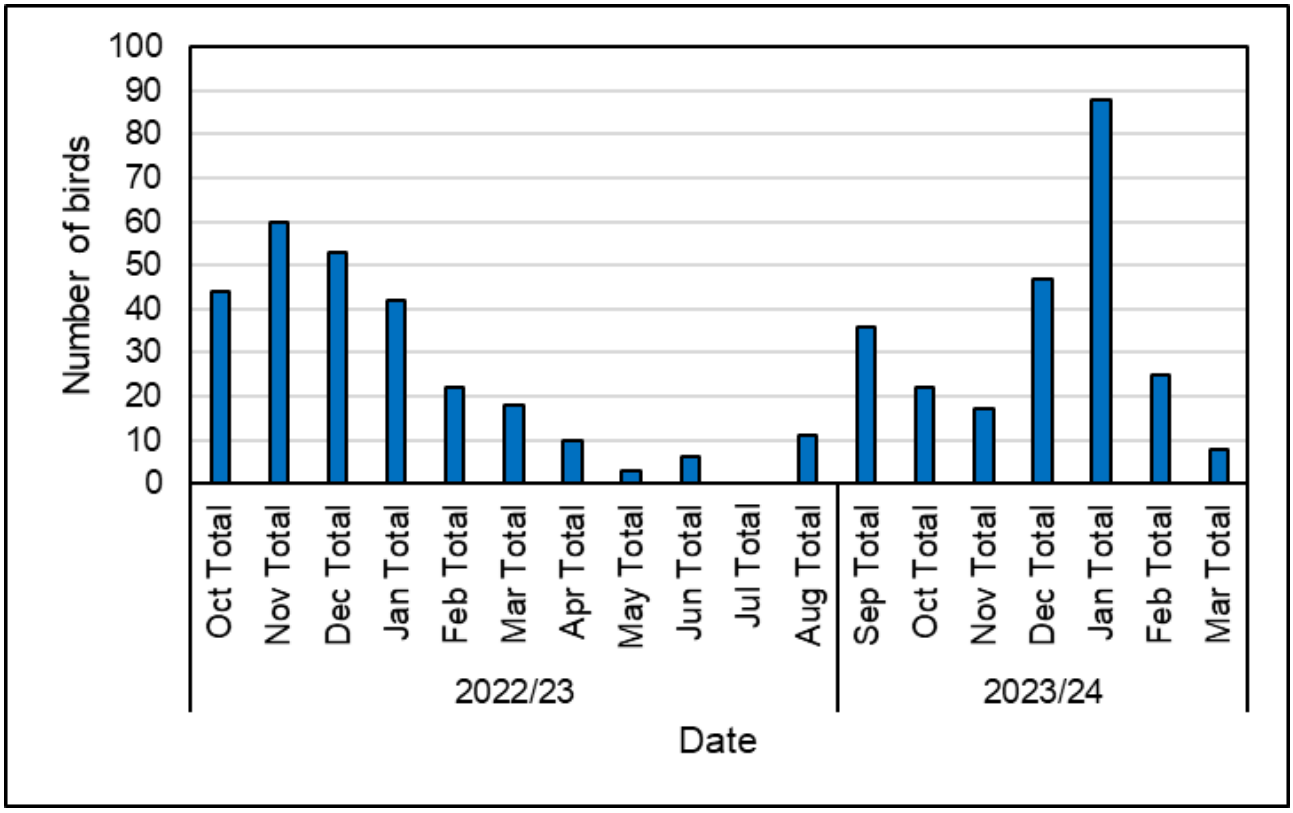


Diagram 1.26: Monthly peak maximum counts of mallard

1.4.5.63 Teal were present in high numbers as well (albeit lower than wigeon) with peaks of 275 in 2022/23 and 167 in 2023/24. They were also seasonally present in a similar manner to the wigeon (**Diagram 1.27**) with birds using the area for overwintering and returning to their breeding grounds, generally on lakes and ponds and often in upland areas. Like wigeon, teal were present in low numbers during the breeding season (**Figure 1.60**) but were well distributed with a preference for the western end of the estuarine survey area during the non-breeding season (**Figure 1.59**).

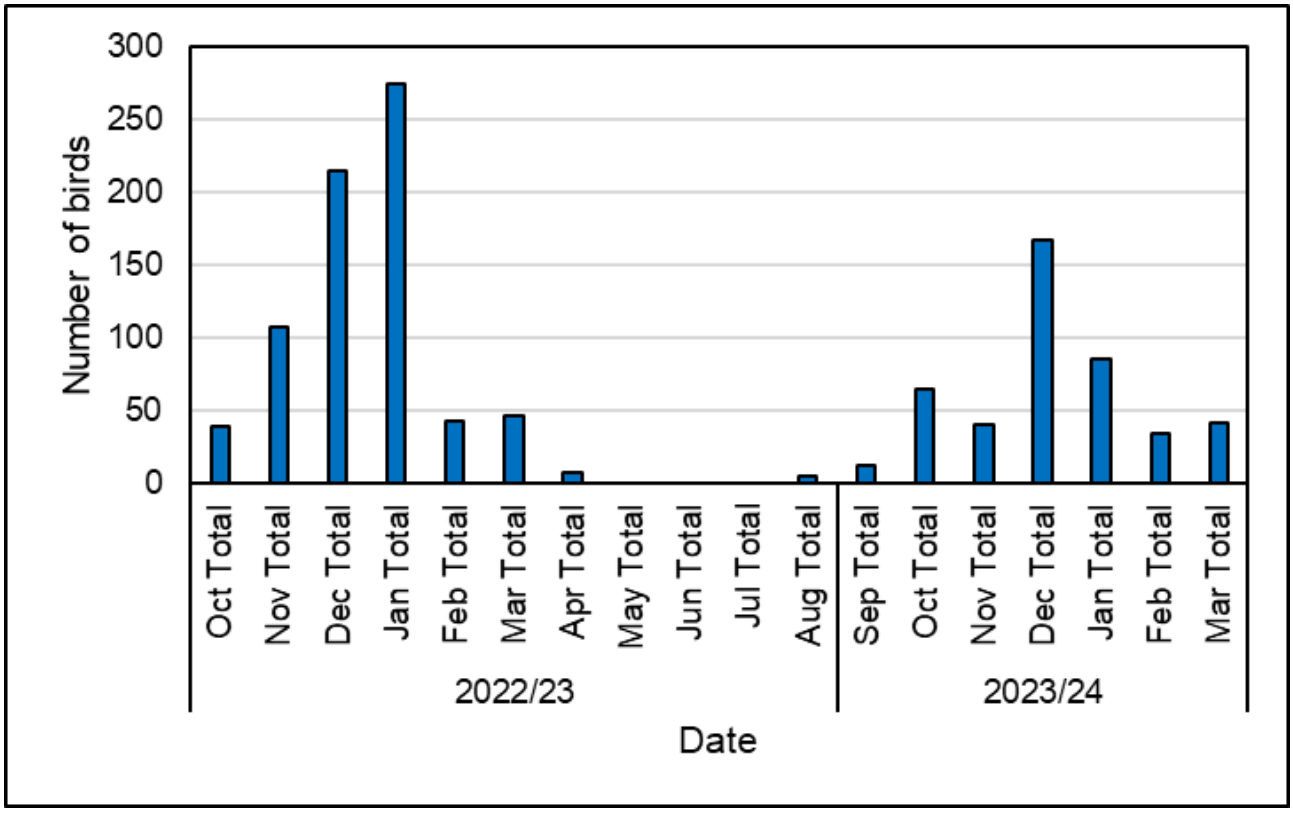


Diagram 1.27: Monthly peak maximum counts of teal

1.4.5.64 Goosander were present in the estuarine survey area predominantly during the non-breeding season with a peak of nine, although with one bird seen during June (**Diagram 1.28**). During the non-breeding season, they were distributed throughout the survey area with sporadic records during the breeding season (**Figure 1.61** and **Figure 1.62**).

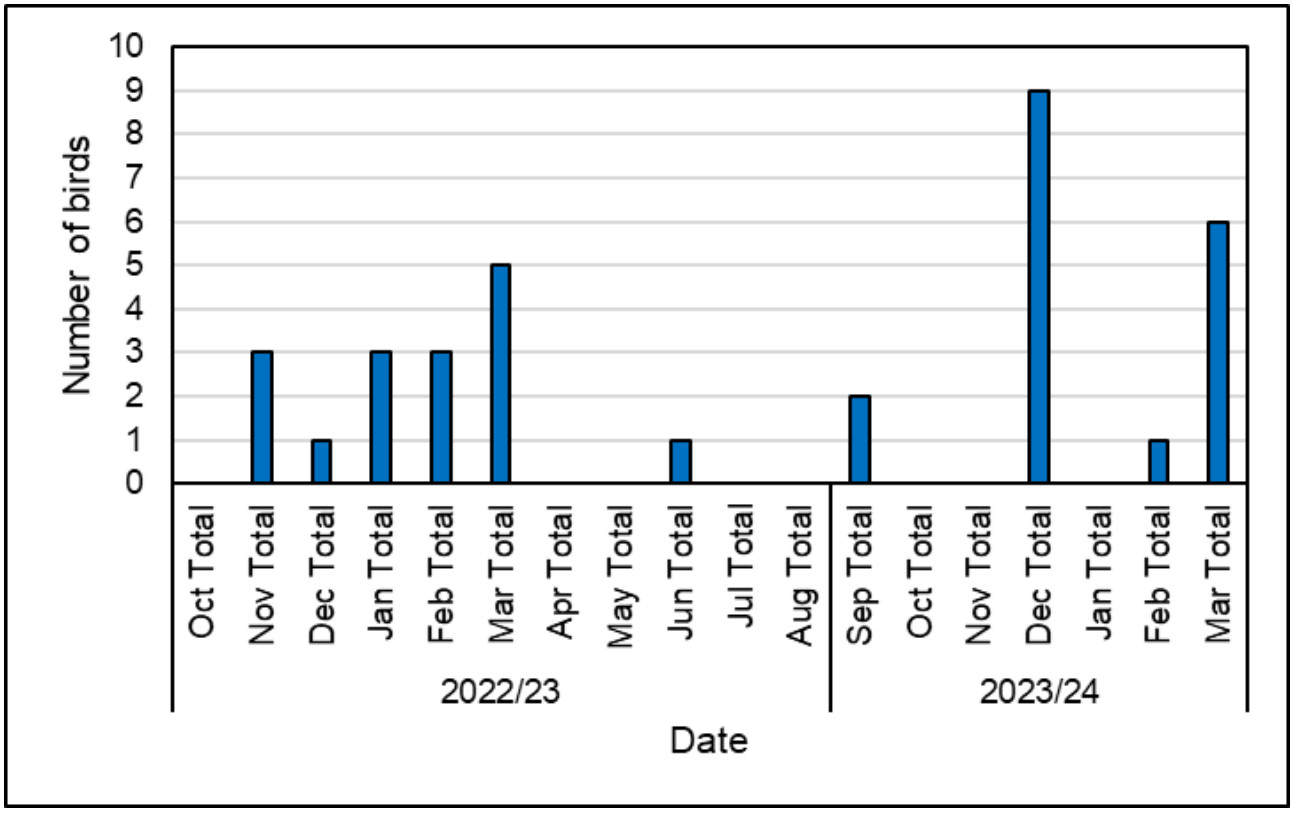


Diagram 1.28: Monthly peak maximum counts of goosander

Waders

1.4.5.65 A total of 12 wader species were recorded within the estuarine survey area (**Table 1.14**) with the birds found predominantly on the intertidal habitats.

1.4.5.66 Oystercatcher were sporadically present within the estuarine survey area with records in the core wintering and passage seasons although the peak of 54 was recorded during the core wintering period in 2022/23 (**Diagram 1.29**). Individuals were distributed across the estuarine survey area with some preference for the western end (**Figure 1.63** and **Figure 1.64**).

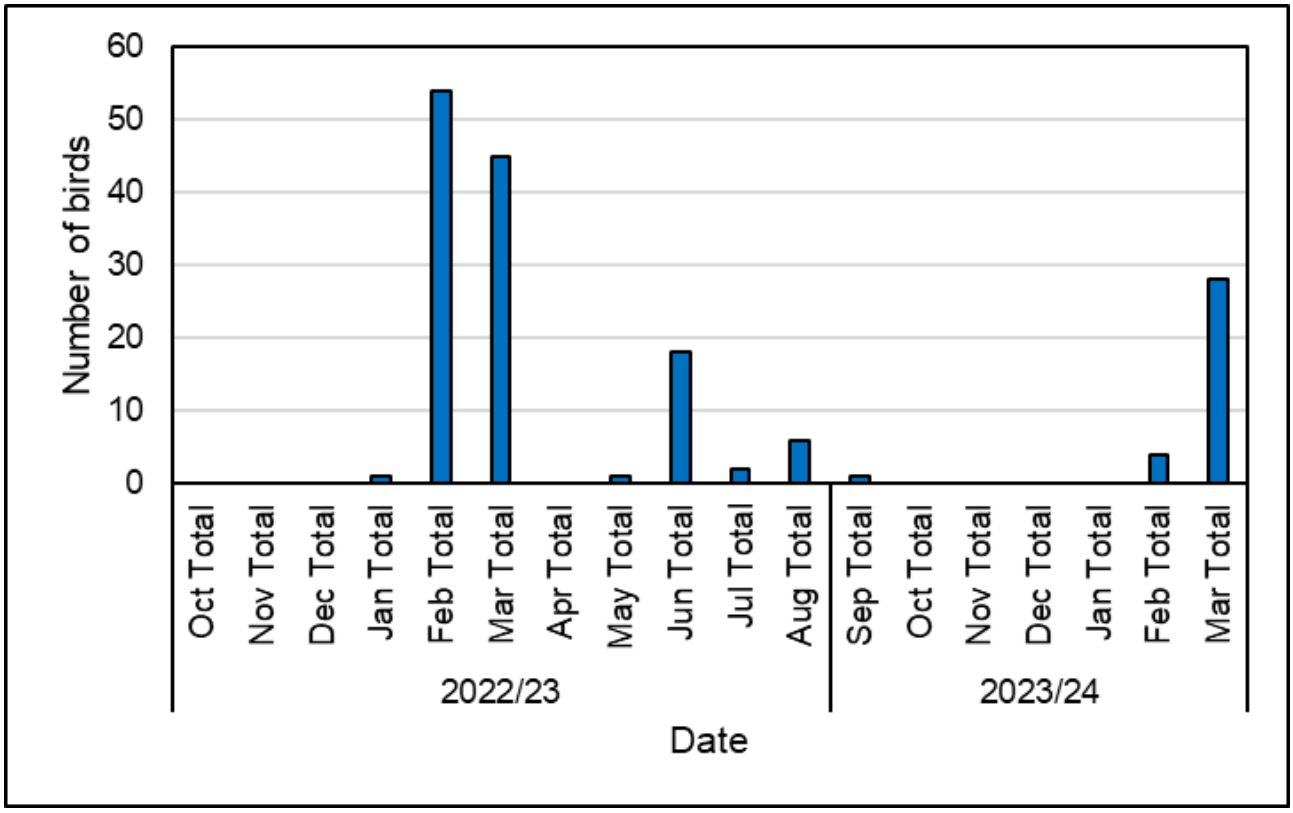


Diagram 1.29: Monthly peak counts of oystercatcher

1.4.5.67 Lapwing were present within the estuarine survey area across the core wintering and passage seasons however monthly peak counts were greatest during the 2022/23 core wintering period with 444 when compared to the 2023/24 passage and core wintering seasons (**Diagram 1.30**) peak 82. Lapwing were primarily distributed towards the western side of the estuarine survey area in both the core wintering and passage seasons (**Figure 1.65** and **Figure 1.66**).

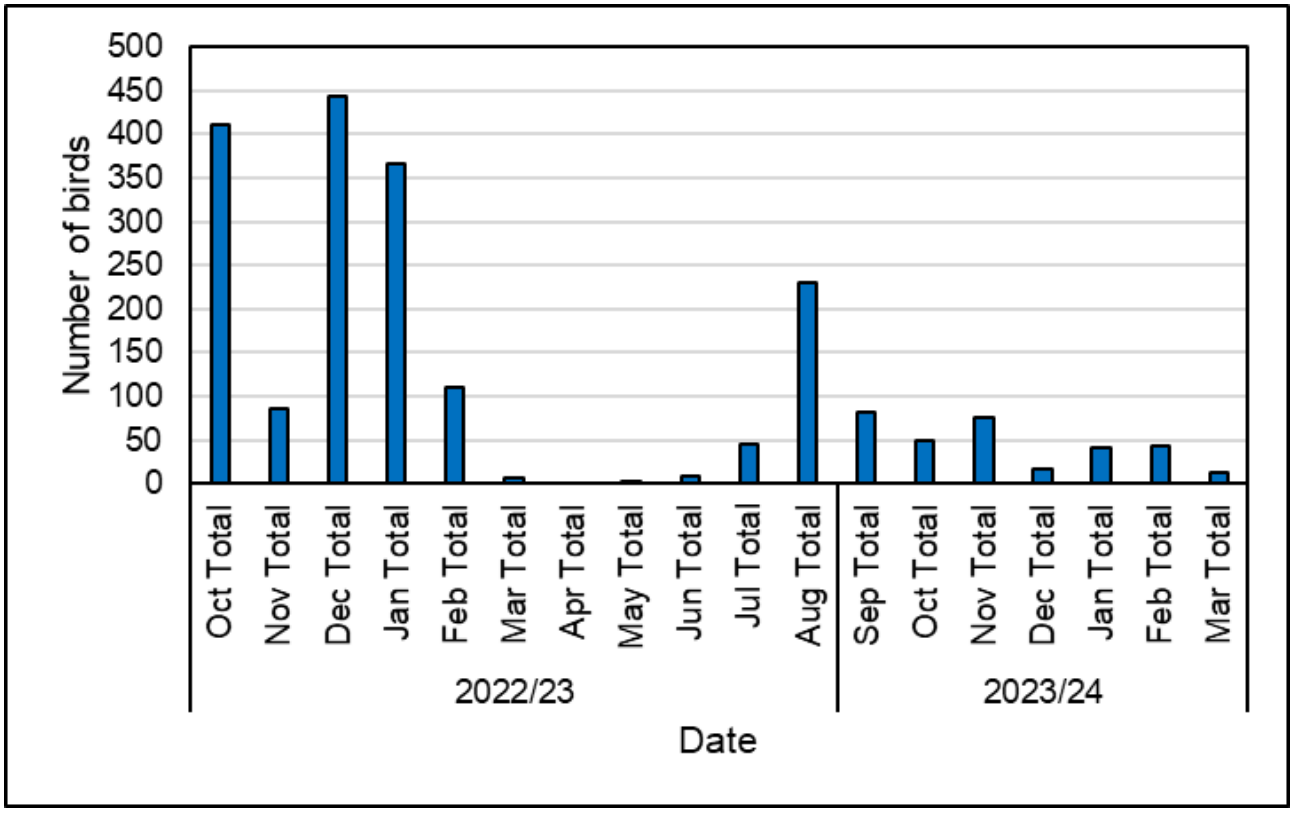


Diagram 1.30: Monthly peak maximum counts of lapwing

1.4.5.68 Grey plover were only recorded during the core wintering season in 2022 in low numbers, the monthly peak count being two individuals (**Diagram 1.31**). The species was recorded towards the western end of the estuarine survey area (**Figure 1.65** and **Figure 1.66**).

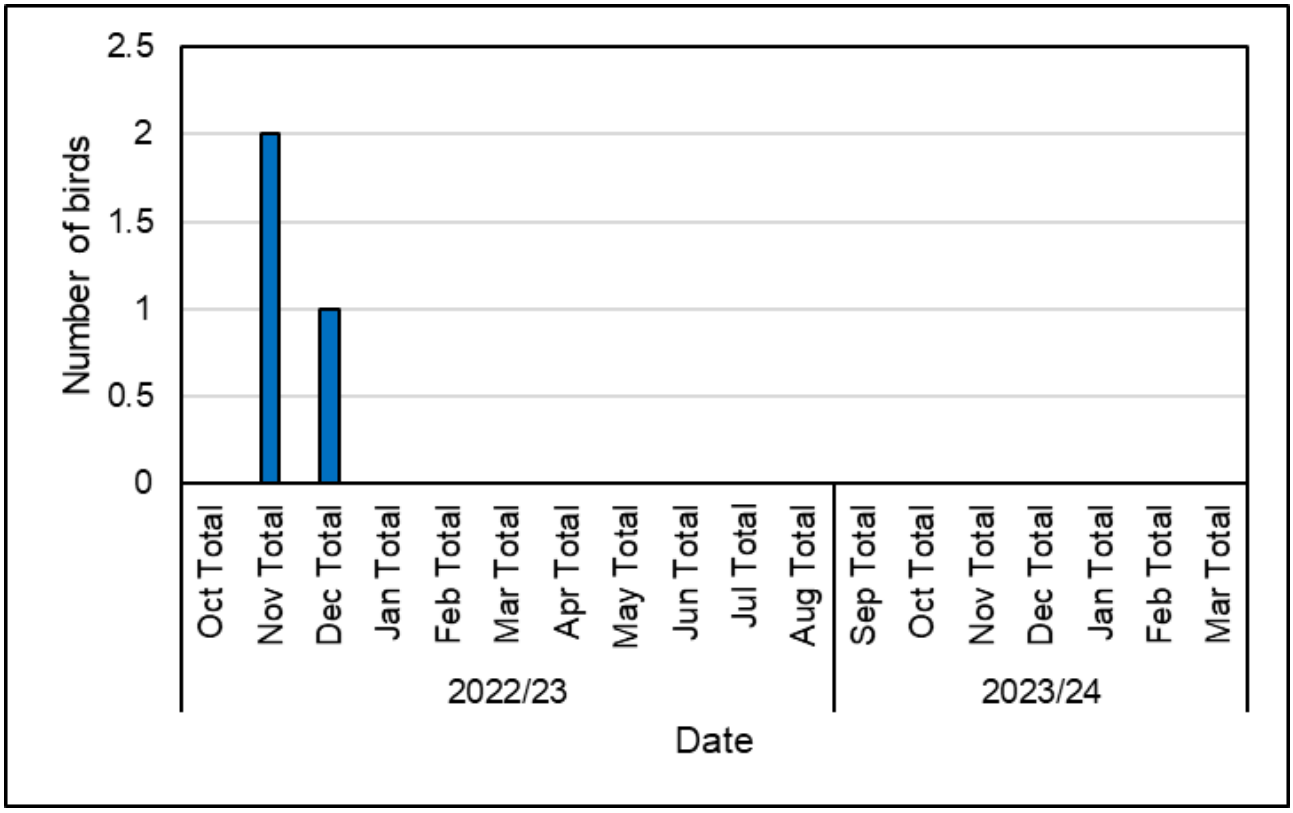


Diagram 1.31: Monthly peak maximum counts of grey plover

1.4.5.69 Curlew were recorded in varying numbers throughout the passage and core wintering seasons. The peak monthly count of 24 occurred early in the 2022/23 core wintering season (**Figure 1.33**) however the next highest count, 19 individuals, occurred in the passage season during August 2023 indicating usage of the estuarine survey area throughout the year. A low density of birds was recorded across the estuarine survey area during the core wintering period (**Figure 1.68**) with slightly higher densities occurring towards the western end of the estuarine survey area. During the passage period (**Figure 1.69**) this preference for the western end was also identified.

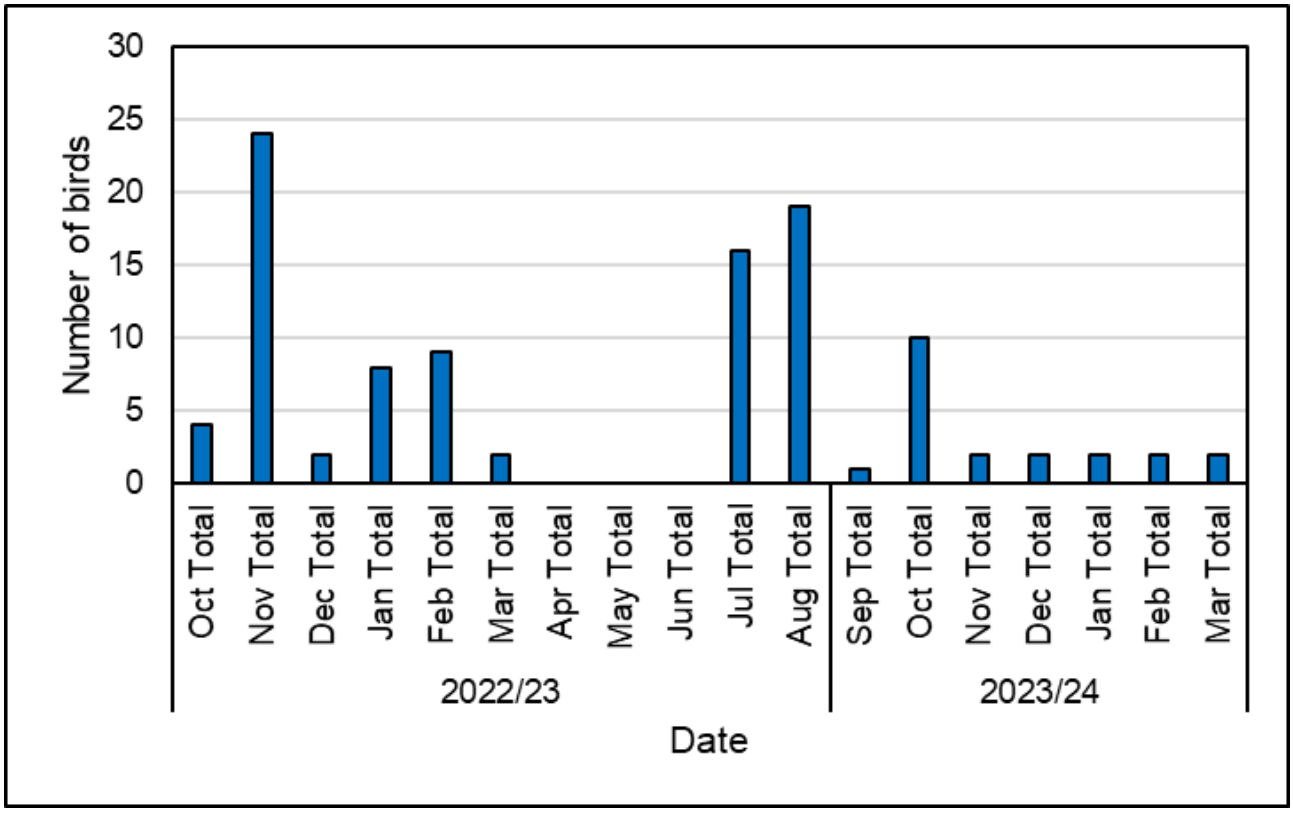


Diagram 1.32: Monthly peak counts of curlew

1.4.5.70 Black-tailed godwit were only recorded within the estuarine survey area once (**Diagram 1.33**) and in relatively low numbers of 14 birds (in comparison with the current Ribble and Alt SPA population). They were sighted on the north bank towards the west of the survey area (**Figure 1.70**).

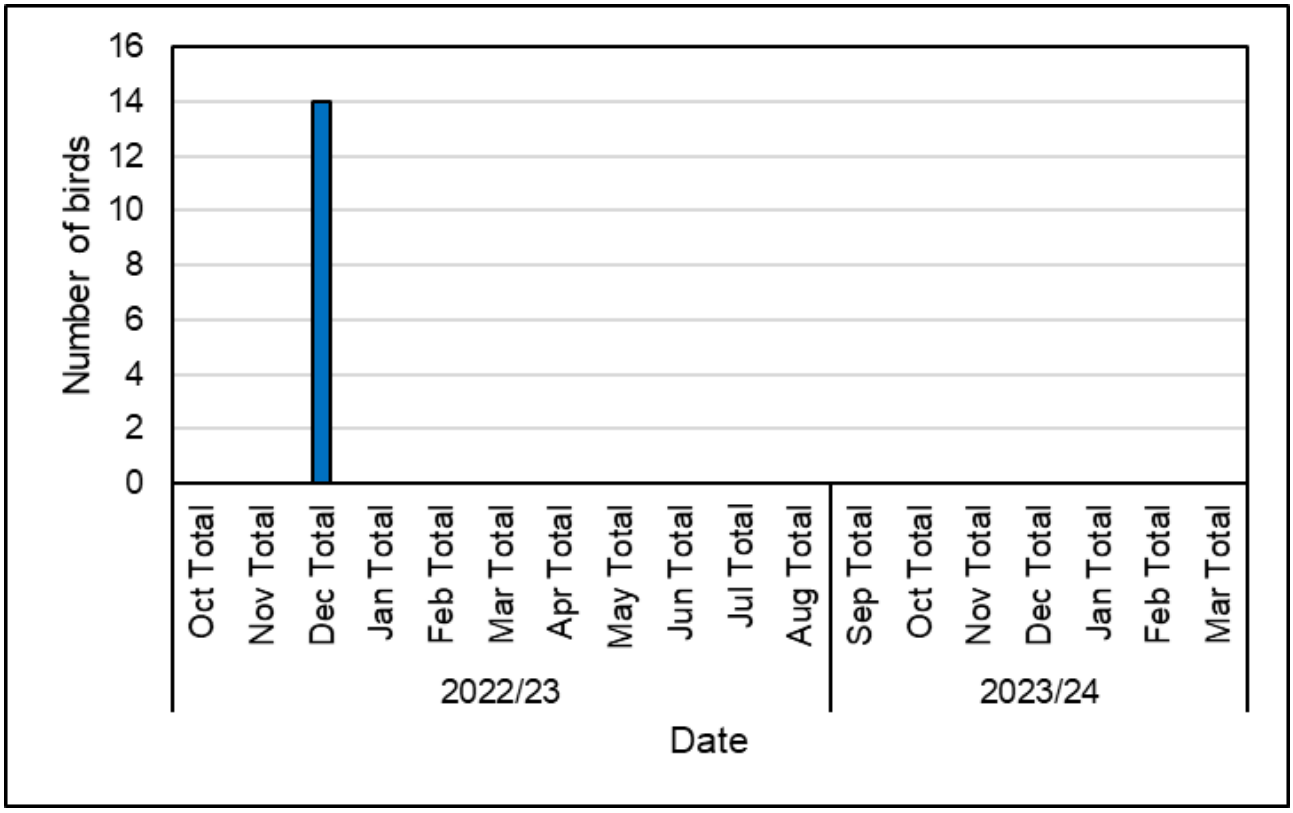


Diagram 1.33: Monthly peak maximum counts of black-tailed godwit

1.4.5.71 Dunlin were infrequently recorded during both the winter and the passage periods (**Diagram 1.34**) and only in notable numbers during January 2023 when 222 birds were present. Dunlin feed on extensive mudflats and would be expected to be found in higher densities closer to the estuary mouth. Those birds that were seen during the winter and passage periods (**Figure 1.71** and **Figure 1.72** respectively) may have been forced upstream due to high spring tides flooding the saltmarsh.

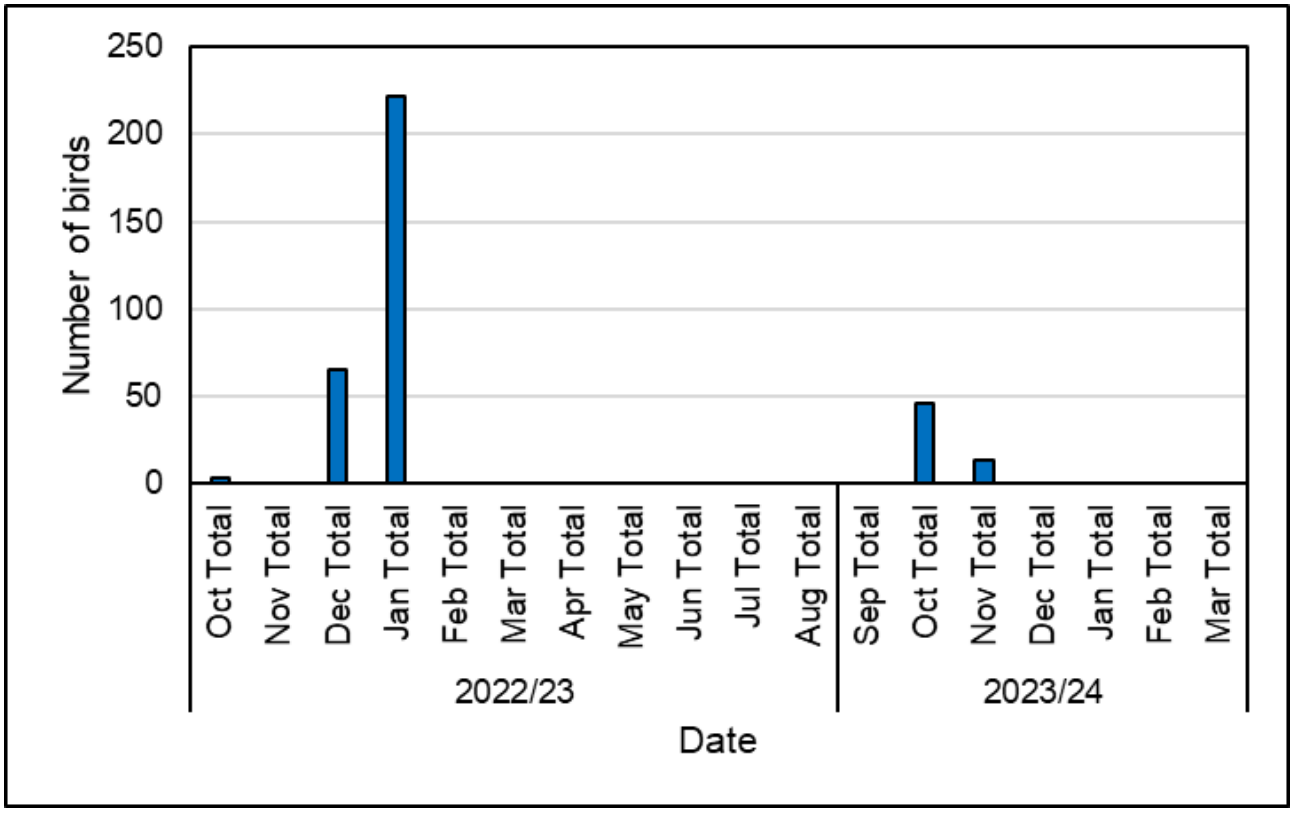


Diagram 1.34: Monthly peak maximum counts of dunlin

1.4.5.72 Snipe were recorded within the estuarine survey area within the passage and core wintering period. Peak counts occurred within the passage periods in October 2022 (13) and October 2023 (21) (**Diagram 1.35**). Snipe were primarily distributed towards the western end of the estuarine survey area during both the wintering and passage periods (**Figure 1.73** and **Figure 1.74** respectively).

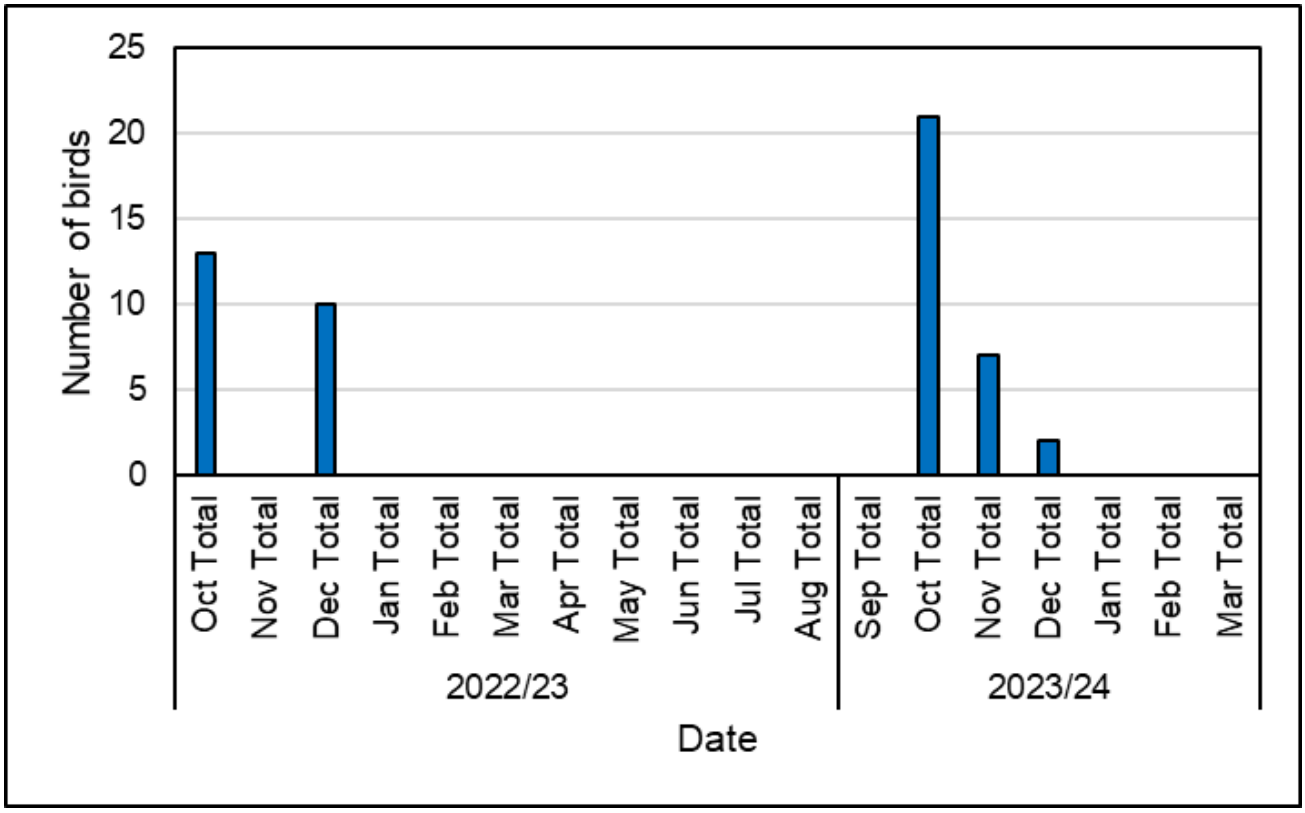


Diagram 1.35: Monthly peak maximum counts of snipe

Most records of common sandpiper *Actitis hypoleucos* were for a single bird, the exceptions being October 2022 (2) and July 2023 (4) (**Diagram 1.36)** both of which are during the autumn passage period. Birds were distributed throughout the river corridor during both winter and the passage (**Figure 1.75** and **Figure 1.76**).

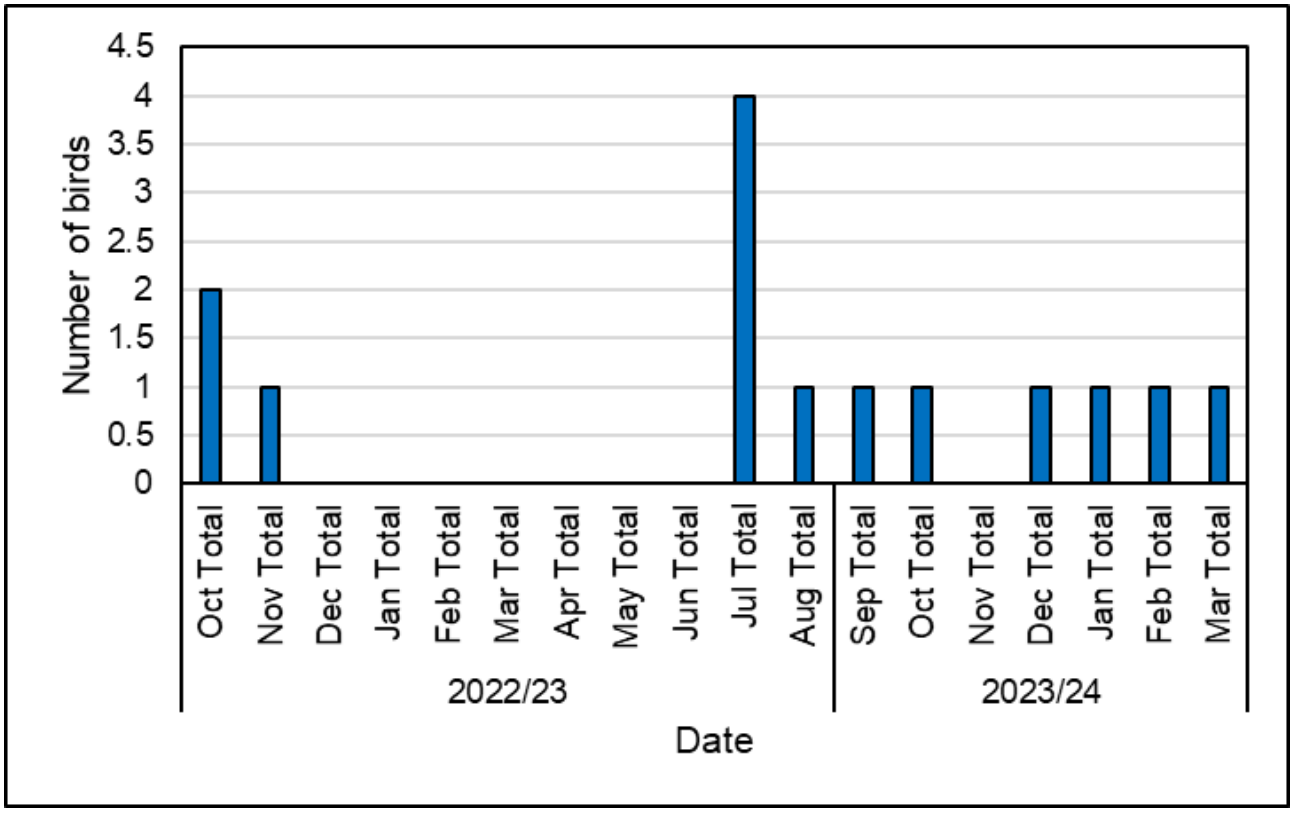


Diagram 1.36: Monthly peak maximum counts of common sandpiper

1.4.5.73 Green sandpiper *Tringa ochropus* are notable for being present in February 2024 as, although they are frequent autumn passage visitors, they are only known to winter in low (likely 100 birds or less Hume, *et. al*, 2016) numbers in the UK. The distribution suggests that all sightings may have been of the same bird with distribution clustered towards the west of the estuarine survey area (**Figure 1.77** and **Figure 1.78**).

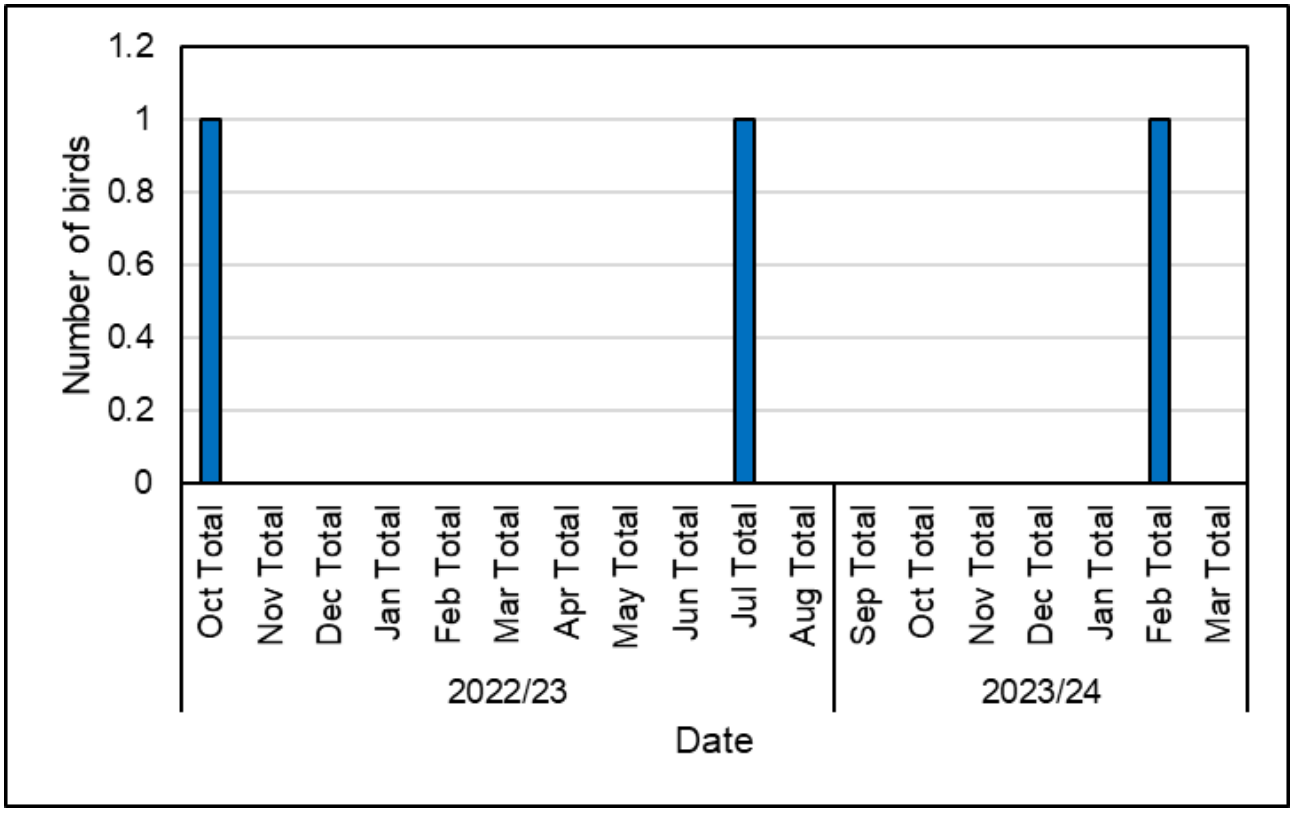


Diagram 1.37: Monthly peak maximum counts of green sandpiper

1.4.5.74 Redshank were present throughout the winter and passage periods with greater numbers of birds present during the winter (peak of 40 birds **Diagram 1.38**). Redshank were distributed throughout the estuarine survey area (**Figure 1.79** and **Figure 1.80**) with this species favouring foraging in muddy, brackish water. Even though they were frequent visitors they were generally found in low numbers with most sightings of small groups of foraging birds.

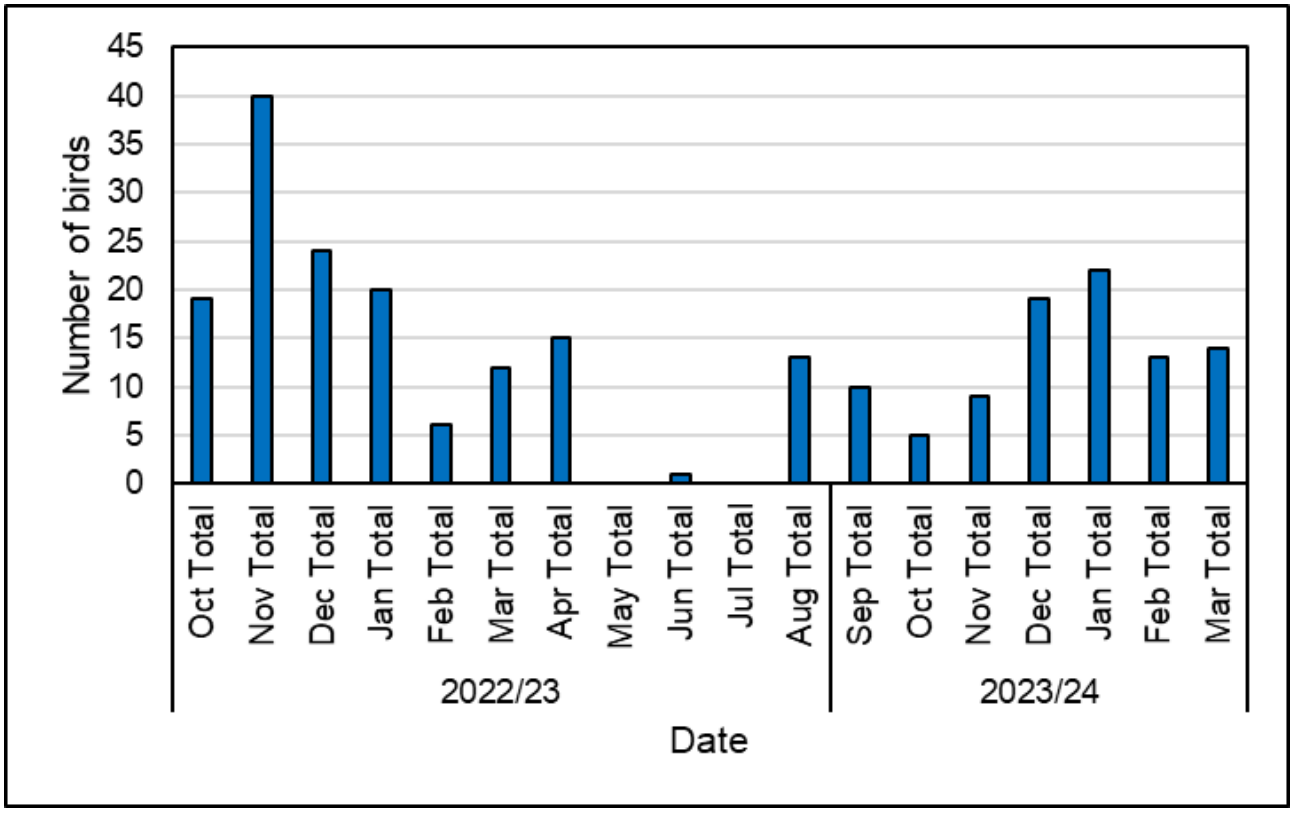


Diagram 1.38: Monthly peak maximum counts of redshank

Gulls and terns

1.4.5.75 Black-headed gull and herring gull were the most abundant of the gull species, with peak maximum counts of 296 and 156 individuals respectively (**Table 1.14**). Whilst herring gull were predominantly exhibiting non-foraging behaviours, black-headed gull were recorded foraging and non-foraging. Common tern were the only tern species recorded.

1.4.5.76 Black-headed gull were found during both the breeding and non-breeding periods (**Diagram 1.39**). Due the proximity of the breeding colony on the Ribble saltmarshes, Preston dock and at Marshside RSPB the much lower abundancies in the breeding season are notable. During the breeding season they were sporadically sighted loafing (**Figure 1.82**) but in the non-breeding season they were concentrated in higher numbers towards Preston dock (**Figure 1.81**).

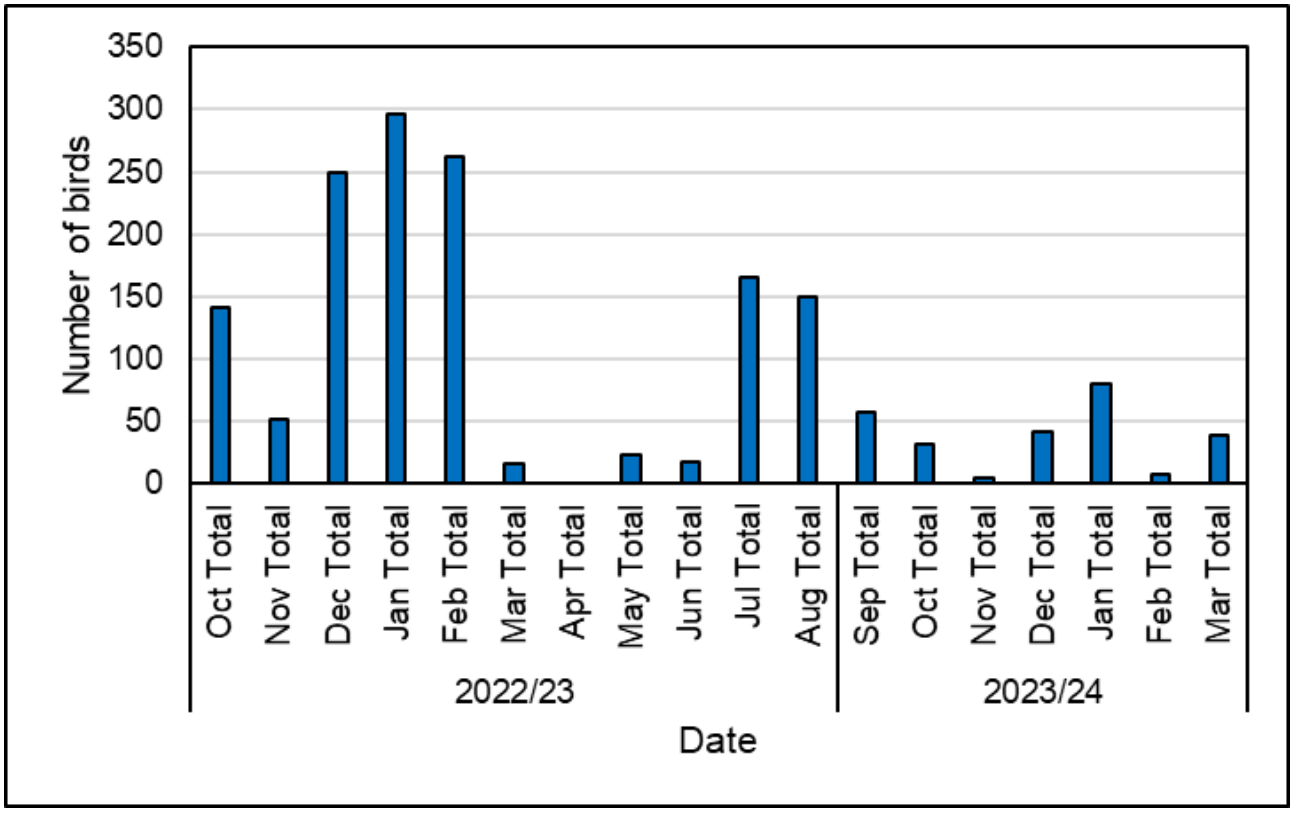


Diagram 1.39: Monthly peak maximum counts of black-headed gull

1.4.5.77 Common gull were present in low numbers (peak of eight) during the non-breeding season (**Diagram 1.40**). This is unsurprising as they tend to favour foraging inland on pasture unless cold weather forces them to forage in more saline habitats. Their distribution can be seen in **Figure 1.83**.

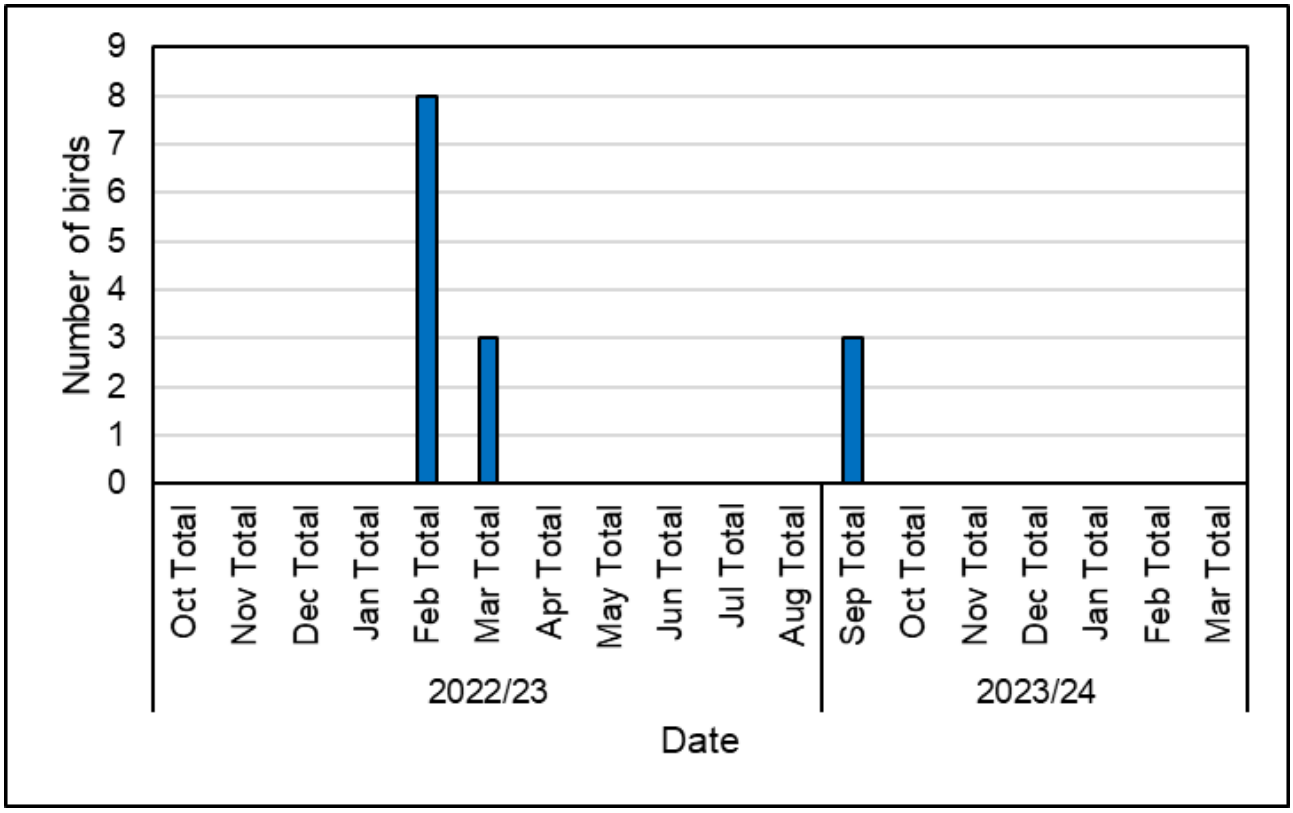


Diagram 1.40: Monthly peak maximum counts of common gull

1.4.5.78 Great black-backed gull were frequent visitors although in low numbers with a peak of five (**Diagram 1.41**). Although present during both seasons they were represented by a single bird during the breeding season (**Figure 1.85).** During the non-breeding season, they used the estuarine survey area sporadically for foraging (**Figure 1.84**).

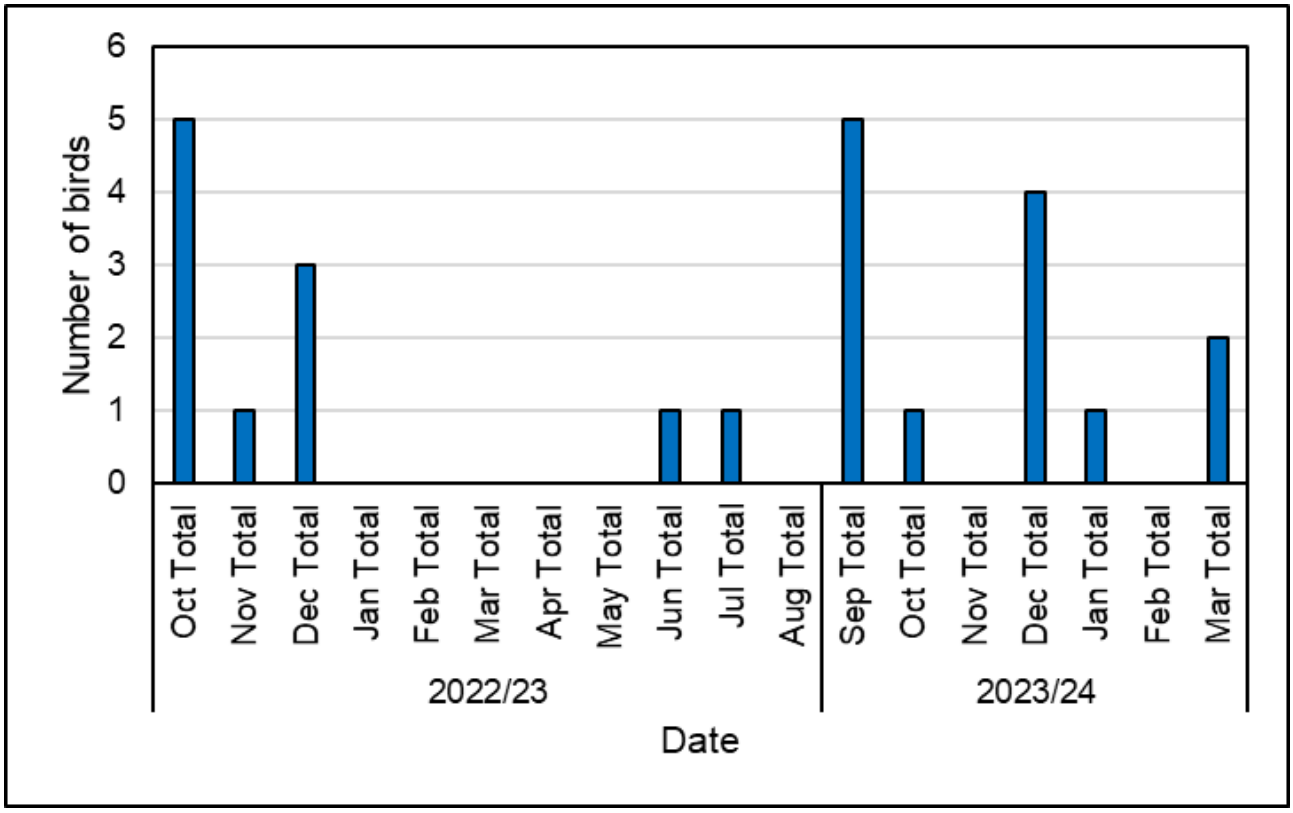


Diagram 1.41: Monthly peak maximum counts of great black-backed gull

1.4.5.79 Herring gull were the most frequent and numerous large gull species found within the estuarine survey area with a peak of 156 and were present throughout the year, although in lower numbers during the breeding season (**Diagram 1.42).** During the breeding season they were concentrated near Preston docks (**Figure 1.87**) where they may have been trying to predate the black-headed gull and common tern that nest there. In the non-breeding season, they were more widely distributed (**Figure 1.86**).

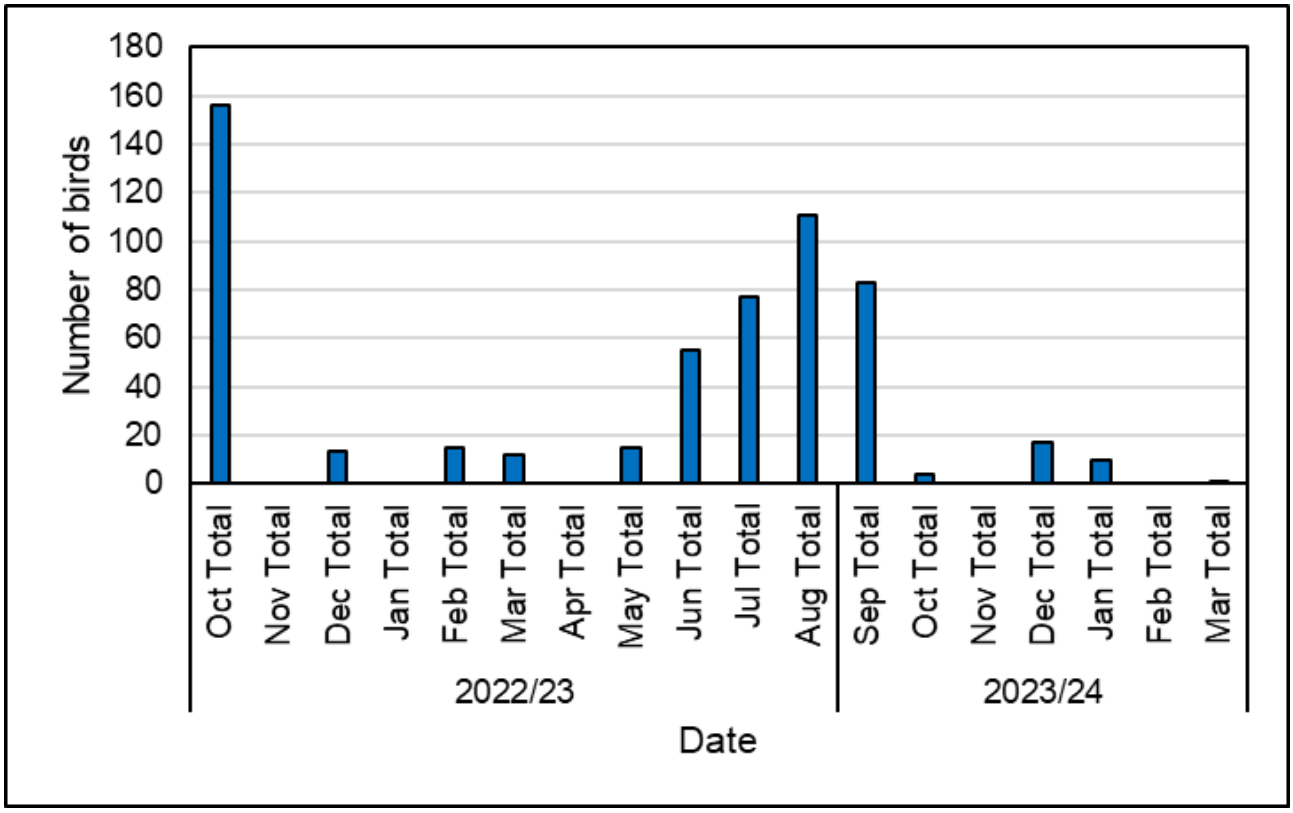


Diagram 1.42: Monthly peak maximum counts of herring gull

1.4.5.80 Lesser black-backed gull also have a colony located on the Ribble saltmarsh. Despite this, birds did not frequent the estuarine survey area until late in the breeding season with a peak of 41 in August 2023 (**Diagram 1.43**). This suggests that breeding birds are not using this area and these birds may have already fledged young or been failed breeders. Again, there was a tendency for birds during the breeding season to be found in higher numbers towards Preston dock (**Figure 1.89**) and it has been reported that lesser black-backed gulls have been seen predating the common tern there (Fylde Bird Club, 2023). During the non-breeding season birds were more widely distributed (**Figure 1.88**).

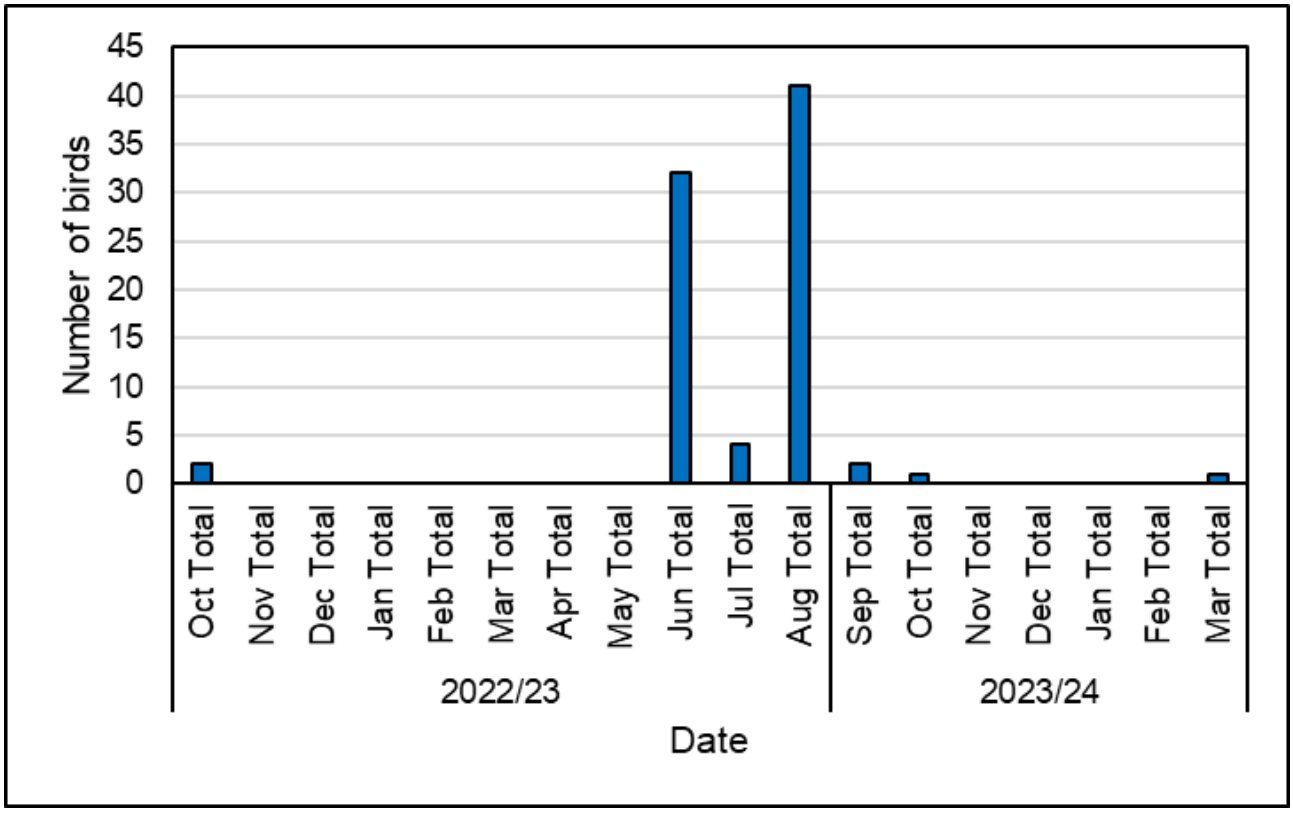


Diagram 1.43: Monthly peak maximum counts of lesser black-backed gull

1.4.5.81 Common tern historically bred on the Ribble saltmarshes although it is likely that this colony no longer exists and no apparently occupied nests were reported in 2023 (BTO and JNCC, 2023). There is also the small colony on the artificial platforms at Preston dock, built and maintained by Preston City Council with the assistance of Fylde Bird Club. Common tern were present during the breeding and post-breeding period (**Diagram 1.44**) with low numbers of birds recorded (a peak of 5 birds). It is likely that these were part of the 33 pairs that fledged an estimated 20 young in 2023 (Fylde Bird Club). Birds were distributed along the river corridor during the breeding season (**Figure 1.91**) with only one sighting in the non-breeding season (**Figure 1.92**).

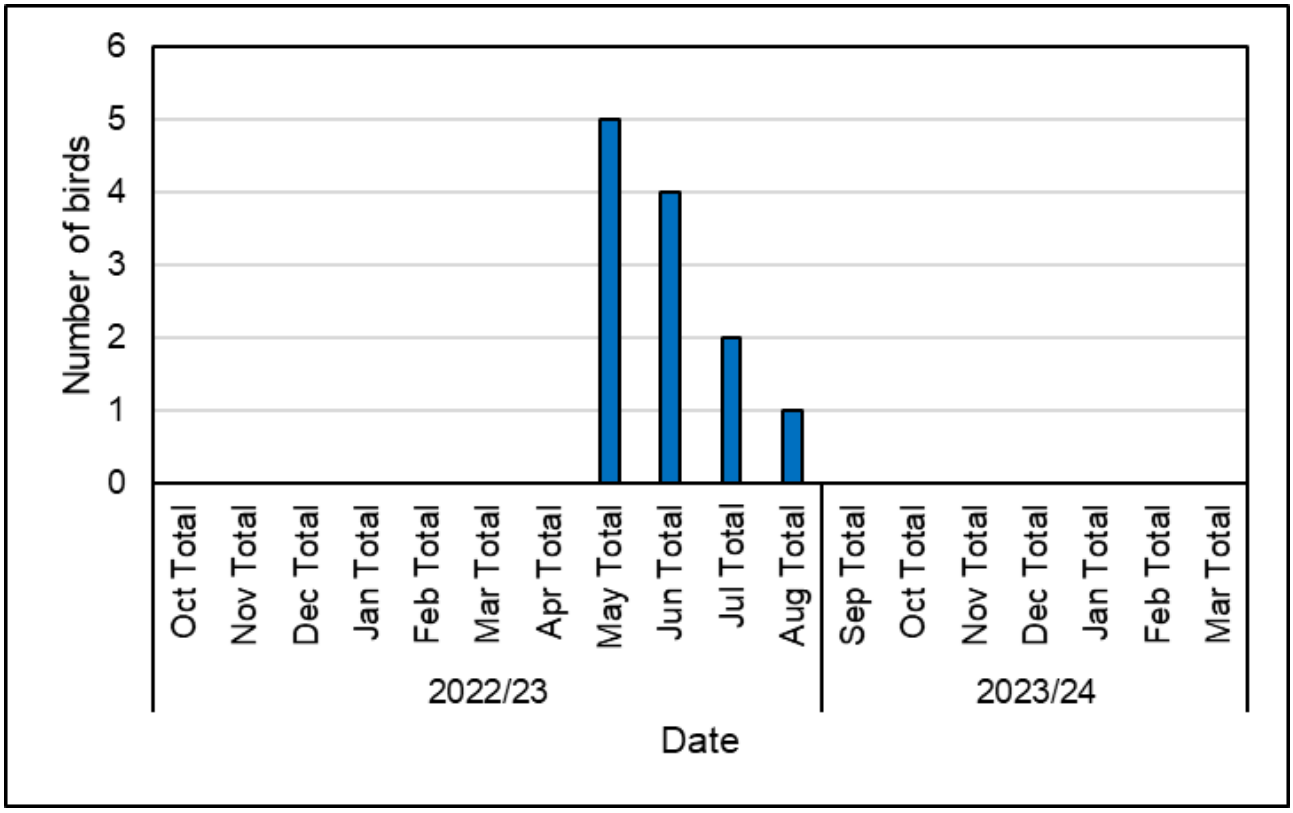


Diagram 1.44: Monthly peak maximum counts of common tern

Cormorants and shag

1.4.5.82 A peak maximum count of 11 cormorant were recorded in the channel of the River Ribble during the 2022/23 year with a peak of 5 recorded so far in the 2023/24 year (**Diagram 1.45**). Cormorant were recorded throughout the year although in low numbers during the breeding season. They were distributed throughout the estuarine survey area (**Figure 1.92** and **Figure 1.93**).

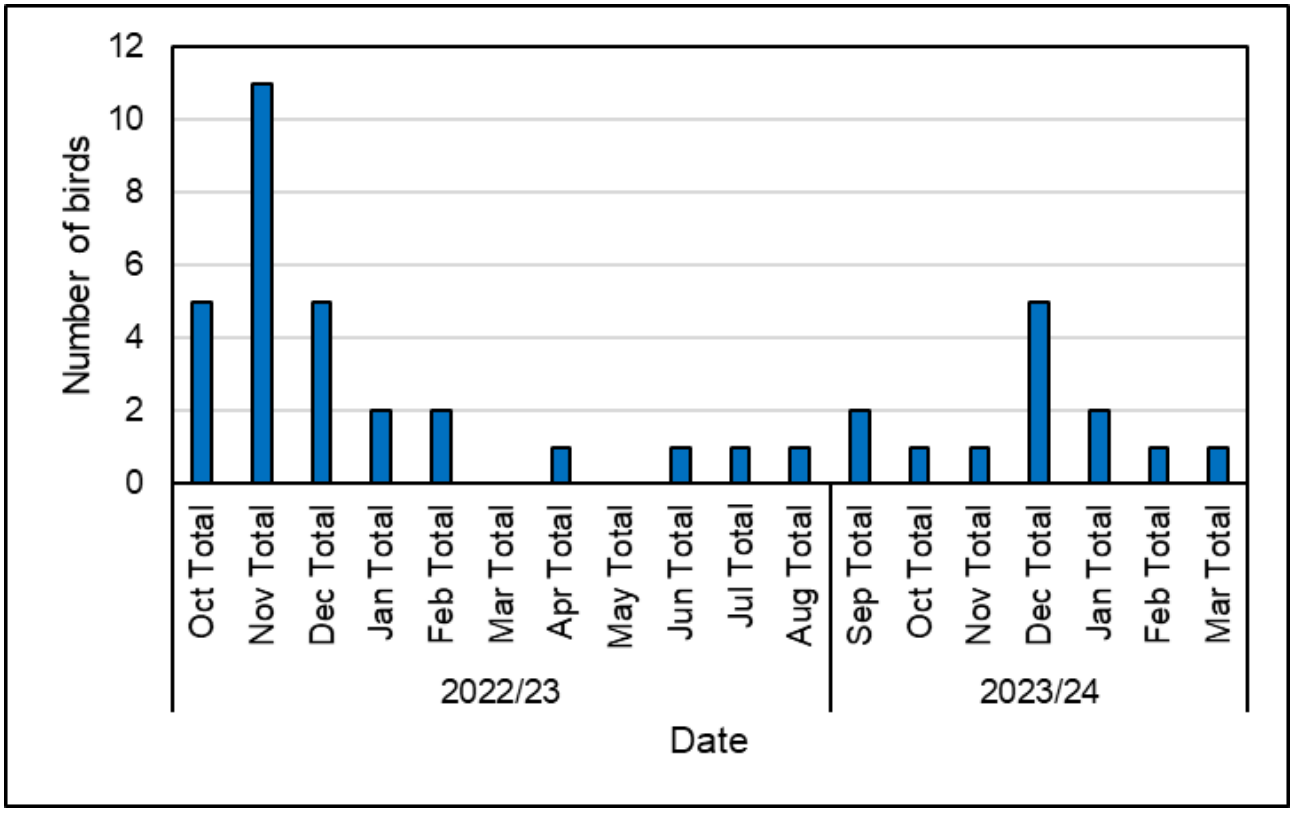


Diagram 1.45: Monthly peak maximum counts of cormorant

Herons and storks

1.4.5.83 Of note was the presence of three cattle egrets *Bubulcus ibis* in October 2022. Other species were grey heron *Ardea cinerea* with eight birds and little egret with 10 birds (**Diagram 1.46** and **Diagram 1.47**). Both species were present year-round, although in greater numbers during the non-breeding season. Their distributions were confined to the river channel and their seasonal distributions can be seen in **Figure 1.94**, **Figure 1.95**, **Figure 1.96** and **Figure 1.97** respectively.

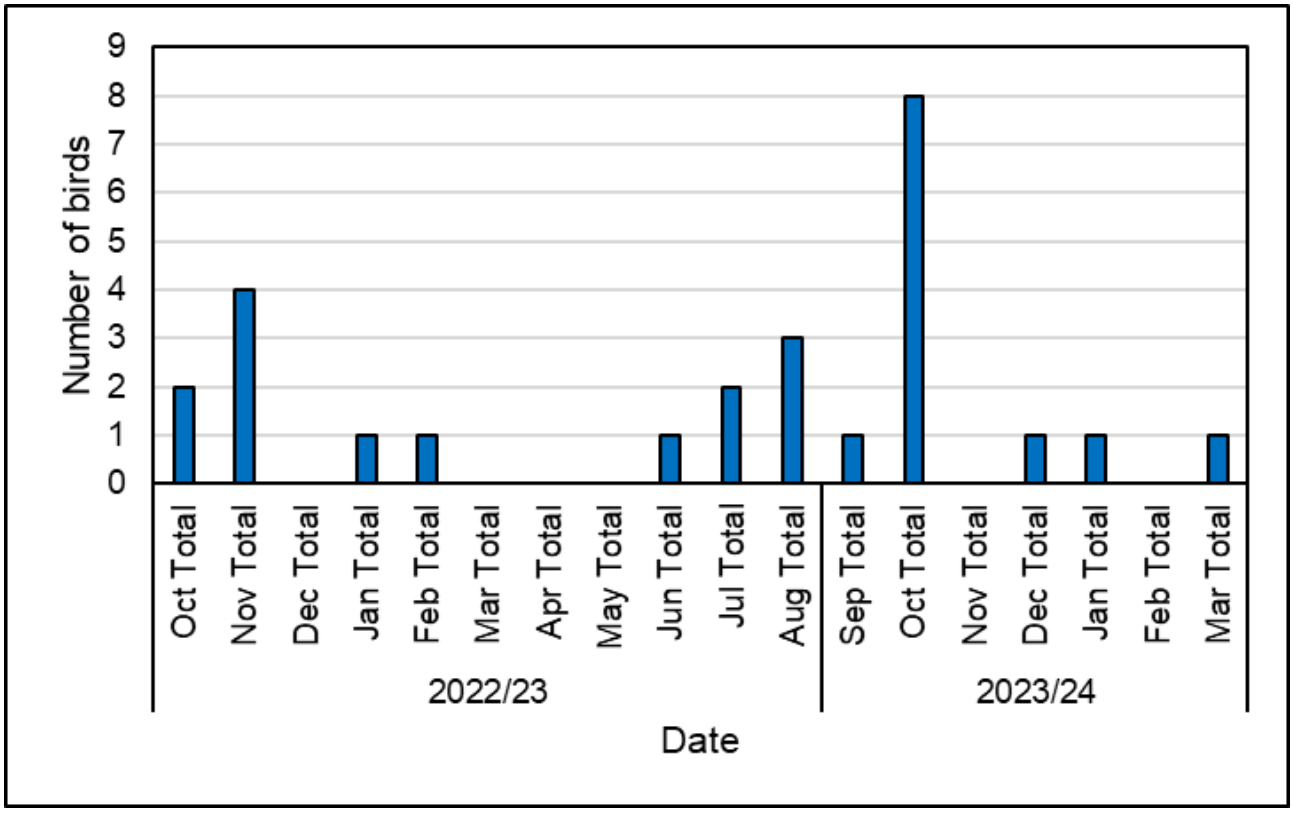


Diagram 1.46: Monthly peak maximum counts of grey heron

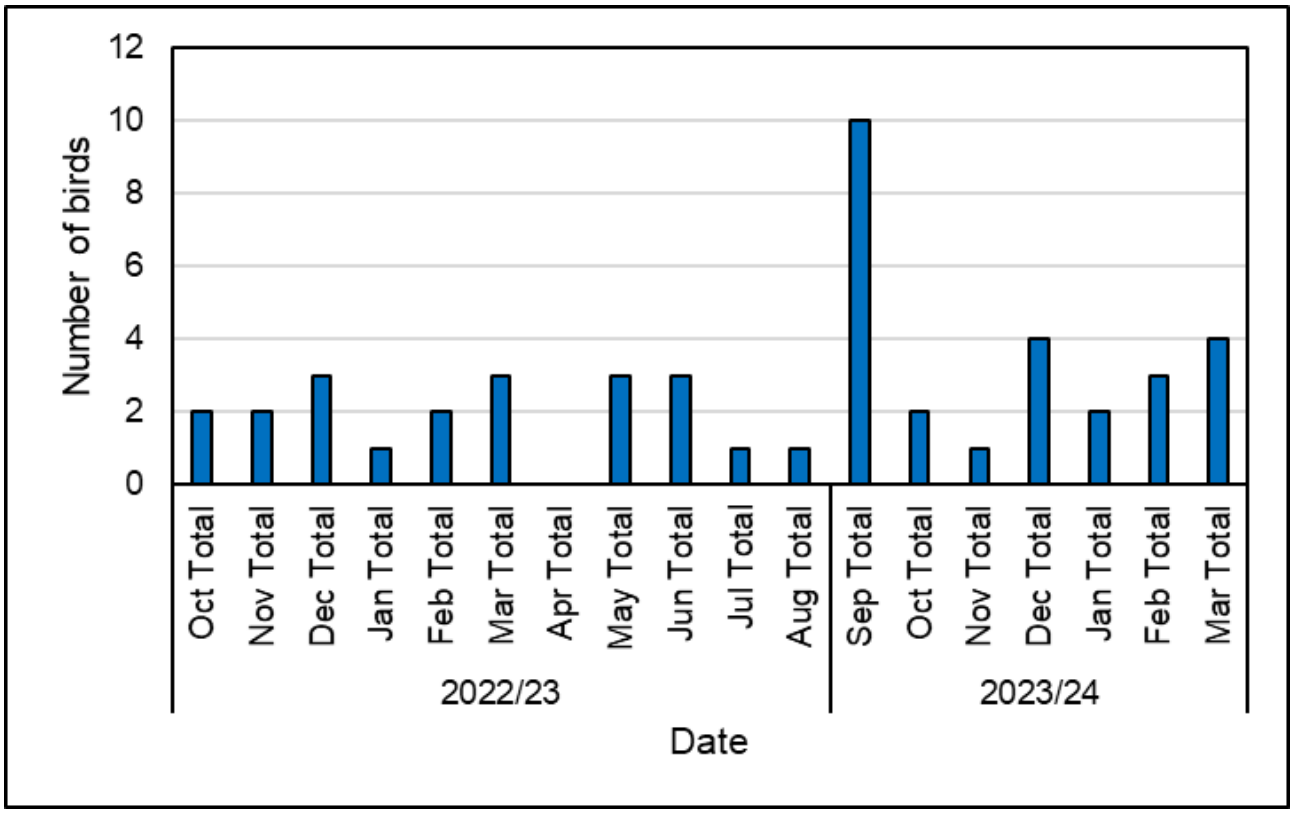


Diagram 1.47: Monthly peak maximum counts of little egret

Table 1.14: Peak abundance of waterbirds recorded in the estuarine survey area during the site-specific surveys (October 2022 to March 2023)

Group	Species	Peak maximum count 2022/23	Peak maximum count 2023/24	UK BOCC5 status	Annex 1 listed	Schedule 1 listed	Section 41 listed
Geese, ducks and swans	Canada goose	282	268	Green	no	no	no
	Greylag goose	84	67	Amber	no	no	no
	Mute swan *Cygnus olor*	0	2	Green	no	no	no
	Whooper swan	30	0	Amber	yes	yes	no
	Shelduck	11	66	Amber	no	no	no
	Wigeon	822	670	Amber	no	no	no
	Mallard	60	88	Amber	no	no	no
	Teal	275	167	Amber	no	no	no
	Goldeneye	1	0	Red	no	no	no
	Goosander	5	9	Green	no	no	no
Waders	Oystercatcher	54	28	Amber	no	no	no
	Lapwing	444	82	Red	no	no	yes
	Grey plover	2	0	Amber	no	no	no
	Curlew	24	10	Red	no	no	yes
	Black-tailed godwit	14	0	Red	no	yes	yes
	Dunlin	222	46	Red	no	no	no
	Jack snipe *Lymnocryptes minimus*	0	1	Green	no	no	no

Group	Species	Peak maximum count 2022/23	Peak maximum count 2023/24	UK BOCC5 status	Annex 1 listed	Schedule 1 listed	Section 41 listed
	Snipe	13	21	Amber	no	no	no
	Common sandpiper	4	1	Amber	no	no	no
	Green sandpiper	1	1	Amber	no	yes	no
	Redshank	40	22	Amber	no	no	no
	Greenshank	0	1	Amber	no	yes	no
Gulls and terns	Black-headed gull	296	80	Amber	no	no	no
	Common gull	8	3	Red	no	no	no
	Great black-backed gull	5	5	Red	no	no	no
	Herring gull	156	83	Red	no	no	yes
	Lesser black-backed gull	41	2	Amber	no	no	no
	Common tern	5	0	Amber	yes	no	no
Cormorants and shag	Cormorant	11	5	Green	no	no	no
Herons and storks	Cattle egret	3	0	Amber	no	no	no
	Grey heron	4	8	Green	no	no	no
	Little egret	3	10	Green	yes	no	no
Kingfishers	Kingfisher	1	1	Green	yes	yes	no

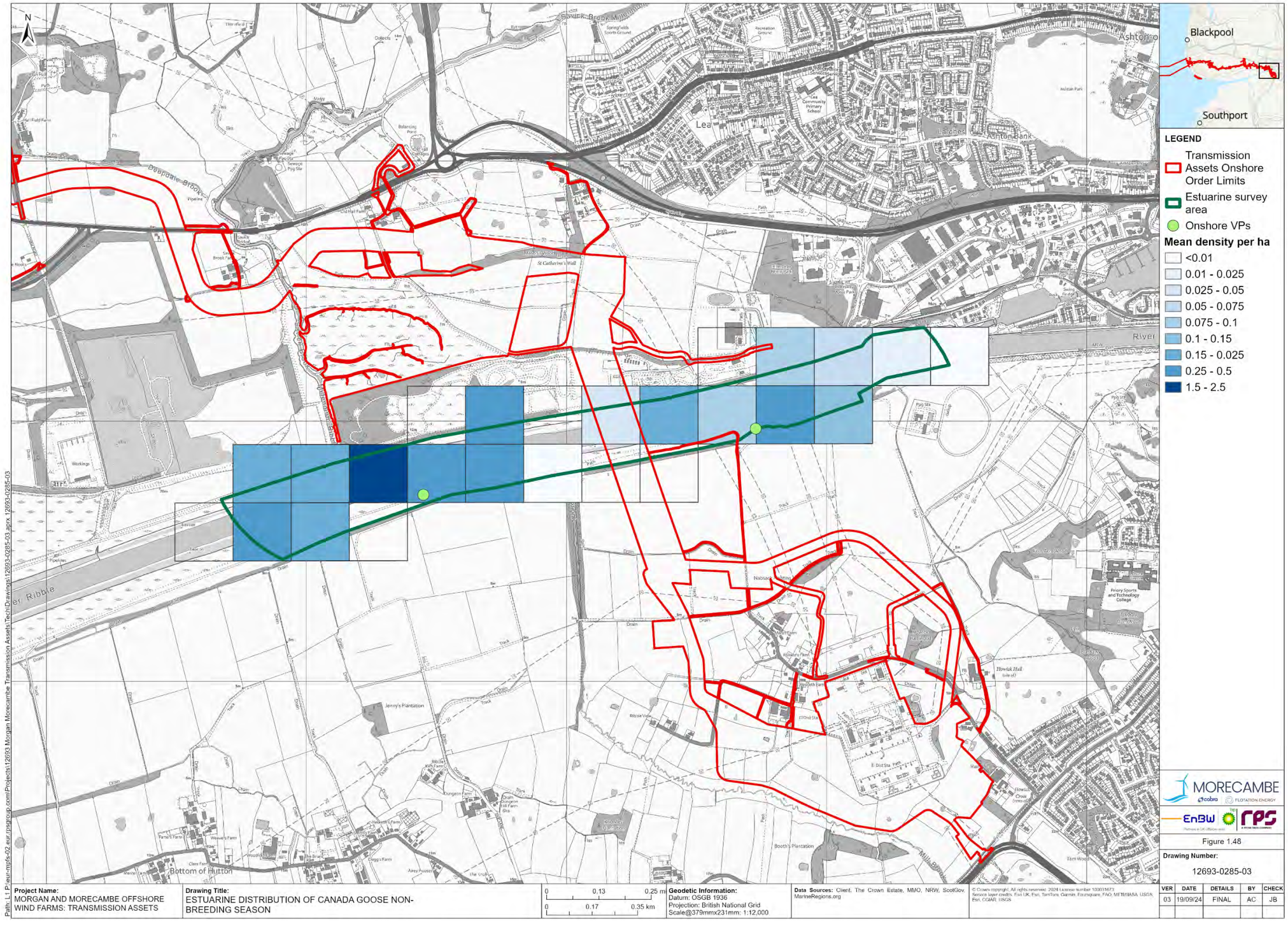


Figure 1.48: Distribution of Canada goose during the non-breeding season

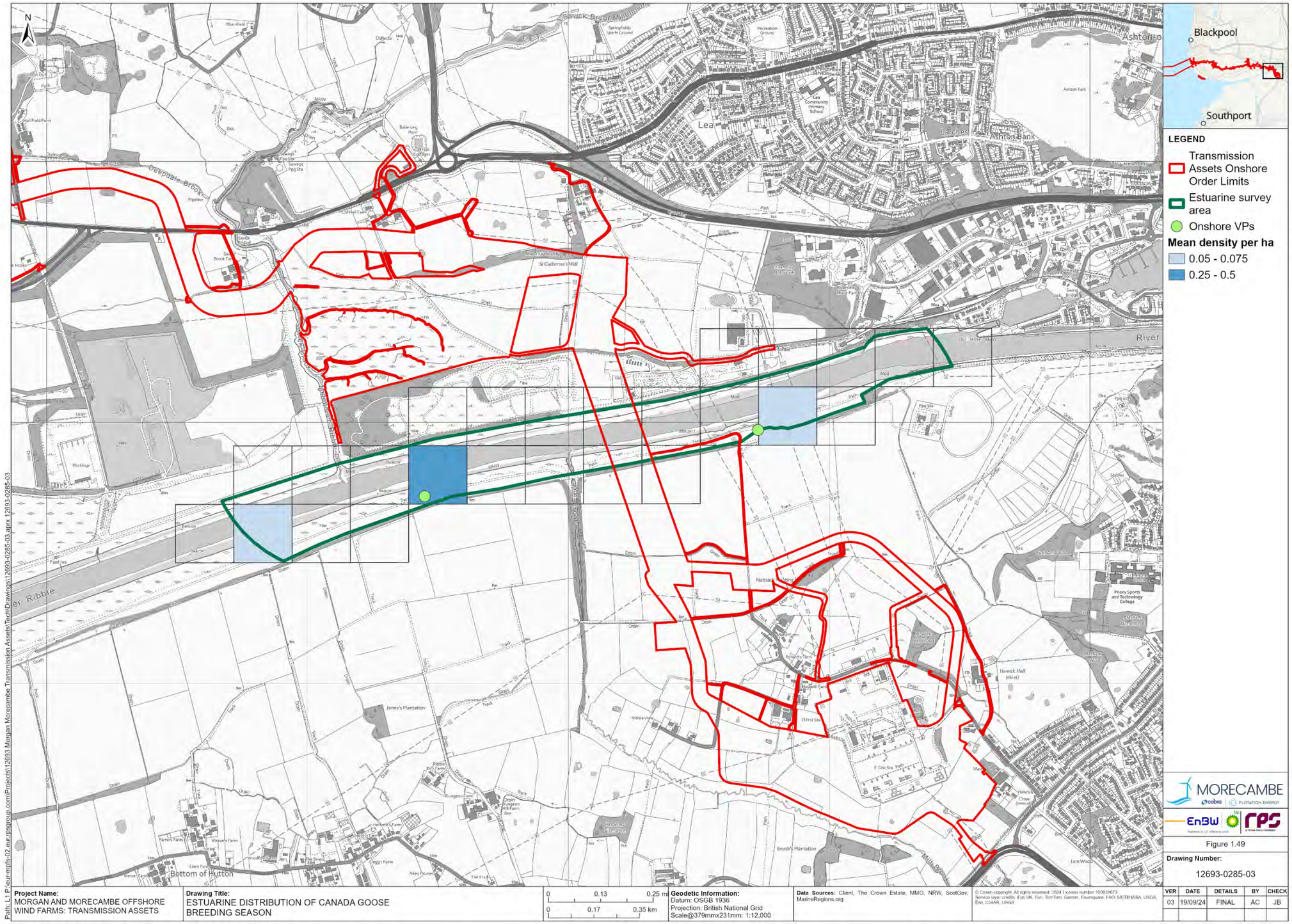


Figure 1.49: Distribution of canada goose during the breeding season

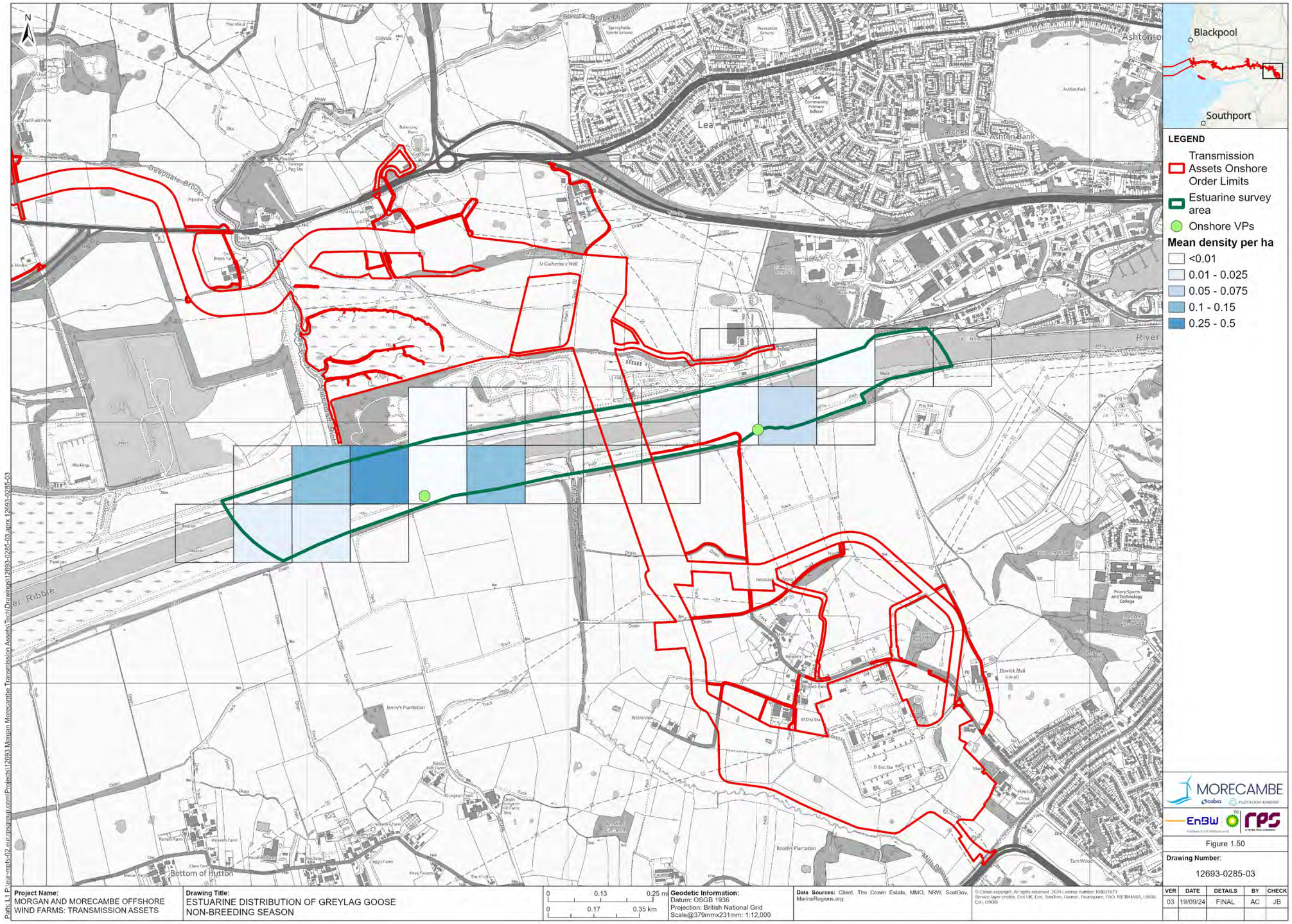
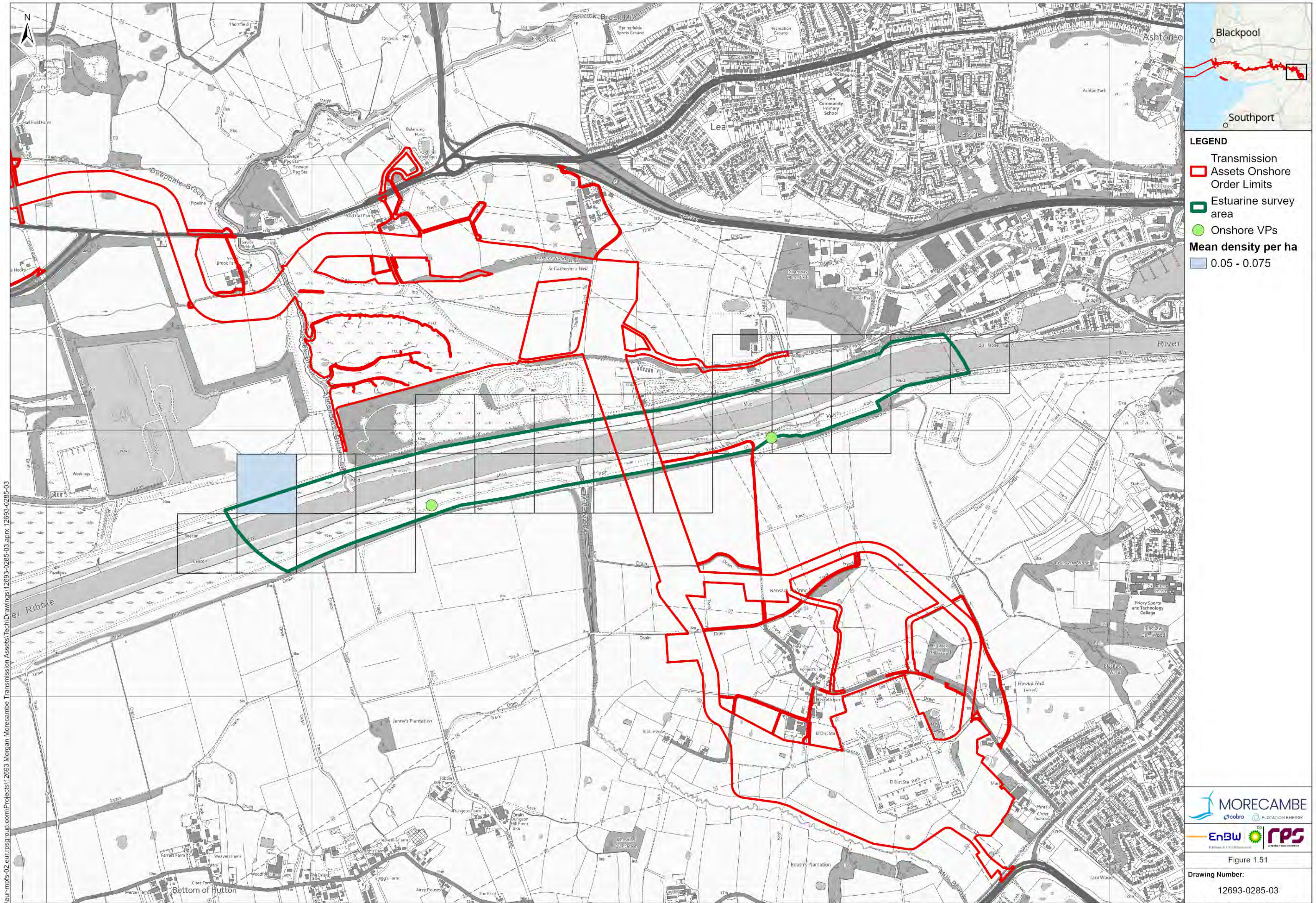


Figure 1.50: Distribution of greylag goose during the non-breeding season



VER	DATE	DETAILS	BY	CHECK
03	19/09/24	FINAL	AC	JB

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Project Name:
MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Drawing Title:
ESTUARINE DISTRIBUTION OF GREYLAG GOOSE BREEDING SEASON

0 0.13 0.25 mi
0 0.17 0.35 km

Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid
Scale@379mmx231mm: 1:12,000

Data Sources: Client, The Crown Estate, MMO, NRW, ScotGov, MarineRegions.org

Figure 1.51: Distribution of greylag goose during the breeding season

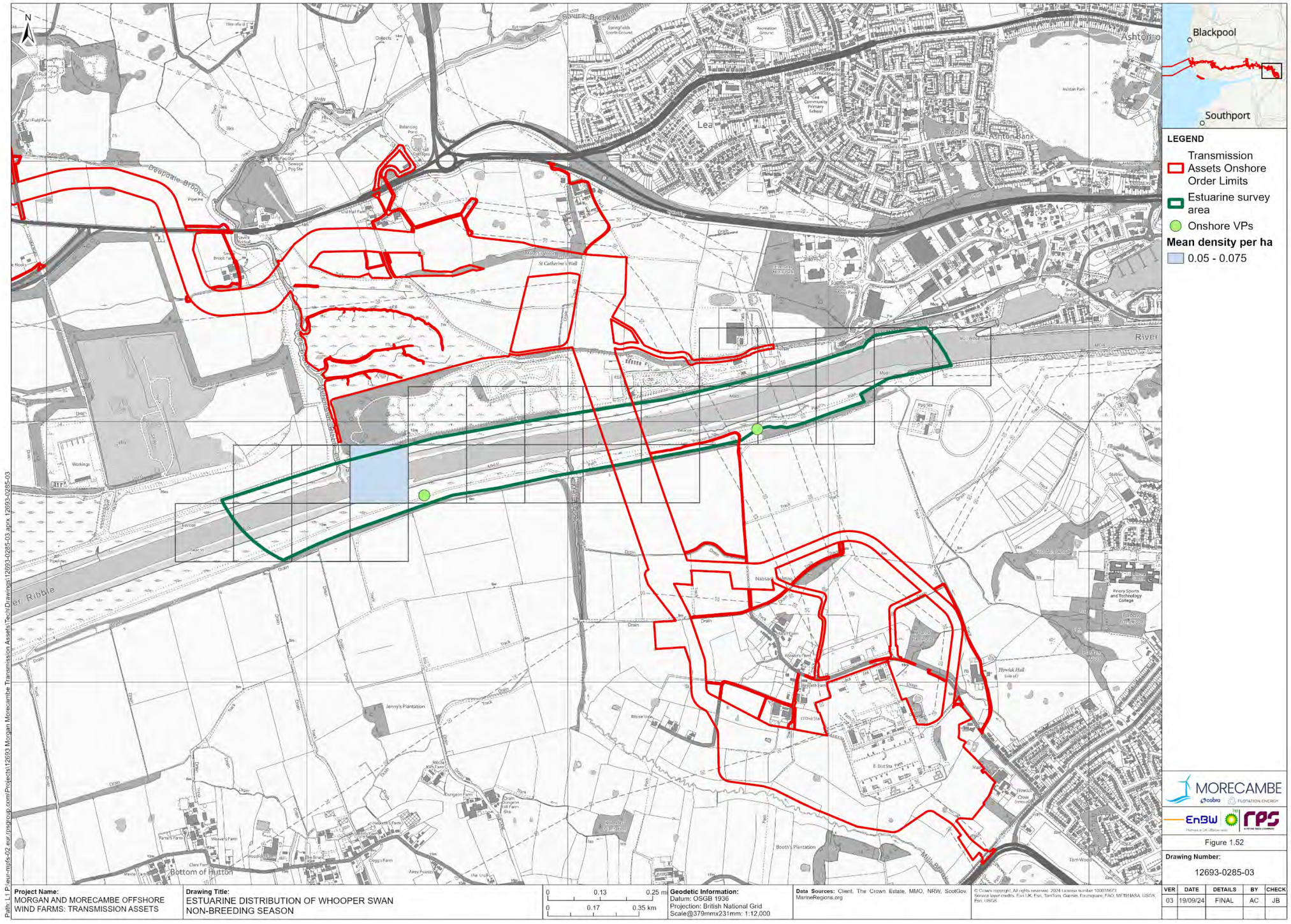

Figure 1.52: Distribution of whooper swan during the non-breeding season

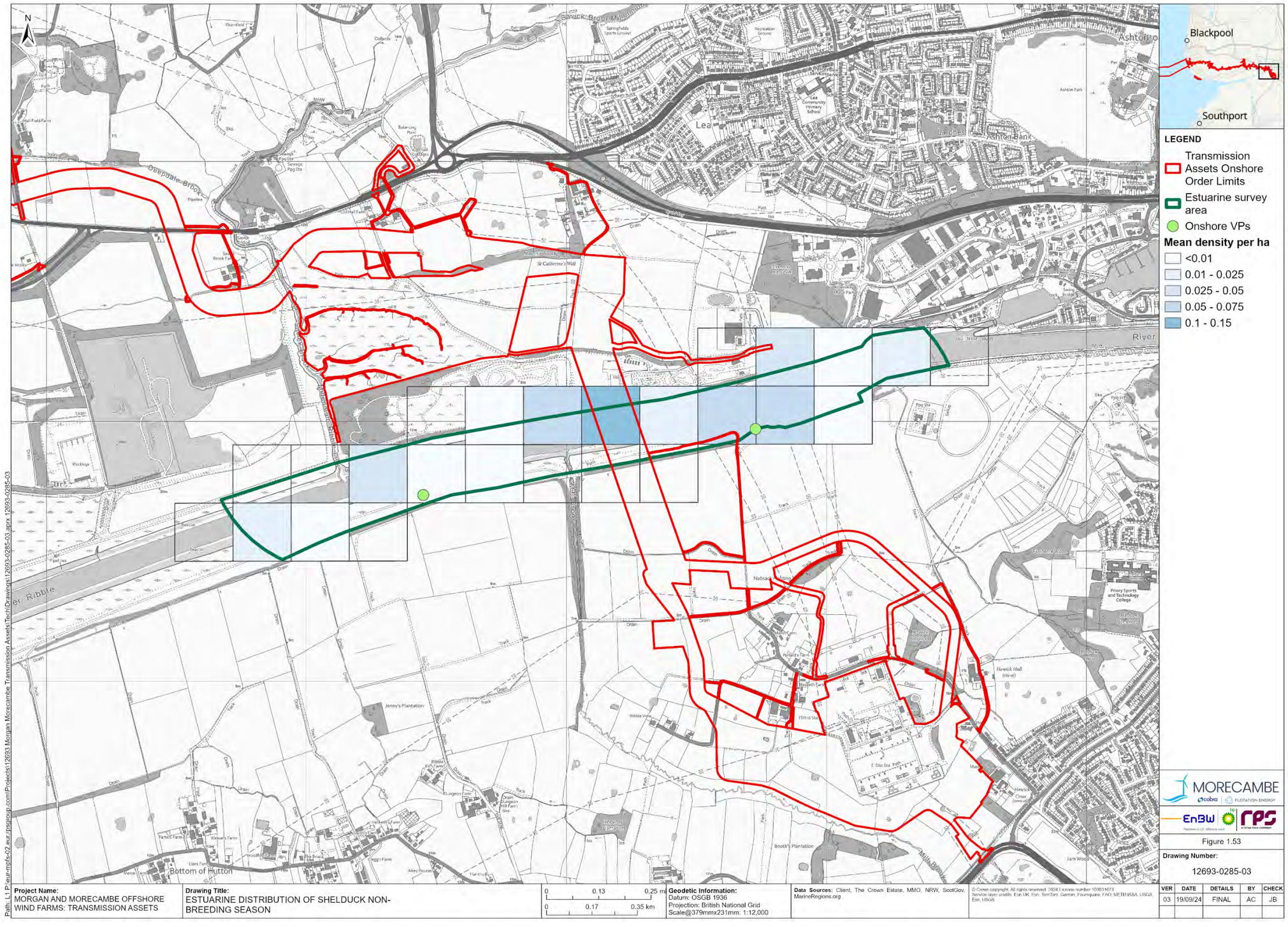

Figure 1.53: Distribution of shelduck during the non-breeding season

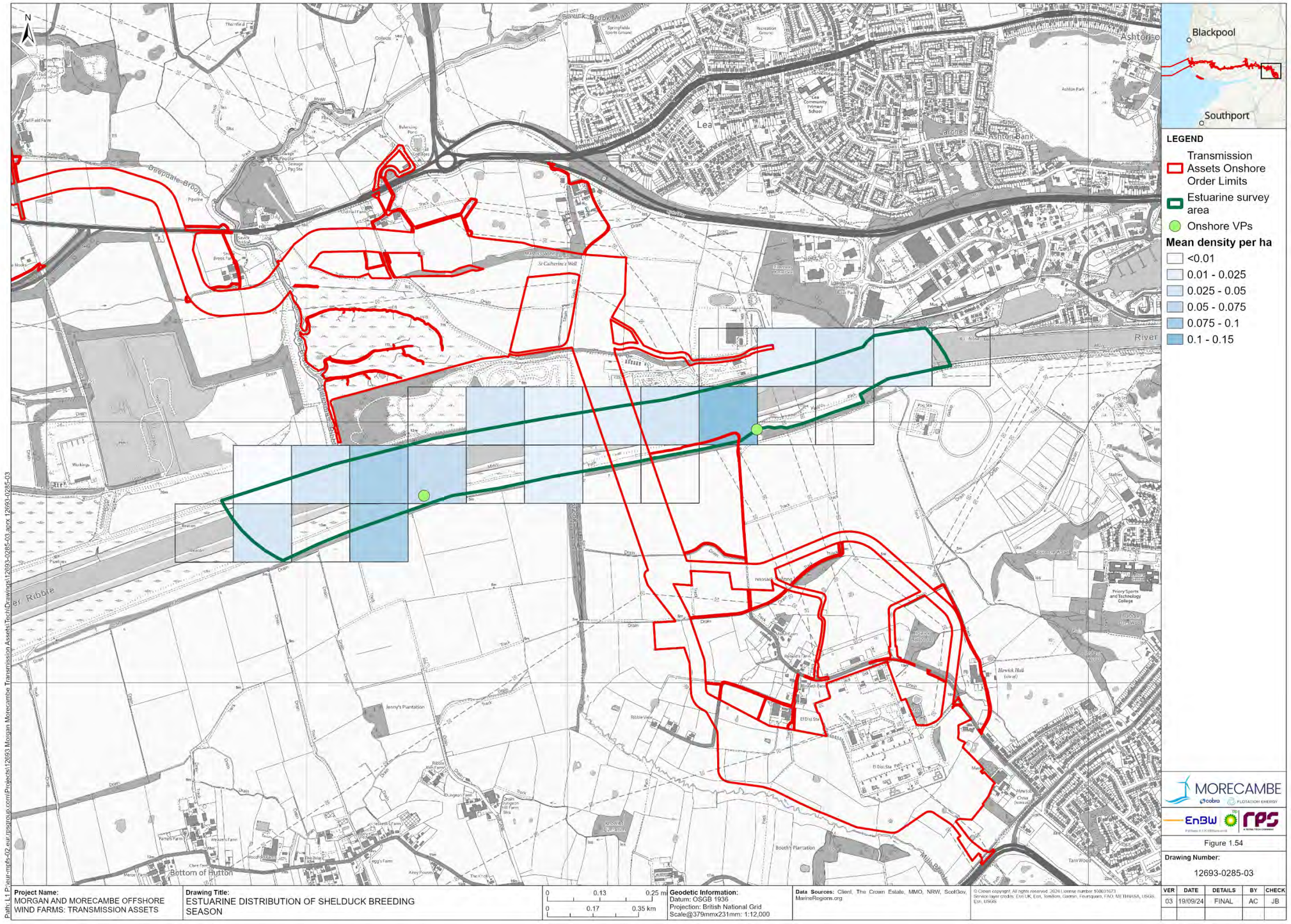

Figure 1.54: Distribution of shelduck during the breeding season

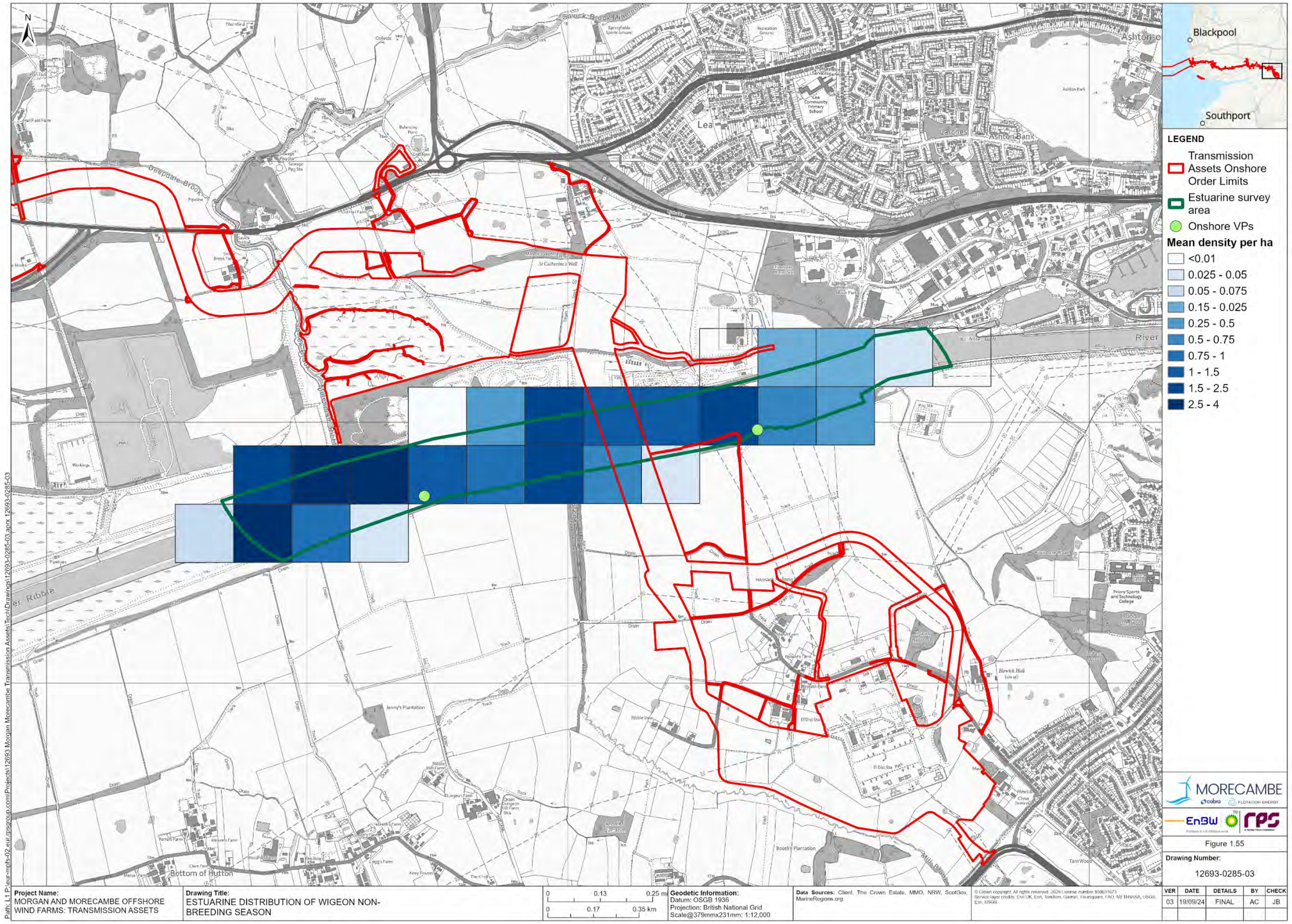

Figure 1.55: Distribution of wigeon during the non-breeding season

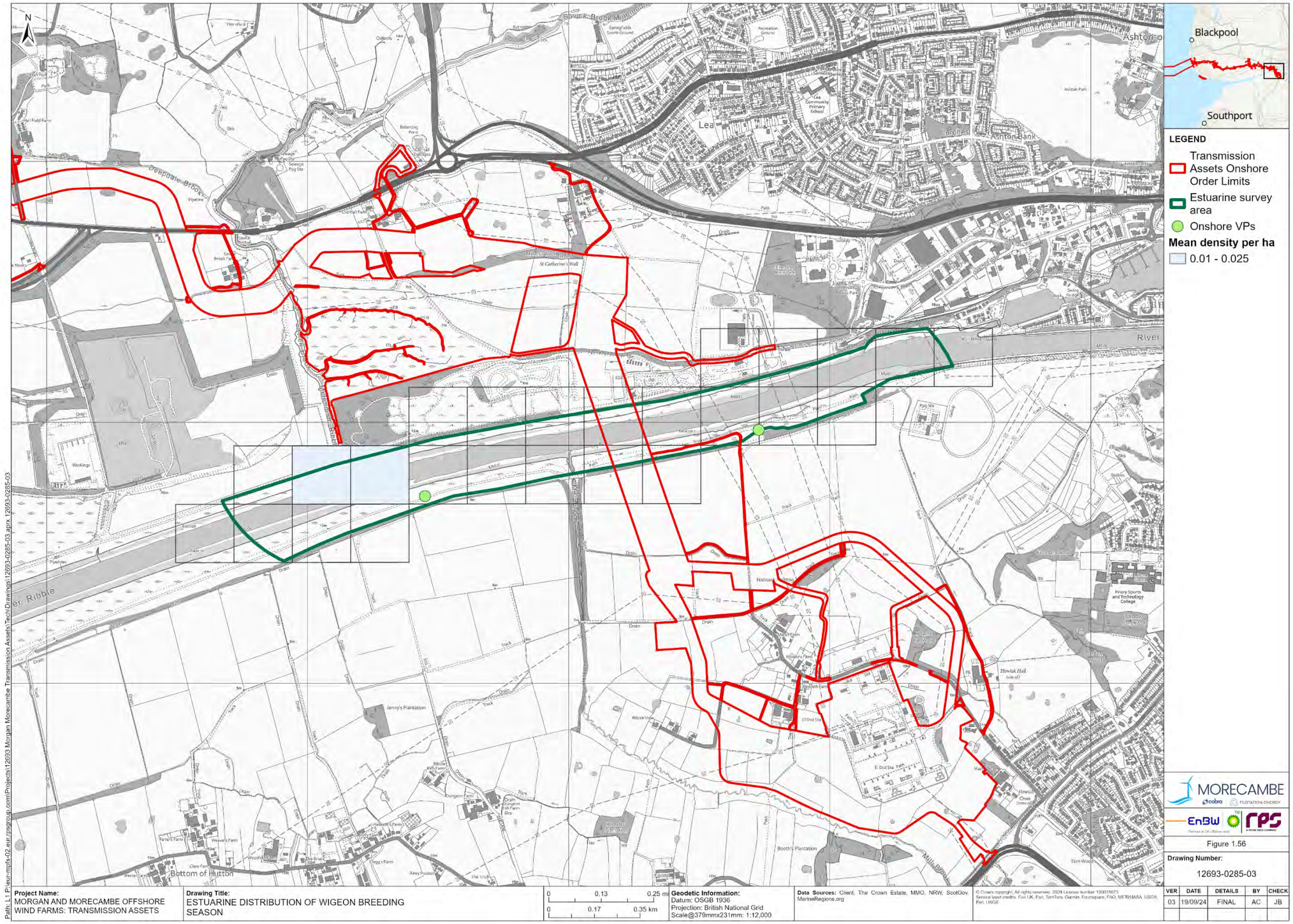

Figure 1.56: Distribution of wigeon during the breeding season

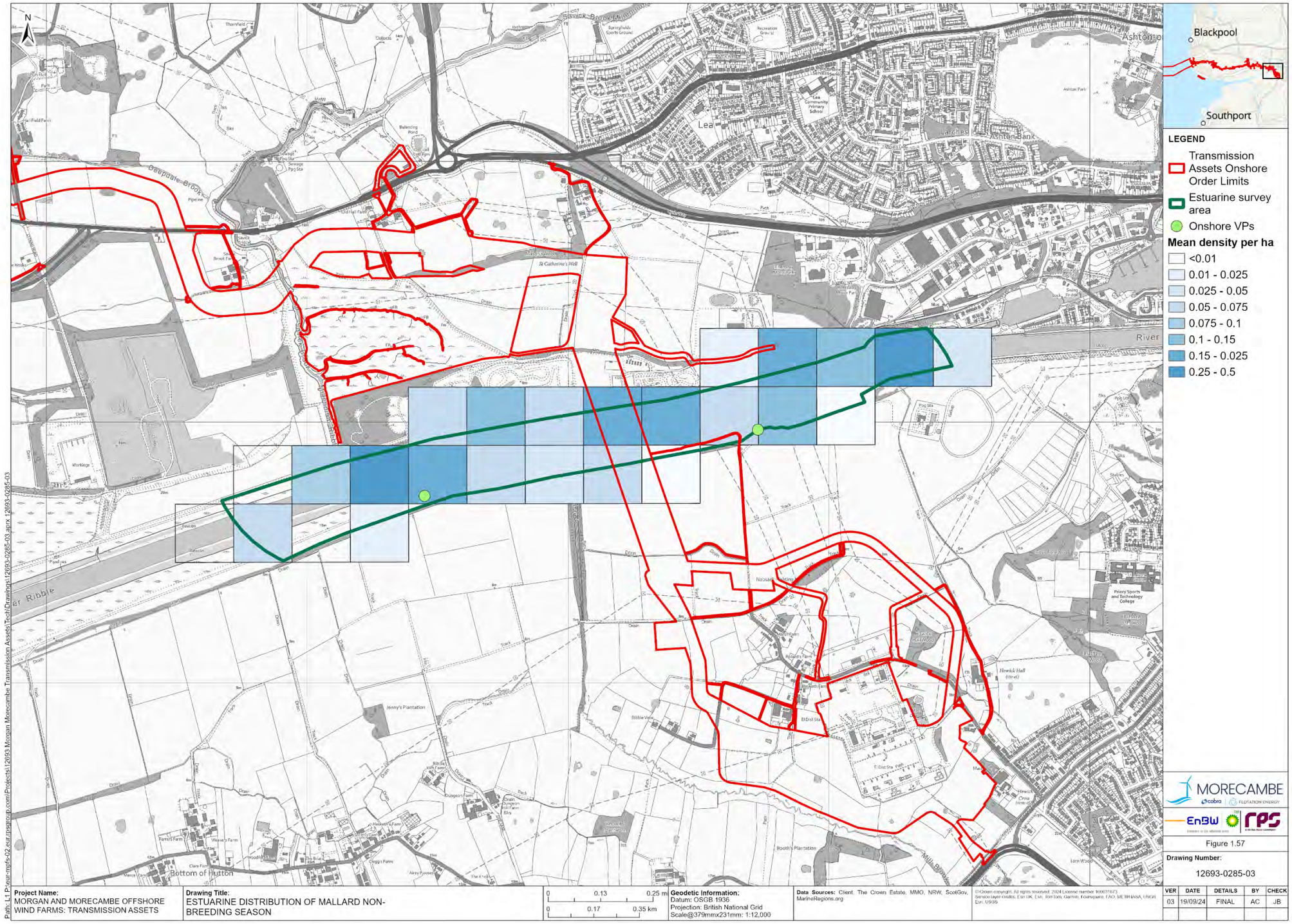

Figure 1.57: Distribution of mallard during the non-breeding season

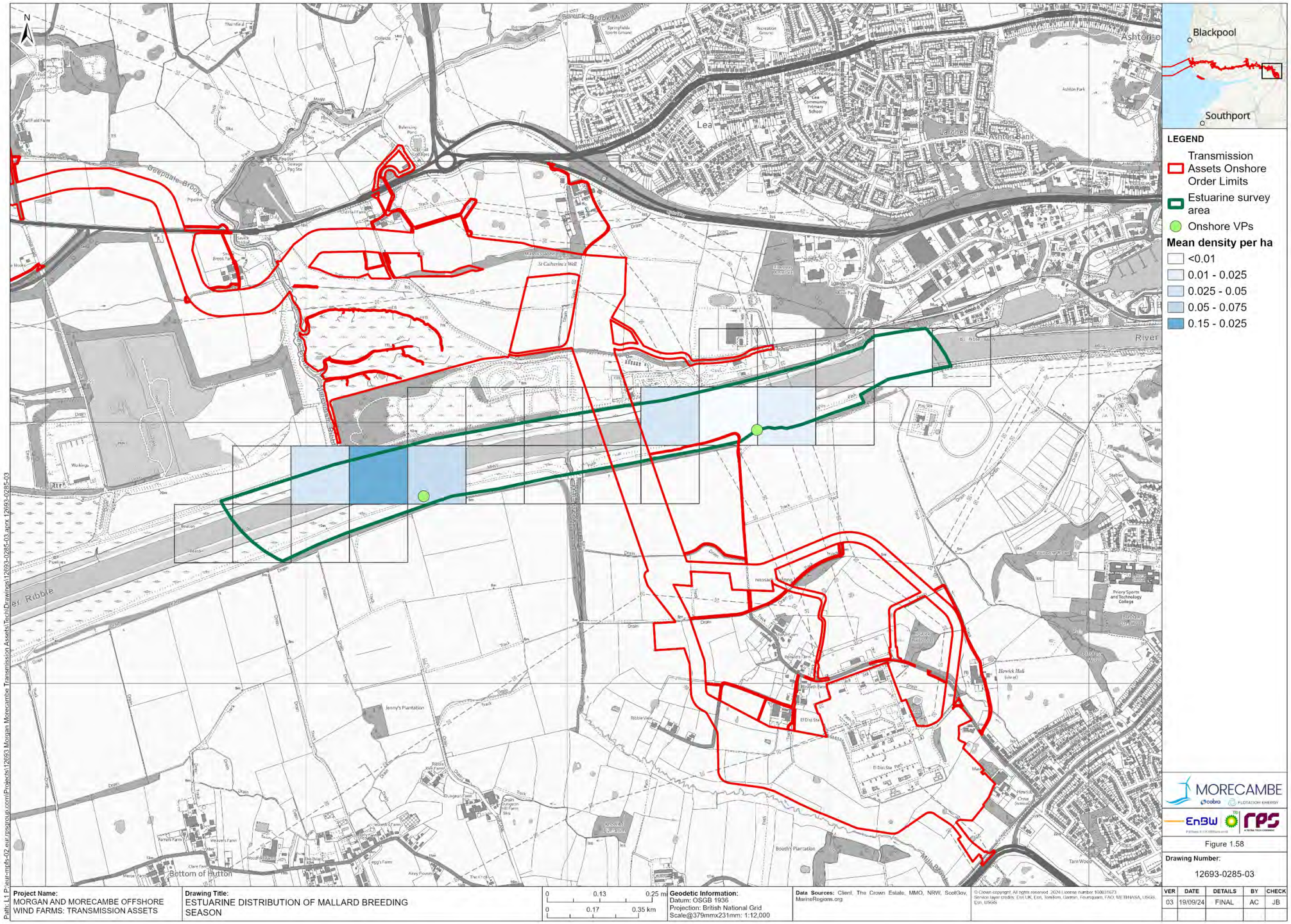

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Figure 1.58: Distribution of mallard during the breeding season

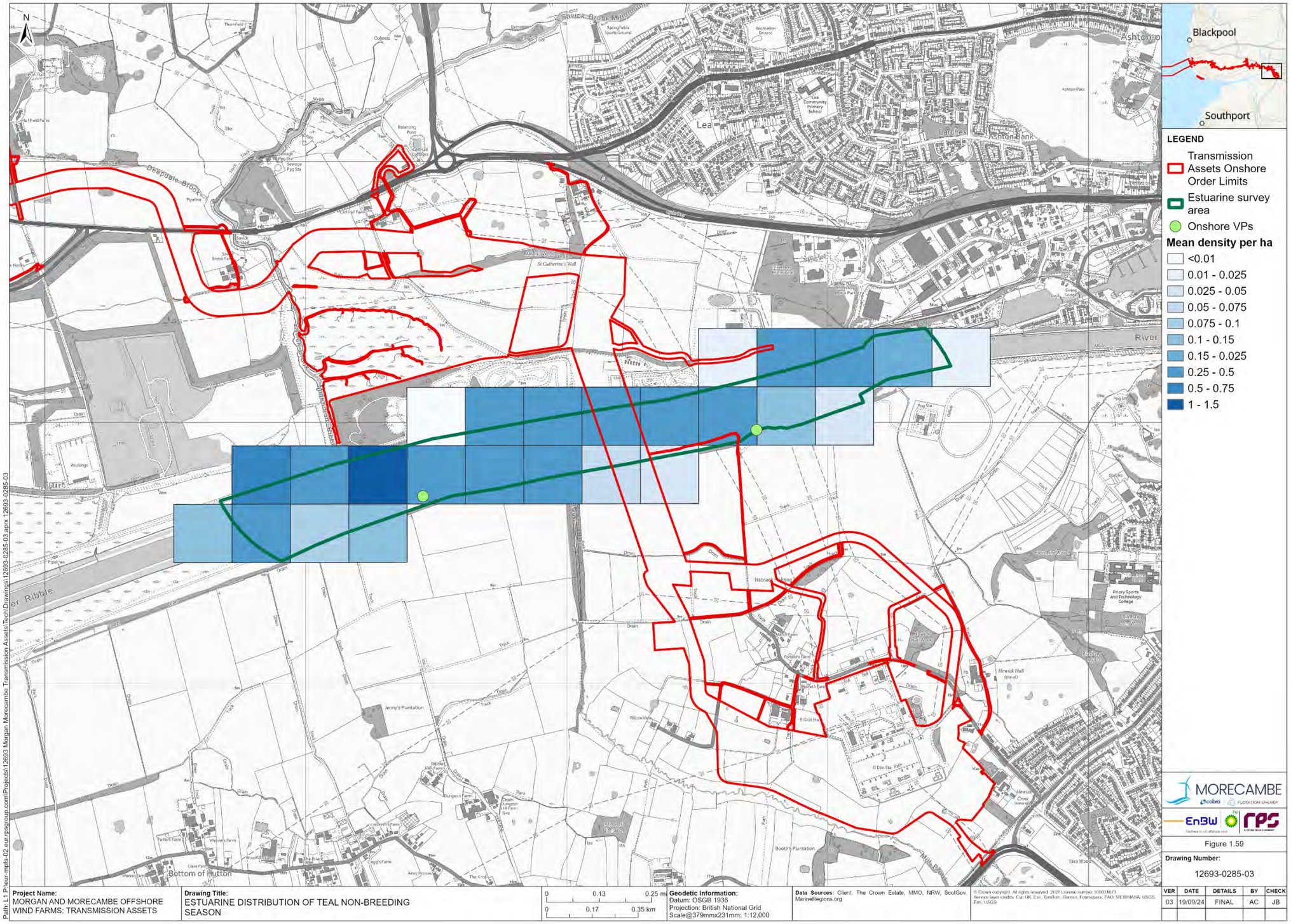

Figure 1.59: Distribution of teal during the non-breeding season

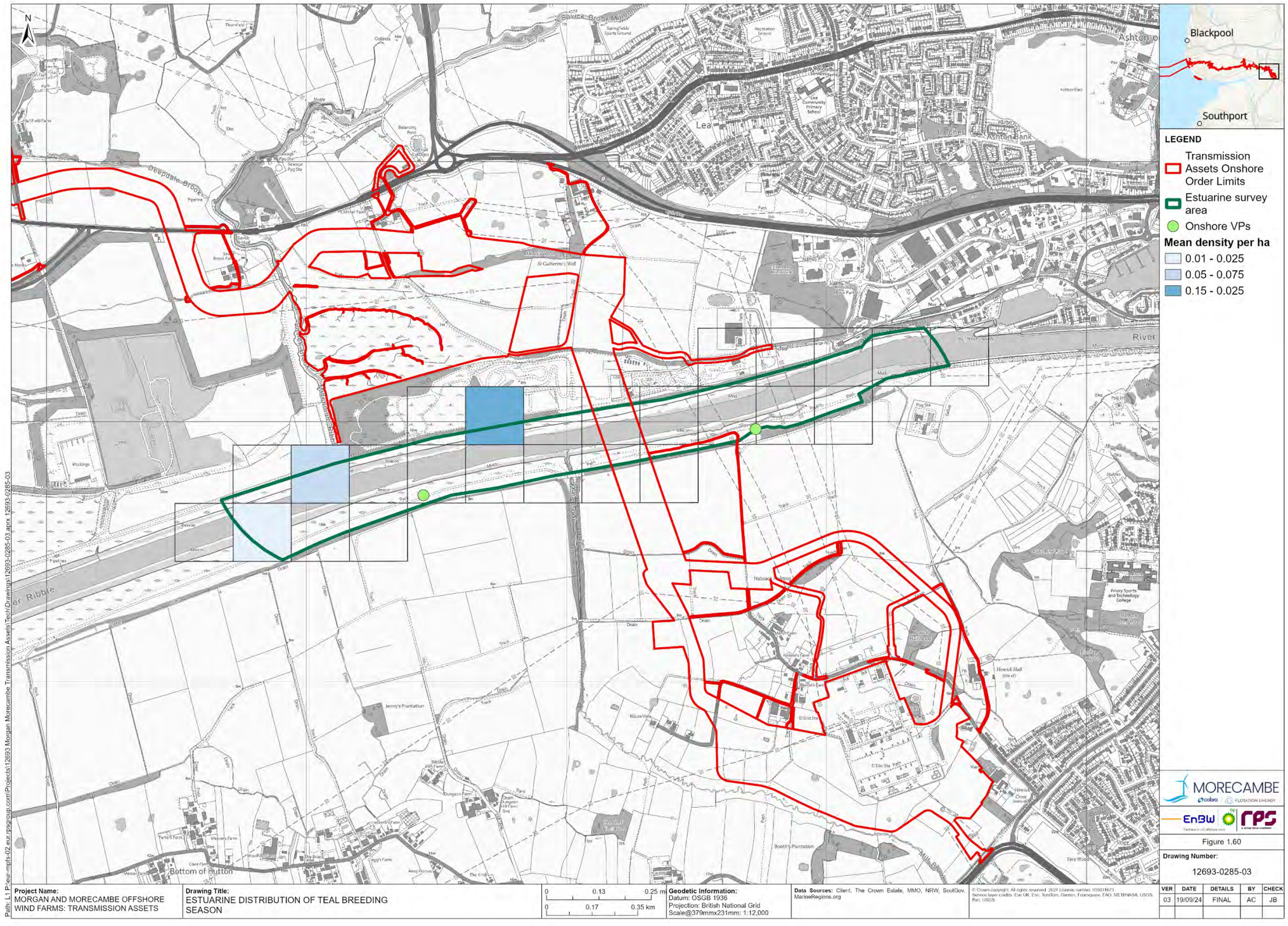

Figure 1.60: Distribution of teal during the breeding season

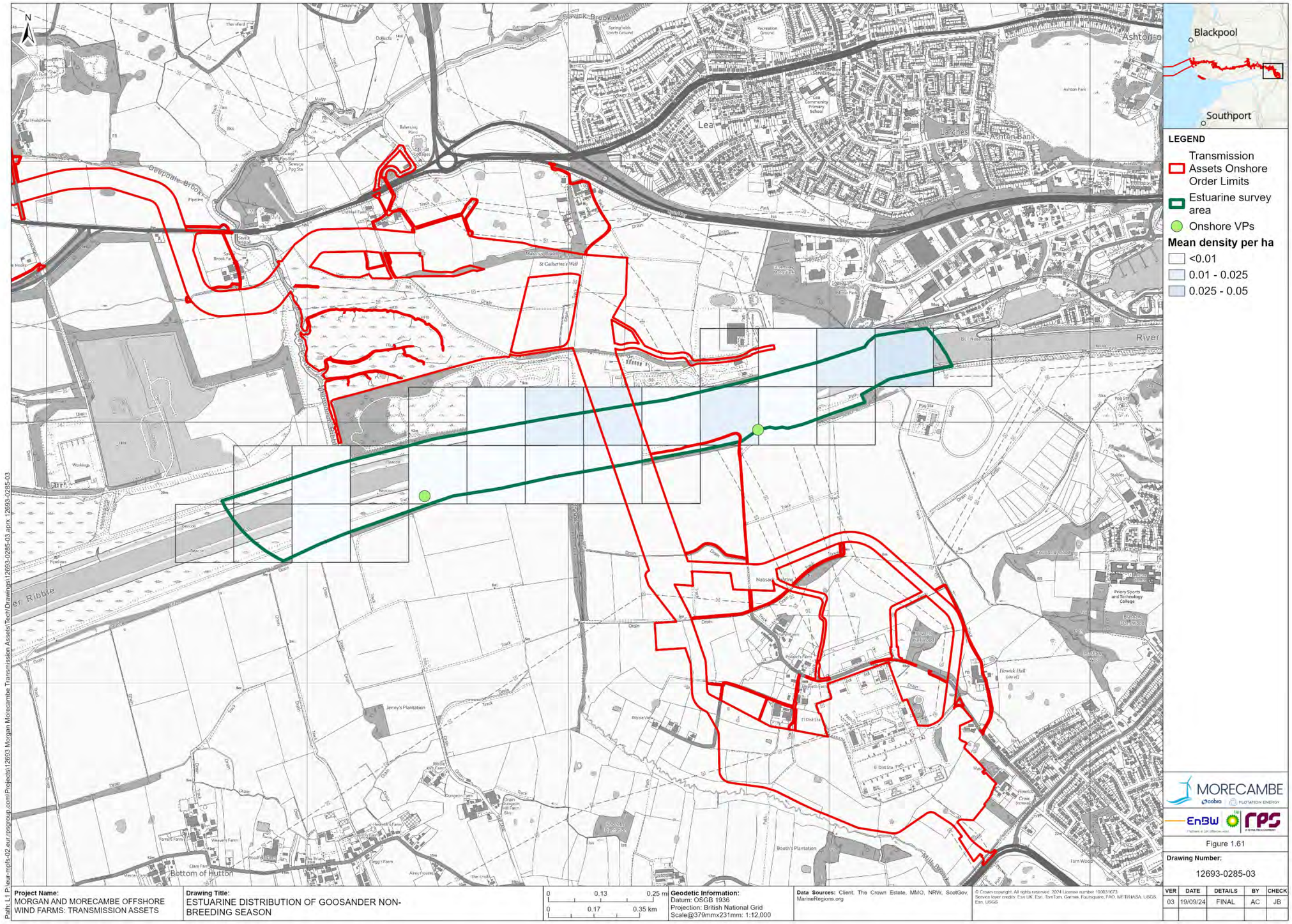

Figure 1.61: Distribution of goosander during the non-breeding season

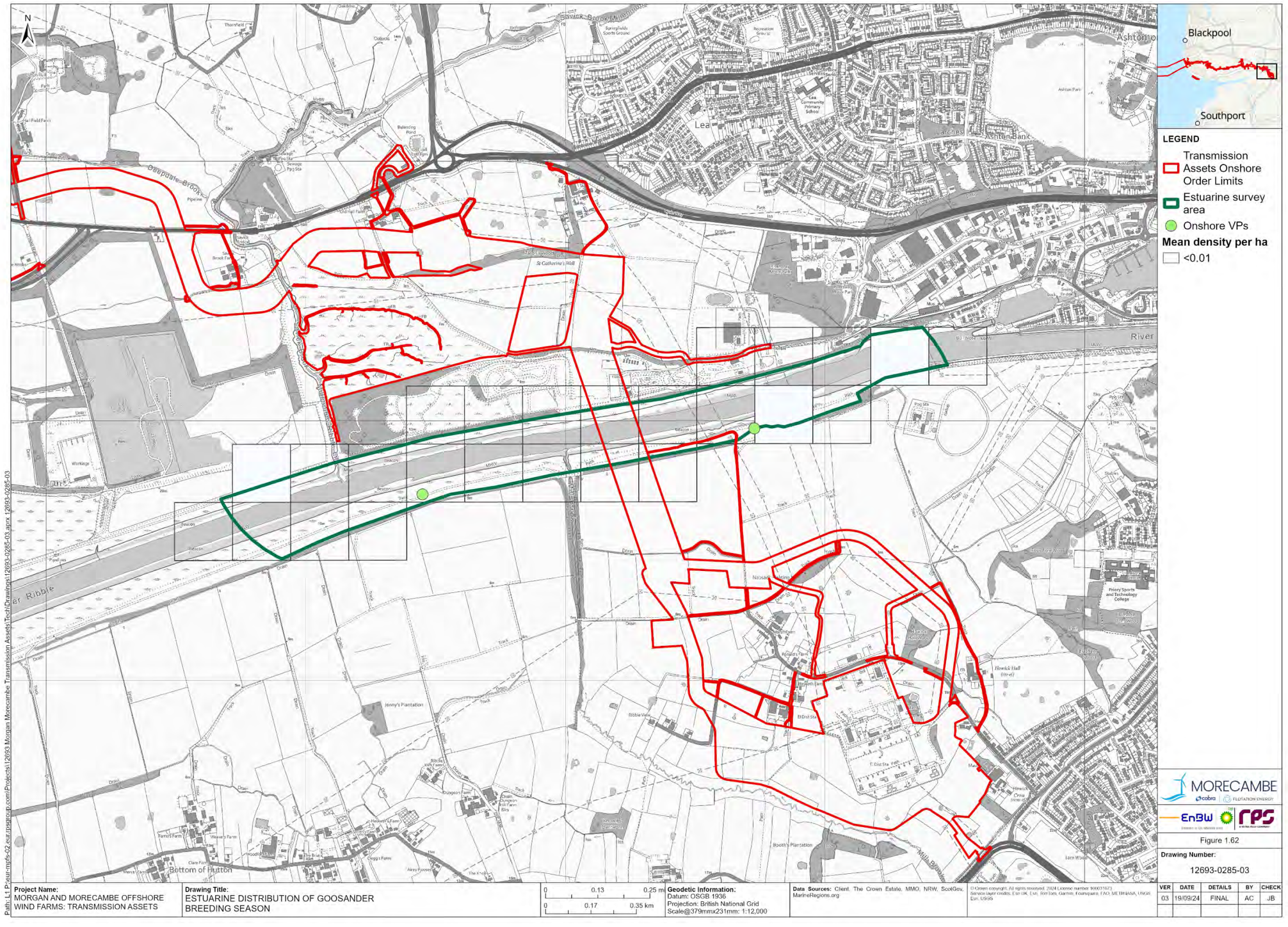

Figure 1.62: Distribution of goosander during the breeding season

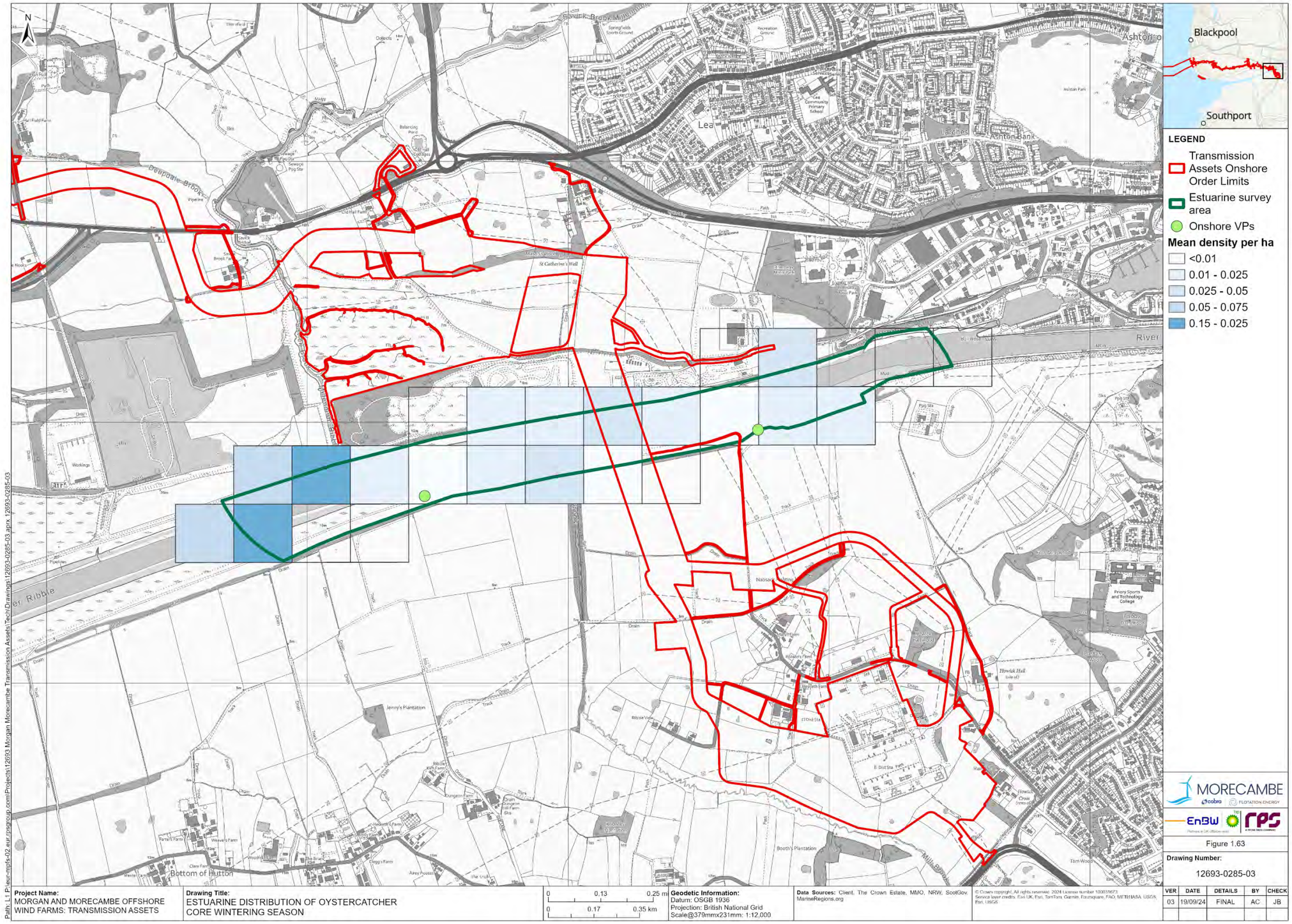

Figure 1.63: Distribution of oystercatcher during winter

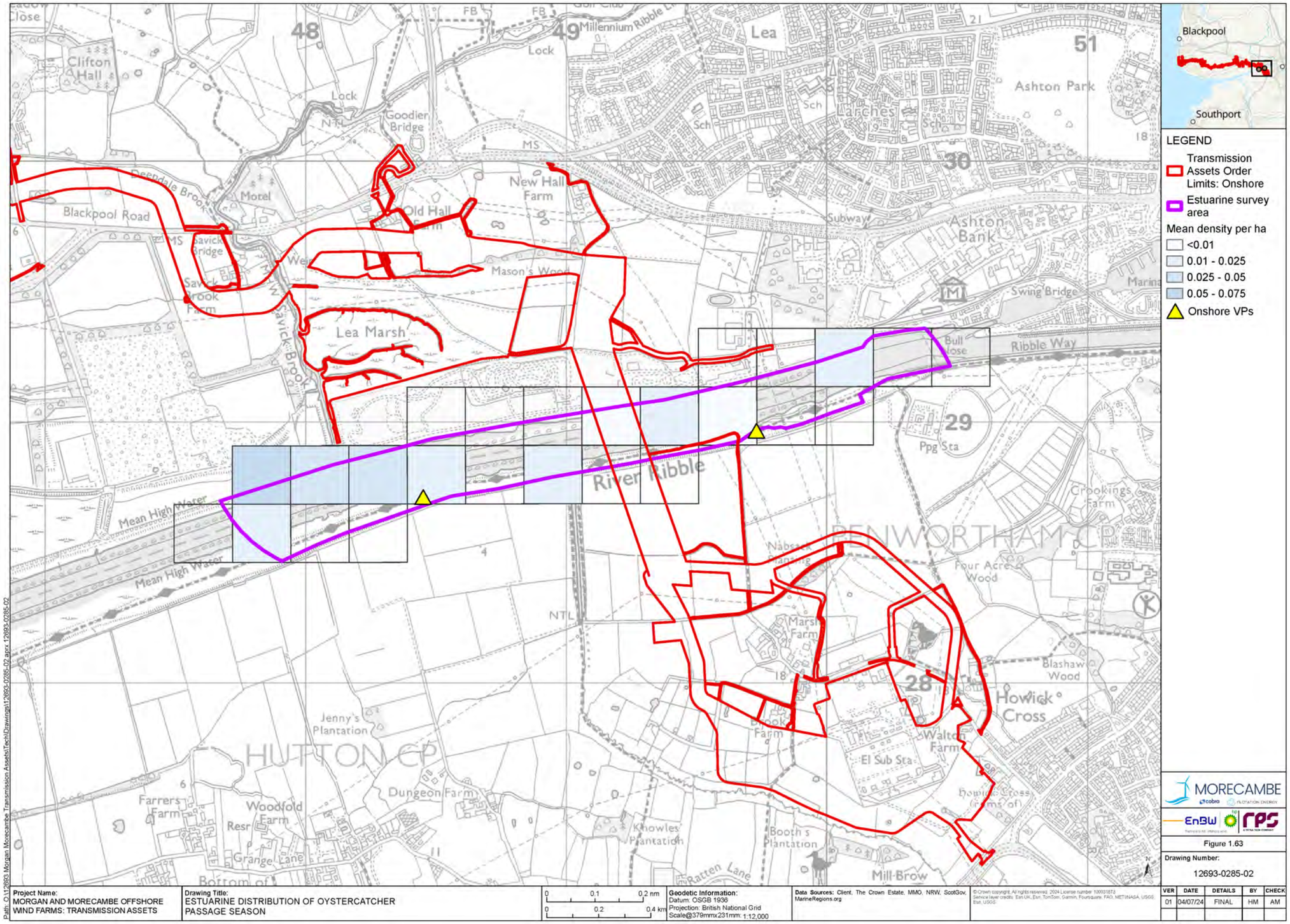

Figure 1.64: Distribution of oystercatcher during passage

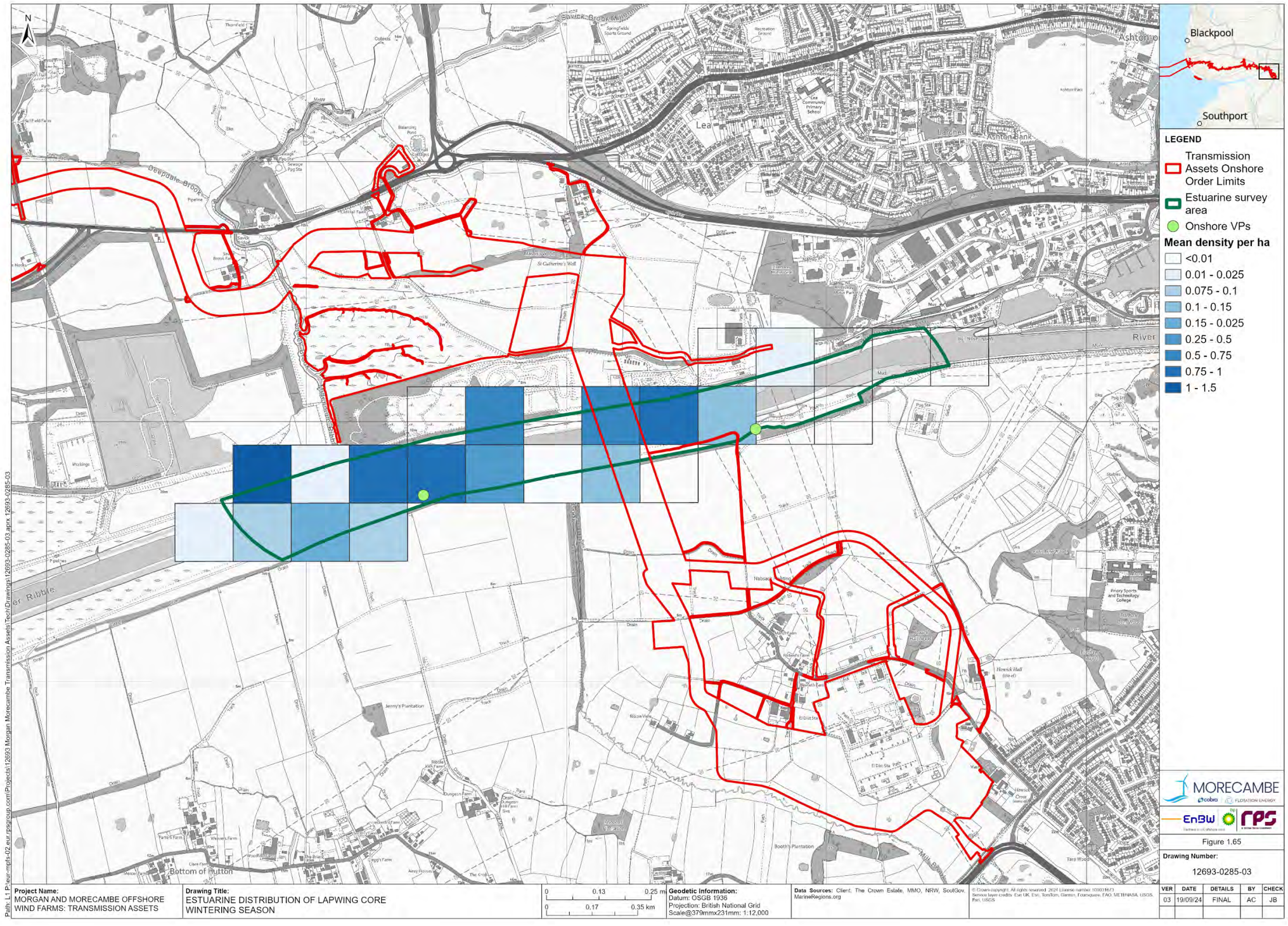

Figure 1.65: Distribution of lapwing during winter

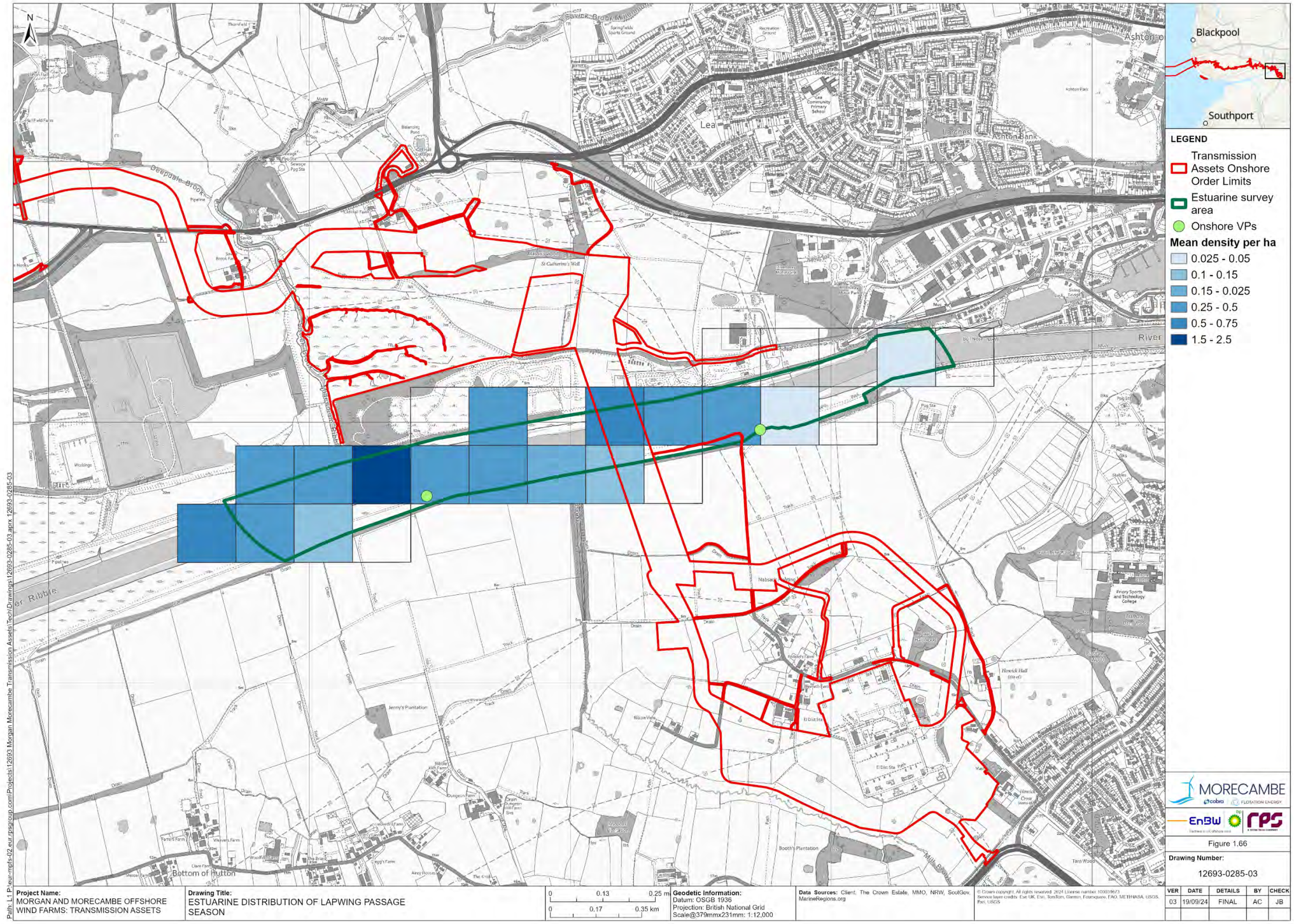

Figure 1.66: Distribution of lapwing during passage

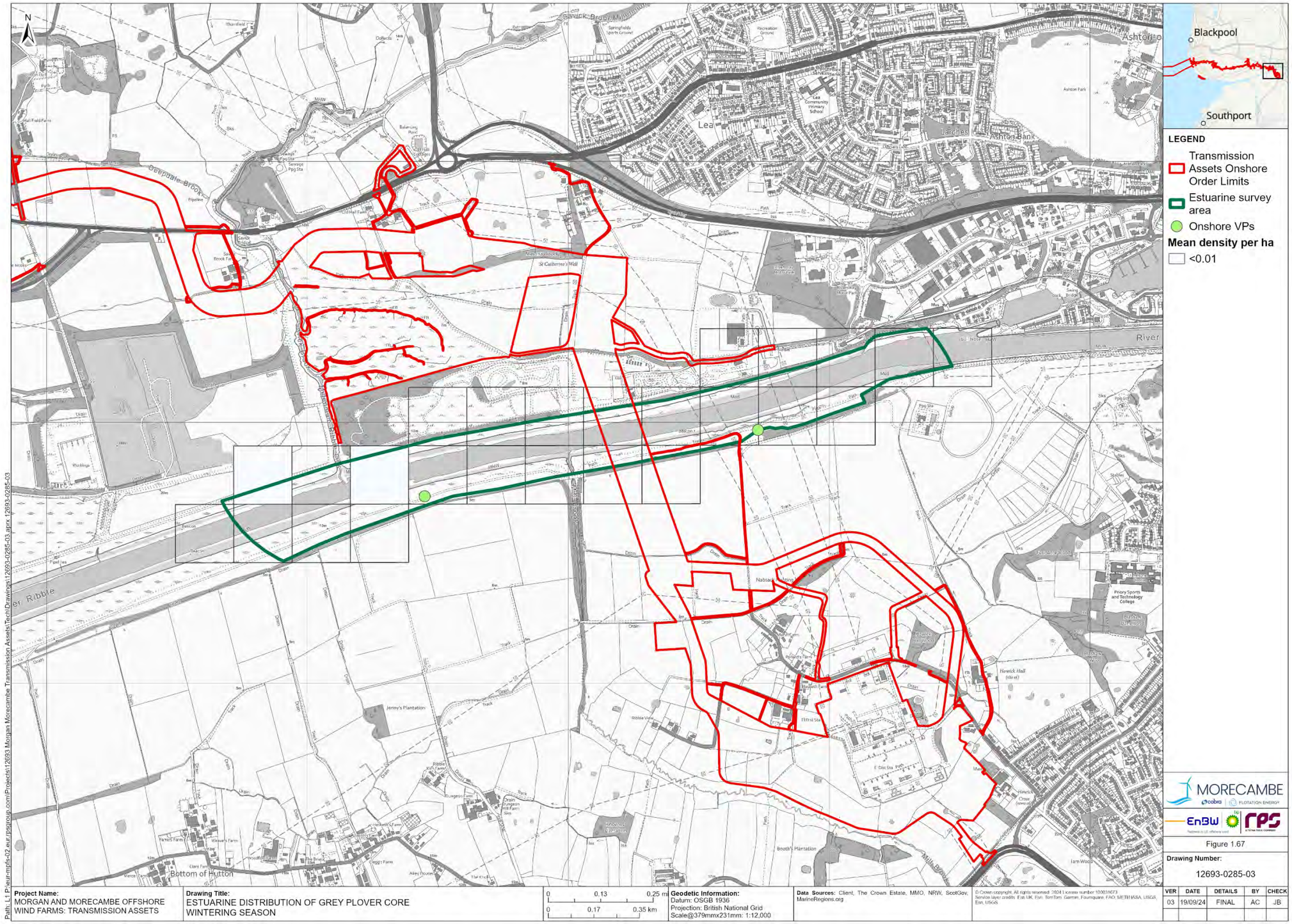

Figure 1.67: Distribution of grey plover during winter

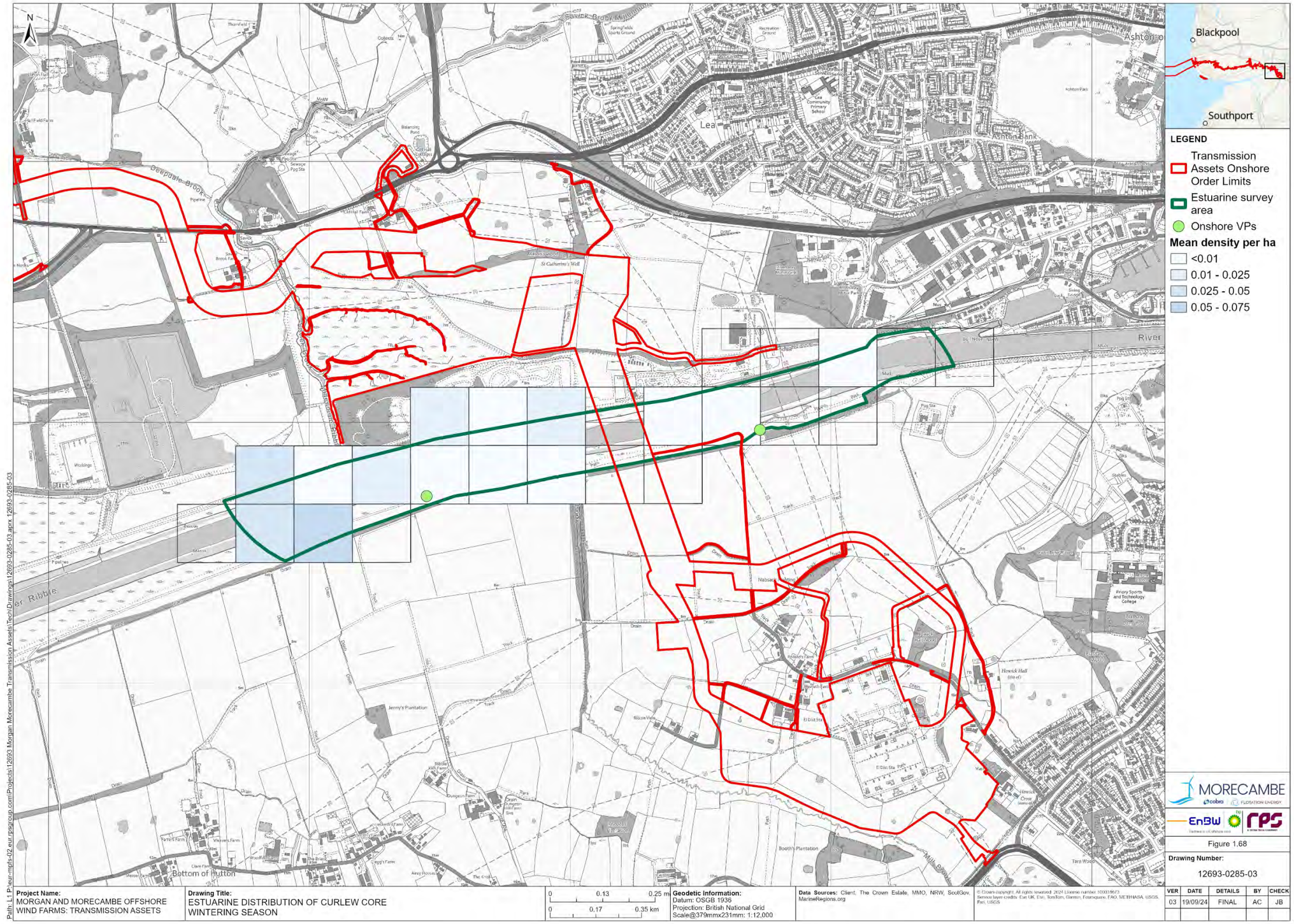

Figure 1.68: Distribution of curlew during winter

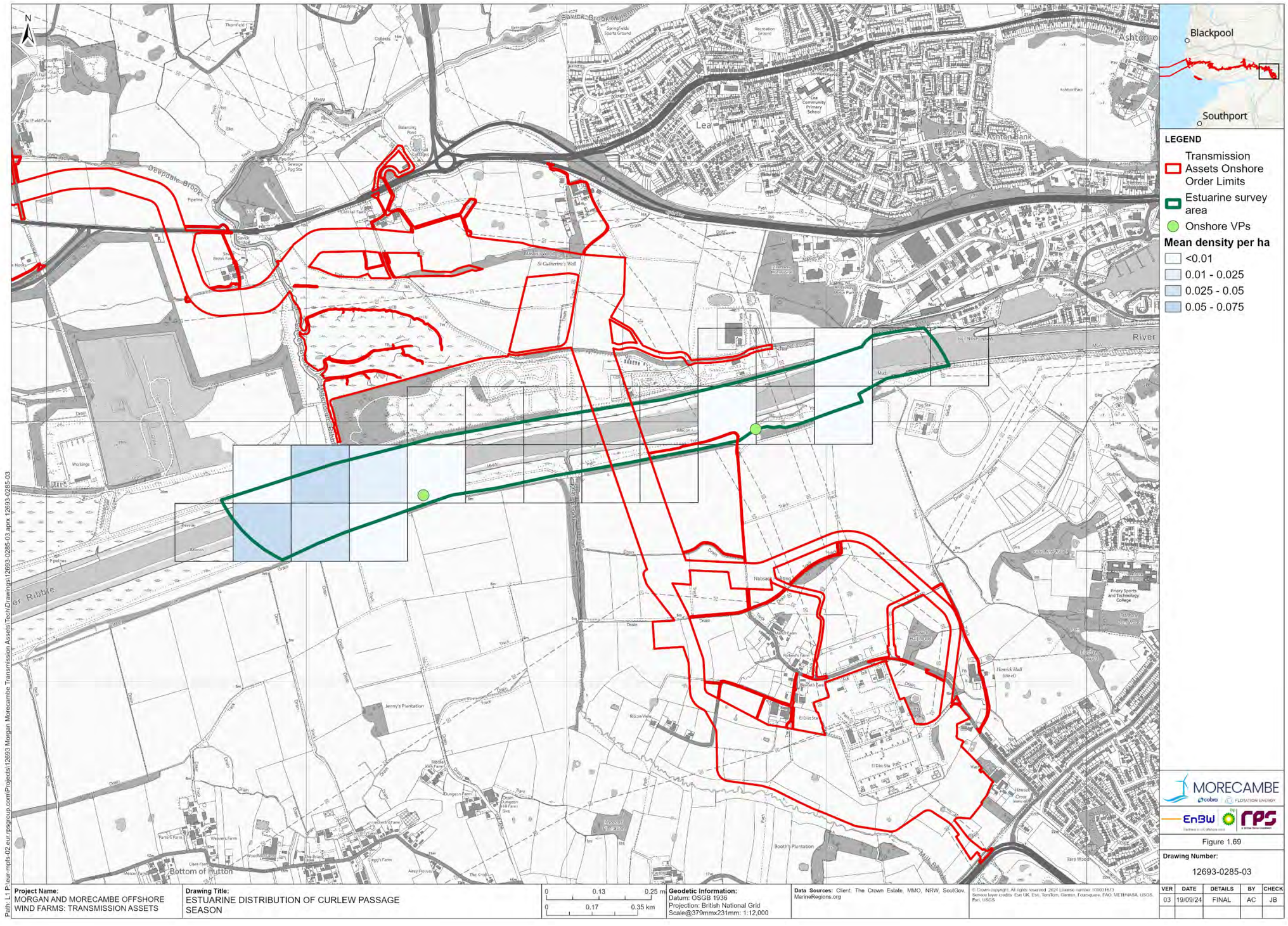

Figure 1.69: Distribution of curlew during passage

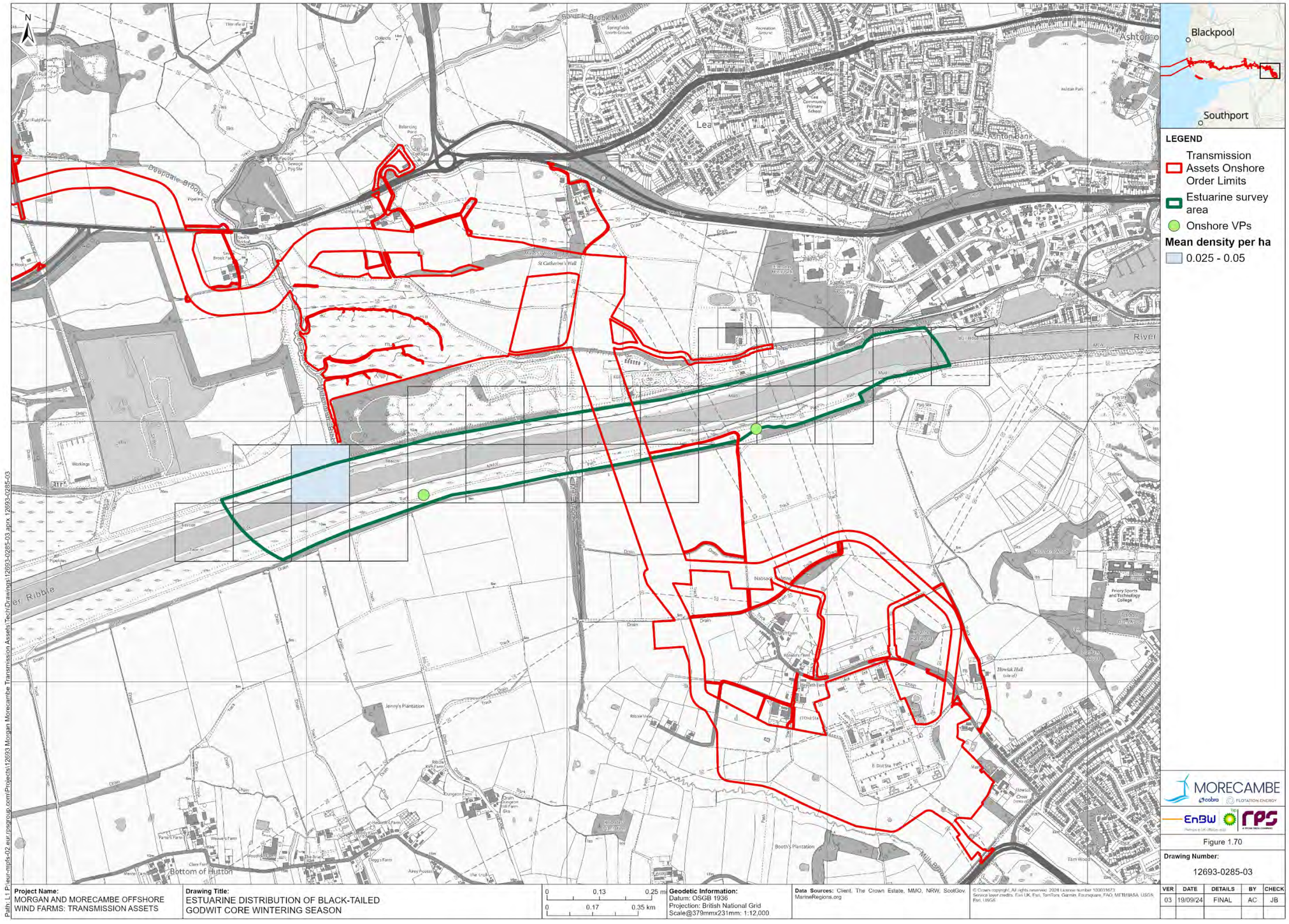

Figure 1.70: Distribution of black-tailed godwit during winter

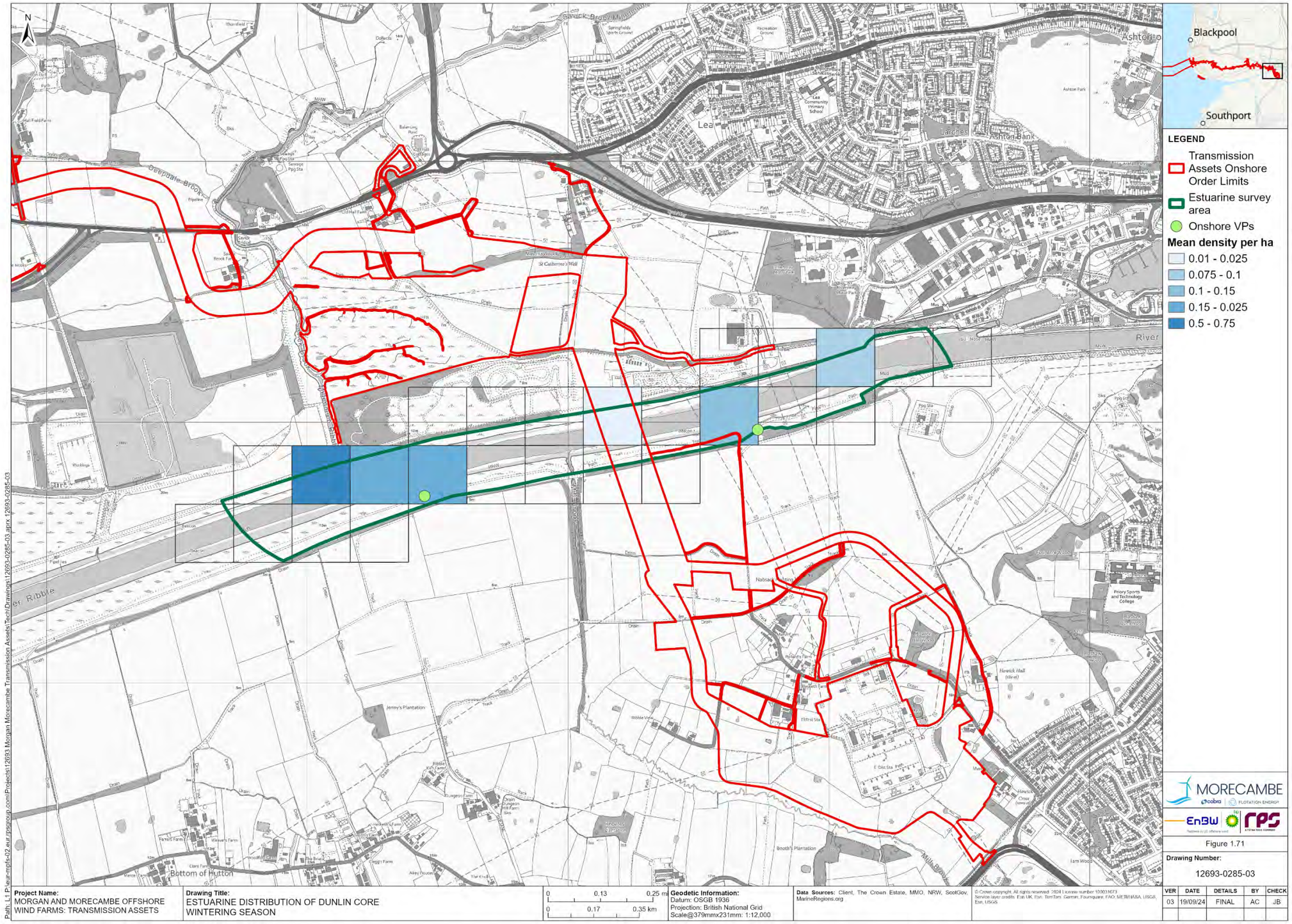

Figure 1.71: Distribution of dunlin during winter

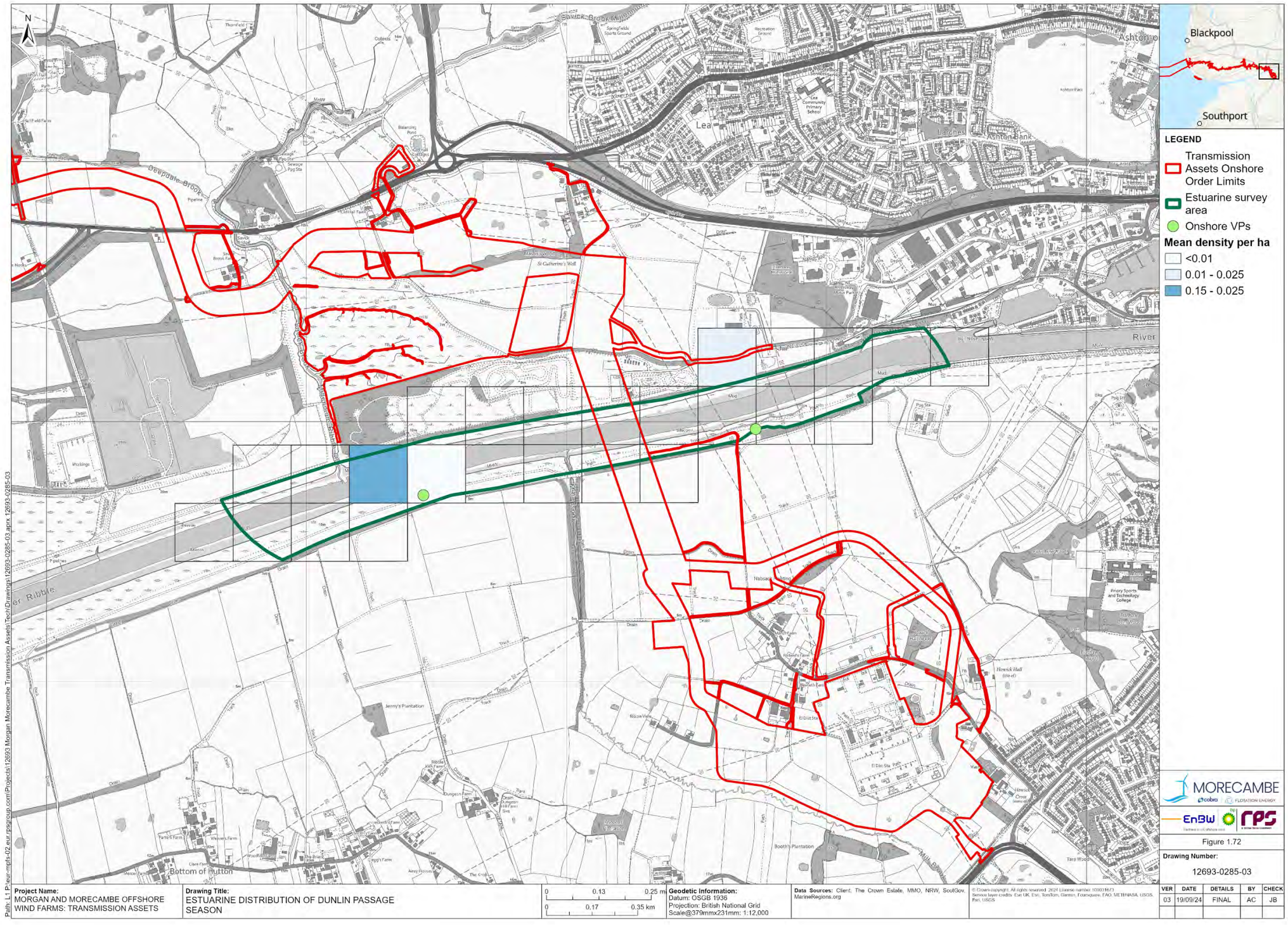

Figure 1.72: Distribution of dunlin during passage

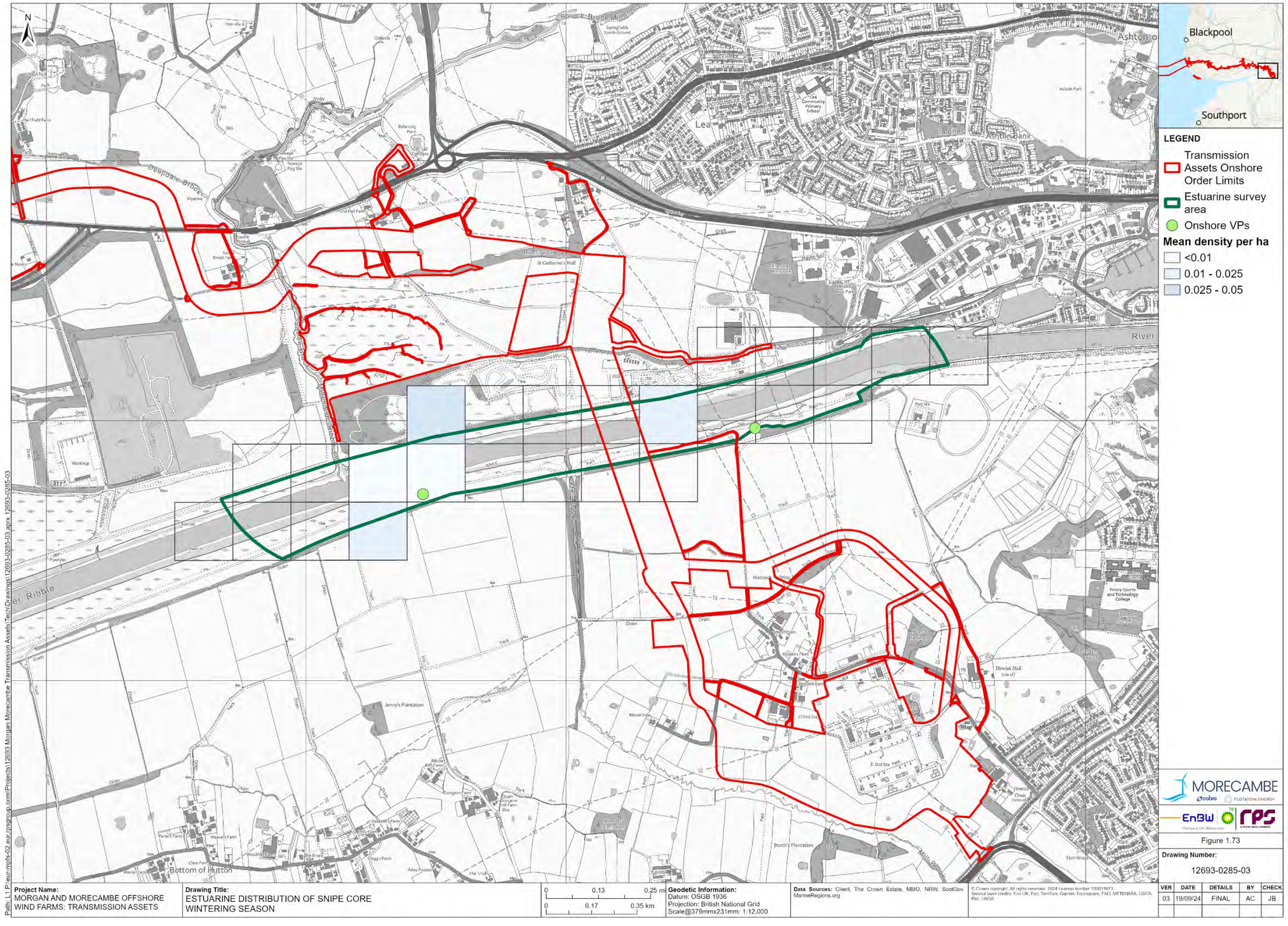

Figure 1.73: Distribution of snipe during winter

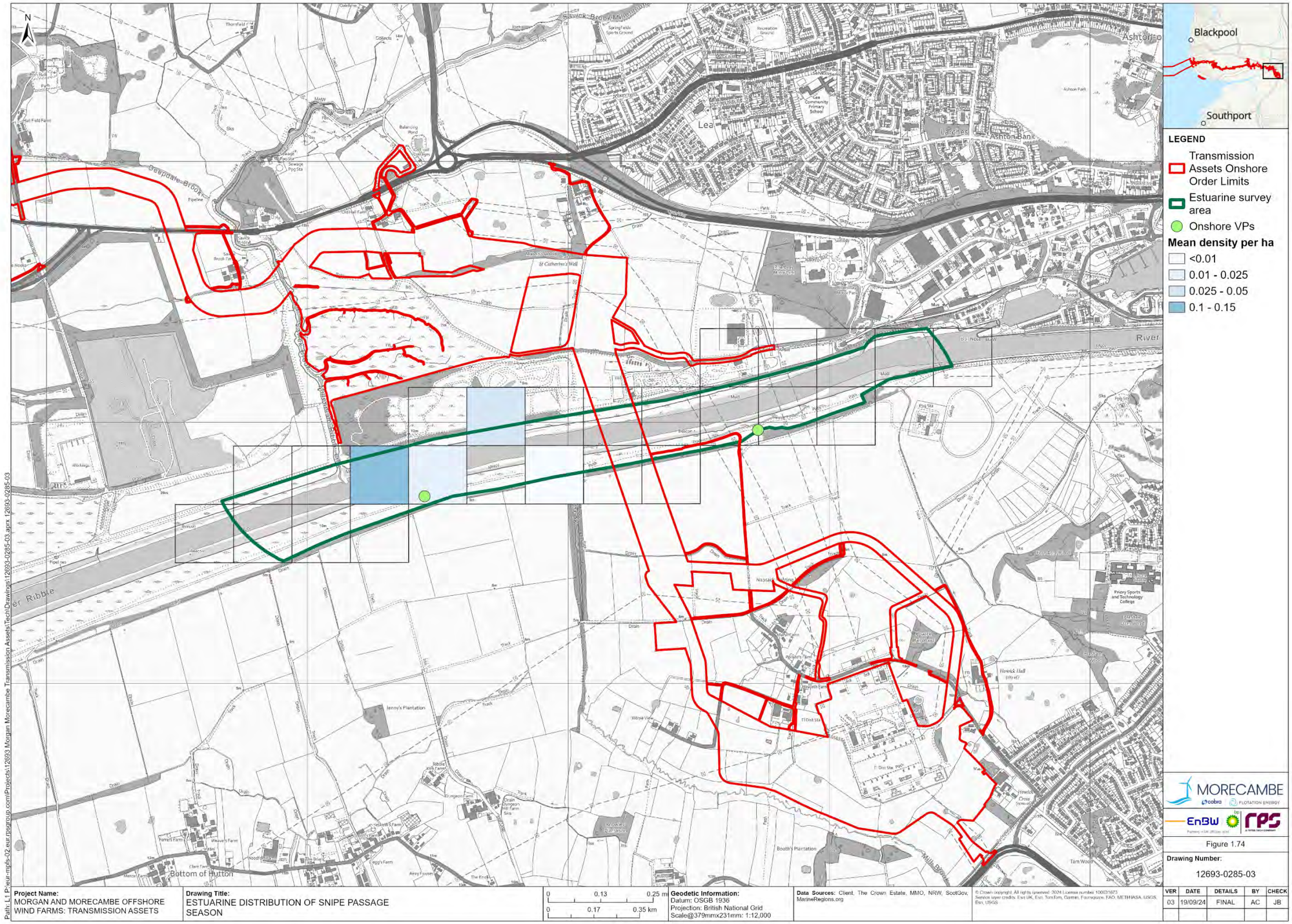

Figure 1.74: Distribution of snipe during passage

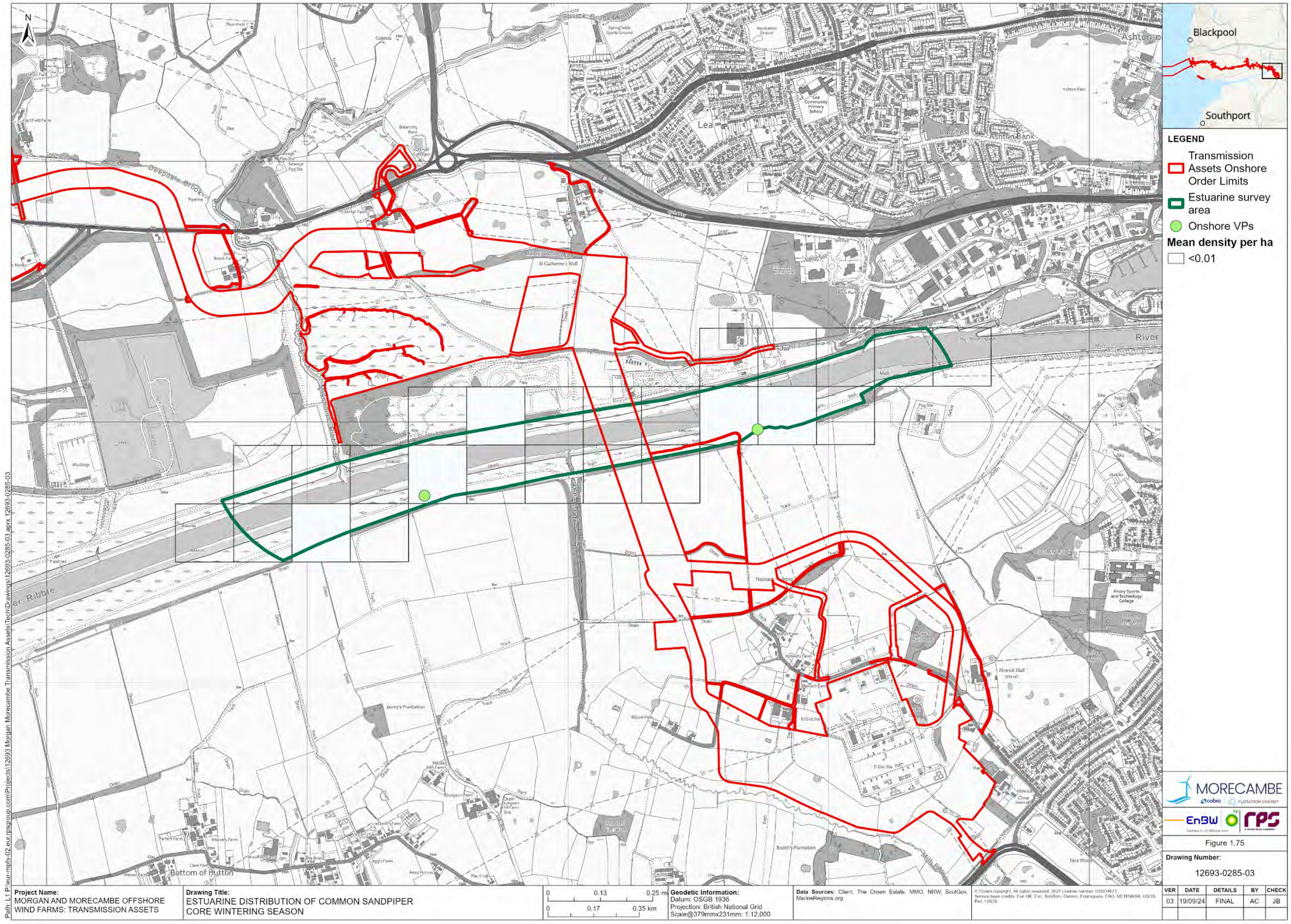

Figure 1.75: Distribution of common sandpiper during winter

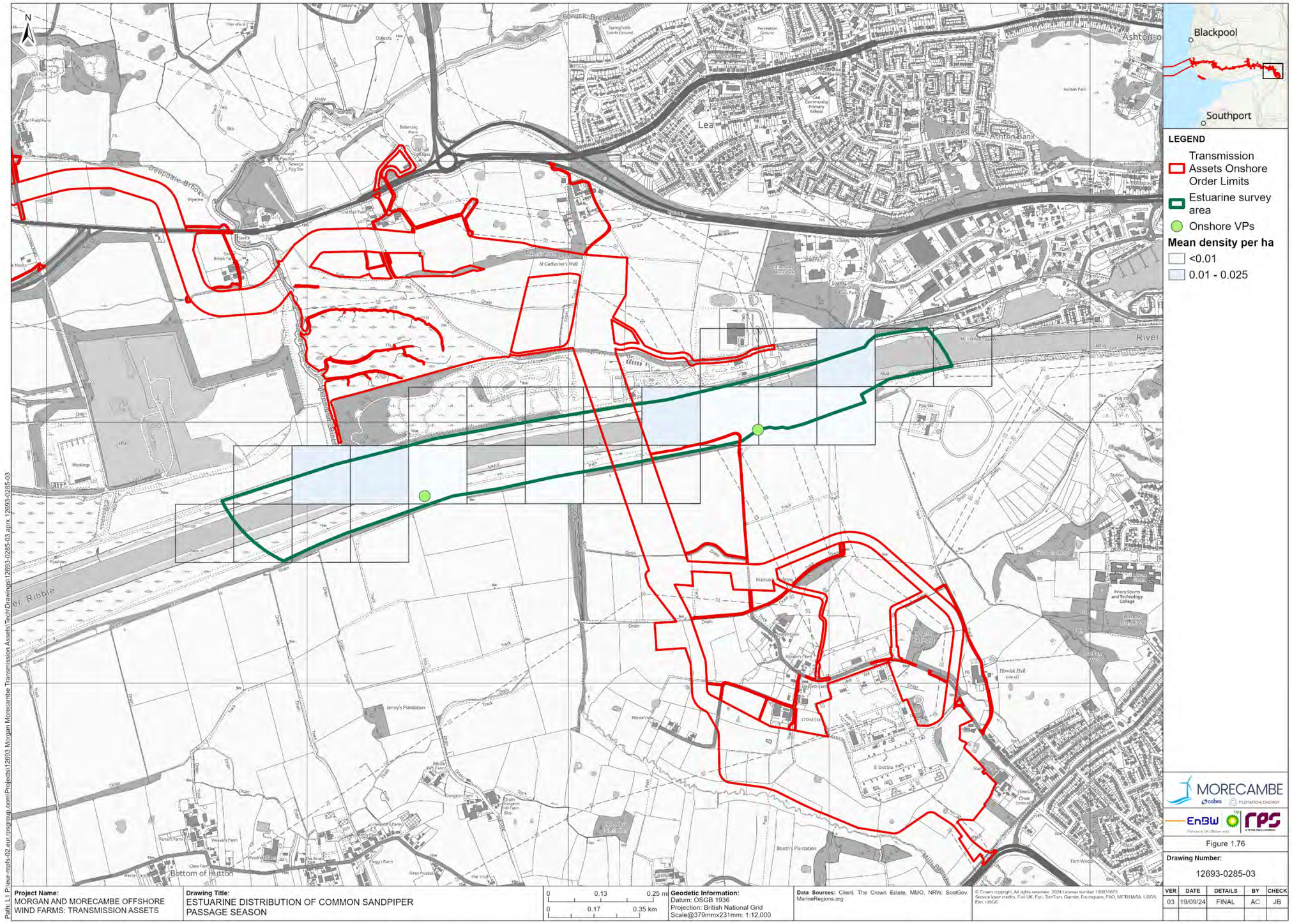

Figure 1.76: Distribution of common sandpiper during passage

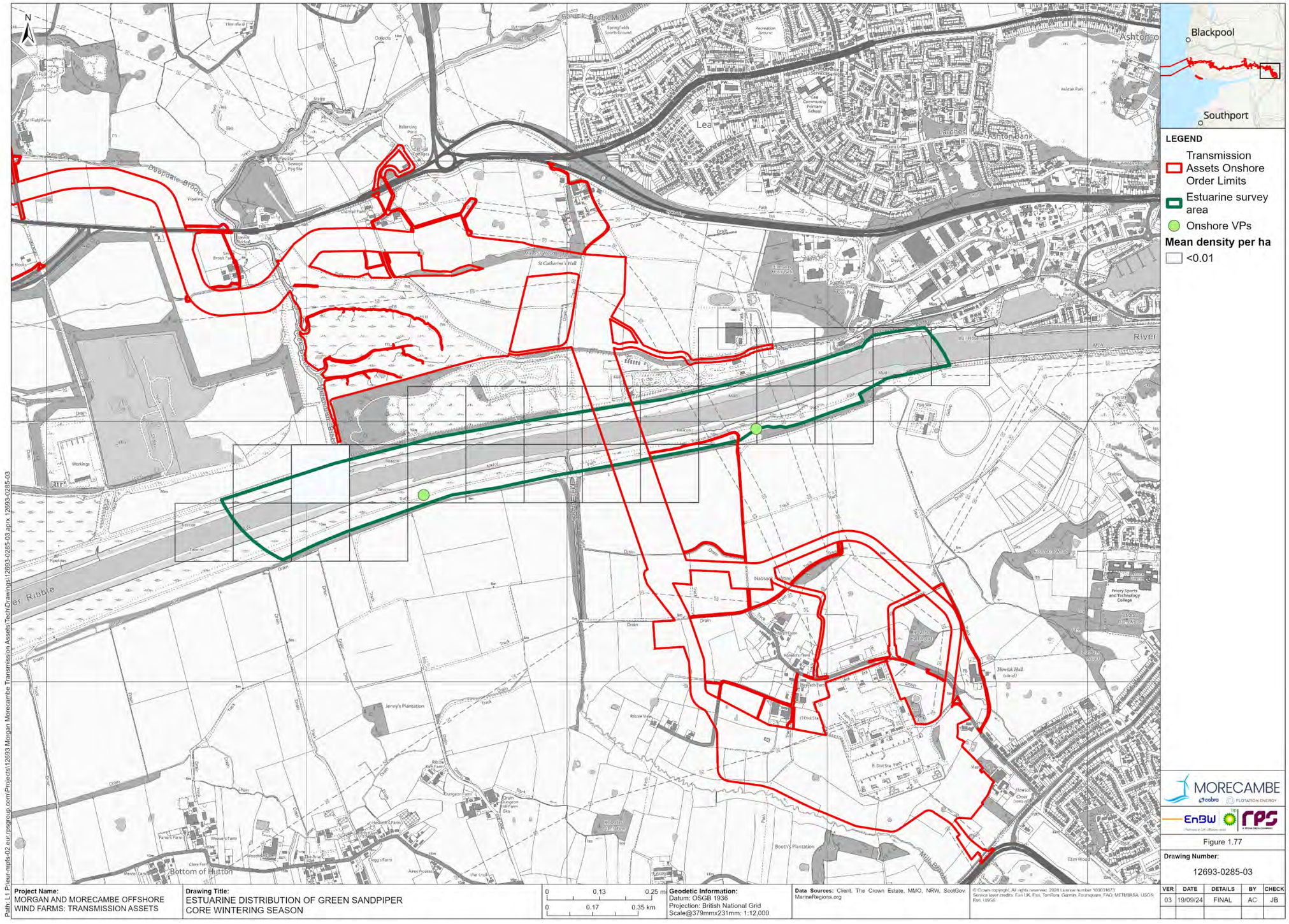

Figure 1.77: Distribution of green sandpiper during winter

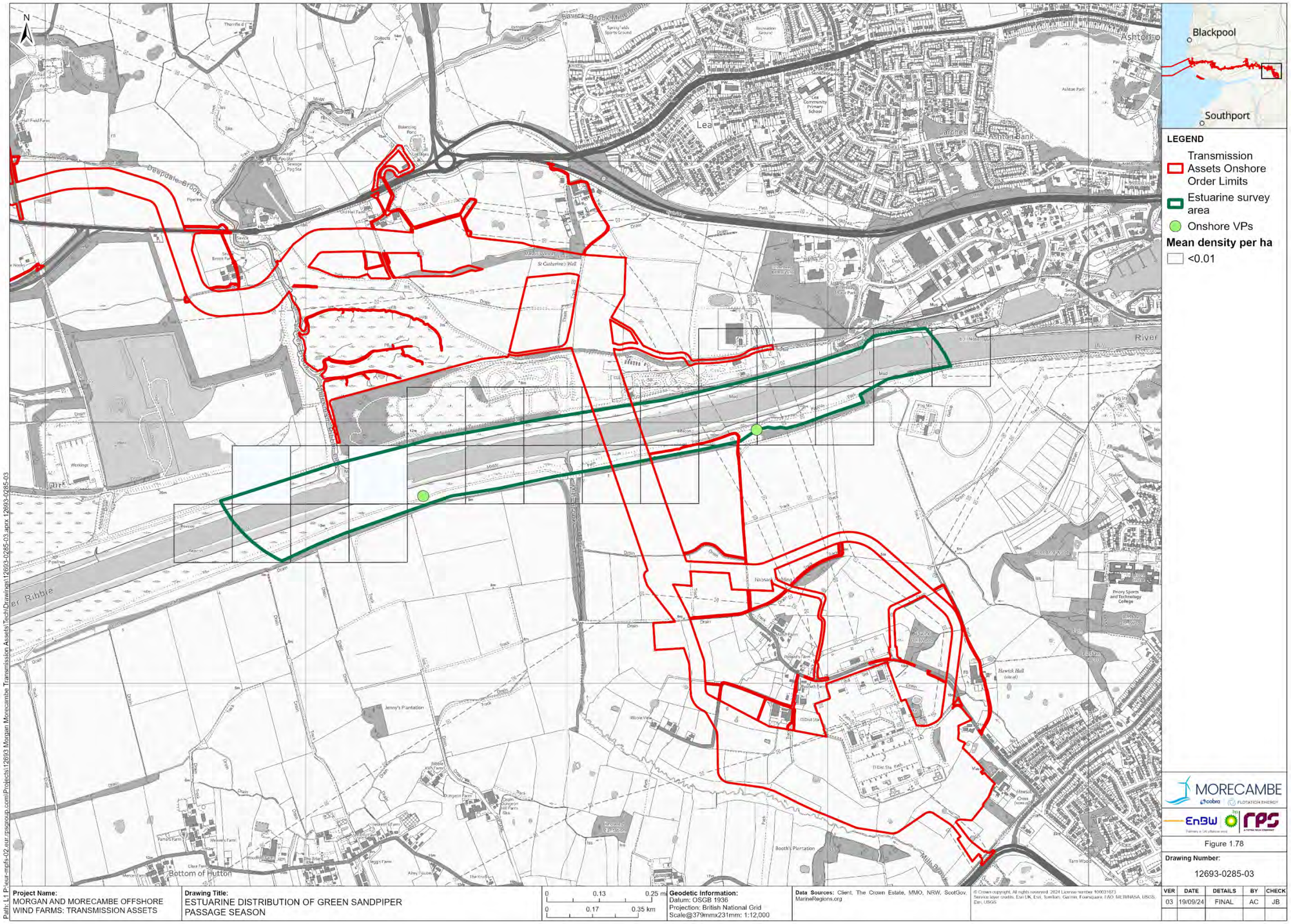

Figure 1.78: Distribution of green sandpiper during passage

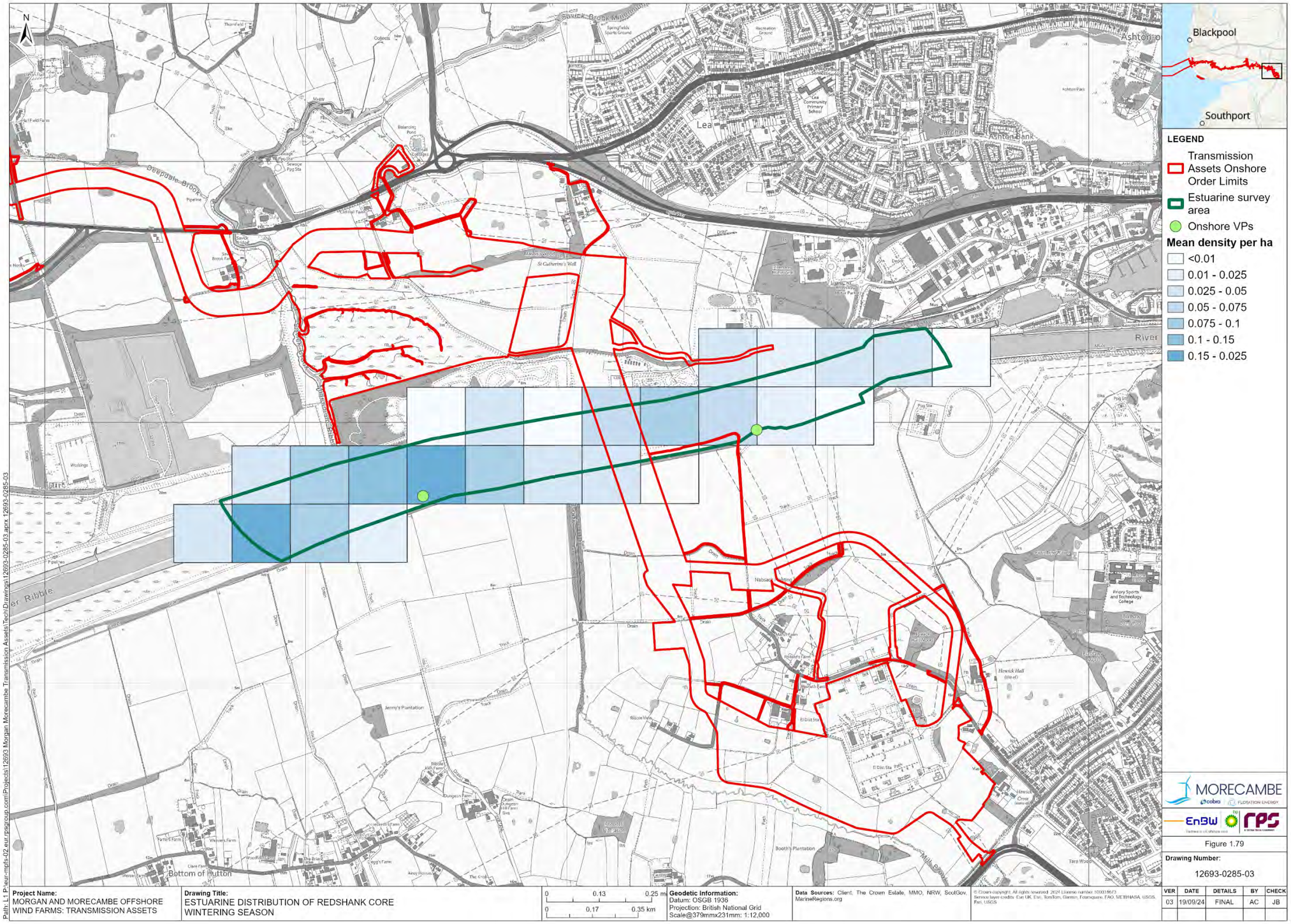

Figure 1.79: Distribution of redshank during winter

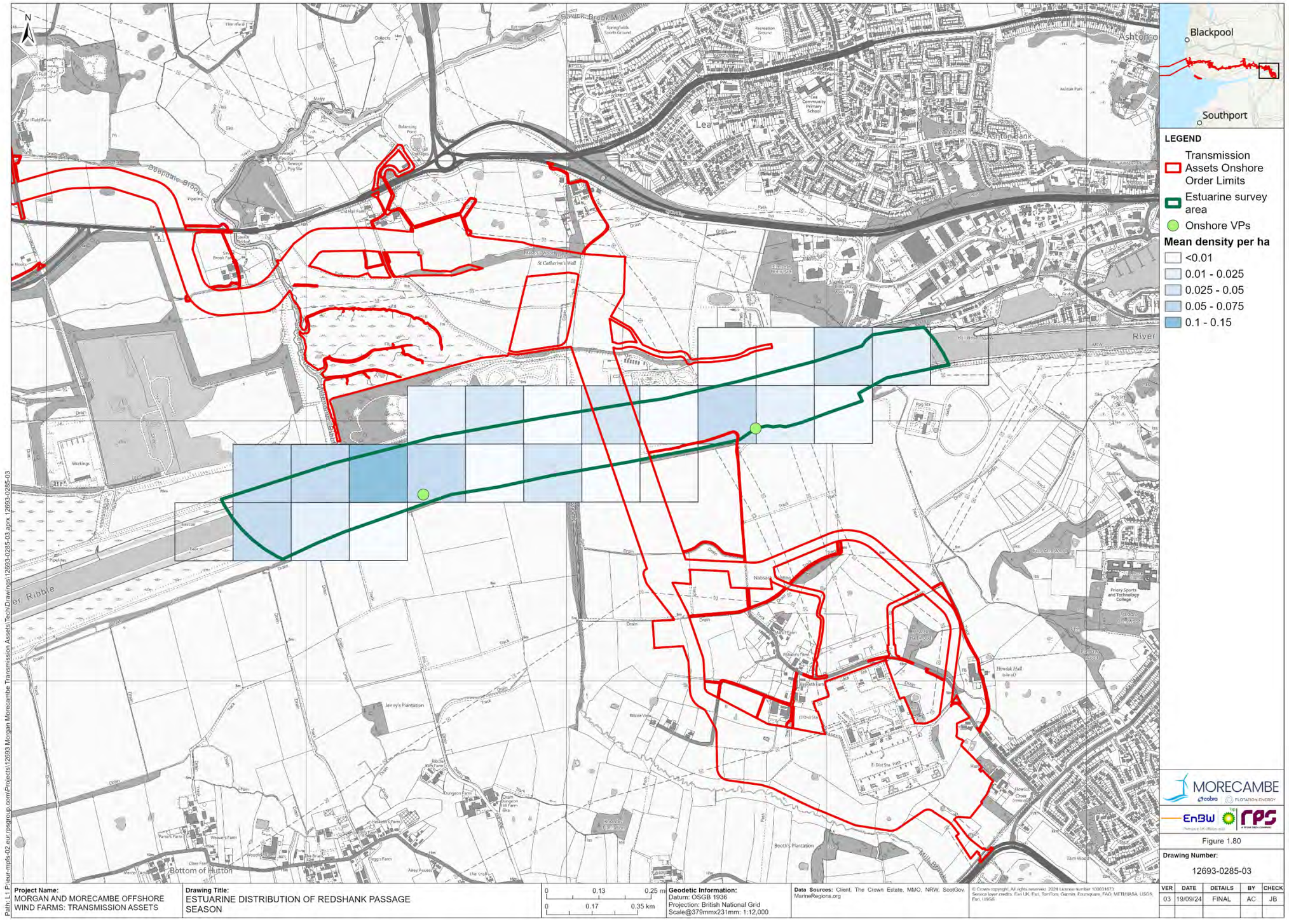

Figure 1.80: Distribution of redshank during passage

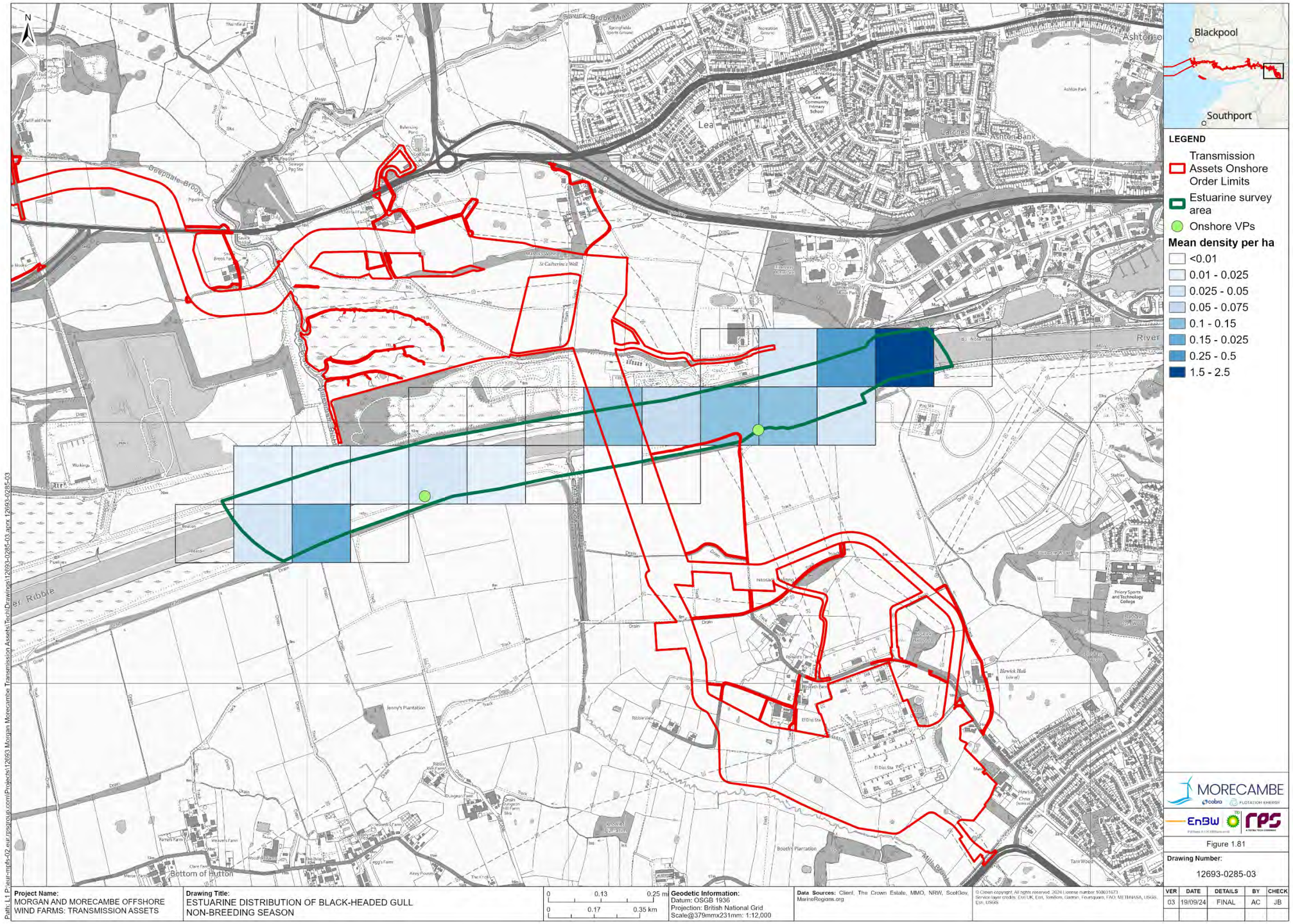

Figure 1.81: Distribution of black-headed gull during the non-breeding season

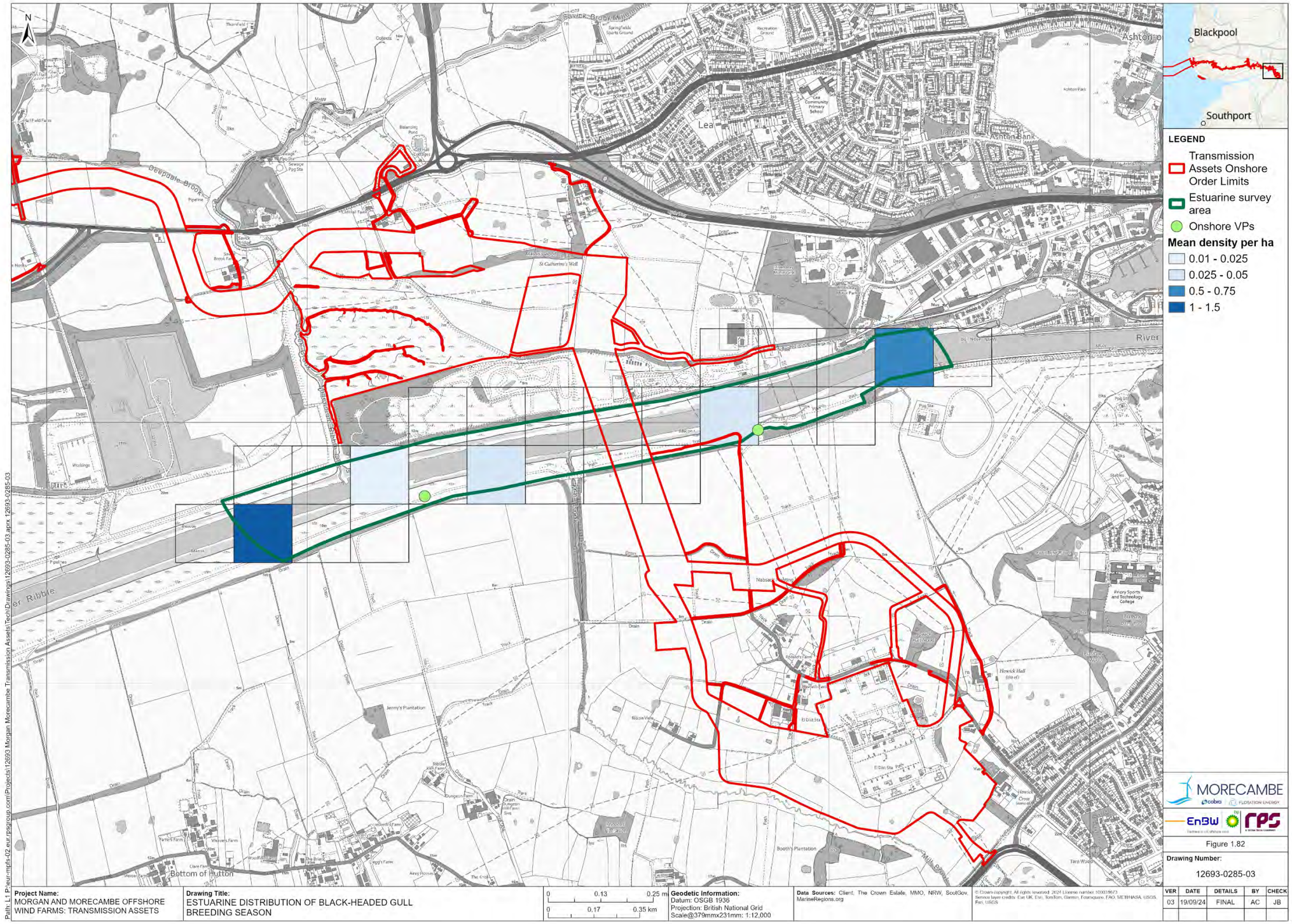

Figure 1.82: Distribution of black-headed gull during the breeding season

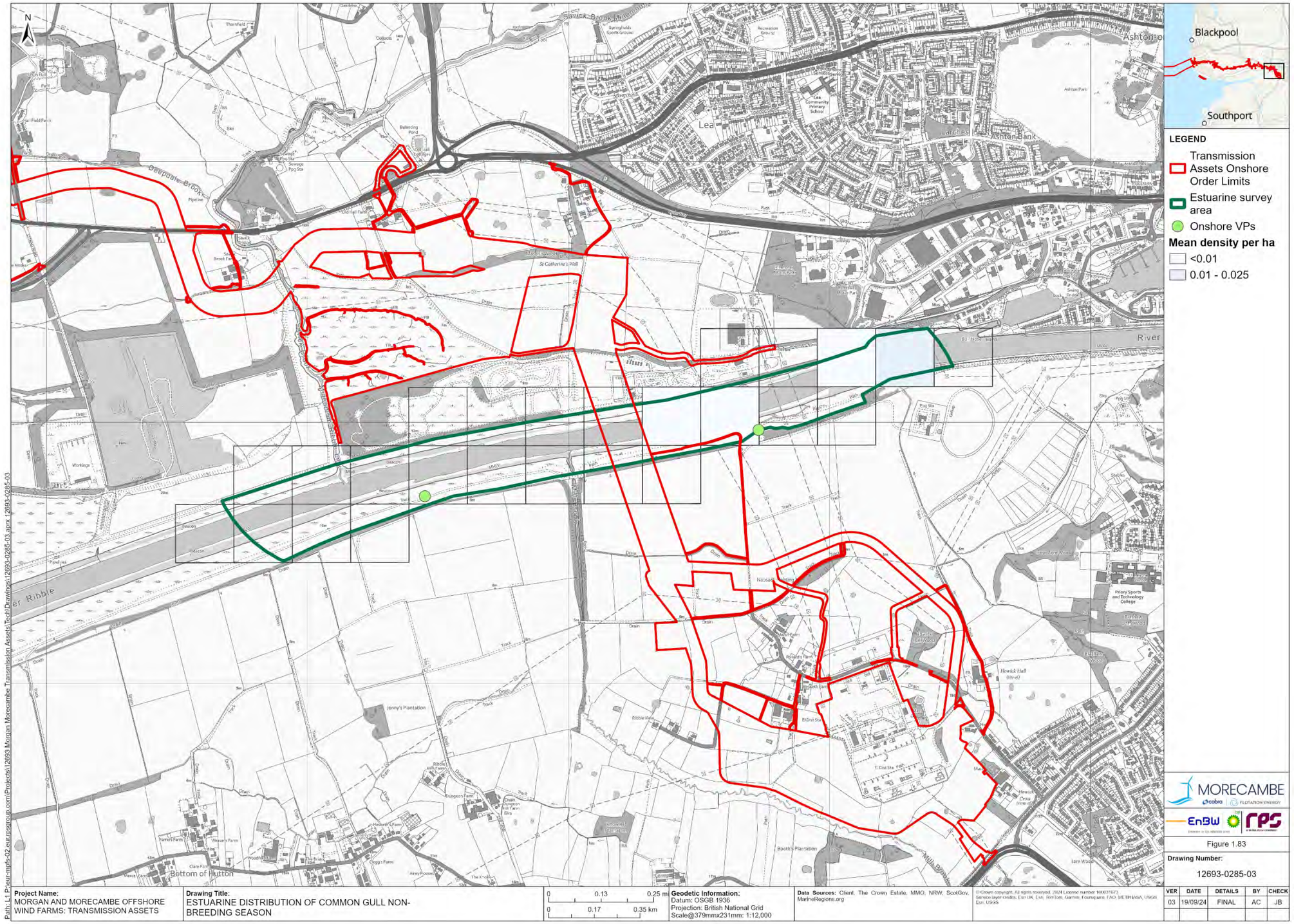

Figure 1.83: Distribution of common gull during the non-breeding season

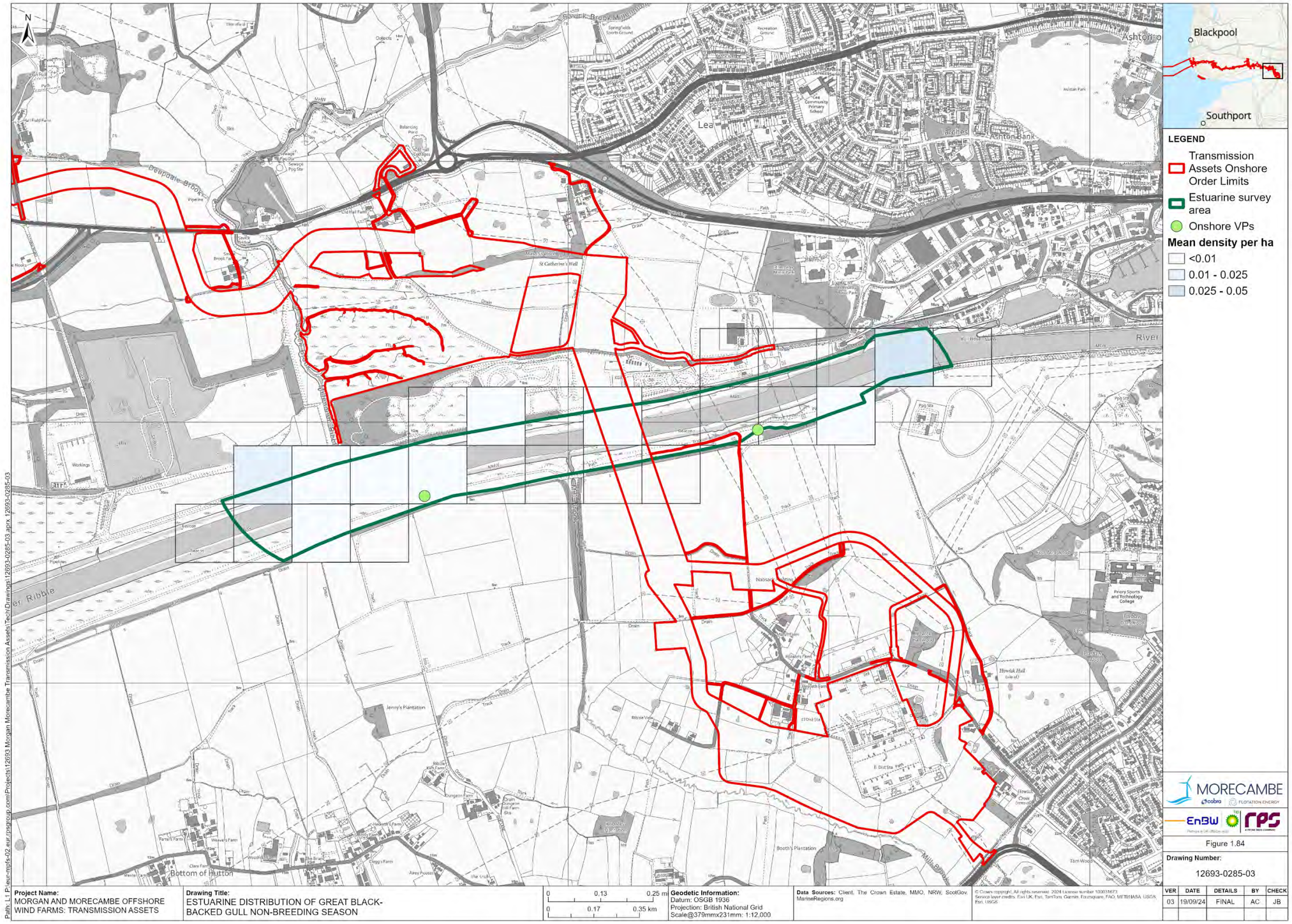

Figure 1.84: Distribution of great black-backed gull during the non-breeding season

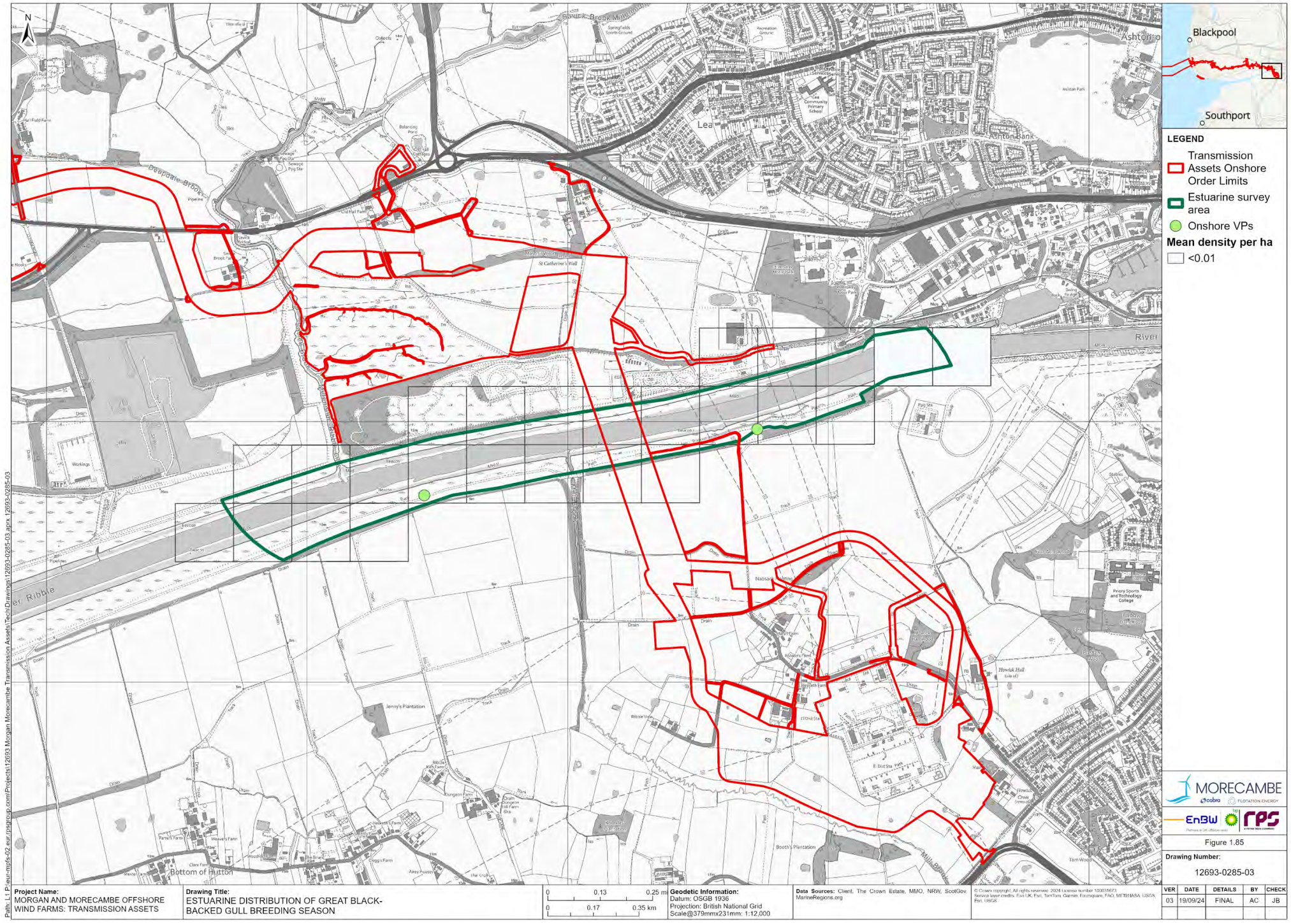

Figure 1.85: Distribution of great black-backed gull during the breeding season

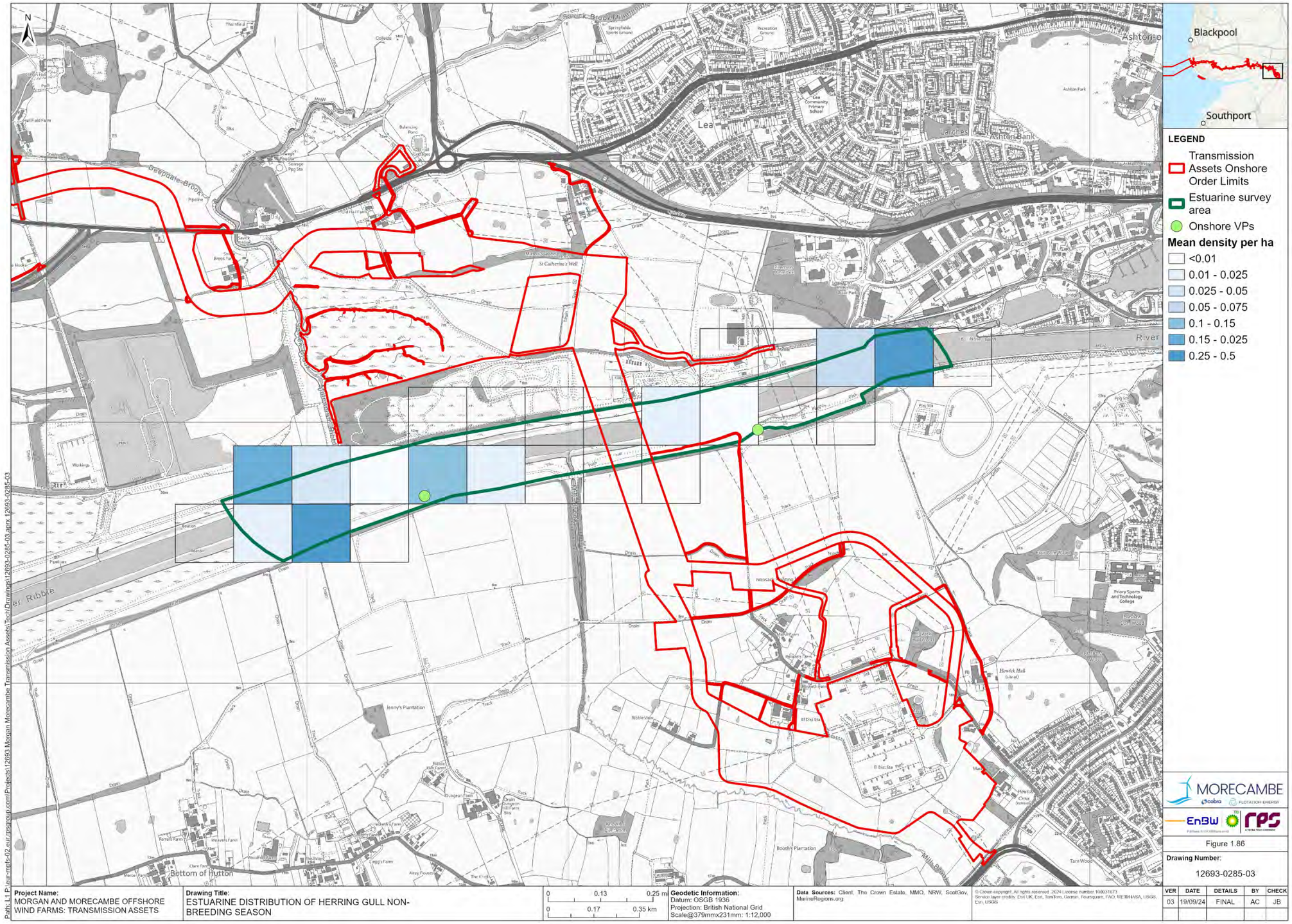

Figure 1.86: Distribution of herring gull during the non-breeding season

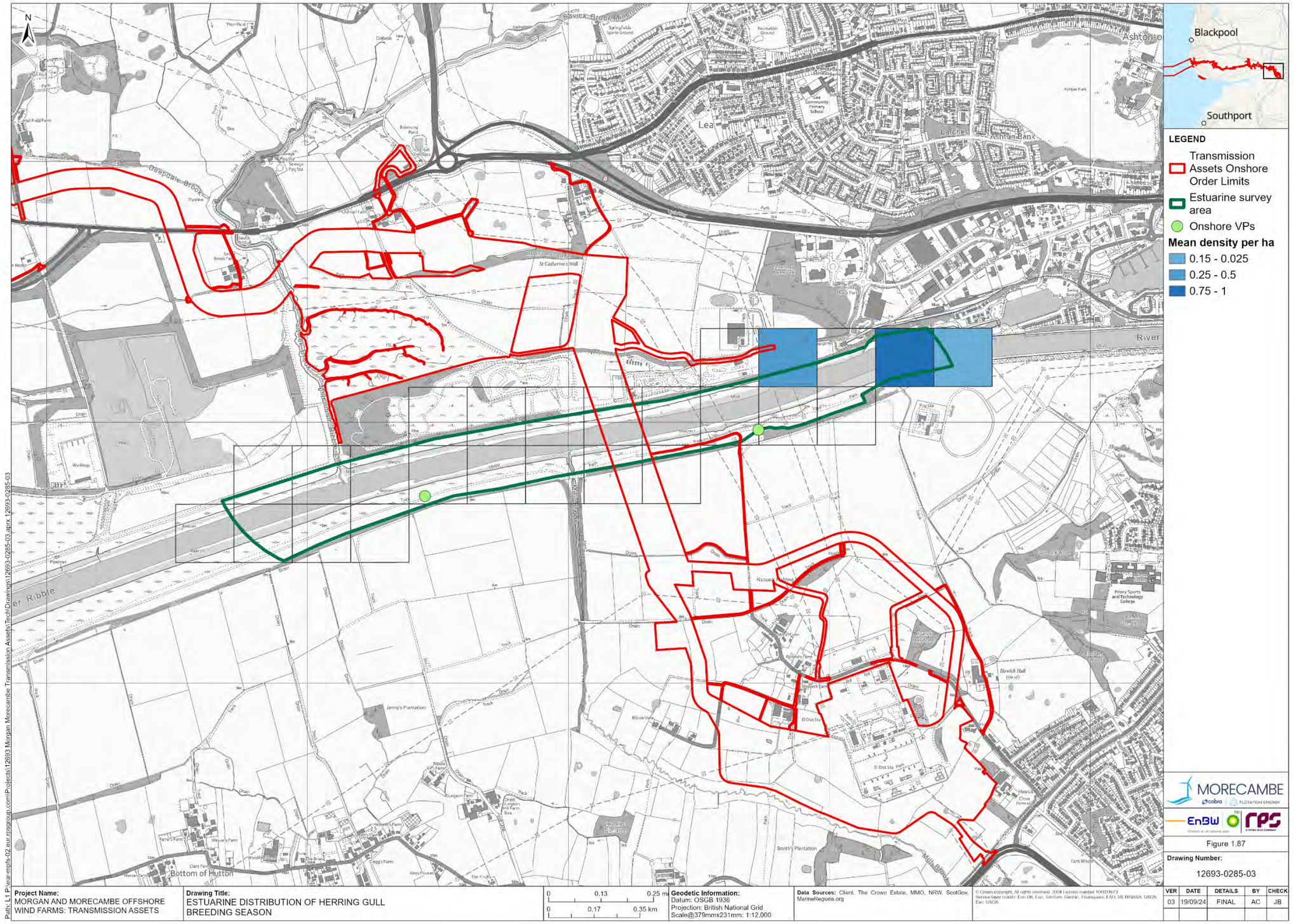

Figure 1.87: Distribution of herring gull during the breeding season

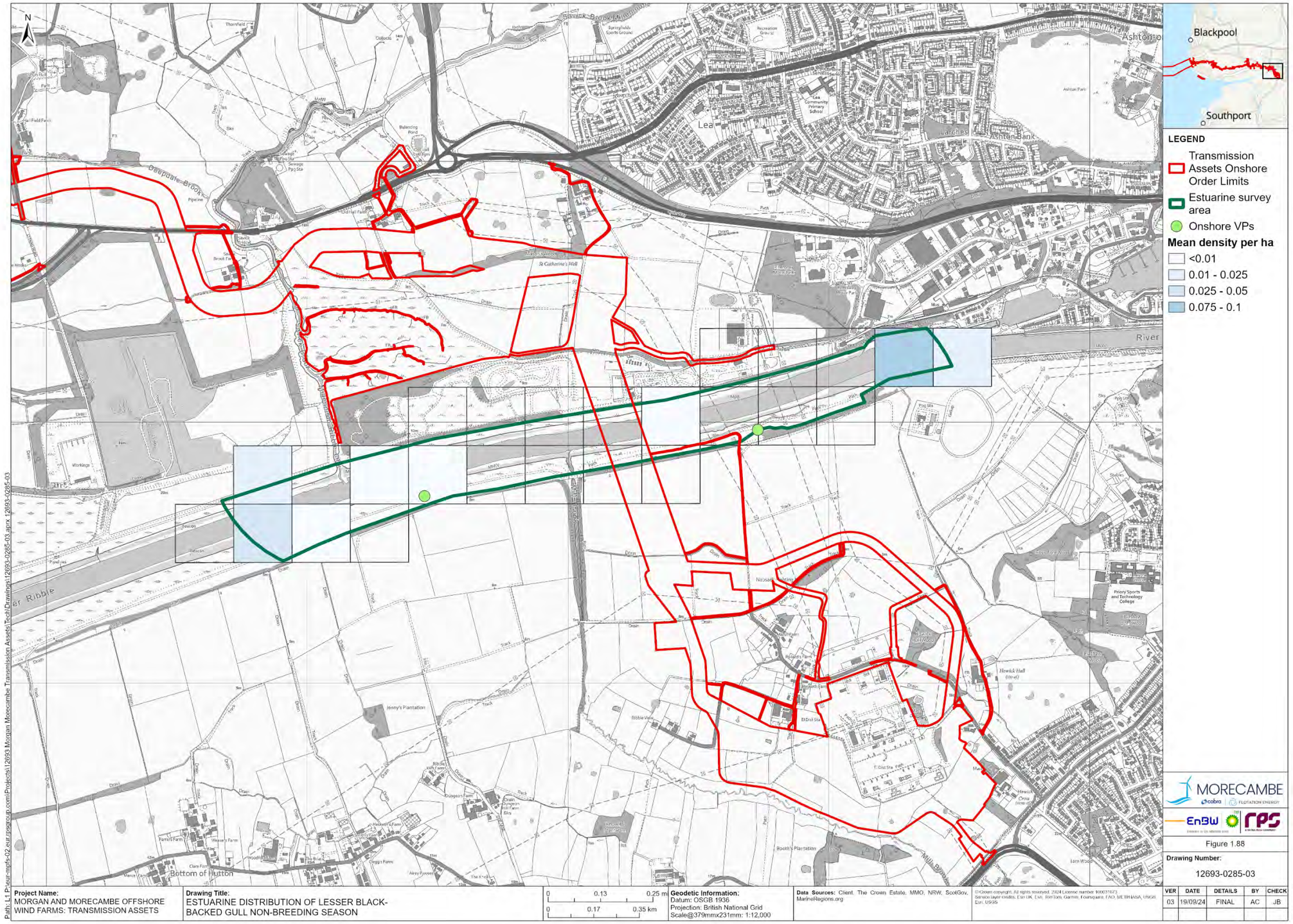

Figure 1.88: Distribution of lesser black-backed gull during the non-breeding season

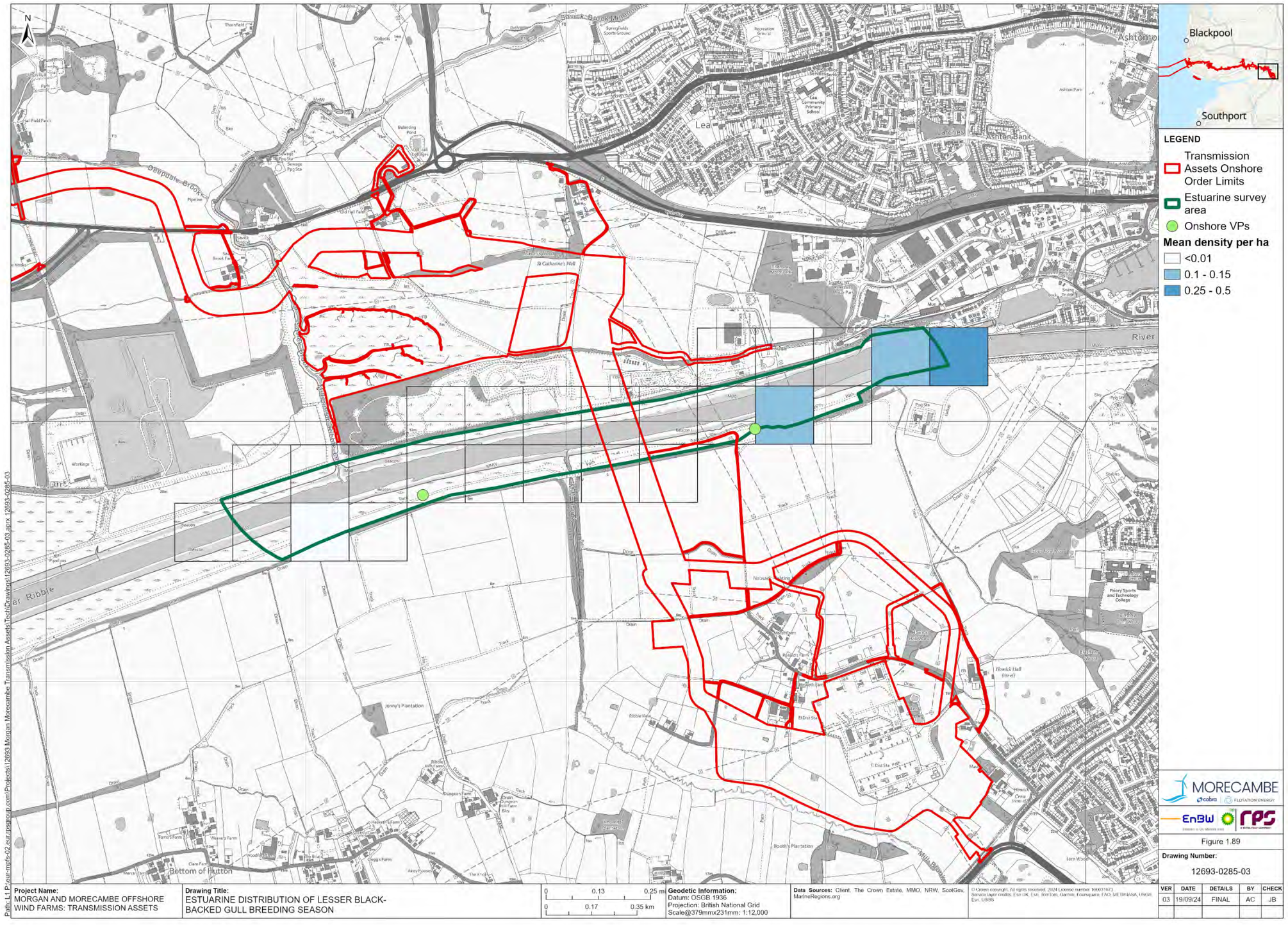

Figure 1.89: Distribution of lesser black-backed gull during the breeding season

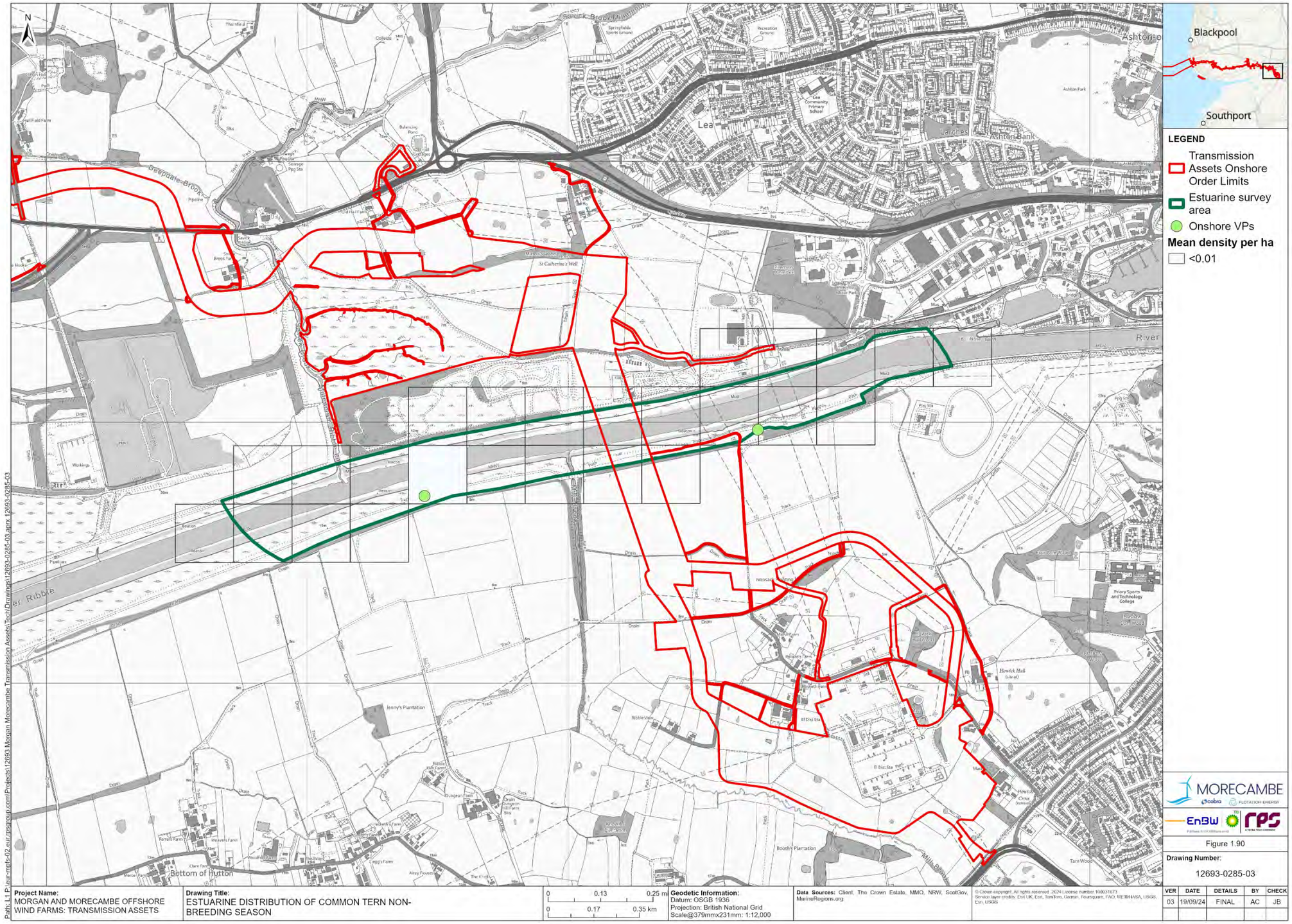

Figure 1.90: Distribution of common tern during the non-breeding season

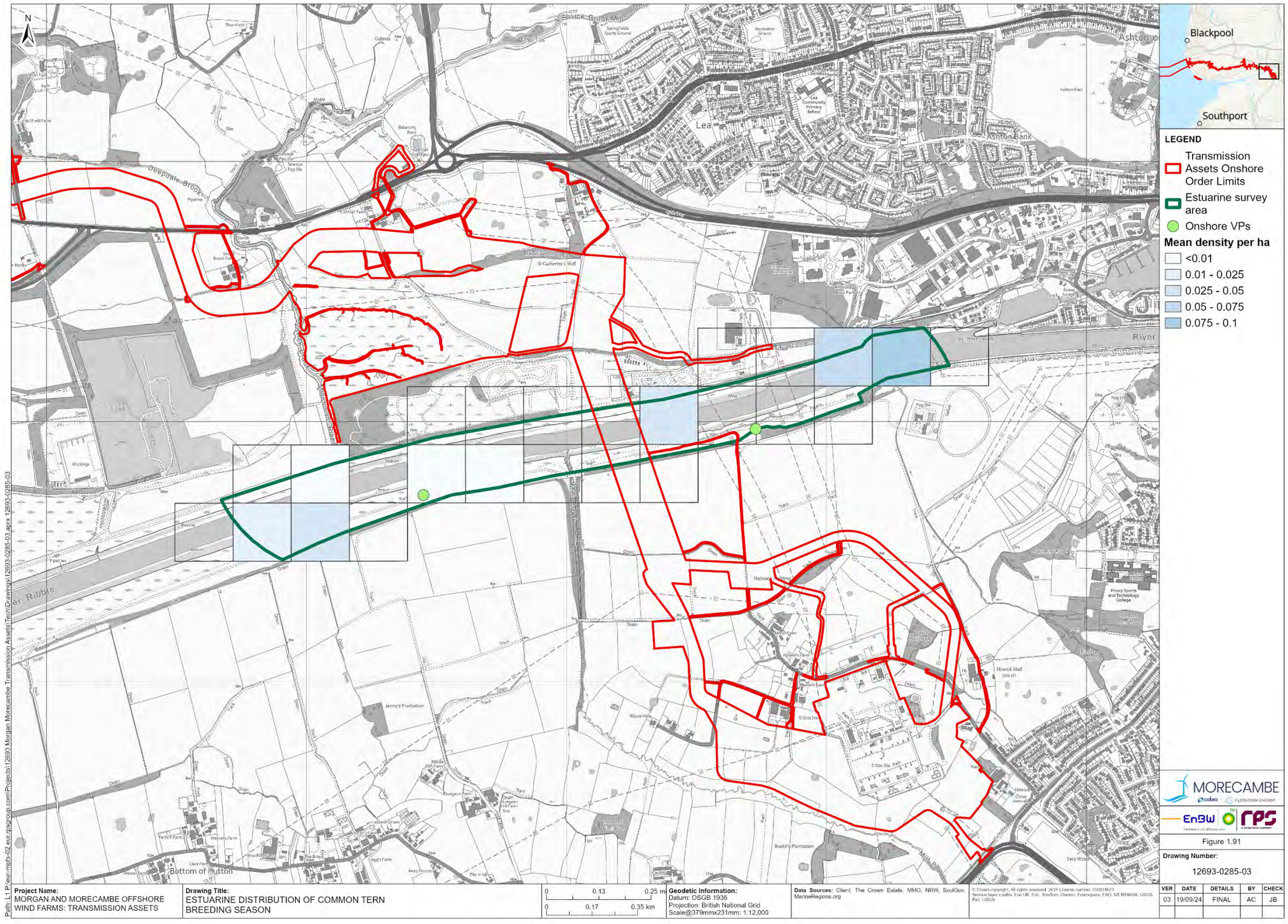

Figure 1.91: Distribution of common tern during the breeding season

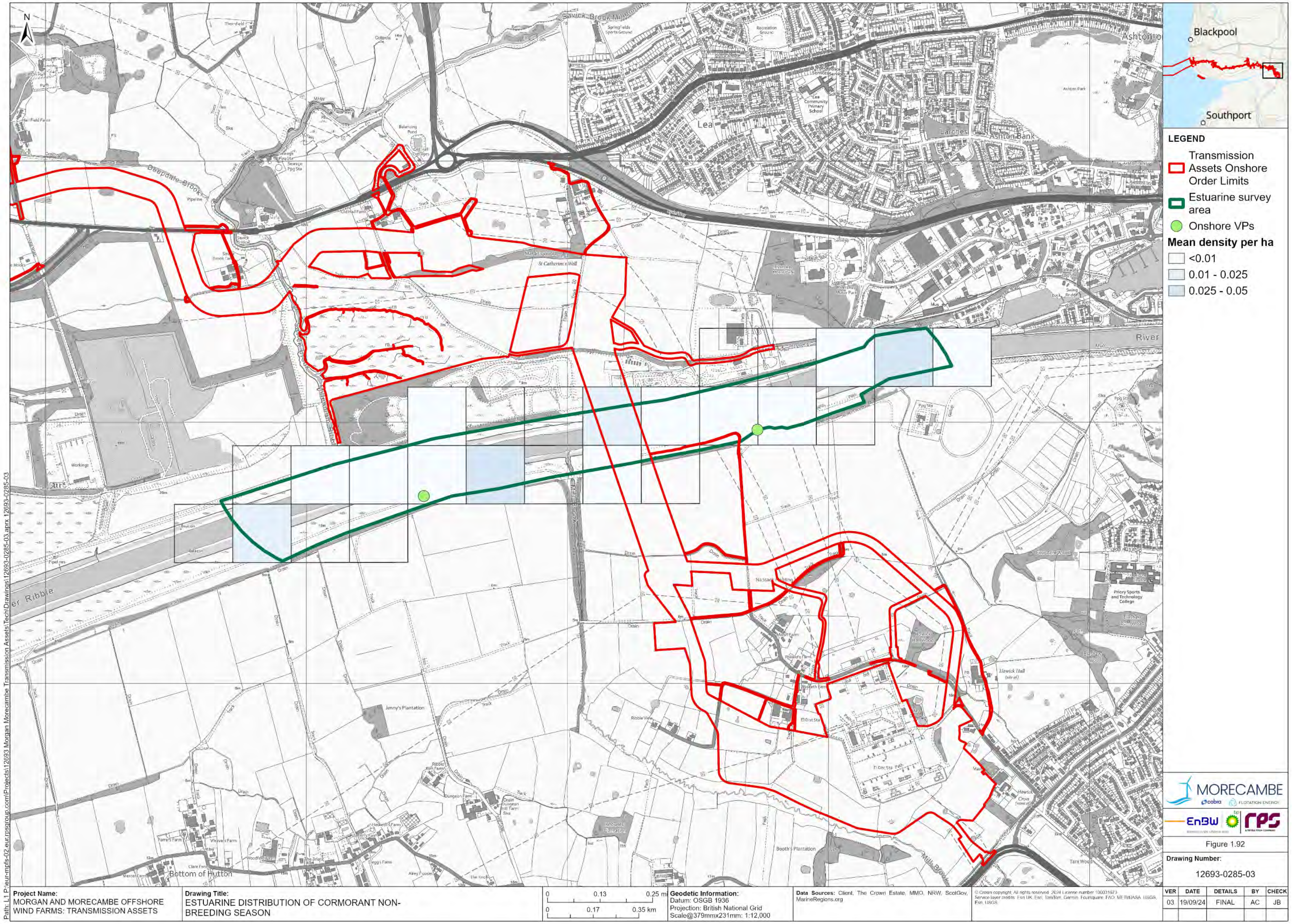

Figure 1.92: Distribution of cormorant during the non-breeding season

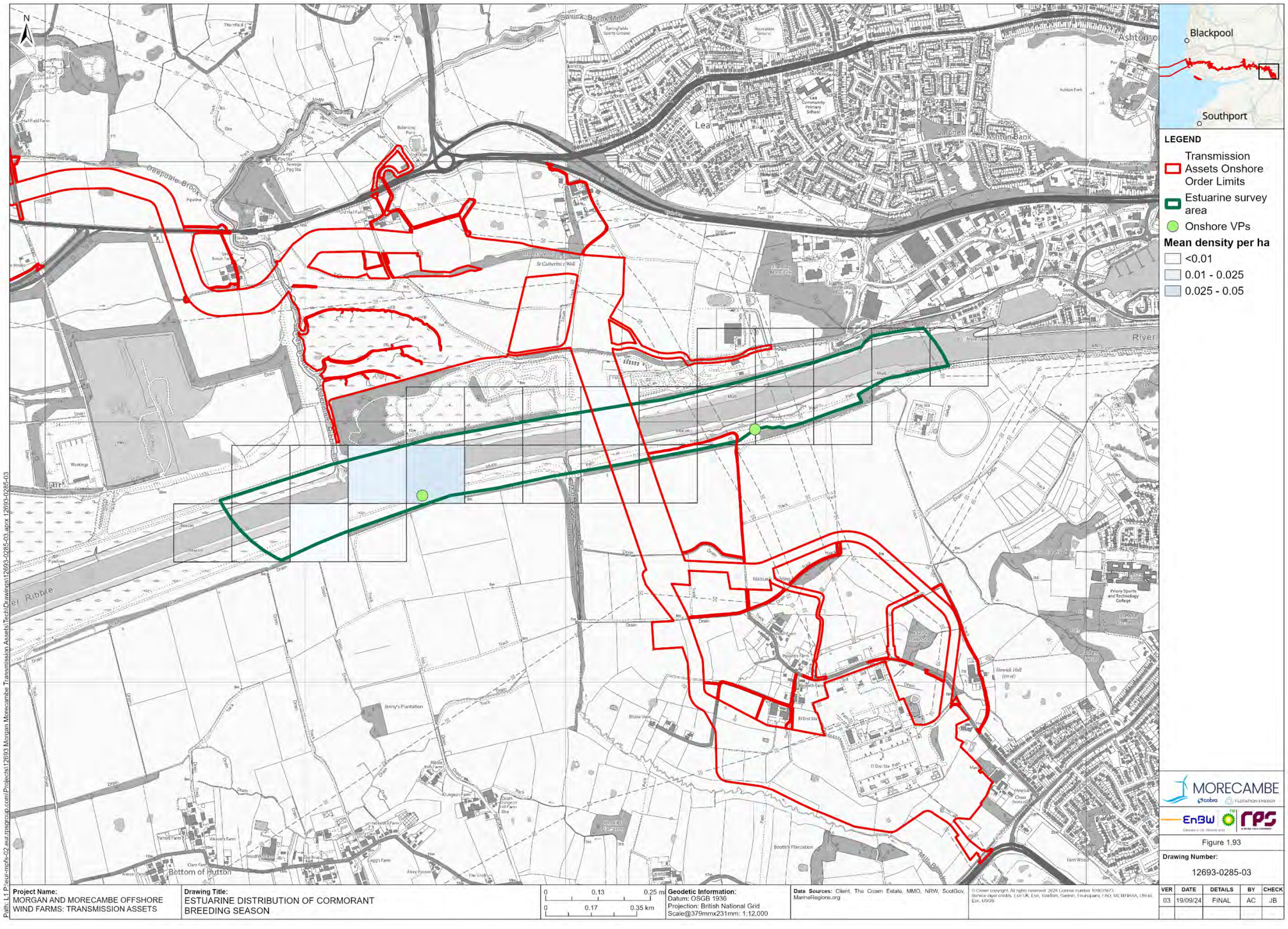

Figure 1.93: Distribution of cormorant during the breeding season

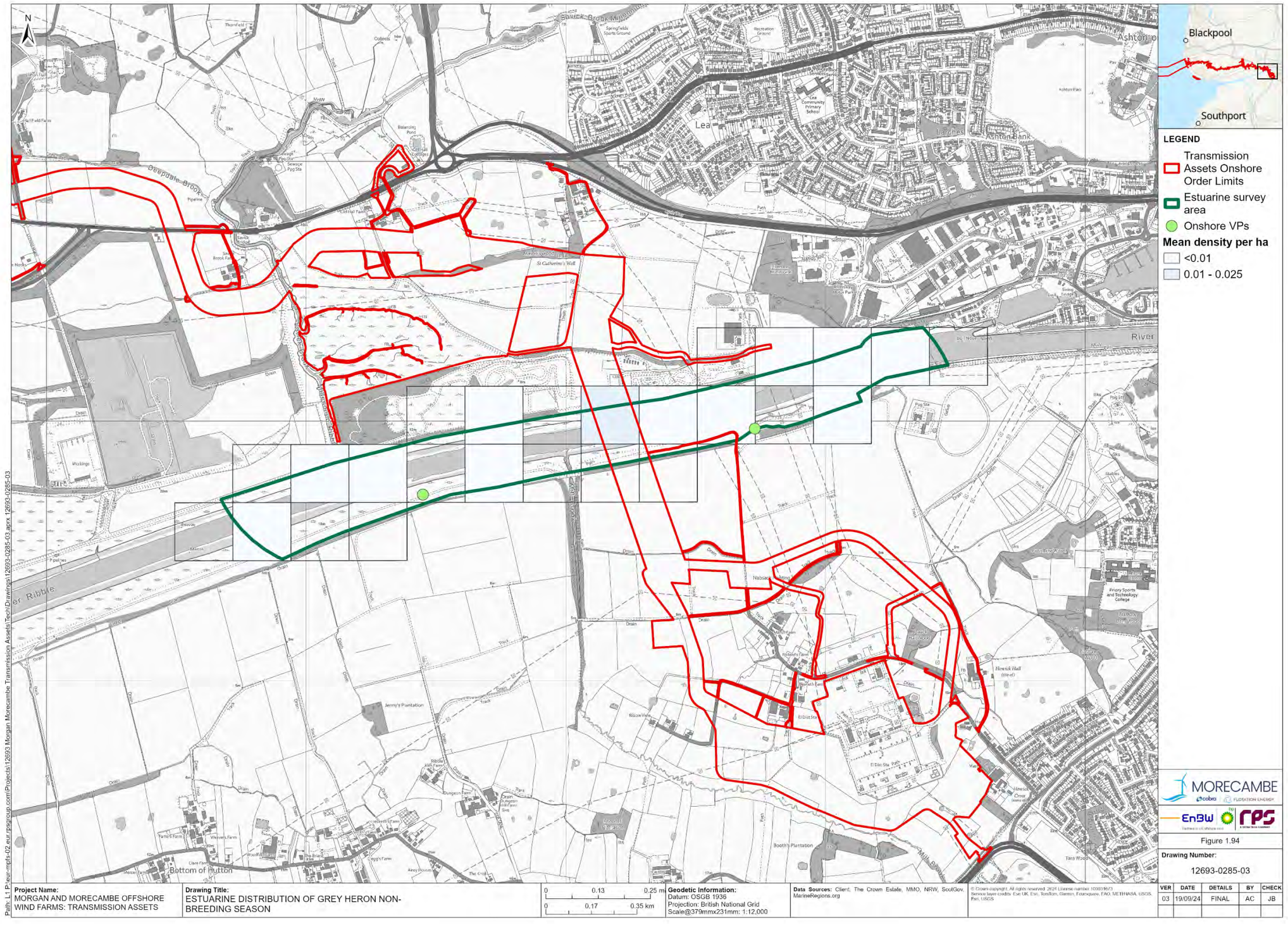

Figure 1.94: Distribution of grey heron during the non-breeding season

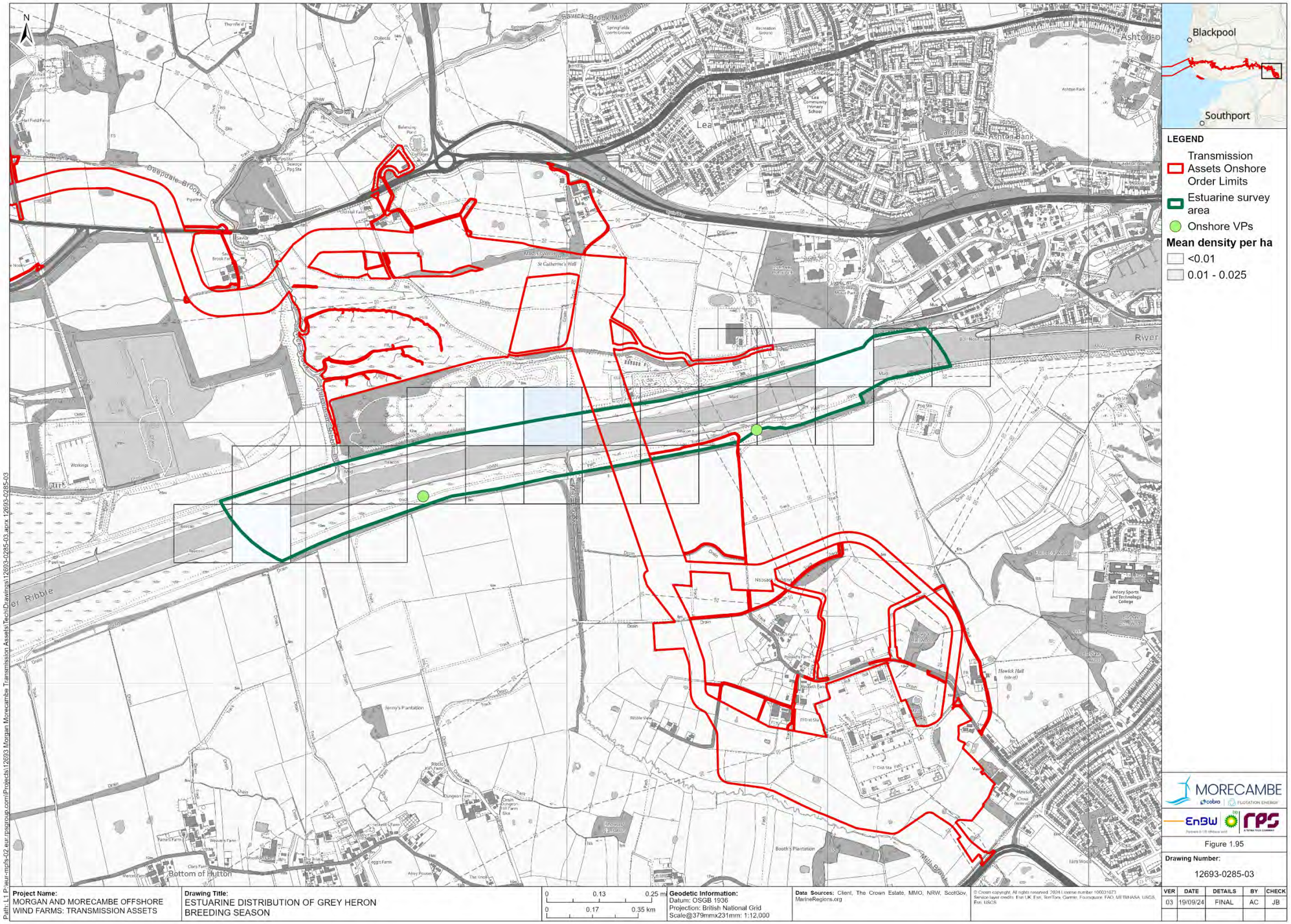

Figure 1.95: Distribution of grey heron during the breeding season

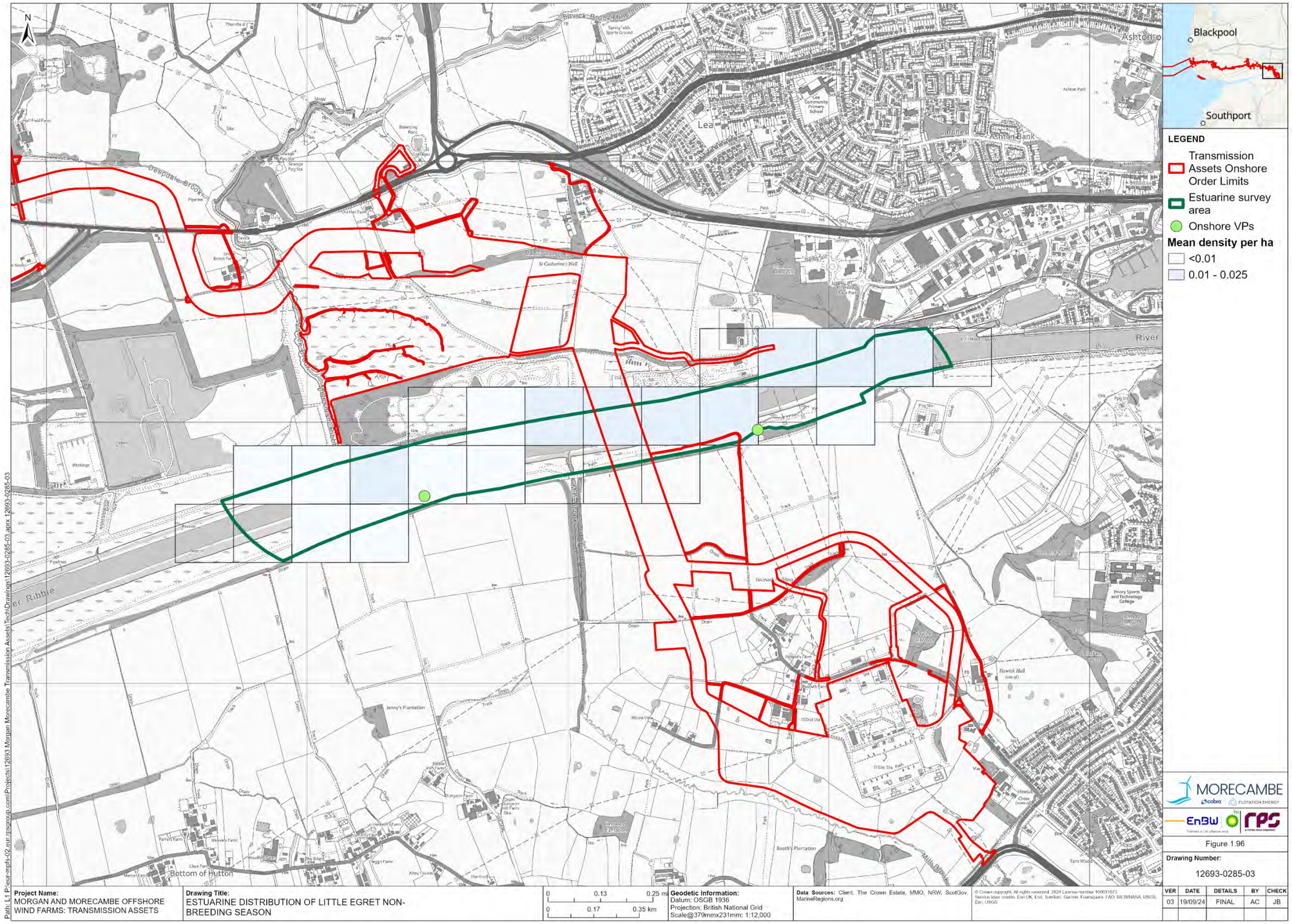

Figure 1.96: Distribution of little egret during the non-breeding season

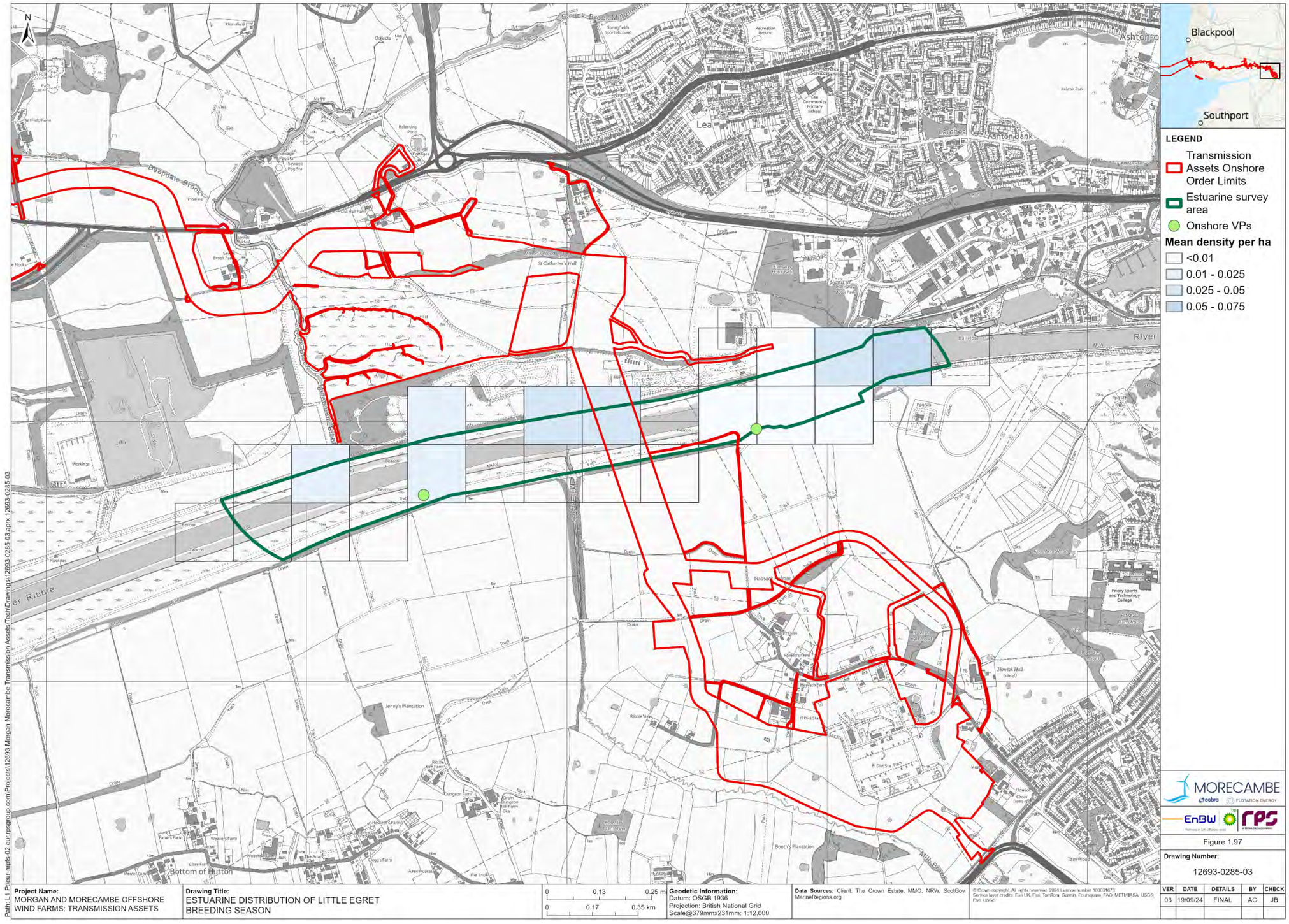

Figure 1.97: Distribution of little egret during the breeding season

1.4.6 Limitations

1.4.6.1 Previous outbreaks of Highly Pathogenic Avian Influenza (HPAI) have tended to hit wintering waterfowl, subsiding as wintering flocks disperse. Over the winter of 2021/22 an outbreak of HPAI was confirmed in barnacle geese wintering on the Solway Firth and from late spring 2022, increasing numbers of reports of the disease were received from seabird colonies around the northern UK (Pearce-Higgins et al., 2022). The extent of impact of HPAI on individual species is assessed through ongoing monitoring.

1.4.6.2 As the baseline was characterized during the outbreak, there is potential that the baseline is not representative of a typical year. However, it must be noted that bird populations are subject to natural fluctuations in response to a range of environmental conditions (e.g., weather) and this may cause inter-annual variations in abundance. Collecting bird data over a two-year period is considered sufficient to capture the inter-annual variation and characterise the baseline.

1.4.6.3 Due to the technical limitations of using nocturnal equipment (thermal monocular and infra-red camcorders), only the first 500 m of the intertidal at the coastal survey area (from MHWS seaward) could be fully surveyed. Although the thermal imaging equipment could detect birds at a greater distance, accurate counting and identification was not always possible.

1.4.6.4 Both periods of strong wind and precipitation, even slight rain, can interfere with nocturnal equipment and therefore nocturnal surveys at the coastal survey area were planned to avoid these weather conditions as far as possible.

1.4.6.5 One nocturnal survey was missed due to inclement weather during the 2021 to 2022 winter. This survey was caught up during April 2022, however it is acknowledged that some wintering species may have left on migration at that stage. One nocturnal survey was missed due to inclement weather during the 2022 to 2023 winter.

1.5 Summary

1.5.1.1 The purpose of this annex is to present baseline data on waterbirds using the intertidal habitats along the Transmission Assets.

1.5.1.2 In order to establish a baseline of ornithological receptors within the coastal and estuarine survey areas, a combination of desk-based study and site-specific surveys have been undertaken between 2021 and 2024.

1.5.1.3 The desk-based study focussed on a review of WeBS core count data together with the Fylde Bird Club data and results from bird surveys associated with developments (e.g., Fylde Sand Extraction application and the Fylde Export Cable Route) which overlapped with the coastal and estuarine survey areas.

1.5.1.4 The WeBS core count data indicated sanderling to be present in numbers of national importance during the spring and autumn at St. Annes Beach, at landfall. Fylde Bird Club recorded 91 species in the vicinity of the coastal

survey area. Fylde Bird Club also found sanderling to be present in high numbers with a peak count of 2,427.

1.5.1.5 The Fylde Export Cable Route bird surveys also reported a high level of activity in nearshore waters with flocks of common scoter exceeding 1,000 individuals. The most abundant species on the intertidal area was sanderling.

1.5.1.6 At the River Ribble-Bull Nose-Clifton Marsh, the WeBS core count showed no species in numbers greater than 1% of the GB population.

1.5.1.7 Site-specific surveys were undertaken within the coastal survey area to characterise the waterbird baseline usage (i.e., abundance and distribution) of the supratidal, intertidal and subtidal habitats at the landfall. Diurnal and nocturnal surveys used a 'through-the-tidal-cycle' survey methodology. Diurnal surveys were undertaken approximately twice per month, with visits between September 2021 and August 2023. Nocturnal surveys were undertaken over the wintering period only (once per month between November 2021 to March 2022 and November 2022 to March 2023).

1.5.1.8 Additionally, diurnal site-specific surveys were undertaken within the estuarine survey area on the intertidal habitats and in the adjacent terrestrial habitats. Diurnal surveys were undertaken twice per month, with reported data collected between October 2022 and March 2024. Surveys have been ongoing until September 2024 with results available post application.

1.5.1.9 Both the desk-based study and site-specific surveys show that areas of the coastal survey area is important either nationally or internationally for a number of ornithological waterbird features.

1.5.1.10 From the site-specific surveys, there is evidence that the intertidal habitats at the landfall support a wader assemblage which is of importance in the context of the Ribble and Alt Estuaries SPA population. Sanderling were observed to forage or roost in large numbers along the tide line (peak maximum count of 4,702 individuals) and there was a very large influx of dunlin (peak maximum count of 4,200 individuals) in the coastal survey area during passage period. Additionally, intertidal habitats at the landfall supports a small overwintering population of wintering waders, including redshank (70) and turnstone (143).

1.5.1.11 The site-specific surveys shows that the estuarine survey area supports numbers of lapwing, wigeon and teal during the non-breeding season which use the intertidal habitats and channels of the Inner Ribble Estuary. The area also supports large numbers of non-breeding naturalised Canada and greylag goose alongside mallard. Smaller numbers of curlew and redshank were regularly recorded with a notable record of a single wintering green sandpiper.

1.5.1.12 The breeding common tern from Preston Dock were recorded in low numbers and it is likely that they just use the estuarine survey area for commuting to and from foraging grounds. There was also no evidence of the area being of importance to the SPA and SSSI breeding gull colonies of lesser black-backed gull and black-headed gull that are situated on the Ribble saltmarsh to the west.

1.5.1.13 An assessment of the potential impact of the Transmission Assets on onshore and intertidal ornithological receptors is presented in Volume 3, Chapter 4: Onshore and intertidal ornithology of the ES.

1.6 References

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Table 1.15: The monthly peak data for the coastal intertidal survey (including the highest of either the diurnal and nocturnal peaks)

Species	2021/22												2022/23											
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Shelduck	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0
Scaup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
Eider	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	3	0
Common Scoter	0	0	200	0	226	250	700	0	0	103	248	4,000	800	357	290	505	3,934	950	1,892	30	0	0	63	180
Great Crested Grebe	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	0	0	0
Oystercatcher	35	23	105	284	822	413	343	93	66	31	65	110	35	62	500	94	720	1,073	176	136	18	1	47	93
Golden Plover	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Plover	0	0	62	10	49	37	19	118	0	0	0	0	1	0	0	11	0	62	50	0	0	0	0	0
Ringed Plover	9	14	3	12	0	37	31	0	0	0	7	0	33	0	32	2	15	19	0	2	0	0	4	93
Whimbrel	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	6	0	0	0
Curlew	0	0	7	9	2	9	1	2	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
Bar-tailed Godwit	0	0	625	71	11	25	6	40	0	0	0	0	27	458	500	4	0	285	250	1	0	0	0	1
Turnstone	0	61	43	118	16	142	96	39	0	0	0	0	0	0	0	3	143	52	27	0	0	0	0	0
Knot	0	1	113	370	0	0	0	52	0	0	0	0	0	0	0	300	0	33	300	0	0	0	0	0
Sanderling	21	152	800	705	390	4,702	628	2,134	115	0	220	5	800	220	514	417	2,000	2,000	420	450	35	0	9	121
Dunlin	0	7	1,200	250	66	4,200	510	1,031	7	0	3	0	12	20	25	55	77	50	677	120	0	0	0	19
Redshank	0	8	23	37	70	39	51	13	0	0	0	0	0	10	16	31	6	33	24	0	0	0	0	0
Kittiwake	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull	64	81	260	780	236	877	156	2	0	102	137	141	14	30	550	225	620	247	44	0	0	51	82	32
Mediterranean Gull	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Gull	3	170	20	245	438	436	162	1	0	0	29	86	22	14	150	98	750	200	10	0	0	0	1	20

Species	2021/22												2022/23											
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Great Black-backed Gull	17	9	5	3	13	7	11	6	5	7	12	14	8	5	6	23	13	16	9	3	2	8	4	12
Herring Gull	59	90	570	535	227	842	196	118	1,543	430	165	653	720	94	1,600	212	1,500	500	216	812	143	580	460	414
Lesser Black-backed Gull	4	40	2	0	0	14	2	130	295	343	255	353	42	0	2	2	1	15	20	101	30	210	137	90
Sandwich Tern	1	2	0	0	0	0	0	0	0	0	84	4	0	0	0	0	0	0	0	20	0	15	12	427
Little Tern	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Tern	0	0	0	0	0	0	0	0	0	29	5	0	0	0	0	0	0	0	0	17	0	4	0	90
Arctic Skua	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
Guillemot	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3	0
Red-throated Diver	0	0	0	0	0	2	0	0	0	0	0	6	14	10	6	11	1	3	1	4	0	0	0	0
Manx Shearwater	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	0
Cormorant	6	1	1	0	1	1	0	2	2	5	0	14	54	12	13	112	7	9	6	22	4	1	15	0
Grey Heron	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Little Egret	0	0	0	0	0	0	0	0	1	2	0	0	3	4	0	0	0	0	0	0	0	2	0	0

Table 1.16: The monthly peak data for the estuarine intertidal survey.

Species	2022/23											2023/24						
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Canada goose	282	58	27	11	82	19	24	0	8	0	248	6	65	13	268	110	30	32
Greylag goose	37	0	68	0	0	0	0	0	0	7	84	0	67	0	13	1	0	0
Mute swan	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Whooper swan	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shelduck	0	1	5	11	2	7	11	5	9	0	0	0	0	0	1	26	66	6
Wigeon	83	94	822	521	196	446	2	0	0	0	0	0	315	465	513	670	280	170
Mallard	44	60	53	42	22	18	10	3	6	0	11	36	22	17	47	88	25	8

Species	2022/23											2023/24						
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Teal	39	108	215	275	43	47	8	0	0	0	5	13	65	40	167	85	34	42
Goldeneye	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goosander	0	3	1	3	3	5	0	0	1	0	0	2	0	0	9	0	1	6
Oystercatcher	0	0	0	1	54	45	0	1	18	2	6	1	0	0	0	0	4	28
Lapwing	411	85	444	367	111	7	0	2	8	46	230	82	49	75	16	41	44	12
Grey plover	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curlew	4	24	2	8	9	2	0	0	0	16	19	1	10	2	2	2	2	2
Black-tailed godwit	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dunlin	3	0	65	222	0	0	0	0	0	0	0	0	46	13	0	0	0	0
Jack snipe	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Snipe	13	0	10	0	0	0	0	0	0	0	0	0	21	7	2	0	0	0
Common sandpiper	2	1	0	0	0	0	0	0	0	4	1	1	1	0	1	1	1	1
Green sandpiper	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Redshank	19	40	24	20	6	12	15	0	1	0	13	10	5	9	19	22	13	14
Greenshank	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Black-headed gull	141	51	250	296	262	16	0	23	17	166	149	57	31	5	41	80	8	38
Common gull	0	0	0	0	8	3	0	0	0	0	0	3	0	0	0	0	0	0
Great black-backed gull	5	1	3	0	0	0	0	0	1	1	0	5	1	0	4	1	0	2
Herring gull	156	0	13	0	15	12	0	15	55	77	111	83	4	0	17	10	0	1
Lesser black-backed gull	2	0	0	0	0	0	0	0	32	4	41	2	1	0	0	0	0	1
Common tern	0	0	0	0	0	0	0	5	4	2	1	0	0	0	0	0	0	0
Cormorant	5	11	5	2	2	0	1	0	1	1	1	2	1	1	5	2	1	1
Cattle egret	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey heron	2	4	0	1	1	0	0	0	1	2	3	1	8	0	1	1	0	1

Species	2022/23											2023/24						
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Little Egret	2	2	3	1	2	3	0	3	3	1	1	10	2	1	4	2	3	4
Sparrowhawk	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Buzzard	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Kingfisher	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Peregrine	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Sand martin	0	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0