

Liverpool Bay CCS Ltd HYNET CARBON DIOXIDE TRANSPORTATION AND STORAGE PROJECT - OFFSHORE

Environmental Statement Report
Volume 3, Appendix K.3: Intertidal Ornithology Technical Report



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Glossary

Term	Meaning
Abundance	Defined as the number of birds.
British Trust for Ornithology (BTO)	The BTO is a UK charity that focuses on understanding birds and, in particular, how and why bird populations are changing.
Cormorants	Birds from the family Phalacrocoracidae.
Density	Abundance per unit area.
Divers	Bird from the family Gaviidae.
Estuary	The area where freshwater courses reach the sea, they are often influenced by river flow and tidal cycles.
Foraging	Defined as actively seeking food and feeding.
Geographic Information System (GIS)	A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface.
Grebes	Birds belonging to the family Podicipedidae.
Gulls	Birds from the family Lariidae.
Hérons	Birds from the family Ardeidae.
Intertidal	The area between Mean-High Water Spring (MHWS) and Mean-Low Water Spring (MLWS).
Joint Nature Conservation Committee (JNCC)	The JNCC are the only statutory nature advisor to all four countries of the UK.
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.
Loafing	Defined as bird resting (i.e., not actively engaging in any activity but also not sleeping).
Nearshore waters	Coastal waters adjacent to the coast.
Non-Estuarine Waterbird Survey (NEWS)	The NEWS monitors the non-estuarine sections of the UKs coast that are not captured by the WeBS.
Ornithology	The study of birds.
Rails	Birds from the family Rallidae.
Ramsar	An area of land that has been designated as internationally important by the Ramsar Convention on wetlands. Ramsar sites often contain both ornithological and habitat features.
Roosting	Defined as bird sleeping. A roost is where birds congregate to sleep together.
Royal Society for the Protection of Birds (RSPB)	The RSPB are a nature conservation charity that actively own and run nature reserves as well as contributing to other schemes.
Seabirds	Birds that are fully dependent upon the sea for at least part of their life cycle including gannet, kittiwake, and auks.
Seaducks	Ducks which are fully dependent upon the sea during at least part of their life cycle.
Site of Special Scientific Interest (SSSI)	An area of land that has been designated for the protection of the nationally important biological or geological features that are present.
Special Protection Area (SPA)	An area protected under law for its internationally or nationally important numbers of migratory bird species.
Species richness	The total number of species within a given area.
Terns	Birds from the family Sterniidae.
Tidal cycle	The rising and the falling of the tides caused by the gravitational pull of the moon's orbit.
Vantage Point (VP)	A fixed location with good views from where surveyors count birds.
Waders	Birds from the order Charadriiformes.

Term	Meaning
Waterbird	The Ramsar Convention defines ‘waterfowl’ as species of birds that are ecologically dependent upon wetlands.
Wetland Birds Survey (WeBS)	WeBS surveyors monitor the UK’s internationally important non-breeding waterbirds. Wetland sites are counted once per month, providing data for population and trends in abundance and distribution. WeBS is a partnership jointly funded by the BTO, RSPB and JNCC, with fieldwork conducted by volunteers and previous support from WWT.
Wildfowl	Ducks, geese and swans.

Acronyms

Acronym	Description
BTO	British Trust for Ornithology
GIS	Geographic Information System
JNCC	Joint Nature Conservation Council
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
NEWS	Non-Estuarine Waterbird Survey
PoA	Point of Ayr
RSPB	Royal Society for the Protection of Birds
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
VP	Vantage Point
WeBS	Wetland Birds Survey
WWT	Wildfowl and Wetlands Trust

Units

Unit	Description
CO ₂	Carbon dioxide
Km	Kilometre
Km ²	Kilometre squared
M	Metre

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1 INTERTIDAL ORNITHOLOGY TECHNICAL REPORT

1.1 Introduction

This Intertidal Ornithology Technical Report provides a baseline characterisation of waterbirds and seabirds using the intertidal and nearshore waters surrounding the proposed cable and pipeline landfall for the Hynet Carbon Dioxide Transportation and Storage Project - Offshore (hereafter referred to as “the Project”).

As part of the offshore components of the Project (hereafter referred to as the ‘Proposed Development’), the existing offshore natural gas import pipeline from Point of Ayr (PoA) gas terminal will be re-purposed to become a CO₂ export pipeline and will transport the CO₂ to the repurposed Douglas platform. From the Douglas platform, CO₂ will be transported along re-purposed natural gas pipelines to the Hamilton main platform for injection into the Hamilton main reservoir, to the Hamilton north platform for injection into the Hamilton north reservoir, and to the Lennox platform for injection into the Lennox reservoir. The Proposed Development will also require new electrical and fibre optic transmission infrastructure seawards of Mean High-Water Spring (MHWS), connecting the PoA terminal to the offshore infrastructures.

This Liverpool Bay and surrounding coasts are of national and international importance for waterbird and seabird populations. Seaward of Mean Low-Water Spring (MLWS) is the Liverpool Bay Special Protection Area (SPA) which is designated for its non-breeding populations of gulls, sea ducks and divers, and landward of the MLWS is the Dee Estuary SPA designated for its non-breeding populations of waders and wildfowl. Both sites are also designated for their breeding populations of terns.

1.2 Study area

The Intertidal Ornithology Study Area is situated on the outer western edge of the Dee Estuary in Denbighshire, North Wales (Figure 1.1) and is approximately 2.86 km² in surface. It encompasses the proposed landfall plus a 500 m buffer. It also encompasses all of the intertidal and nearshore waters within the proposed corridor plus a 500 m buffer. The Intertidal Ornithology Study Area extends from MHWS to up to 1.5 km seawards (Figure 1.1).

Intertidal habitats within the Intertidal Ornithology Study Area are primarily composed of mud and sandflats. The adjacent nearshore waters are shallow with a strong tidal current which sweeps outwards from the Dee Estuary mouth. The gradient of the beach is shallow and large expanses of mud and sandflats can be exposed at low tide. Beyond the western extent at MHWS is an area of saltmarsh where the freshwater Prestatyn Gutter drains onto the intertidal.

The intertidal habitats and nearshore waters are of importance to waterbirds that may utilise these habitats for roosting, loafing, or foraging.



Figure 1.1: Showing The Intertidal Ornithology Study Area

1.3 Consultation

No consultation activities were undertaken to date specific to Intertidal Ornithology.

1.4 Methodology

1.4.1 Diurnal field methodology

The survey method is based on Wetland Bird Survey (WeBS) Core Count (high tide) and the Low Tide Count methodologies of the British Trust for Ornithology (BTO), Joint Nature Conservation Council (JNCC), Royal Society for the Protection of Birds (RSPB), Wildfowl and Wetlands Trust (WWT), WeBS scheme as outlined by Gilbert *et al.* (1998). The survey uses a ‘through-the-tidal-cycle’ methodology.

Surveyors made six hourly counts per survey, and a minimum of two survey visits (to account for tidal influence) per month between October 2022 to April 2023. All surveys were carried out by competent and experienced field ornithologists.

Counts were undertaken from Vantage Points (VPs) located on the upper shore or the bank of the estuary.

Surveys were scheduled to cover a range of different tidal conditions (high, low, ebb, and flow) throughout the survey programme. If feasible, counts were made once per hour of the tidal cycle period of 12 hrs (- 6 hrs to +5 hrs relative to low tide), but as a minimum counts of birds were undertaken during the four tidal states (i.e., high tide, ebb tide, low tide, and flood tide) every month.

The surveyors recorded the species and number of individuals from VPs along the coast using binoculars and a telescope. In addition to the location and number of birds, notes were also made of their behaviour: (e.g. roosting, loafing etc).

Field records were transferred to a Geographic Information System (GIS). This produces accurate information on the distribution of birds within the study area and enables maps to be produced so that areas of ornithological importance could be identified.

Weather conditions including wind speed (using the Beaufort Scale), cloud cover (estimated as eighths or octas of the sky), visibility and temperature were also recorded as well as sources of disturbance to birds encountered during surveys. Surveys did not take place during periods of low visibility (below 500 m).

1.4.2 Nocturnal field methodology

The nocturnal element of the intertidal and nearshore bird survey followed the same approach as the diurnal surveys, except that the surveys ran on a reduced intensity, (i.e., single survey visit of a half tidal cycle (six-hour period) per month between November 2022 and March 2023 inclusive). The methodology followed best practice guidance as per Bird Survey & Assessment Steering Group (Bird Survey & Assessment Steering Group, 2022).

Whilst similar to the diurnal ‘through the tidal cycle’ surveys, the nocturnal through the tidal cycle counts are undertaken on a reduced intensity 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). All surveys were carried out by competent and experienced field ornithologists.

Only the first 500 m of the intertidal zone (from the MHWS) was fully surveyed. Each monthly count was undertaken across half a tidal cycle of approximately 6 hrs (versus a full tidal cycle of approximately 12 hrs). The frequency of counts is adapted to the survey effort required to effectively use nocturnal equipment with a minimum of two counts per survey (e.g. low and flood, or high and ebb).

Working in pairs, one observer located birds using a thermal monocular, whilst the second observer videoed and identified species using an image-intensifying camera (or camcorder) coupled with an infra-red spotlight.

This approach allows the detection and identification of most waterbird species within 400 m from the observer's position. For health and safety reasons, observers carried out night work in pairs.

Similar to the diurnal surveys, the position of the birds was directly mapped using BTO codes. Behaviour was recorded as foraging (actively looking for food) and non-foraging. 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 where possible.

1.4.3 Limitations

Because the MLWS is at some distance from the shore, surveyors could not always identify smaller birds to species level during periods of haze or glare. Where this was the case surveyors still counted the birds but marked them as unidentified small wader species or unidentified gull species during the diurnal surveys.

Due to the more limited range of nocturnal equipment, only the first 500 m of the intertidal zone from MHWS was fully visible. Furthermore, moisture in the air and blowing sand also affected the effectiveness of the nocturnal equipment, which led to further reduced detection and identification of birds on occasion. Despite several precautions birds were also more easily disturbed at night and responded negatively to the presence of the surveyors, which led to a possible under-estimation of number of birds at night, not all birds seen at night were identifiable to species level, and birds on the water were harder to pick up and identify. Thus, the nocturnal survey data is not directly comparable to the diurnal survey data.

1.4.4 Defining the conservation value of birds

All species that were named in SPA, Ramsar, or Site of Special Scientific Interests (SSSIs) citations and had connectivity to the Proposed Development were considered of high conservation value. In addition, species national and international importance which were connected to the Proposed Development were also considered to be of high conservation value. **Throughout this report all SPA, Ramsar, and SSSI features are outlined in purple when referred to in tables.**

1.4.5 Deriving maximum peak counts

The count with the highest peak over the half tidal cycle was taken as the peak for that survey. As two surveys were conducted per month, the monthly peak was taken as the maximum of the two survey peaks. The overall species peak was defined as the maximum of all monthly peaks. An overall waterbird peak maximum was produced as the sum of all species peak maxima.

1.4.6 Mapping densities of birds

In order to map the density, all results were first entered into a GIS database as point data. A 250 m x 250 m grid was then overlain on the study area and all counts of birds recorded within each square over the period were then averaged. The number of birds were averaged by the number of counts carried out by surveyors over the study period (October 2022 to April 2023). This gave the mean number of birds present in each square.

Maps were produced for species or group of species deemed to be of importance (Table 1.10) Important species were those cited in designated SPAs (within 20 km), Ramsar sites (within 20 km), or SSSIs (within 20 km).

A 'heat effect' was used to create density maps. Categories for grid abundance were created using quantile intervals between the averaged count per grid square. Eight categories were used for each species.

1.5 Desktop study

Information on waterbird usage within the Intertidal Ornithology Study Area was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 1.1 below.

Table 1.1: Summary Of Key Desktop Reports

Title	Source	Year	Author
MAGIC Map	Department for Environment, Food & Rural Affairs (DEFRA)	2023	N/A
Wetland Bird Survey (WeBS)	BTO	2023	Graham E. Austin, Neil A. Calbrade, Gillian A. Birtles, Kirsi Peck, Simon R. Wotton, Jessica M. Shaw, Dawn E. Balmer and Teresa M. Frost.
Non-Estuarine Waterbird Survey (NEWS)	BTO	2016	Uncredited data
An assessment of the numbers and distributions of wintering waterbirds and seabirds in Liverpool Bay/Bae Lerpwl area of search	JNCC	2016	Lawson J., Kober, K., Win, I., Allcock, Z., Black, J., Reid, J.B., Way, L. & O'Brien, S.H.

1.6 Designated sites

DEFRA's Magic map was consulted to identify designated sites situated within 20 km of the Proposed Development (landfall only). Many waterbird species are mobile and may travel to and from roosting and/or foraging areas. As such, a 20 km buffer was applied to the Proposed Development as this is the largest of the accepted foraging ranges for waterbirds used to detect impact pathways for assessing connectivity with SPAs (NatureScot, 2016), and will therefore act as an umbrella to capture designated sites that may be used by less mobile species. Coastal sites that were designated for waterbird species, and the features for which the sites are designated, are summarised in Table 1.2 to Table 1.3. Both of the coastal SPA and Ramsar sites are underpinned by SSSIs. The Dee Estuary is underpinned by multiple SSSIs. The main estuary is underpinned by two SSSIs, one Welsh and one English. The area surrounding Gronant is underpinned by the Gronant Dunes and Talacre Warren SSSI. The Mersey Narrows and North Wirral Foreshore is underpinned by the North Wirral Foreshore SSSI. The North Wirral Foreshore is the only SSSI that is designated for species other than those already named in the SPA and Ramsar citations. These are mostly sea ducks, with red-throated diver and two wader species also named.

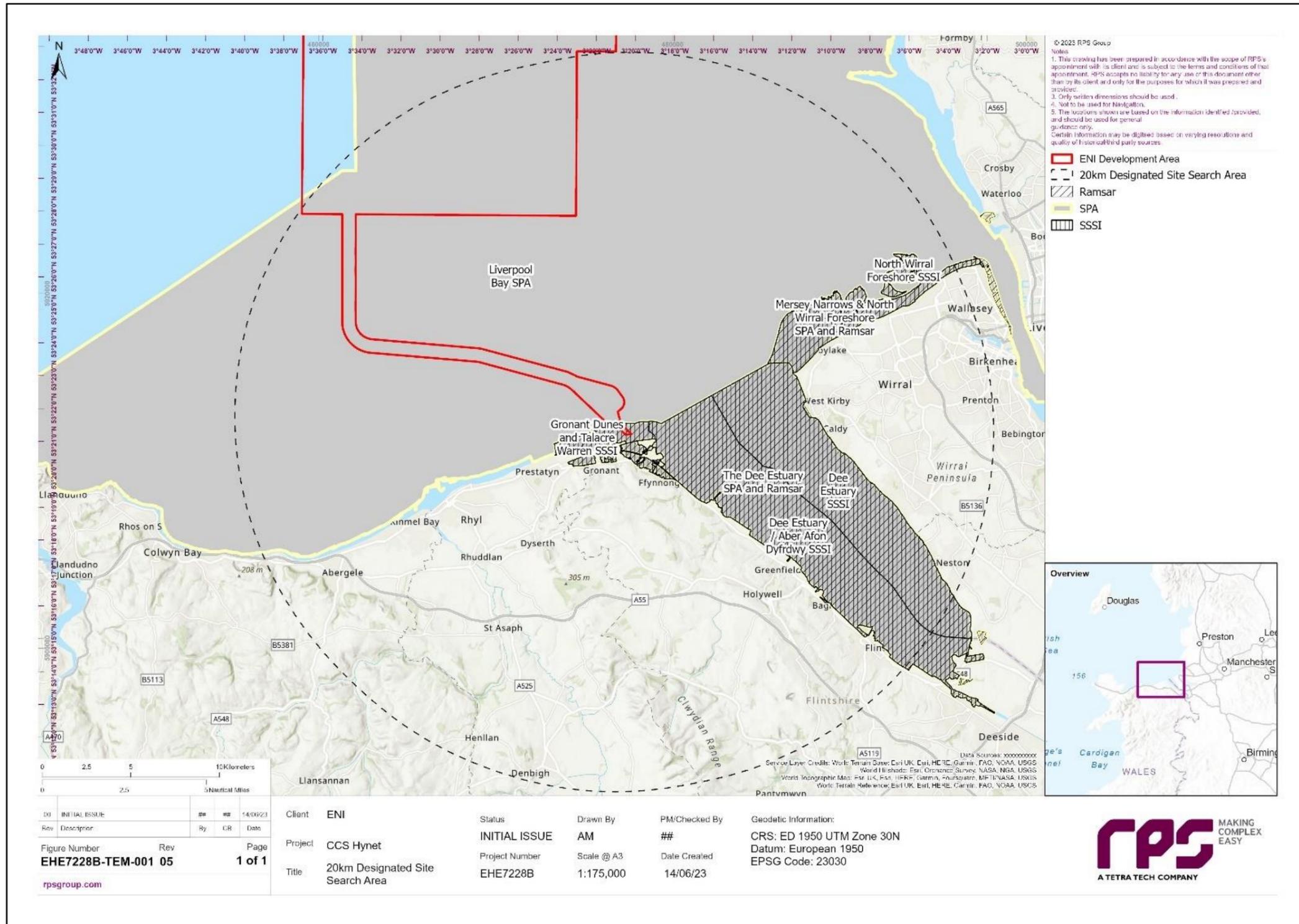


Figure 1.2: Showing The Designated Sites Within 20 Km Of The Project’s Boundary

The Proposed Development crosses the Liverpool Bay SPA and the Dee Estuary SPA and is 7.9 km from the Mersey Narrows and North Wirral Foreshore. Both of the coastal SPAs are designated for their wader assemblages with the Dee Estuary also supporting important populations of waterfowl.

The Liverpool Bay SPA supports important non-breeding populations of red-throated diver (*Gavia stellata*) and common scoter (*Melanitta nigra*) in addition to non-breeding little gull (*Hydrocoleus minutus*) which are also named as a feature of the Mersey Narrows and North Wirral Foreshore SPA. The figures quoted in the citation for Liverpool Bay SPA are derived from Lawson *et al.* (2016). All three SPAs support important populations of breeding common tern (*Sterna hirundo*) with breeding little tern (*Sternula albifrons*) being a feature of both the Dee Estuary and the Liverpool Bay SPA. As the Liverpool Bay is entirely marine it is designated as a foraging ground for both little and common tern.

Table 1.2: SPAs Within 20 km Of The Proposed Development Boundary

SPAs	Distance from site	Features	Citation population	Period
The Dee Estuary	0 km	Shelduck (<i>Tadorna tadorna</i>)	7,725	Wintering
		Teal (<i>Anas crecca</i>)	5,251	Wintering
		Pintail (<i>Anas acuta</i>)	5,407	Wintering
		Common tern (<i>Sterna hirundo</i>)	784	Breeding
		Little tern (<i>Sternula albifrons</i>)	138	Breeding
		Sandwich tern (<i>Sterna sandvicensis</i>)	957	Passage
		Oystercatcher (<i>Haematopus ostralega</i>)	22,677	Wintering
		Grey plover (<i>Pluvialis squatarola</i>)	1,643	Wintering
		Knot (<i>Calidris canuta</i>)	12,394	Wintering
		Dunlin (<i>Calidris alpina</i>)	27,394	Wintering
		Black-tailed godwit (<i>Limosa limosa</i>)	1,747	Wintering
		Bar-tailed godwit (<i>Limosa lapponica</i>)	1,150	Wintering
		Curlew (<i>Numenius arquata</i>)	3,899	Wintering
		Redshank (<i>Tringa totanus</i>)	8,795	Wintering/ passage
Liverpool Bay	0 km	Red-throated diver	1,171	Non-breeding
		Little gull	319	Non-breeding
		Little tern	260	Breeding
		Common tern	360	Breeding
		Common scoter	56,679	Non-breeding
Mersey Narrows and North Wirral Foreshore	7.9 km	Little gull	213	Non-breeding
		Common tern	354	Breeding/non-breeding
		Knot	10,655	Non-breeding
		Bar-tailed godwit	3,344	Non-breeding

Both the Dee Estuary and the Mersey Narrows and North Wirral Foreshore are also Ramsar sites. In addition to the species named in the SPA citation, the coastal Ramsar sites support nationally important non-breeding numbers of waders, waterfowl, and cormorant (*Phalacrocorax carbo*). The Dee Estuary Ramsar also supports breeding redshank.

Table 1.3: Ramsar Sites Within 20 km Of The Proposed Developments Boundary

Ramsars	Distance from site	Features (in addition to those named in the SPAs)	Citation population	Period
The Dee Estuary	0 km	Redshank	400	Breeding
		Ringed plover (<i>Charadrius hiaticula</i>)	272	Passage
		Sanderling (<i>Calidris alba</i>)	502	Winter
		Wigeon (<i>Anas penelope</i>)	4,526	Winter
		Cormorant	405	Winter
		Great crested grebe (<i>Podiceps cristatus</i>)	114	Winter
Mersey Narrows and North Wirral Foreshore	7.9 km	Cormorant	972	Non-breeding
		Oystercatcher	2,718	Non-breeding
		Grey plover	593	Non-breeding
		Sanderling	510	Non-breeding
		Dunlin	7,645	Non-breeding
		Redshank	1,209	Non-breeding

Both of the coastal SPA and Ramsar sites are underpinned by SSSIs. The Dee Estuary is underpinned by multiple SSSIs. The main estuary is underpinned by two SSSIs, one Welsh and one English. The area surrounding Gronant is underpinned by the Gronant Dunes and Talacre Warren SSSI. The Mersey Narrows and North Wirral Foreshore is underpinned by the North Wirral Foreshore SSSI. The North Wirral Foreshore is the only SSSI that is designated for species other than those already named in the SPA and Ramsar citations. These are mostly sea ducks, with red-throated diver and two wader species also named.

Table 1.4: SSSI's Within 20 km Of The Proposed Developments Boundary

SSSIs	Distance from site	Features
North Wirral Foreshore SSSI	7.9 km	Turnstone (<i>Arenaria interpres</i>)
		Black-tailed godwit
		Greater scaup (<i>Anthya marila</i>)
		Common scoter
		Goldeneye (<i>Bucephala clangula</i>)
		Red-throated diver
		Great crested grebe
Dee Estuary SSSI England	4.4 km	As SPA and Ramsar

SSSIs	Distance from site	Features
Dee Estuary/Aber Afon Dyfrdwy SSSI Wales	0 km	As SPA and Ramsar
Gronant Dunes and Talacre Warren SSSI	0 km	As Dee Estuary SPA and Ramsar

The WeBS site totals for the whole Dee Estuary (Austin *et al.*, 2023) provide current context on the fortunes of the coastal SPA waterbird populations (Table 1.5).

There are nine non-interest features that are present in nationally and internationally important numbers.

Table 1.5: Showing Species Currently Present In The Dee Estuary In Internationally And Nationally Important Numbers. Also Showing The Current Status Of Interest Features, Highlighted In Purple (As Taken From Austin *Et Al.*, 2023). A Percentage Value Greater Than 1 Means That They Are Of Importance

Species	% threshold above national importance	% threshold above international importance
Pink-footed goose (<i>Anser brachyrhynchus</i>)	3.3	3.1
Brent Goose (<i>Branta bernicula hrota</i>)	21.4	0.9
Shelduck	21.0	3.9
Teal	1.4	1.2
Pintail	27.2	9.1
Wigeon	1.7	0.5
Shoveler (<i>Anas clypeata</i>)	1.0	0.3
Scaup	0.1	0.0
Goldeneye	0.0	0.0
Common scoter	6.1	1.0
Great crested grebe	1.7	0.0
Red-throated diver	0.1	0.0
Cormorant	2.2	1.1
Oystercatcher	9.7	3.4
Ringed plover	3.8	3.0
Avocet (<i>Recurvirostra avosetta</i>)	1.6	0.2
Grey plover	3.1	0.5
Lapwing (<i>Vanellus vanellus</i>)	1.2	0.4
Ruff (<i>Calidris pugnax</i>)	2.3	0.0
Knot	8.3	4.1
Dunlin	5.0	1.3
Sanderling	4.1	0.4
Turnstone	0.6	0.2
Redshank	11.4	4.5
Greenshank (<i>Tringa nebularia</i>)	4.5	0.0
Green sandpiper (<i>Tringa ochropus</i>)	1.7	0.0
Bar-tailed godwit	1.0	0.3

Species	% threshold above national importance	% threshold above international importance
Black-tailed godwit	16.9	6.0
Curlew	2.9	0.5
Little gull	N/A	N/A
Herring gull (<i>Larus argentatus</i>)	1.3	0.9
Little tern	N/A	1.9
Sandwich tern	N/A	0.8
Common tern	N/A	0.3

1.7 Site-specific surveys

A summary of the surveys undertaken to inform the Intertidal Ornithology Technical Report is outlined in Table 1.6 below.

Table 1.6: Summary Of Site-Specific Surveys

Title	Extent of survey	Overview of survey	Survey contractor	Date
Diurnal intertidal ornithology surveys	The landfall plus a 500m buffer and all land adjacent to the cable corridor where it runs parallel to the shore.	Intertidal ornithology surveys to characterise the intertidal ornithology at the landfall	RPS	Twice monthly between October 2022 – April 2023
Nocturnal intertidal ornithology surveys	The landfall plus a 500m buffer either side	Intertidal ornithology surveys to characterise the nocturnal intertidal ornithology at the landfall	RPS	Once monthly between November 2022 – March 2023

1.8 Baseline environment

The baseline environment has been characterised using a combination of desktop sources and site-specific surveys. The desktop data was purchased from BTO. They have long-running survey programmes in place for which data are available (e.g. WeBS and NEWS). WeBS data.

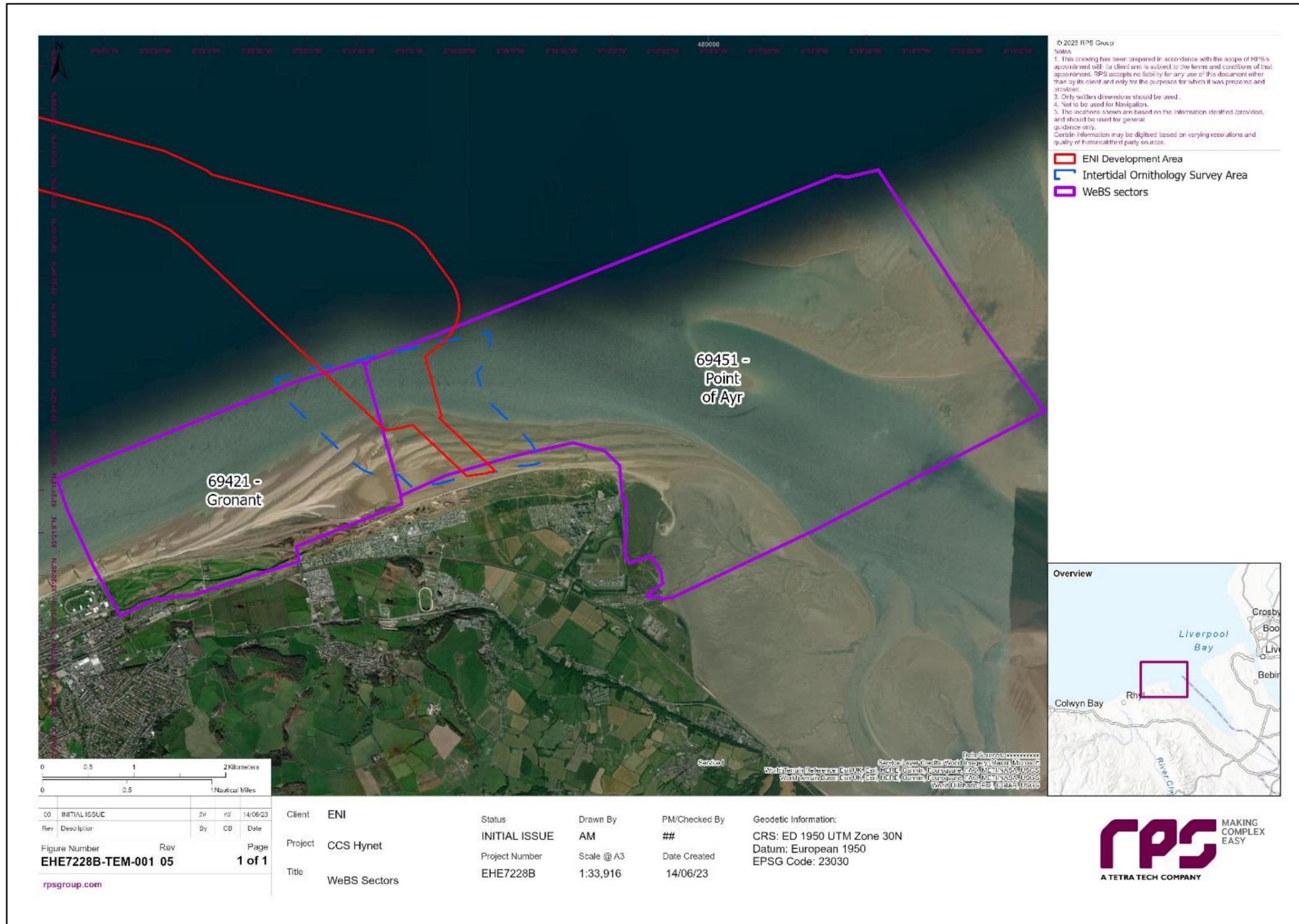


Figure 1.3: The Two Webs Count Sectors For Which Data Were Available

The Intertidal Ornithology study area lies in the middle of two WeBS sectors. Combined together these WeBS sectors cover an area of 24.05 km². This is a surface area of approx. eight times that of the Intertidal Ornithology study area.

Table 1.7 shows the peaks and averages for the period 2017/18 to 2020/21. The monthly peaks of birds over the five-year period are displayed to highlight the maximum number of birds recorded using the WeBS sectors, the maximum of these is then taken as the species peak. The annual species peaks are averaged over a five-year period.

There were 56 species recorded within the two count sectors (Figure 1.3). Of these 22 are named in the local designated sites (within 20 km), 21 of which are SPA/Ramsar features with just turnstone being solely a SSSI species of interest.

The peak maximum number of birds recorded using this area over the five-year period was 51,847. The annual five year mean of peak was 10,369.

Species that were present in high numbers are mostly wader and gull species with oystercatcher and herring gull reporting particularly high peaks. Dunlin, black-tailed godwit, black-headed gull and common gull were also present in high numbers.

In terms of seasonal abundances, there are birds present in high numbers all year around. However, the period from August to April coincided with the highest congregations of birds. Birds reported in the WeBS but not present during site-specific surveys included tufted duck (*Anthya fuligula*), shoveler, eider (*Somateria mollissima*), red-breasted merganser, coot (*Fulica atra*), little grebe (*Tachybaptus ruficollis*), little ringed plover (*Charadrius dubius*), ruff, greenshank, green sandpiper, bar-tailed godwit, and kingfisher (*Alcedo atthis*).

Table 1.7: Summarising The Peak Count Data As Collected By The Webs

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Species peak	5-yr mean of peak
Mute swan (<i>Cygnus olor</i>)	5	11	10	9	10	9	8	3	4	4	18	13	18	4
Canada goose (<i>Branta canadensis</i>)	-	-	165	2	-	-	8	2	17	2	26	-	165	33
Greylag goose (<i>Anser anser</i>)	-	20	350	35	1	33	-	-	-	-	5	-	350	70
Pink-footed goose	-	-	-	6	-	-	30	-	-	-	-	-	30	6
Brent goose	-	-	-	16	19	57	56	120	78	34	-	-	120	24
Shelduck ^{1,2,3}	297	509	818	2332	617	336	82	86	166	140	175	437	2332	466
Shoveler	-	6	-	14	2	19	-	13	3	-	-	-	19	4
Gadwall (<i>Anas strepera</i>)	-	-	-	-	2	-	-	3	-	2	2	-	3	1
Mallard (<i>Anas platyrhynchos</i>)	63	179	96	106	83	96	53	66	46	41	47	43	179	36
Teal ^{1,2,3}	-	8	189	238	479	207	340	140	104	22	-	-	479	96
Wigeon ^{2,3}	-	-	54	200	507	800	1700	750	150	-	-	-	1700	340
Pintail ^{1,2,3}	-	-	170	344	250	450	346	120	84	14	-	-	450	90

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Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Species peak	5-yr mean of peak
Tufted duck (<i>Anthya fuligula</i>)	3	-	-	-	-	-	1	-	3	-	2	-	3	1
Eider (<i>Somateria mollissima</i>)	-	-	-	-	-	1	-	-	-	-	2	6	6	1
Common Scoter ^{1,2,3}	120	-	200	50	100	8	16	6	10	6	-	100	200	40
Goosander (<i>Mergus merganser</i>)	6	2	4	1	10	2	2	1	-	-	-	-	10	2
Red-breasted merganser (<i>Mergus serrator</i>)	-	-	-	-	1	-	-	1	1	-	-	-	1	-
Red-throated diver ^{1,2,3}	-	-	1	-	-	3	-	-	-	-	-	-	3	1
Little grebe (<i>Tachybaptus ruficollis</i>)	4	4	3	2	4	12	7	9	5	3	1	3	12	2
Great crested grebe ^{2,3}	1	1	1	3	3	-	-	-	2	1	2	1	3	1
Cormorant ^{2,3}	280	320	314	636	476	430	277	151	66	128	321	213	636	127
Grey heron (<i>Area cinerea</i>)	4	6	2	4	-	-	-	-	-	-	1	1	6	1
Little egret (<i>Egretta garzetta</i>)	35	22	3-	26	10	3	2	3	9	18	31	44	44	9
Water rail (<i>Rallus aquaticus</i>)	-	-	-	-	1	-	-	-	-	-	-	-	1	-
Moorhen (<i>Gallinula chloropus</i>)	15	20	9	17	7	8	12	13	9	15	11	9	20	4
Coot (<i>Fulica atra</i>)	6	3	4	5	10	14	6	8	9	7	7	7	14	3
Oystercatcher ^{1,2,3}	1,550	9,690	9,000	13,000	10,000	7,820	7,750	7,200	4,400	2,630	1,315	1,430	13,000	2,600
Ringed plover ^{2,3}	28	476	346	100	40	16	29	24	26	80	211	26	476	95
Little ringed plover (<i>Charadrius dubius</i>)	-	-	-	-	-	-	-	-	-	1	-	1	1	-
Lapwing	-	1	1	140	736	1,110	1,150	364	-	1	-	-	1,150	230
Golden plover (<i>Pluvialis apricaria</i>)	1	2	1	-	-	1	3	30	1	-	-	-	30	6
Grey plover ^{1,2,3}	-	-	11	19	130	12	90	51	18	12	-	-	130	26
Ruff	2	-	-	-	-	-	-	-	-	-	-	-	2	-
Knot ^{1,2,3}	-	220	4	1,030	450	2,546	1,225	800	100	2	9	2	2,546	509

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Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Species peak	5-yr mean of peak
Dunlin ^{1,2,3}	257	600	873	735	3,250	2,620	5,700	3,012	331	420	502	15	5,700	1,140
Sanderling ^{2,3}	8	95	41	126	57	28	55	96	147	498	25	-	498	100
Turnstone ³	-	8	-	-	8	-	1	-	-	-	-	-	8	2
Common sandpiper (<i>Actitis hypoleucos</i>)	3	3	-	-	-	-	-	-	-	-	-	-	3	1
Green sandpiper	-	2	-	-	-	-	-	-	-	-	-	-	2	-
Redshank ^{1,2,3}	132	70	402	1,000	523	317	455	282	278	40	6	-	1,000	200
Greenshank	1	1	2	1	2	1	1	1	1	-	-	-	2	-
Black-tailed godwit ^{1,2,3}	2	100	1,011	2,211	34	1,200	800	137	20	-	20	24	2,211	442
Bar-tailed godwit ^{1,2,3}	6	6	28	61	64	40	20	3	3	80	171	7	171	34
Curlew ^{1,2,3}	1,208	1,203	1,226	1,242	1,072	712	725	846	875	720	150	136	1242	248
Whimbrel (<i>Numenius phaeopus</i>)	7	4	3	-	-	-	-	-	-	12	50	1	50	10
Snipe (<i>Gallinago gallinago</i>)	-	2	2	22	50	18	76	25	5	1	-	-	76	15
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	1,354	2,150	983	714	108	370	510	902	122	8	-	21	2,150	430
Mediterranean gull (<i>Larus melanocephalus</i>)	1	-	-	-	-	-	-	-	-	-	-	-	1	-
Common gull (<i>Larus canus</i>)	-	56	150	400	520	180	2,502	475	860	305	113	50	2,502	500
Great black-backed gull (<i>Larus marinus</i>)	29	62	111	116	102	70	42	47	31	14	19	11	116	23
Herring gull	4,740	10,682	8,633	2,357	5,687	7,600	1,362	10,577	5,285	966	1,763	1101	10,682	2,136
Lesser black-backed gull (<i>Larus fuscus</i>)	48	54	48	70	9	25	15	-	21	22	23	31	70	14
Common tern ^{1,2,3}	142	160	10	-	-	-	-	-	-	-	-	50	160	32
Little tern ^{1,2,3}	460	585	2	-	-	-	-	-	-	-	300	519	585	117
Sandwich tern ^{1,2,3}	208	478	215	13	-	-	-	-	-	8	37	10	478	96
Kingfisher (<i>Alcedo atthis</i>)	-	-	1	-	-	-	-	-	-	-	-	-	1	0

Species	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Species peak	5-yr mean of peak
Total peak	11,026	27,821	25,524	27,403	25,434	27,174	25,457	26,367	13,290	6,257	5,365	4,312	51,847	10,369

1 SPA designated feature. 2 Ramsar designated feature. 3 SSSI species of interest. * Overall total waterbird peak derived by summing the individual species peaks.

1.8.1 NEWS data

Fifteen species of waterbird were recorded in the NEWS over the winter of 2015/16. Waders and wildfowl were mostly recorded in relatively low numbers with only gulls (black-headed and herring gull) being recorded in high abundances. Figure 1.4 shows the location of the available count sector data collected by the NEWS, and Table 1.8 summarises the available peak count data collected by the NEWS.

Table 1.8: Summarising the Peak Count Data As Collected By The NEWS

Species	Z360204
Shelduck ^{1,2,3}	4
Teal ^{1,2,3}	18
Cormorant ^{2,3}	35
Little Egret	1
Oystercatcher ^{1,2,3}	78
Ringed plover ^{2,3}	87
Lapwing	2
Dunlin ^{1,2,3}	290
Sanderling ^{2,3}	30
Redshank ^{1,2,3}	8
Curlew ^{1,2,3}	2
Black-headed gull	4,480
Herring gull	560
Lesser black-backed gull	3
Great black-backed gull	13
Total waterbirds *	5,611

¹ SPA designated feature. ² Ramsar designated feature. ³ SSSI species of interest. * Overall total waterbird peak derived by summing the individual species peaks.

1.8.2 RPS diurnal survey results

A total of 51 waterbird species were identified to species level during the diurnal surveys. Of these 22 are named in the local designated sites (within 20 km), with 21 species being SPA/Ramsar features.

Table 1.9: Summarising the RPS Diurnal Survey Data

Species group	Species	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	Species peak
Wildfowl	Mute swan	-	-	-	2	-	-	2	2
	Greylag goose	-	1	-	-	-	2	2	2
	Pink-footed goose	-	-	1	-	3	-	-	3
	Canada goose	-	208	48	13	4	11	7	208
	Brent goose	-	24	-	321	14	14	1	321
	Shelduck ^{1,2,3}	15	34	61	35	77	67	15	77
	Gadwall	-	-	-	-	2	-	-	2
	Mallard	-	10	4	12	14	4	7	14
	Pintail ^{1,2,3}	-	-	-	-	-	2	-	2
	Teal ^{1,2,3}	-	2	-	8	29	11	22	29
	Wigeon ^{2,3}	-	-	1	-	-	-	-	1
Seaducks, divers, and grebes, et al	Common scoter ^{1,2,3}	42	5	185	152	12	61	5	185
	Goosander	-	1	-	-	-	-	1	1

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Species group	Species	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	Species peak
	Red-throated diver ^{1,2,3}	-	1	1	2	1	2	1	2
	Great northern diver (<i>Gavia immer</i>)	-	-	1	-	-	-	-	1
	Great crested grebe ^{2,3}	-	-	1	2	1	7	-	7
Cormorants	Cormorant ^{2,3}	10	388	342	154	68	55	112	388
Herons	Grey heron	-	1	1	-	-	2	-	2
	Little egret	-	2	1	-	-	1	1	2
Rails	Water rail	-	-	-	2	1	1	-	2
	Moorhen	-	2	-	-	-	-	-	2
Waders	Oystercatcher ^{1,2,3}	-	7	39	84	32	15	89	89
	Lapwing	-	112	24	8	31	-	-	112
	Ringed plover ^{2,3}	27	59	18	53	41	29	55	59
	Grey plover ^{1,2,3}	24	52	47	1	-	-	-	52
	Golden plover	-	45	1	-	2	-	-	45
	Knot ^{1,2,3}	-	2	-	2	-	-	-	2
	Dunlin ^{1,2,3}	138	449	1,230	522	651	71	1,357	1,357
	Sanderling ^{2,3}	-	70	211	122	229	152	98	229
	Turnstone ³	-	-	-	-	-	-	1	1
	Common sandpiper	-	-	7	-	-	-	1	7
	Redshank ^{1,2,3}	-	3	7	48	14	26	3	48
	Black-tailed godwit ^{1,2,3}	-	1	-	32	17	15	-	32
	Curlew ^{1,2,3}	2	8	60	48	26	9	3	60
	Whimbrel	-	-	-	-	-	-	3	3
	Snipe	-	2	1-5	-	-	21	2	105
	Jack snipe (<i>Lymnocyptes minimus</i>)		-	-	-	-	1	-	1
Gulls	Black-headed gull	4	84	72	465	215	209	7	465
	Common gull	-	442	111	2,852	1,379	717	3	2,852
	Mediterranean gull	-	1	-	-	-	-	-	1
	Herring gull	16	307	320	392	334	516	421	516
	Yellow-legged gull (<i>Larus michahellis</i>)	-	-	1	-	-	1	-	1
	Lesser black-backed gull	-	7	2	5	3	12	21	21
	Great black-backed gull	1	32	43	41	13	6	8	43
	Unidentified gull	-	2	-	-	-	15	14	15
Terns	Little tern ^{1,2,3}	-	-	-	-	-	-	44	44
	Sandwich tern ^{1,2,3}	-	-	-	-	-	-	1,043	1,043
	Common tern ^{1,2,3}	-	-	-	-	-	-	3	3

Species group	Species	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	Species peak
True seabirds	Gannet (<i>Morus bassanus</i>)	-	2	3	-	3	-	2	3
	Kittiwake (<i>Rissa tridactyla</i>)	-	5	-	-	-	-	12	12
	Guillemot (<i>Uria aalge</i>)	-	2	3	2	1	-	-	3
	Razorbill (<i>Alca torda</i>)	-	2	1	1	2	1	-	2
Overall peak*		279	2375	2952	5381	3219	2056	3366	8479

¹ SPA designated feature. ² Ramsar designated feature. ³ SSSI species of interest. * Overall total waterbird peak derived by summing the individual species peaks

In terms of abundance, gulls were the most abundant species group (3,914), followed by waders (2,202), terns (1,090), wildfowl (661), cormorants (388), and seaducks, et. al. (196). Other groups were present in low numbers.

The most abundant species was common gull (*Larus canus*) with a peak count of 2,852. This peak was in January but there were still over 1,000 birds present in February. Dunlin were the only wader species with numbers over 1,000 and the maximum peak count represented approx. 8% of the current Dee Estuary population. The April peak of sandwich tern coincided with the passage period and birds were likely just passing through on their way to more northerly breeding sites in Cumbria, Scotland and Northern Ireland.

The lower abundances when compared to the WeBS are likely due to the smaller surface area covered by the RPS surveys in comparison to the WeBS sectors.

1.8.1 Nocturnal survey results

Eleven species were identified to species level during the nocturnal surveys (November 2022 to March 2023).

Table 1.10: Table Summarising the RPS Nocturnal Survey Data

Species	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Species peak
Pink-footed goose	-	-	330	200	-	330
Shelduck ^{1,2,3}	-	1	-	-	-	1
Mallard	-	-	-	-	1	1
Cormorant ^{2,3}	-	15	-	-	-	15
Oystercatcher ^{1,2,3}	2	8	188	7	18	188
Ringed plover ^{2,3}	11	-	-	-	-	11
Grey plover ^{1,2,3}	4	1	3	-	-	4
Dunlin ^{1,2,3}	6	19	39	14	-	39
Sanderling ^{2,3}	10	-	13	2	5	10
Redshank ^{1,2,3}	-	3	4	-	-	4
Curlew ^{1,2,3}	4	74	9	24	2	74
Unidentified gull	8	1444	6	-	370	1444
Unidentified wader	54	4	-	-	-	54
Peak	99	1569	592	247	396	2175

Similar species were present at night as during the day, albeit in lower numbers. Species richness was however lower. The most striking exception was the pink-footed geese which utilised the intertidal as a nocturnal roost during the second half of the winter. Most of the wader species were regularly recorded with the exception of ringed plover which was only present in November.

Although gulls were not classified to species level, they were present during most surveys. It was noted that gulls switched from loafing and/or roosting on the intertidal to loafing/roosting on the sea as night fell, this could explain the low counts when compared to the diurnal results as limitations with the nocturnal optics struggled to pick out birds on the water. The peak of total waterbirds in December coincided with a cold snap when most terrestrial habitats were frozen, this may account for the peak in curlew as they may have switched from terrestrial habitats to intertidal habitats.

The total number of waterbirds found to be utilising the intertidal at night peaked in December. This coincided with the peak in gulls. With the exception of gulls, relatively low numbers of waders, wildfowl, and cormorants were found during the nocturnal surveys.

1.8.2 Results in context with national importance thresholds

Maximum peak counts were compared to the 1% threshold of national importance (Figure 1.5). Both brent goose and sanderling exceeded the national importance threshold.

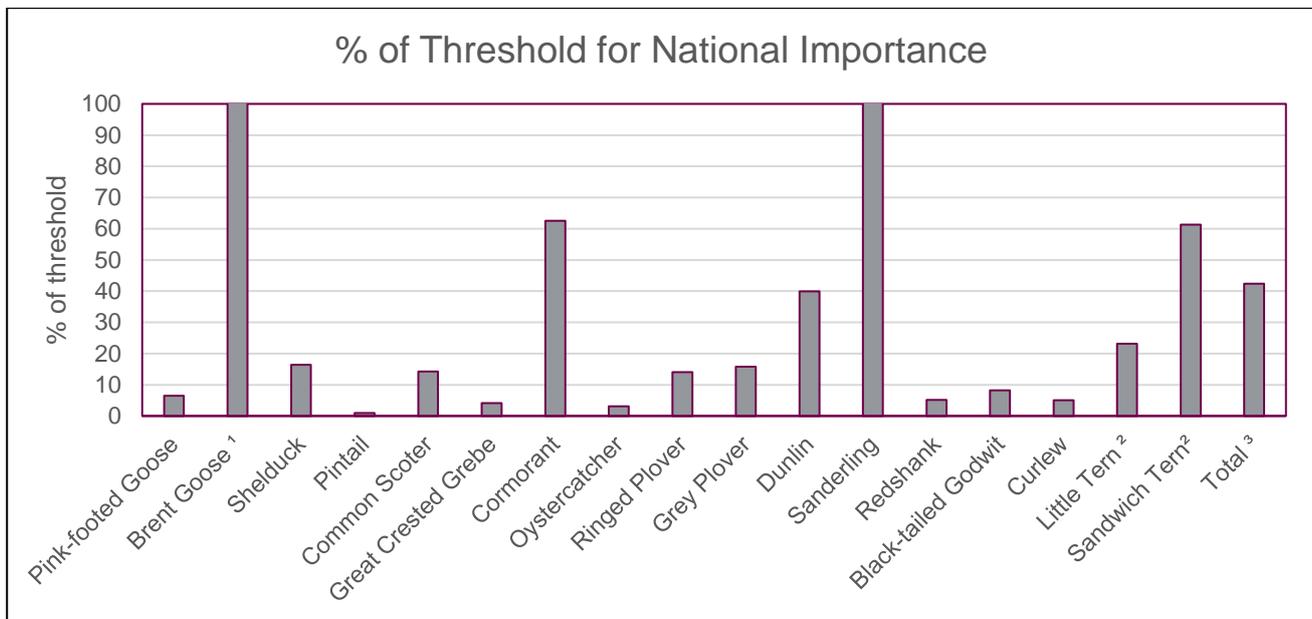


Figure 1.5: Species Which Were Present In The Survey Area In Numbers Exceeding 1% Of The National Threshold Level. ¹ Assumed To Be Light-Bellied Nearctic Subspecies. ² International Threshold Used ³ 20,000 Waterbirds Used As The Threshold

1.8.3 Spatial analysis by species group

Due to the high number of species recorded during surveys it may be easier to see patterns of spatial utilisation by grouping species according to their broad similarities. This grouping has mostly been done according to taxonomical classification (Voous, 1977). However, where species are using the same habitats (e.g. seabirds, kittiwake, and auks) they have been grouped together. Similarly, where their habitat requirements are vastly different (e.g. seaducks and wildfowl) they are split into different groups. For all groupings used in the below analyses refer to

Table 1.9.

1.8.3.1 All waterbirds

All waterbirds were grouped together, and average densities mapped in The Ramsar Convention defines ‘waterfowl’ (other term for waterbirds) as species of birds that are “ecologically dependent upon wetlands”.

When all waterbird species are considered, there is a density hotspot centred around the Prestatyn Gutter outflow, with other areas of high abundance occurring along the intertidal where the cable corridor makes landfall.

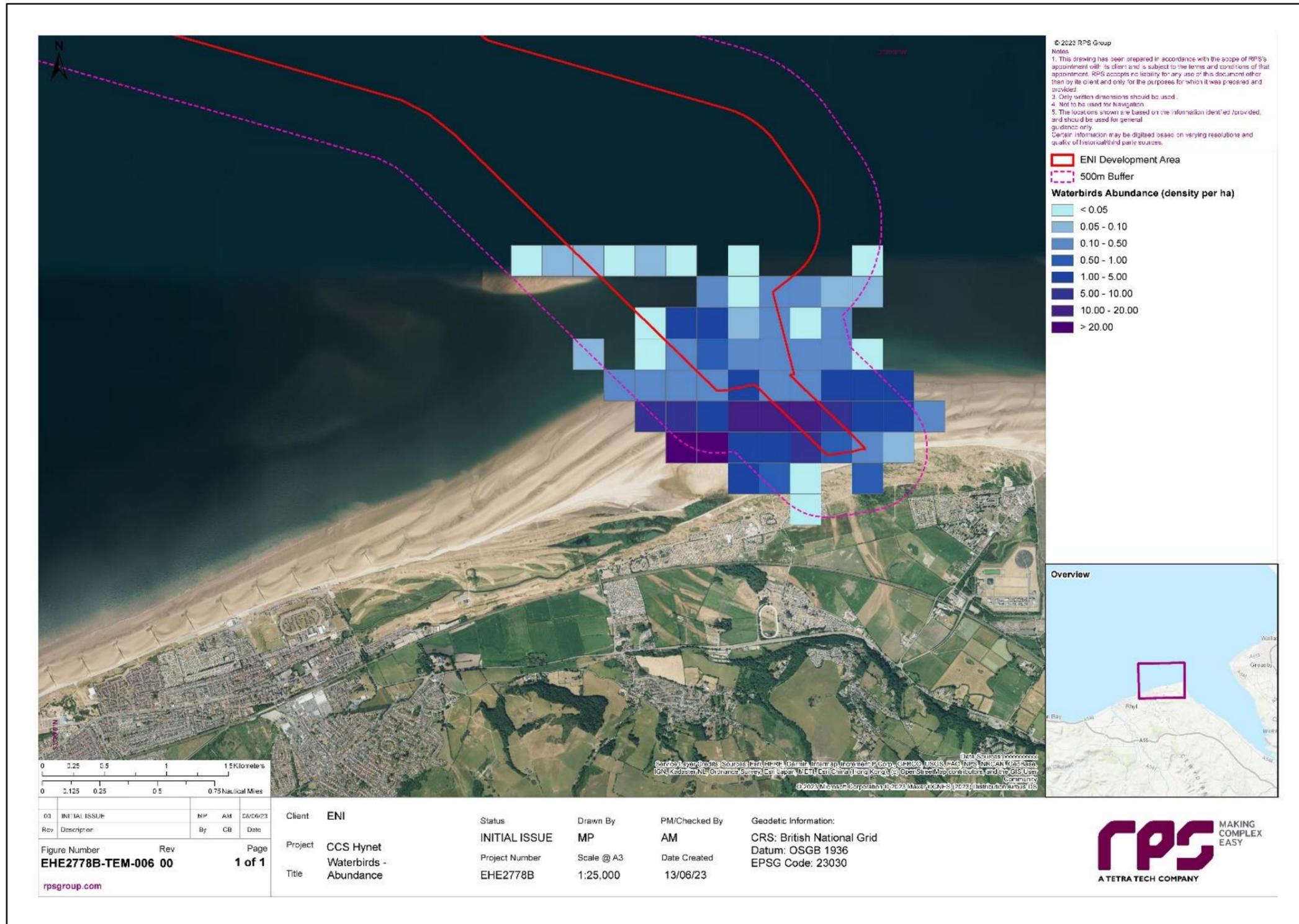


Figure 1.6: Average Density Of All Waterbirds Within The Survey Area

Species richness was mapped in Figure 1.13. Species richness also contains a hotspot centred around the Prestatyn Gutter outflow, although of a lesser magnitude. The richness and abundance in this area could be due to the presence of saltmarsh habitats and the availability of fresh water meaning that less specialist species can exploit the area. Furthermore, the saltmarsh may also provide safety for roosting birds.

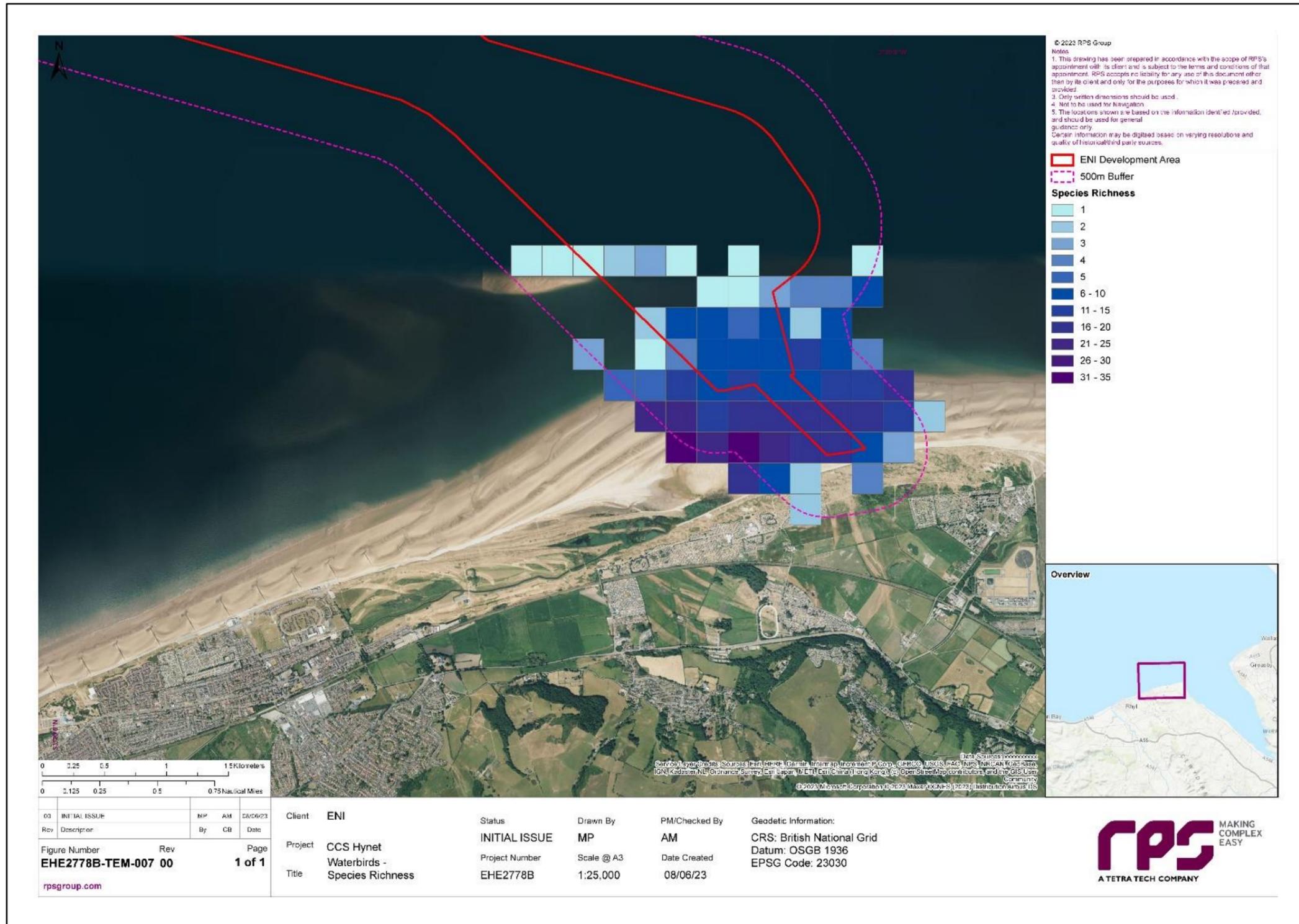


Figure 1.7: The Species Richness Of All Waterbirds Within The Survey Area

The abundance densities were further explored via species groups, only species groups of importance have been analysed, for example seabirds have been omitted due to the low numbers recorded, and rails omitted due to a lack of relevance to the subject (i.e., of low conservation value for this topic). The main groups of importance were wildfowl, waders, and gulls.

Other groups that have already been adequately covered with species density maps were cormorants, seaducks, divers, grebes, and terns.

1.8.3.2 All wildfowl

Wildfowl (ducks, geese, and swans) showed a tendency to stay towards the western half of the study area, around the Prestatyn Gutter outflow. Common scoter were omitted from this analysis as they are a fully marine species during the non-breeding season (see Figure 1.15 for common scoter densities).

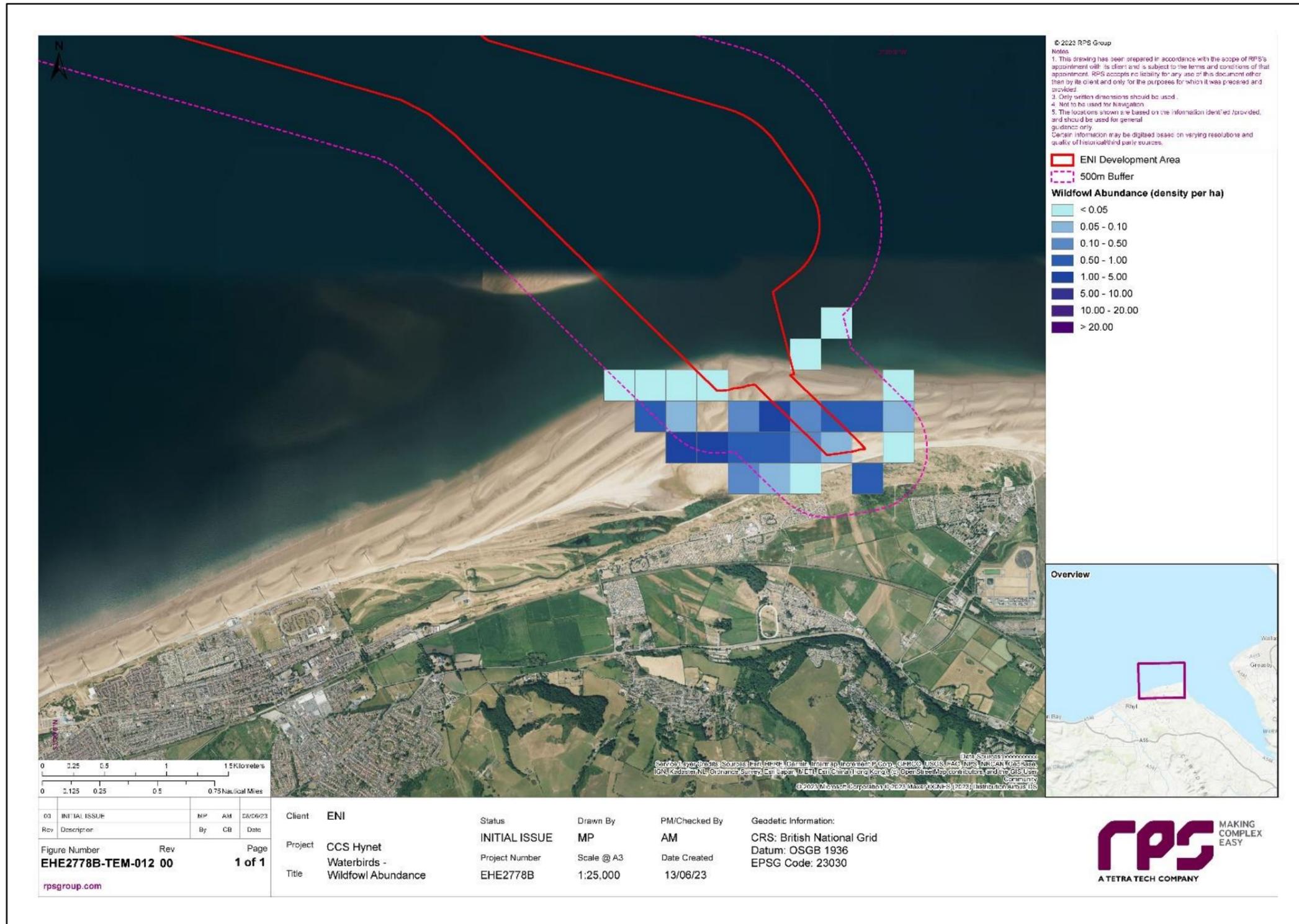


Figure 1.8: Average Density Of All Wildfowl Within The Survey Area

1.8.3.3 All waders

Waders as a group were more evenly spaced along the study area (above MLWS) with their distribution being more aligned with foraging rather than roosting behaviour. Although high densities were concentrated around the Prestatyn Gutter outflow the highest densities were found on the intertidal at the cable corridor landfall.

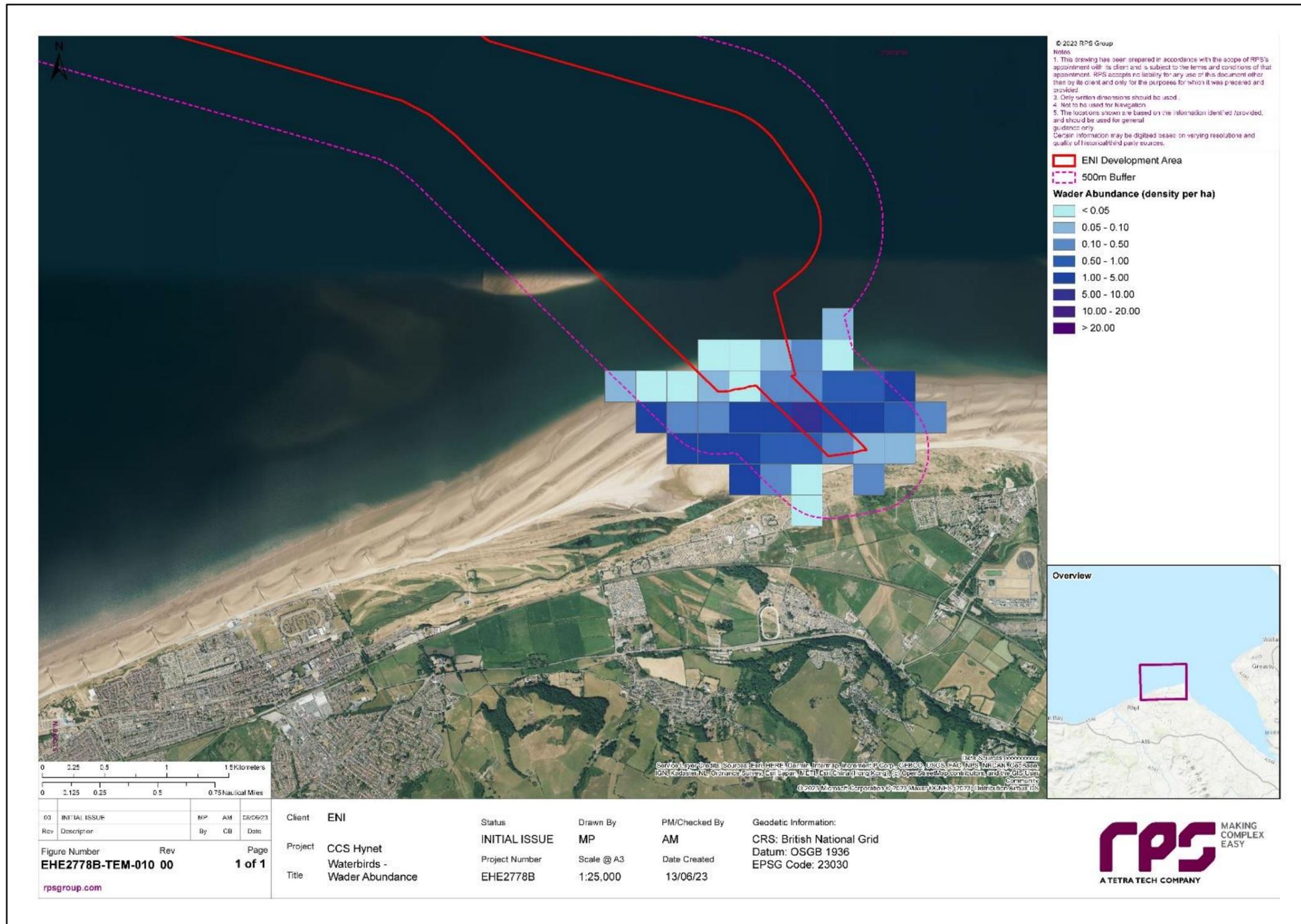


Figure 1.9: Average Density Of All Waders Within The Survey Area

1.8.3.4 All gulls

Gulls (which were the most abundant of all groups) spatial abundance most closely mirrors the 'all waterbirds' densities albeit grouped closer to shore with the highest densities found around the Prestatyn Gutter outflow.

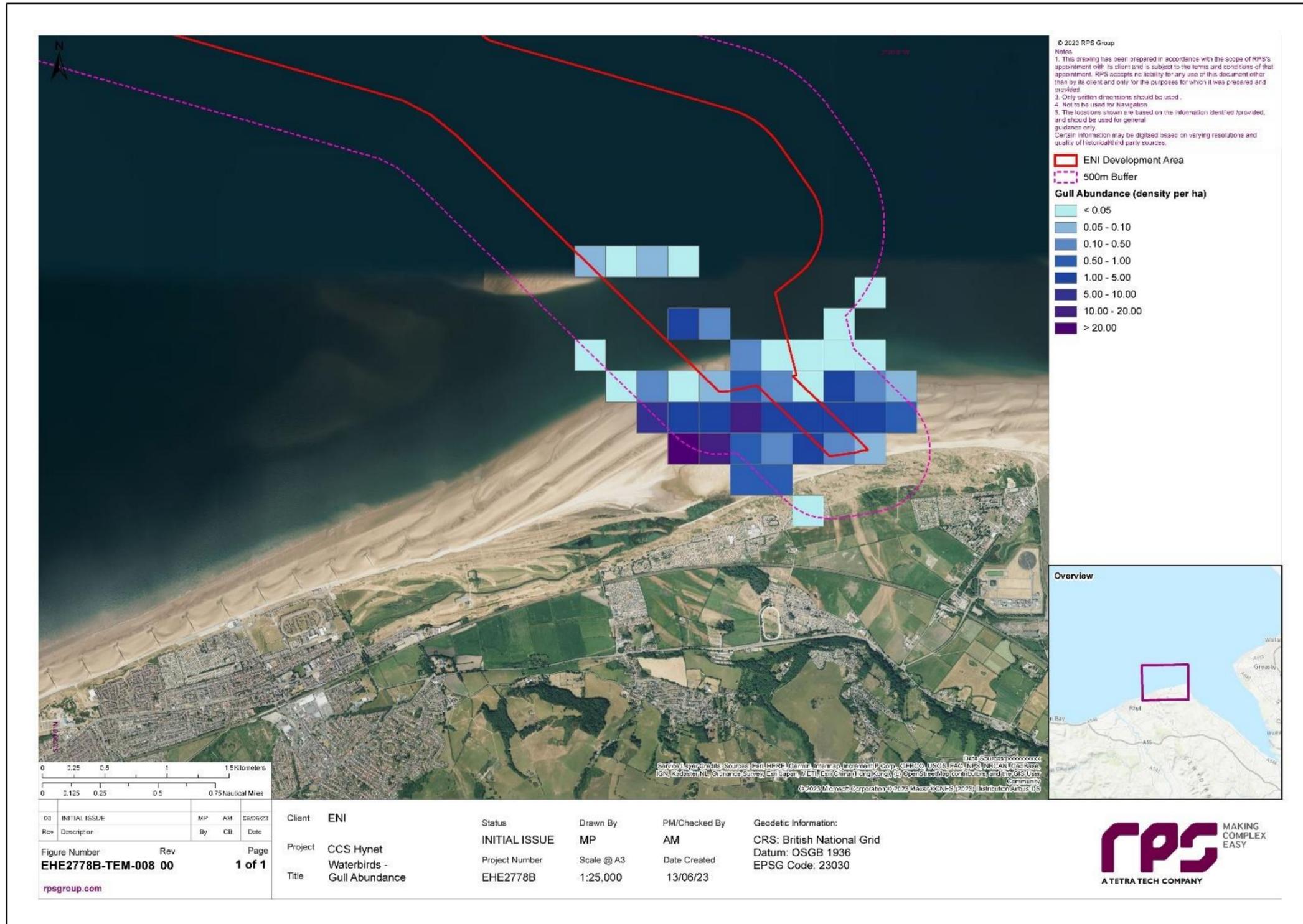
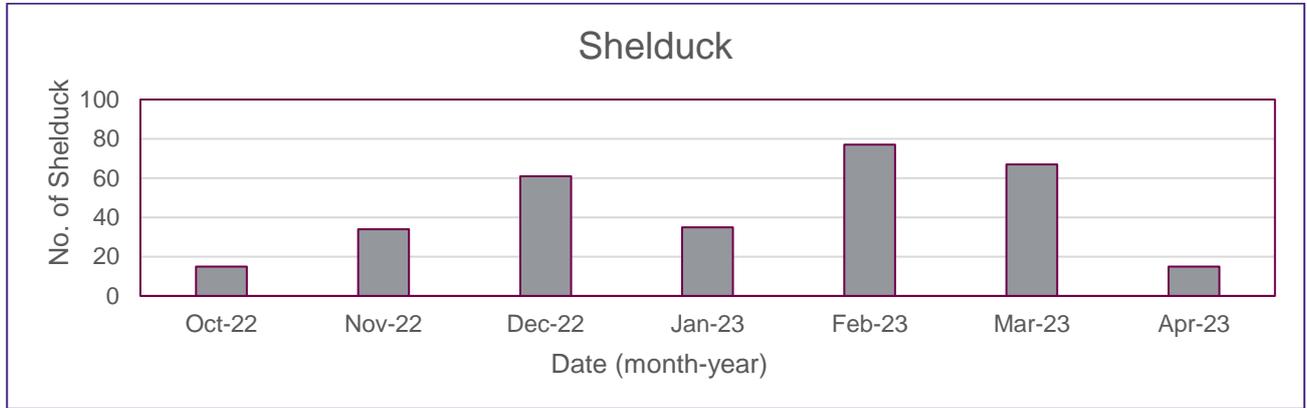


Figure 1.10: Average Density Of All Gulls Within The Survey Area

1.8.4 Species accounts

The following species accounts are provided for feature species only (i.e., only SPA, Ramsar, or SSSI designated features/species of interest).

1.8.4.1 Shelduck



Shelduck were spread throughout the survey area. Although they were found in relatively low numbers, they were regularly present throughout the study period. Shelduck mostly use mudflats and saltmarsh habitats during the non-breeding season.

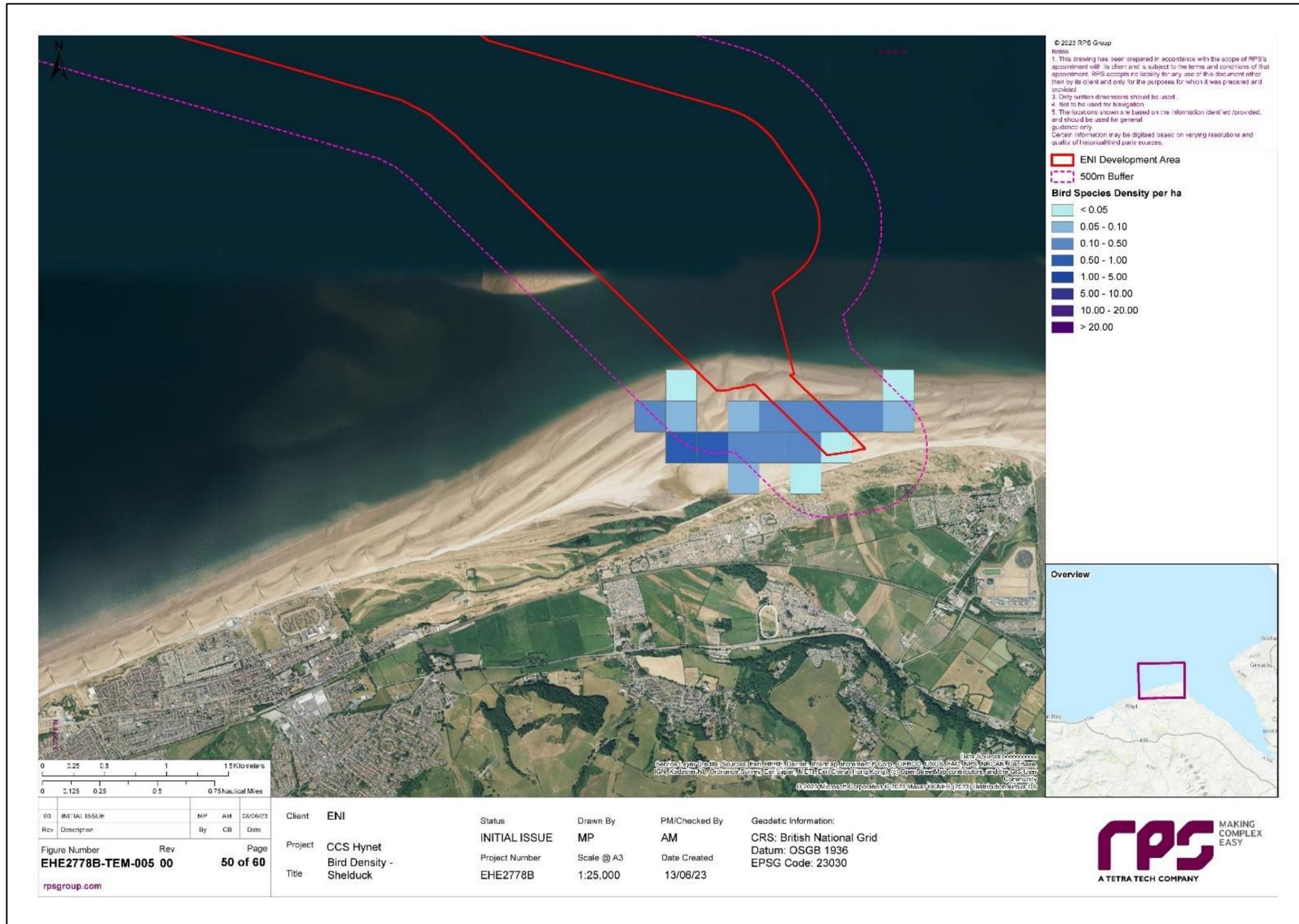
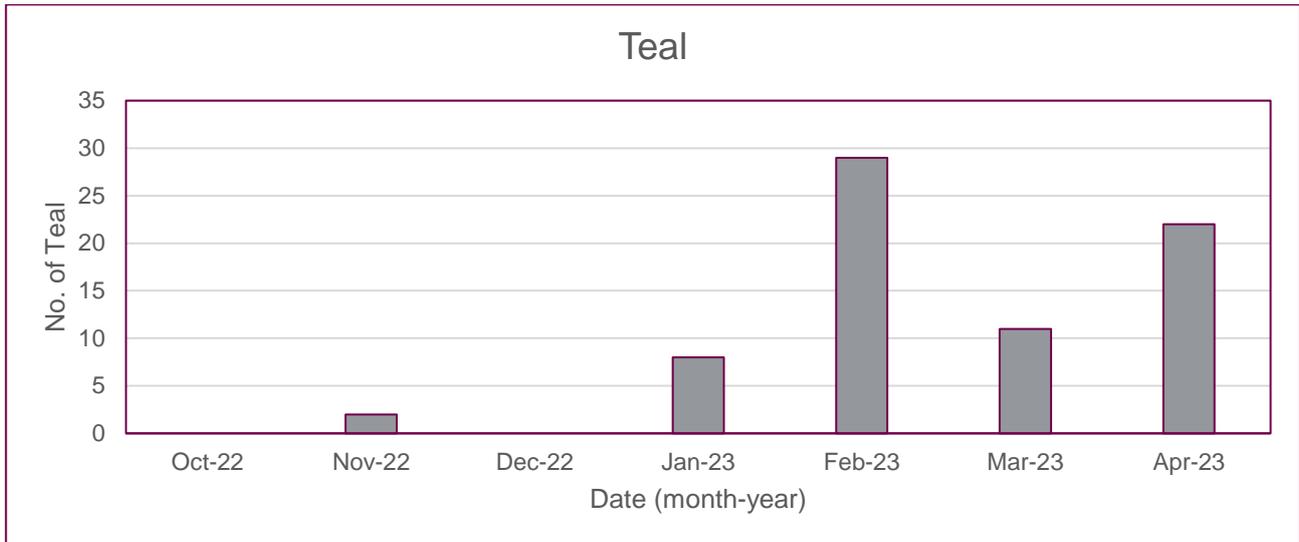


Figure 1.11: Average Density Of Shelduck Within The Survey Area

1.8.4.2 Teal



Teal were also found in relatively low numbers mostly during the latter half of winter. They were mostly concentrated around the area where the Prestatyn Gutter flows out onto the intertidal. As the species prefers muddy creeks, they are less likely to be found out further on the sand flats or in the nearshore waters.

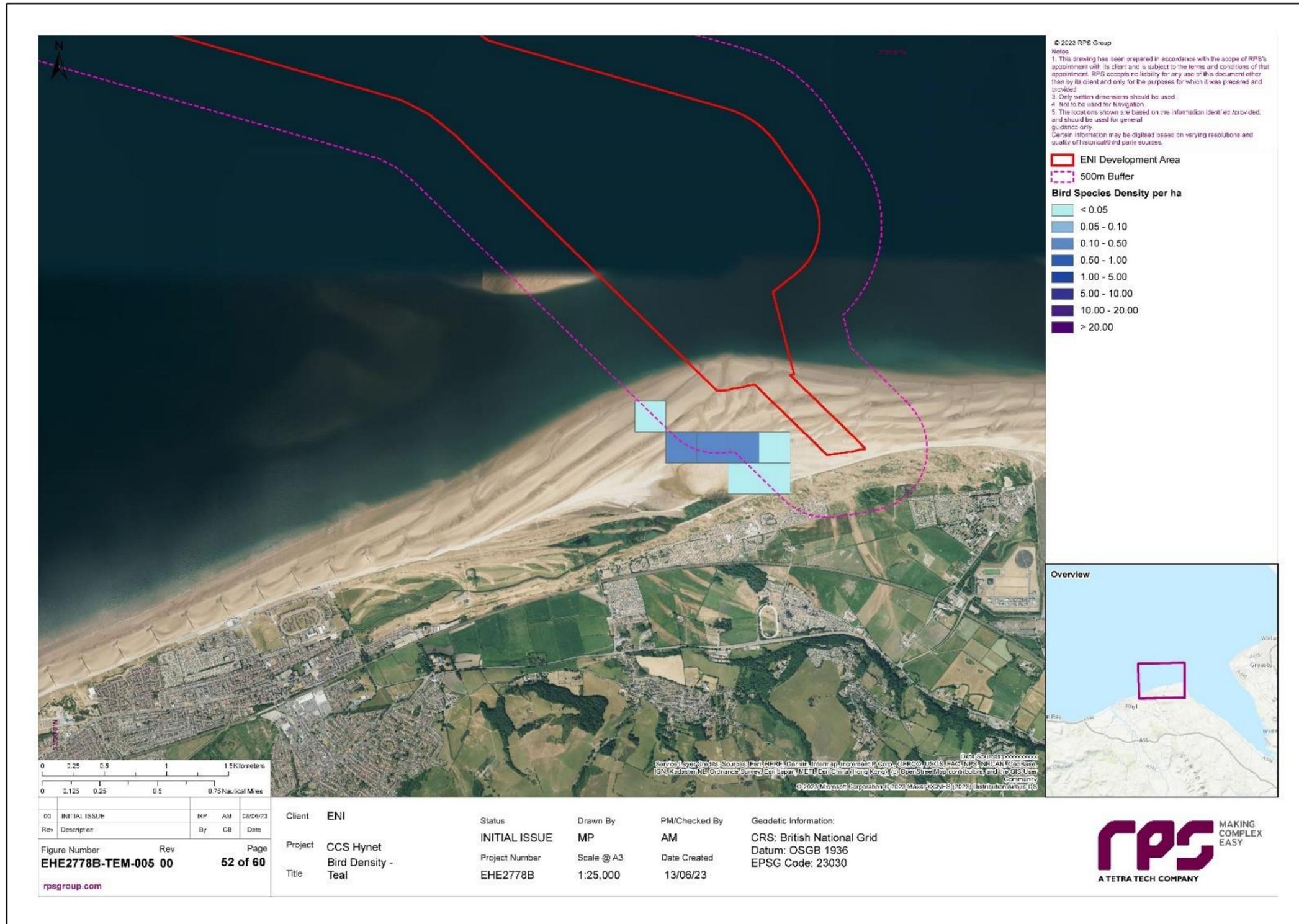


Figure 1.12: Average Density Of Teal Within The Survey Area

1.8.4.3 Wigeon



Wigeon graze on pasture and are usually found in freshwater or brackish marshes outside of the breeding season when they gather in large flocks. They were found infrequently and in low numbers, so it is unlikely that the survey area is of importance to this species.

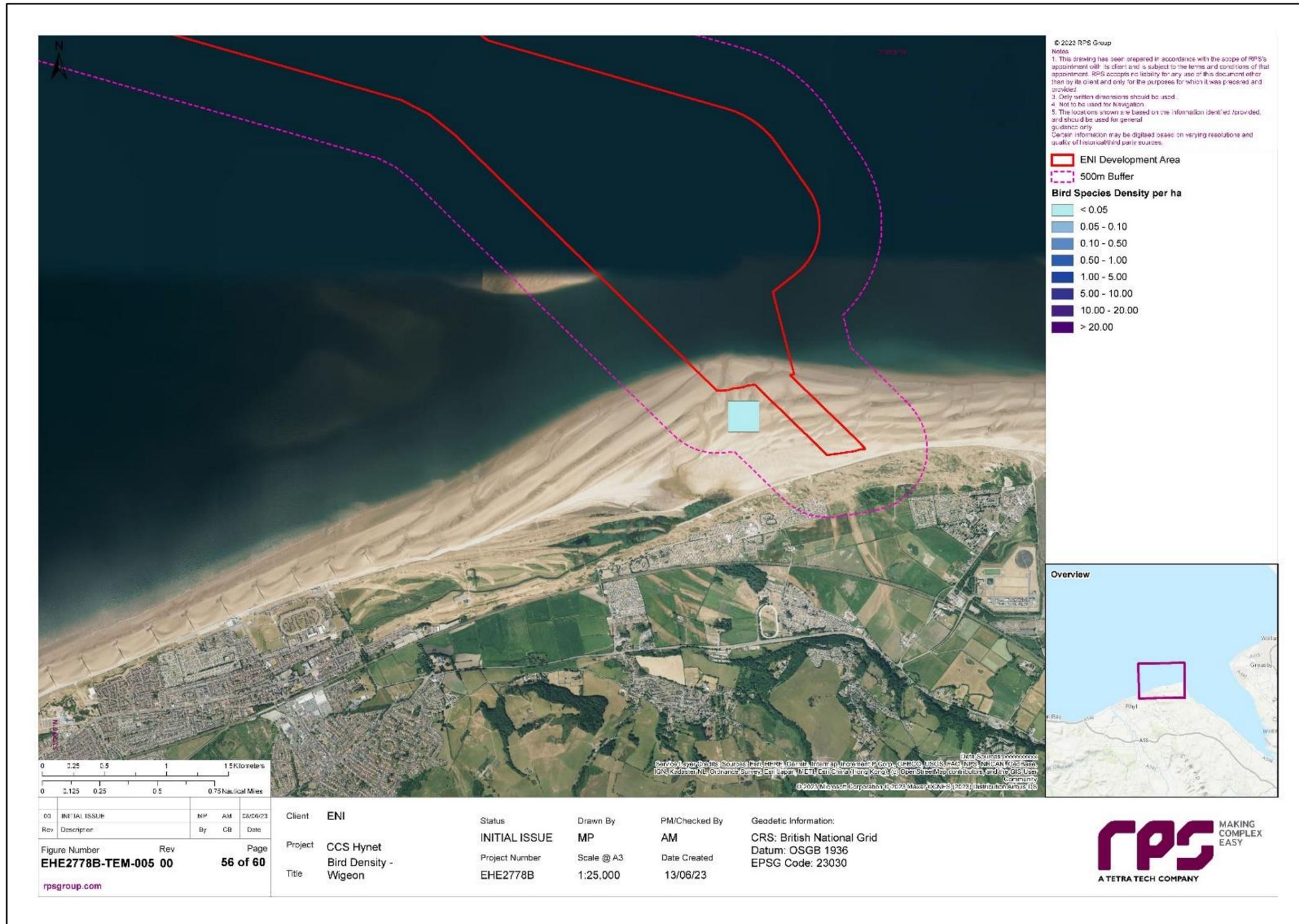
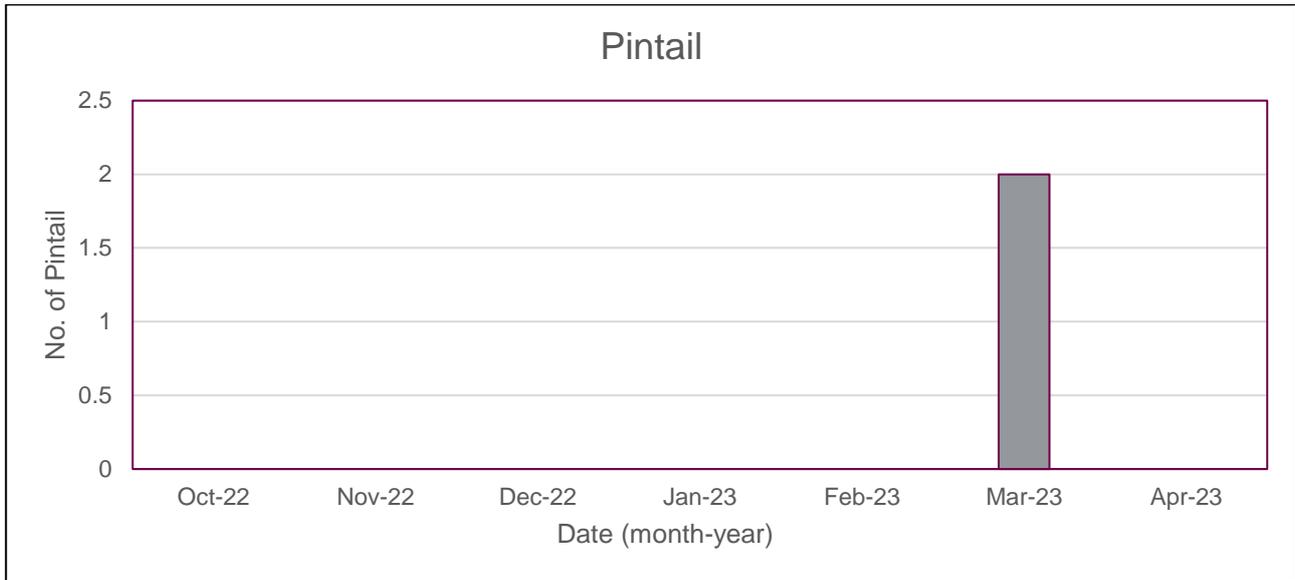


Figure 1.13: Average Density Of Wigeon Within The Survey Area

1.8.4.4 Pintail



Pintail is an estuarine duck which is often associated with saltmarsh and mudflats during the non-breeding season. They were recorded infrequently and in low numbers.

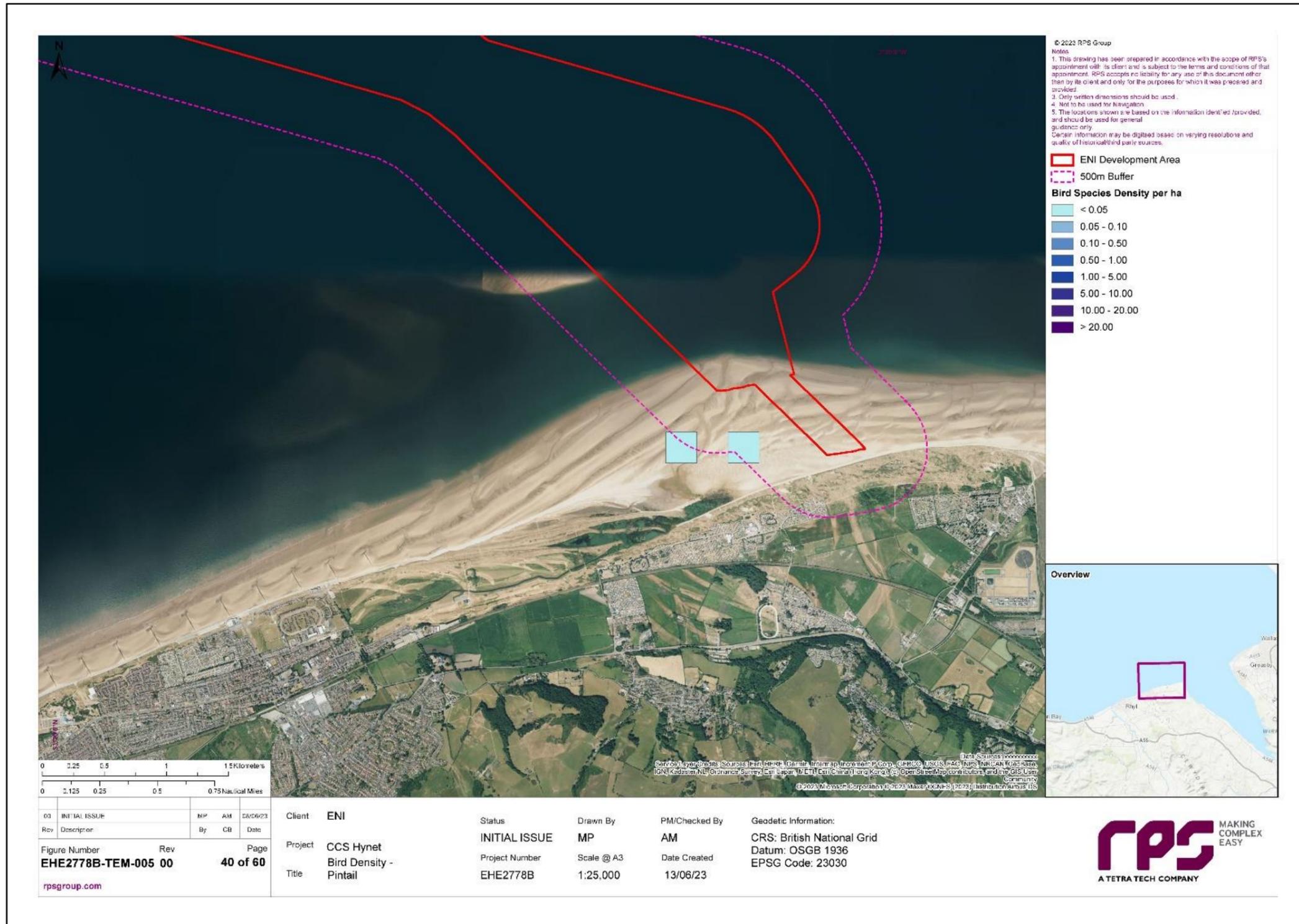
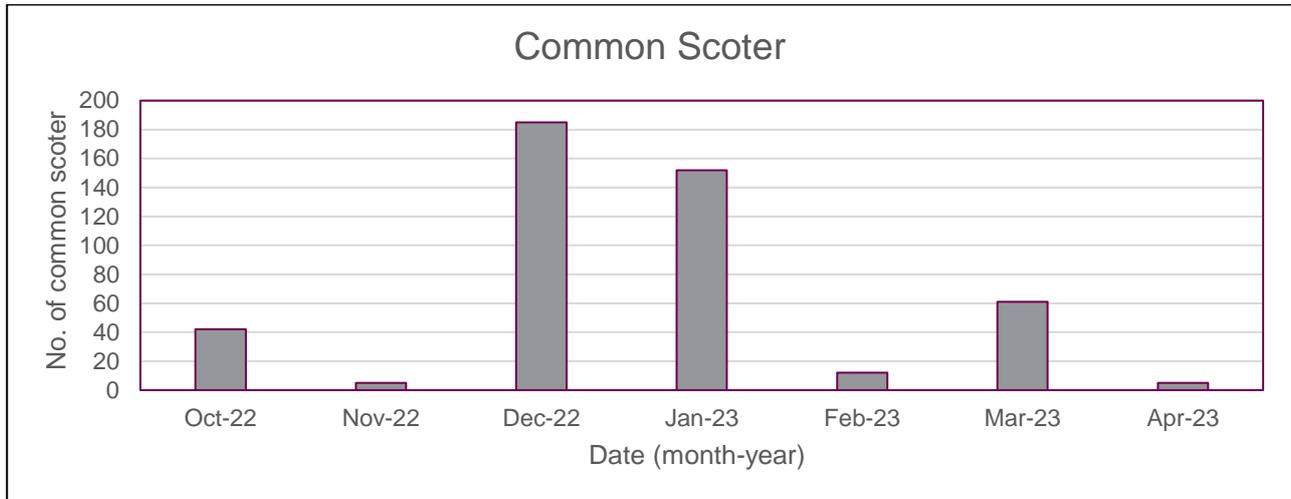


Figure 1.14: Average Density Of Pintail Within The Survey Area

1.8.4.5 Common scoter



Common scoter are a seabird species. They feed in shallow waters (less than 20m depth). The Liverpool Bay SPA is an internationally important non-breeding area for common scoter (Lawson *et al.*, 2016) with an estimated population of approx. 57,000 individuals. The distribution of common scoter within the Liverpool Bay area is discussed in more depth in the Offshore Ornithology Baseline Technical Report. Common scoter were scattered within the nearshore waters and peaked in December 2022 and January 2023.

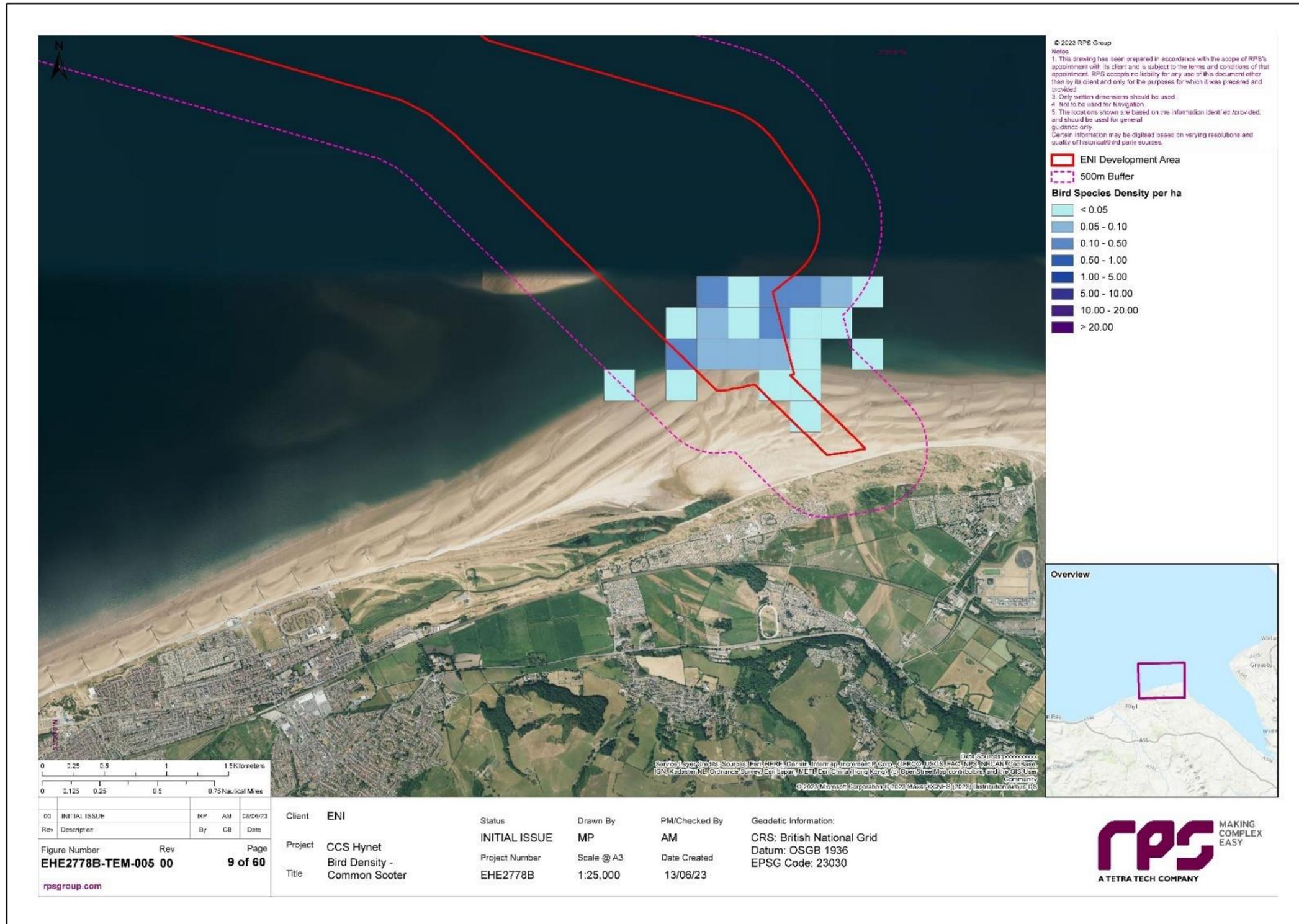
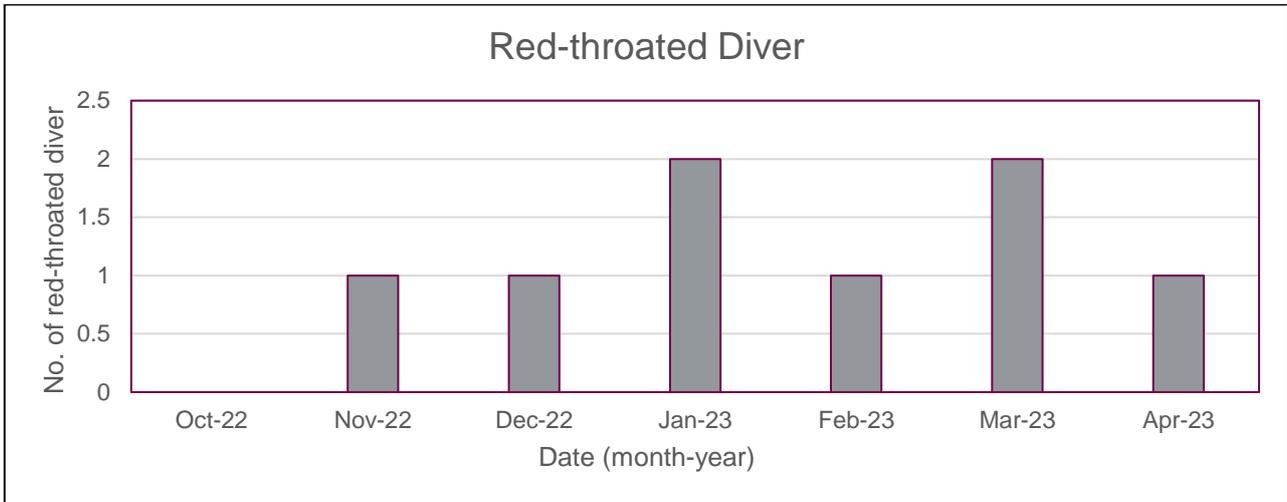


Figure 1.15: Average Density Of Common Scoter Within The Survey Area

1.8.4.6 Red-throated diver



Red-throated diver are another Liverpool Bay SPA feature. During the non-breeding season, the Liverpool Bay area is of international importance for this species. Red-throated diver feed on small fish and are often found in greater concentrations in the nearshore waters.

Red-throated diver within the study area were concentrated where the landfall cable corridor meets the wider Proposed Development boundary.

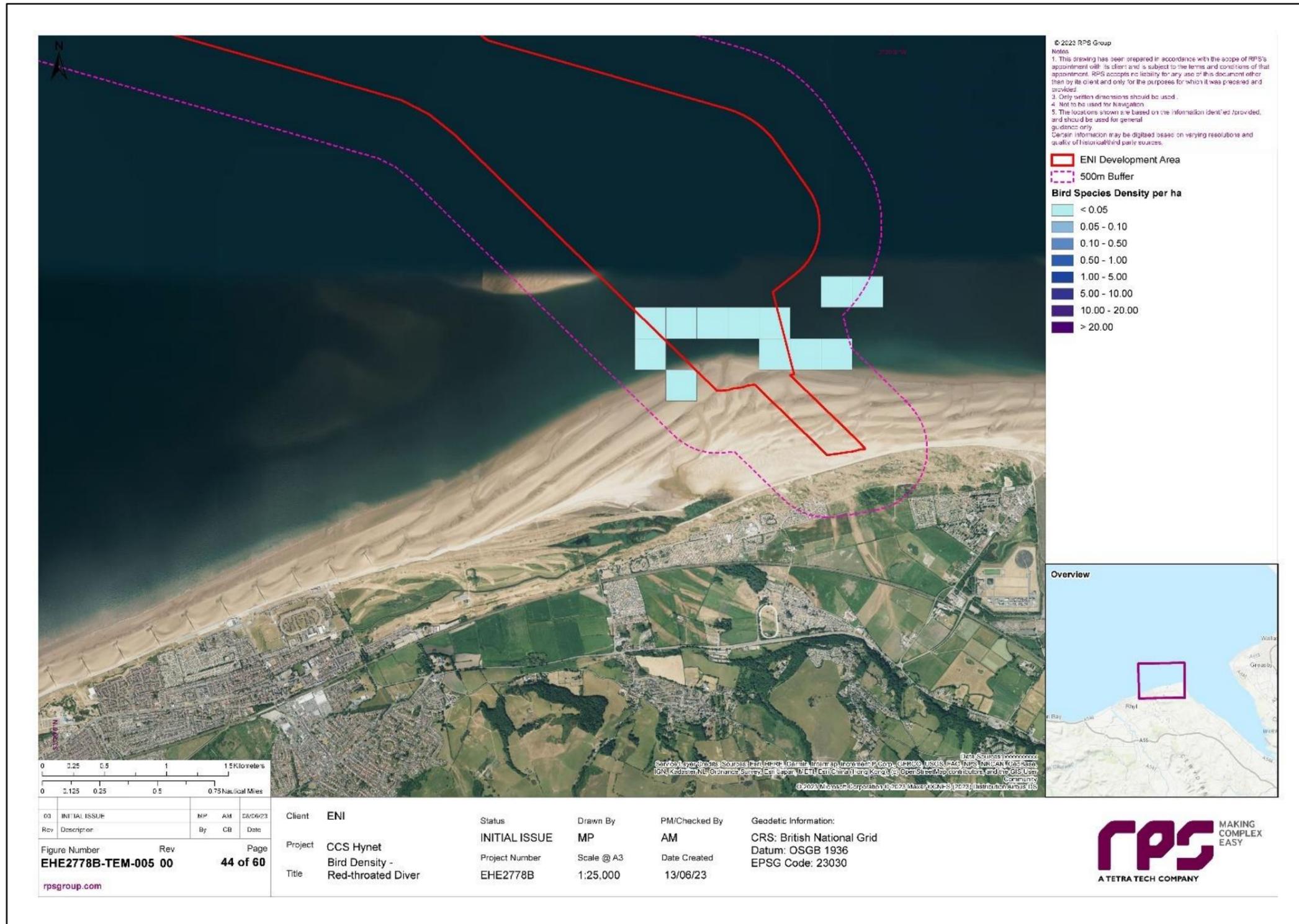
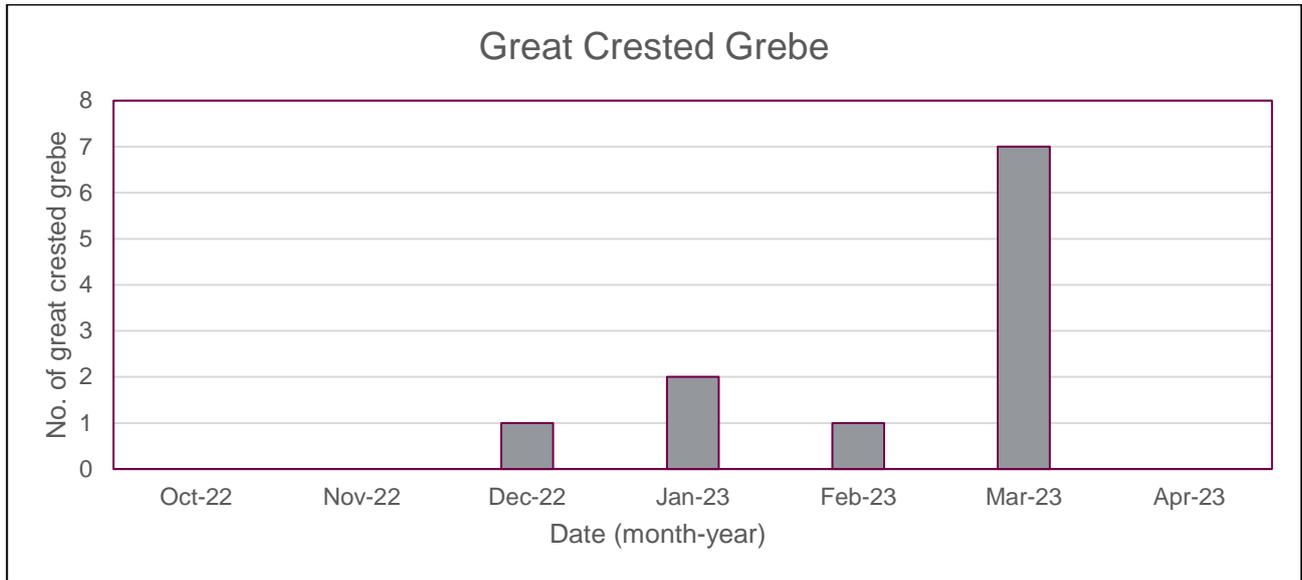


Figure 1.16: Average Density Of Red-Throated Diver Within The Survey Area

1.8.4.7 Great crested grebe



Great crested grebe are a Ramsar feature and the nearshore waters surrounding the Dee Estuary are a nationally important wintering ground for this species. Great crested grebe were scattered throughout the nearshore waters.

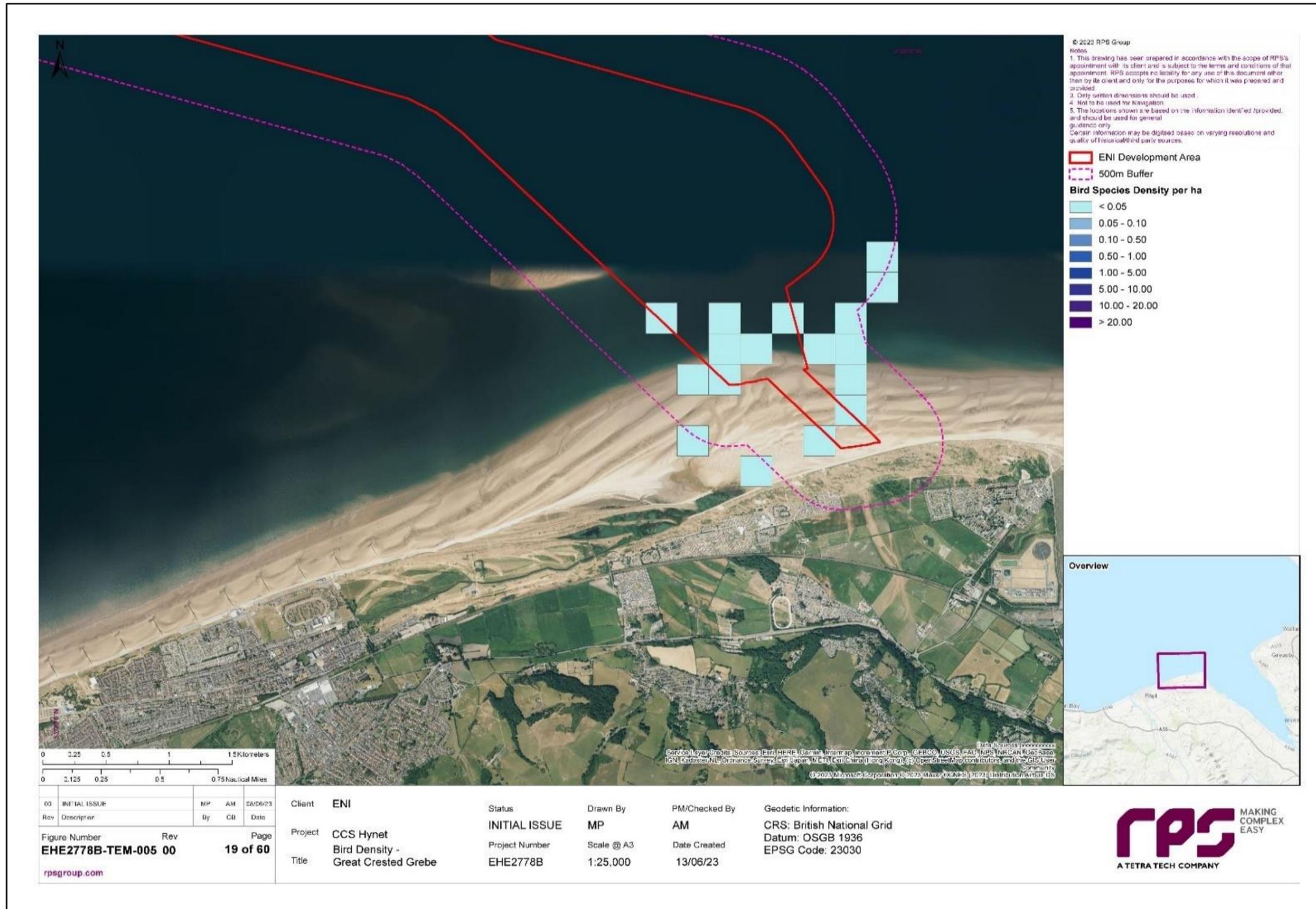
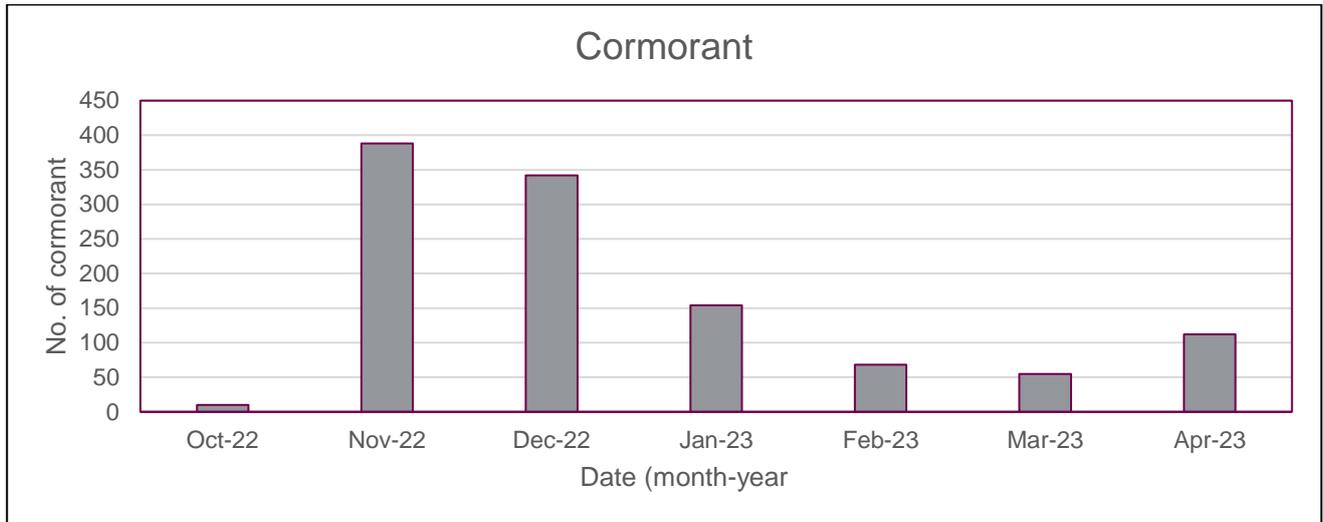


Figure 1.17: Average Density Of Great Crested Grebe Within The Survey Area

1.8.4.8 Cormorant



Cormorant were found throughout the study period although they peaked in numbers during November and December 2022. Their distribution suggests that they may be using both the marine and the terrestrial habitats available in the intertidal zone (Figure 1.18). Cormorants frequently loaf at the water’s edge and spread their wings to help dry their feathers, hence they are often found in congregations at the tide line. The Dee Estuary population is of national importance.

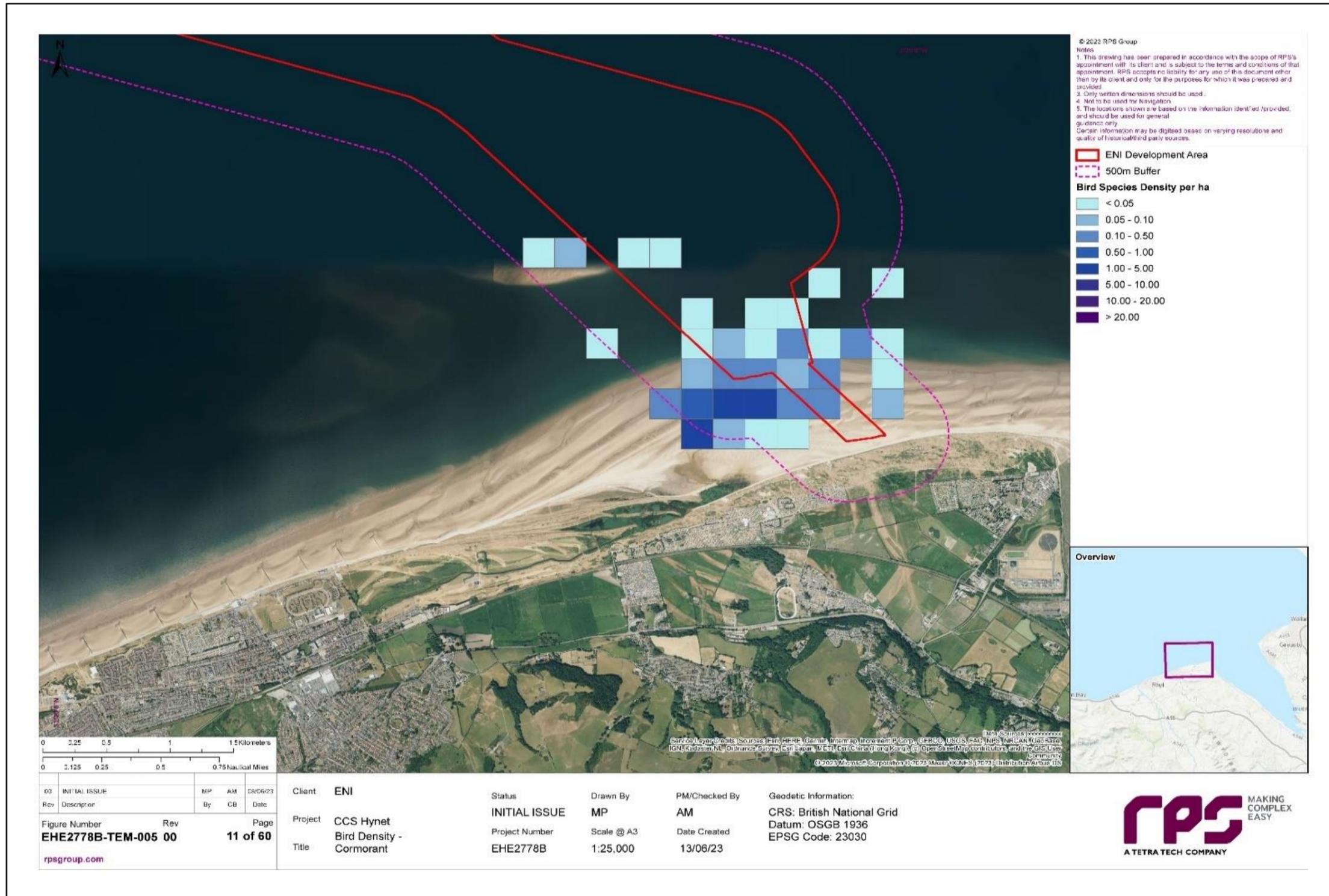
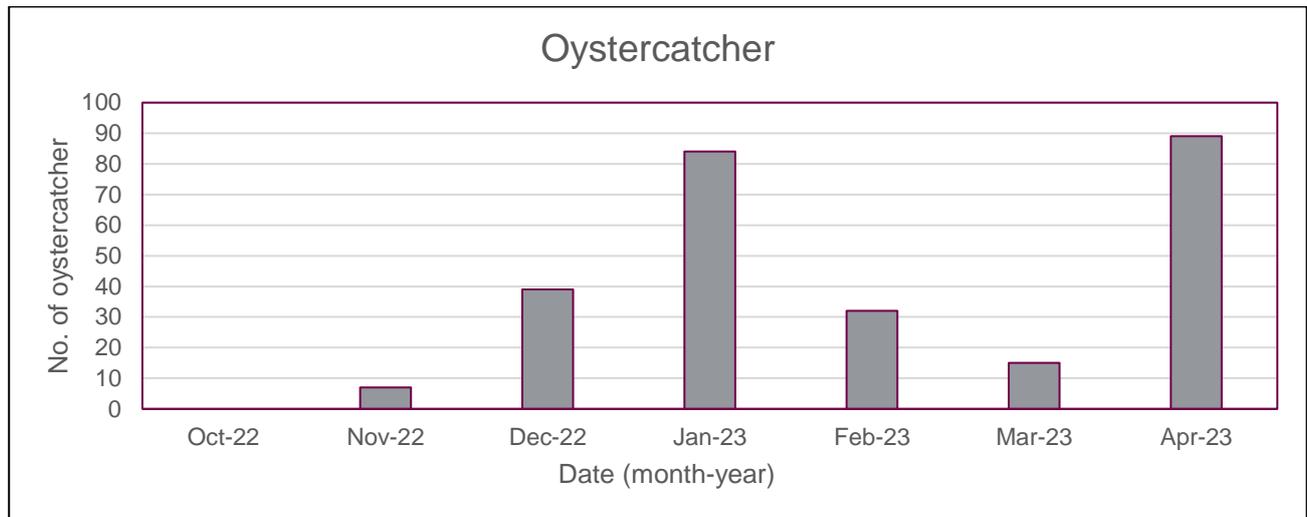


Figure 1.18: Average Density Of Cormorant Within The Survey Area

1.8.4.9 Oystercatcher



Oystercatcher are found in internationally important numbers in the Dee Estuary and the current population estimate is approx. 28,000 individuals. Oystercatcher feed on the intertidal mud and sand flats and they are distributed evenly along shore. As the greater densities were found close to the MLWS, it is suggested that the area was more important for foraging than roosting. They were found in fairly low numbers (relative to the current Dee Estuary population) throughout the winter with higher peaks in January and April 2023.

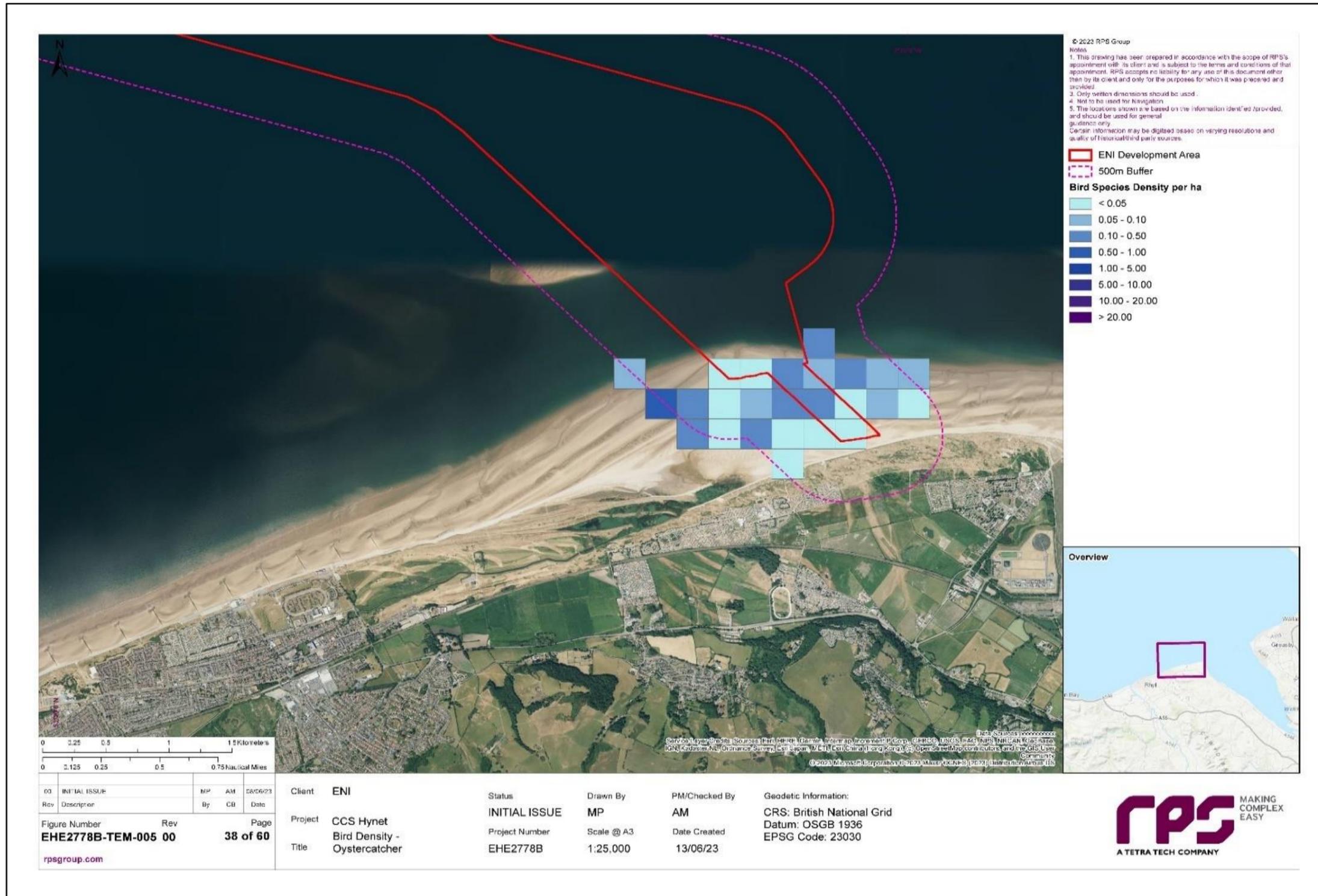
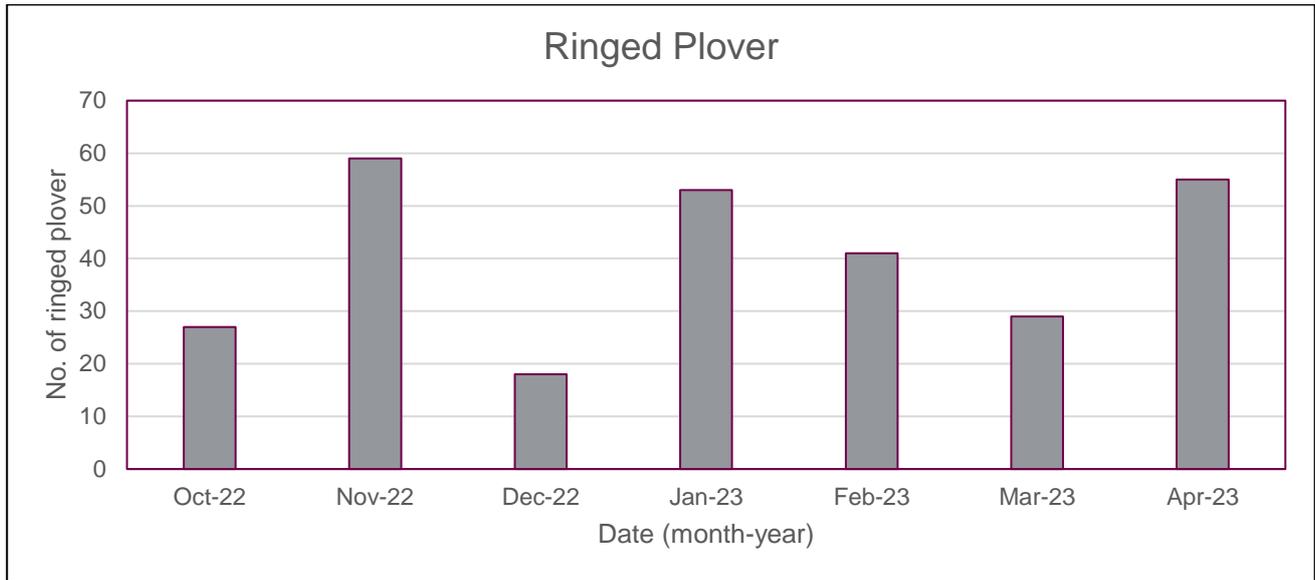


Figure 1.19: Average Density Of Oystercatcher Within The Survey Area

1.8.4.10 Ringed plover



Ringed plover are a bird of the upper shoreline and pebbly beaches, they are Ramsar features during their passage period. They were found regularly throughout the winter period. Ringed plover were spread evenly distributed on the intertidal habitats.

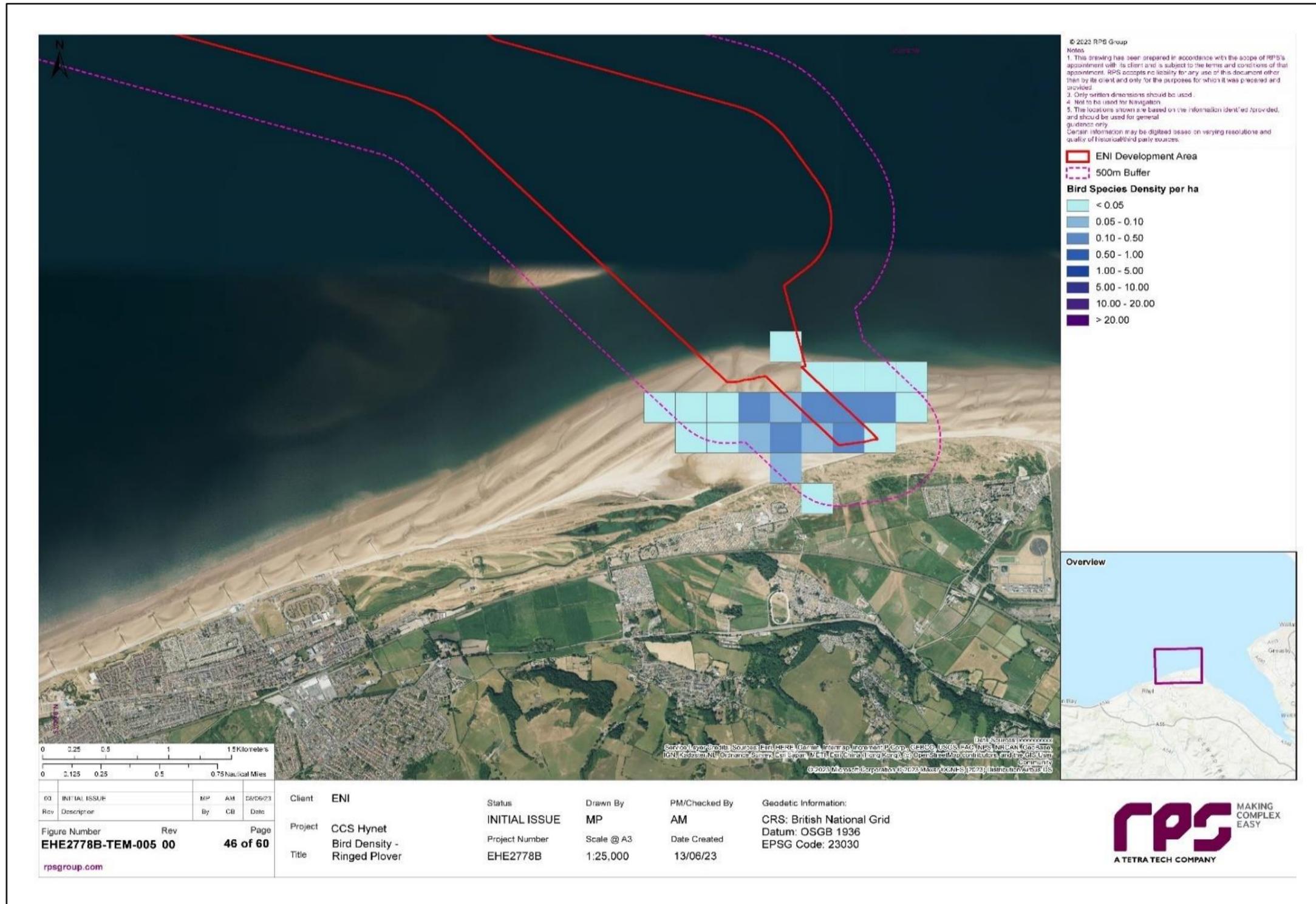
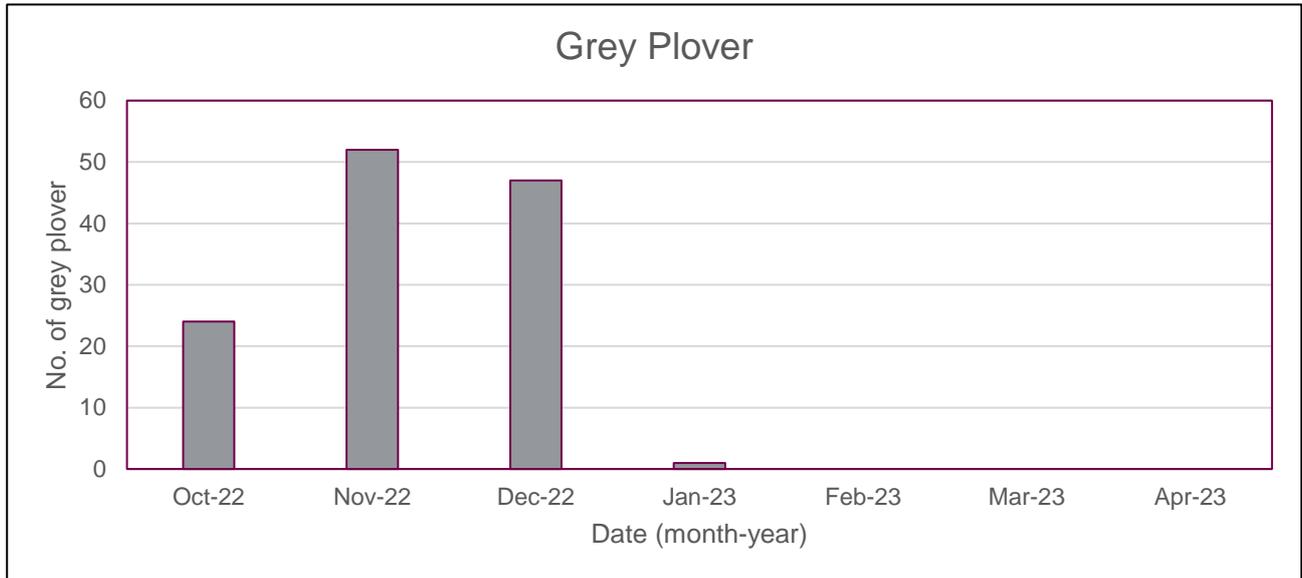


Figure 1.20: Average Density Of Ringed Plover Within The Survey Area

1.8.4.11 Grey plover



Grey plover were found mostly during the first half of the winter. The Dee Estuary is of international importance for wintering grey plover. Grey plover have excellent eyesight that allows them to forage on even the darkest of nights, however they were recorded in greater numbers during the diurnal surveys.

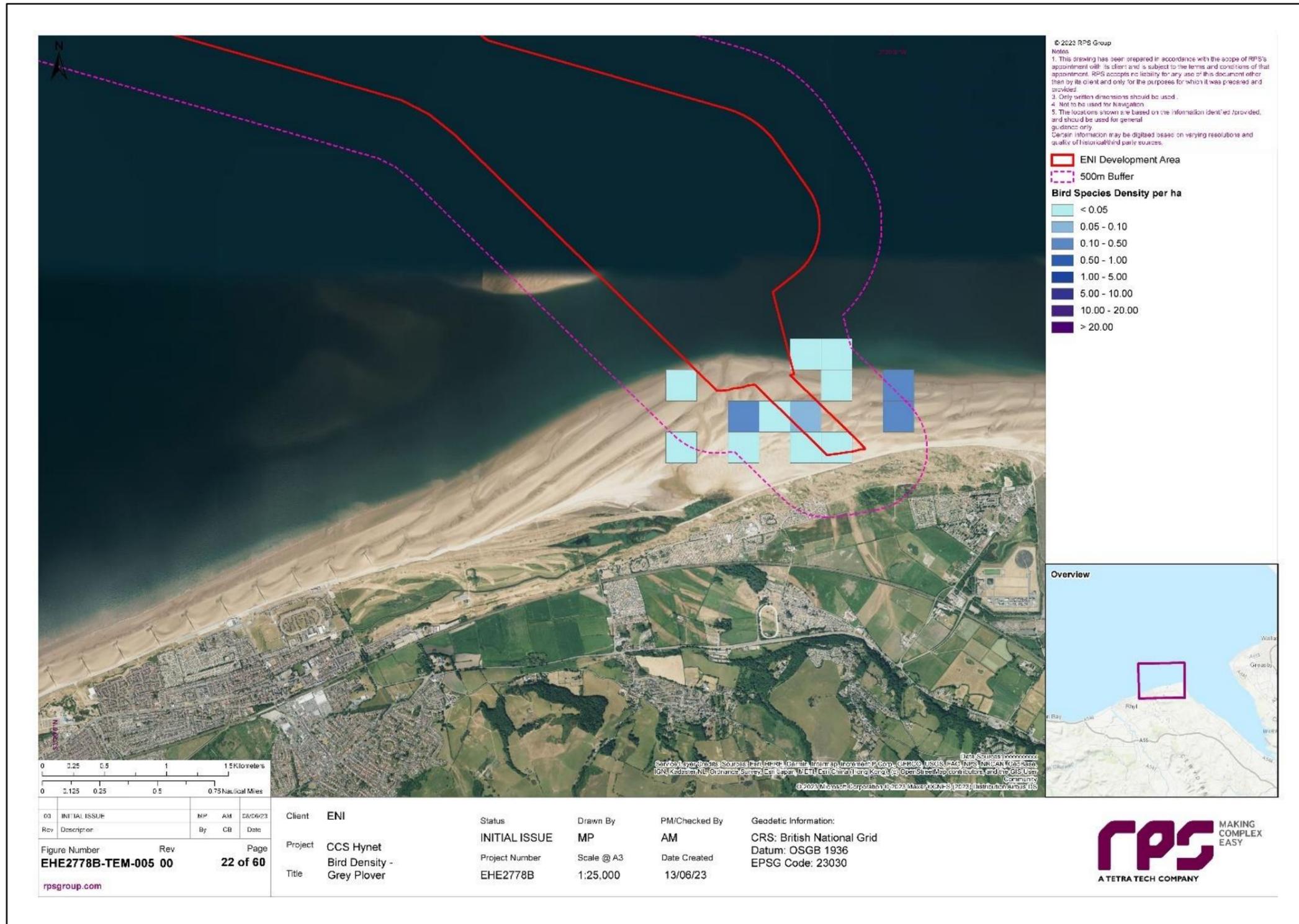
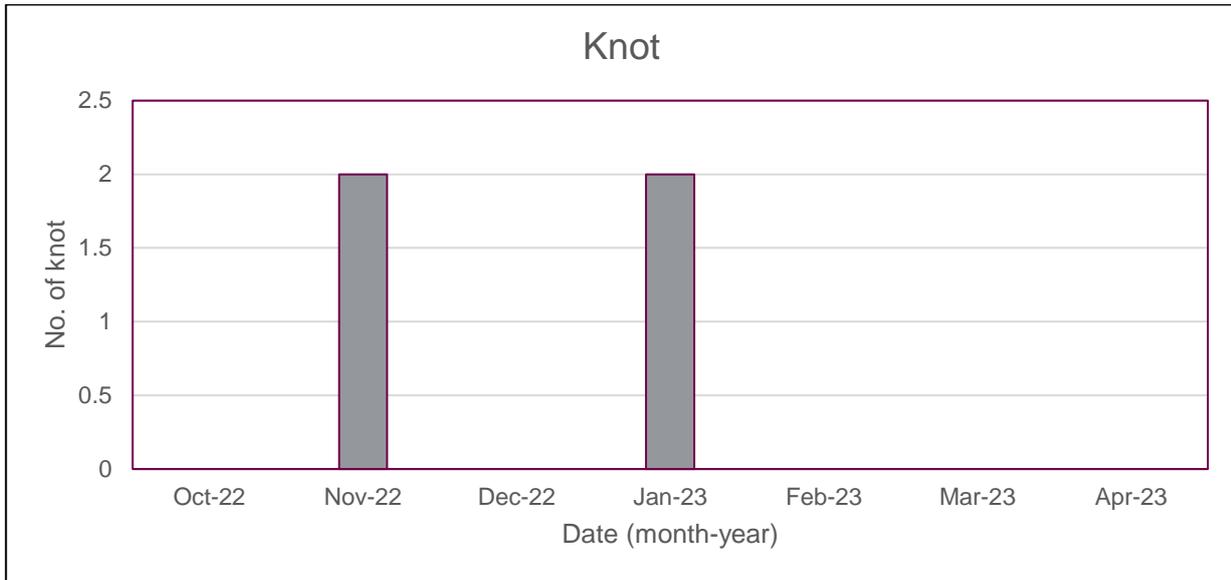


Figure 1.21: Average Density Of Grey Plover Within The Survey Area

1.8.4.12 Knot



Knot were present in low numbers and infrequently.

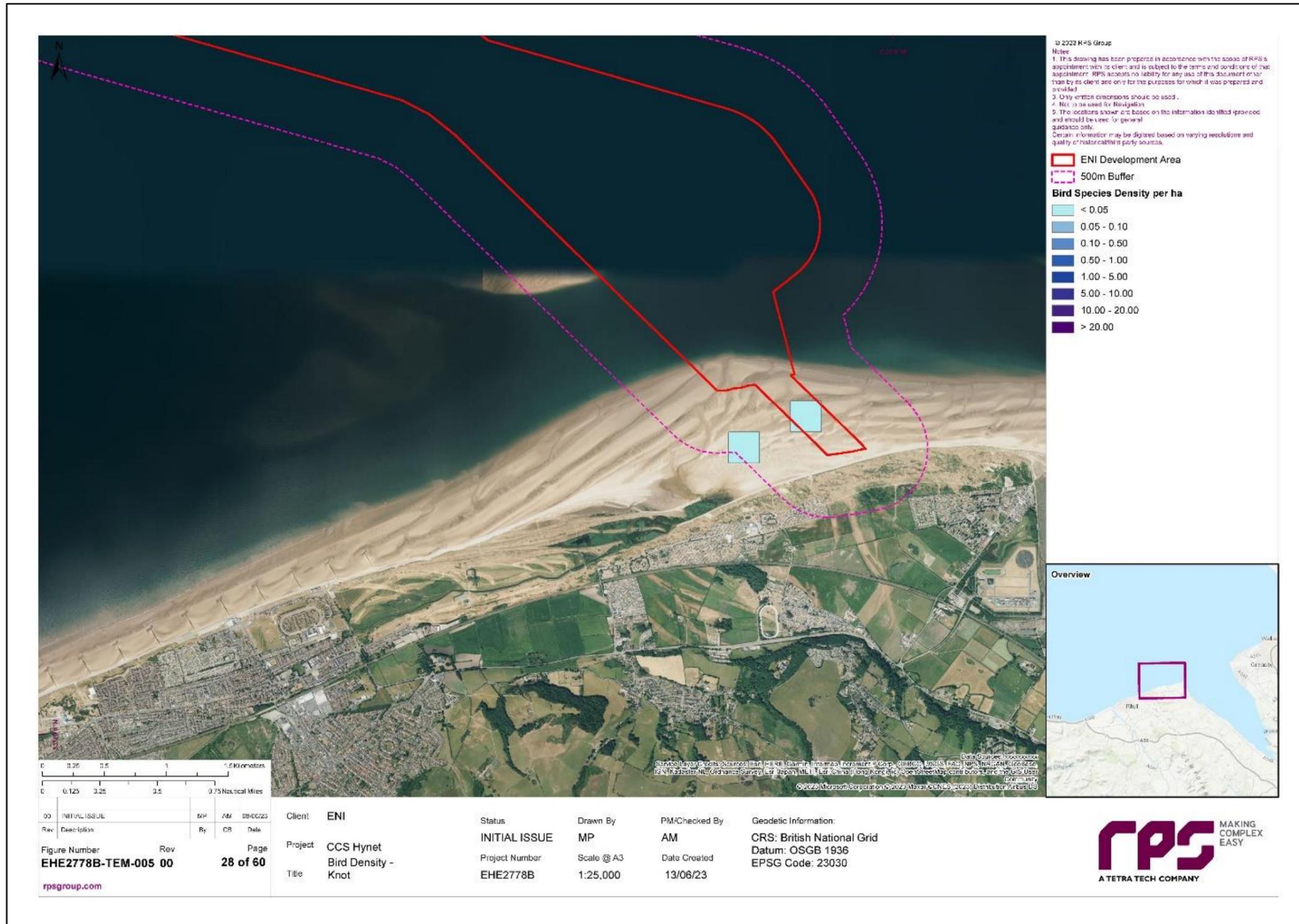
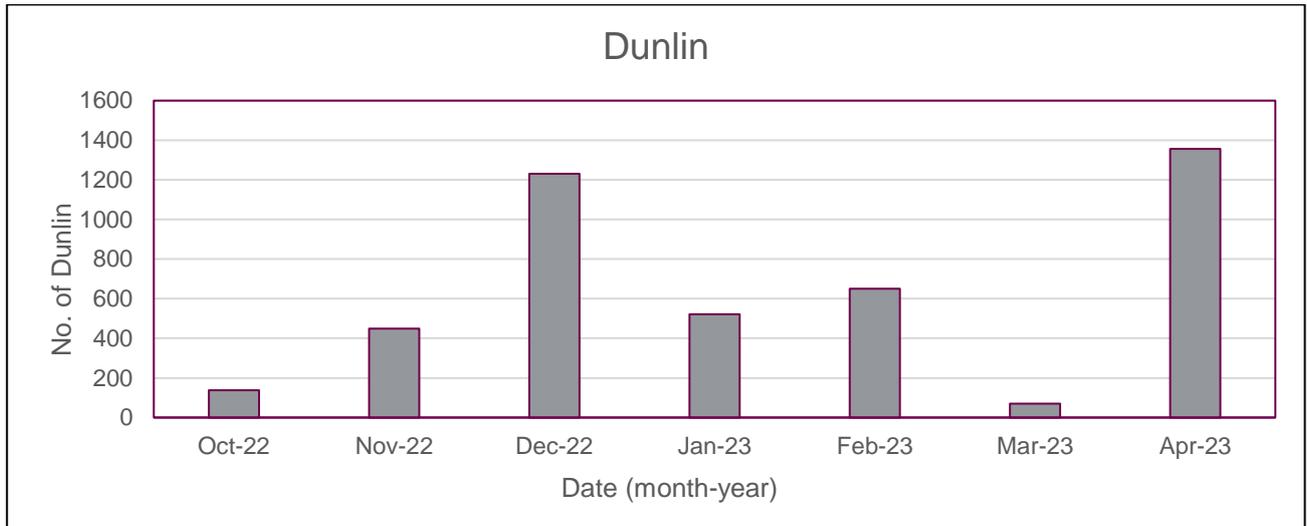


Figure 1.22: Average Density Of Knot Within The Survey Area

1.8.4.13 Dunlin



Dunlin are a small wader species that forage on muddy substrates. The Dee Estuary is an internationally important wintering ground for dunlin. Dunlin were recorded regularly and in moderate numbers (relative to the Dee Estuary population) with peaks in December 2022 and again in April 2023 (the April peak coincided with the spring passage period). Dunlin were evenly distributed throughout the intertidal zone.

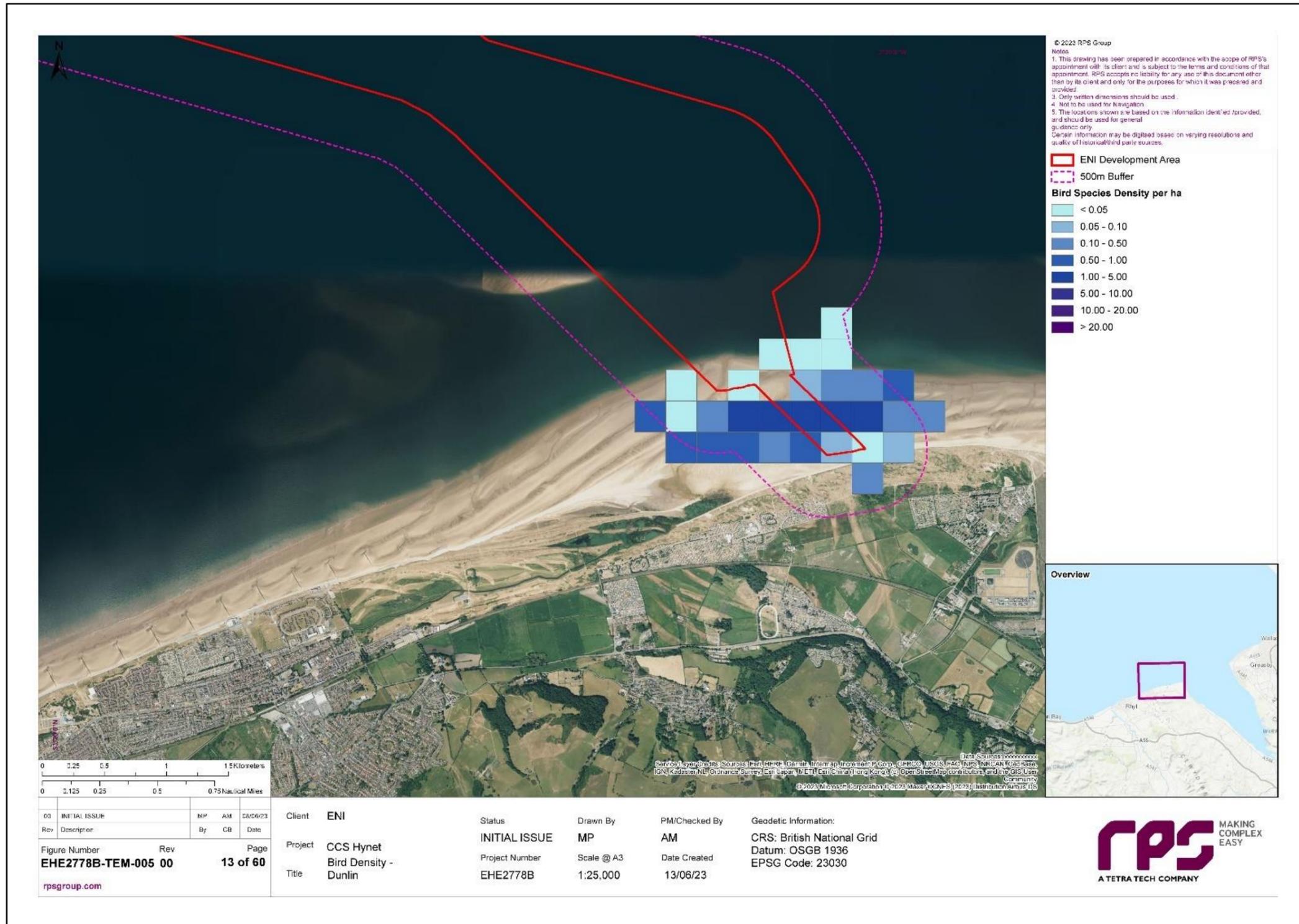
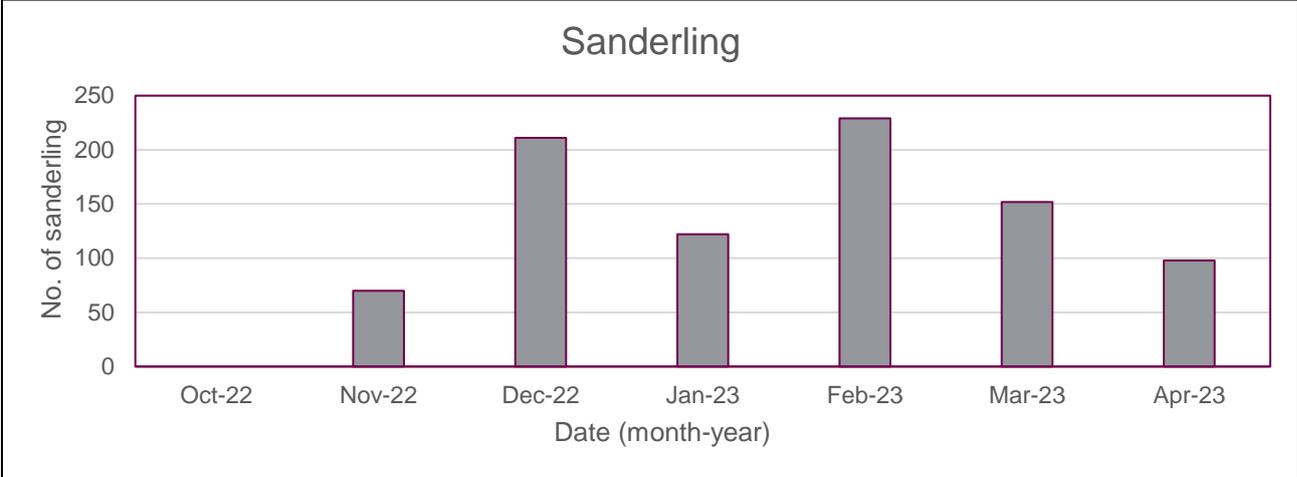


Figure 1.23: Average Density Of Dunlin Within The Survey Area

1.8.4.14 Sanderling



Sanderling are a small wader species that feed on molluscs and small crustaceans that are washed ashore. They feed in small groups dashing in and out of the surf to find prey. The Dee Estuary is of national importance as a wintering ground for this species.

Sanderling were present throughout the study period with higher concentrations during the core winter months (November – March). There is a clear concentration of sanderling below MHWS which corresponds to the species feeding habits along the tide line.

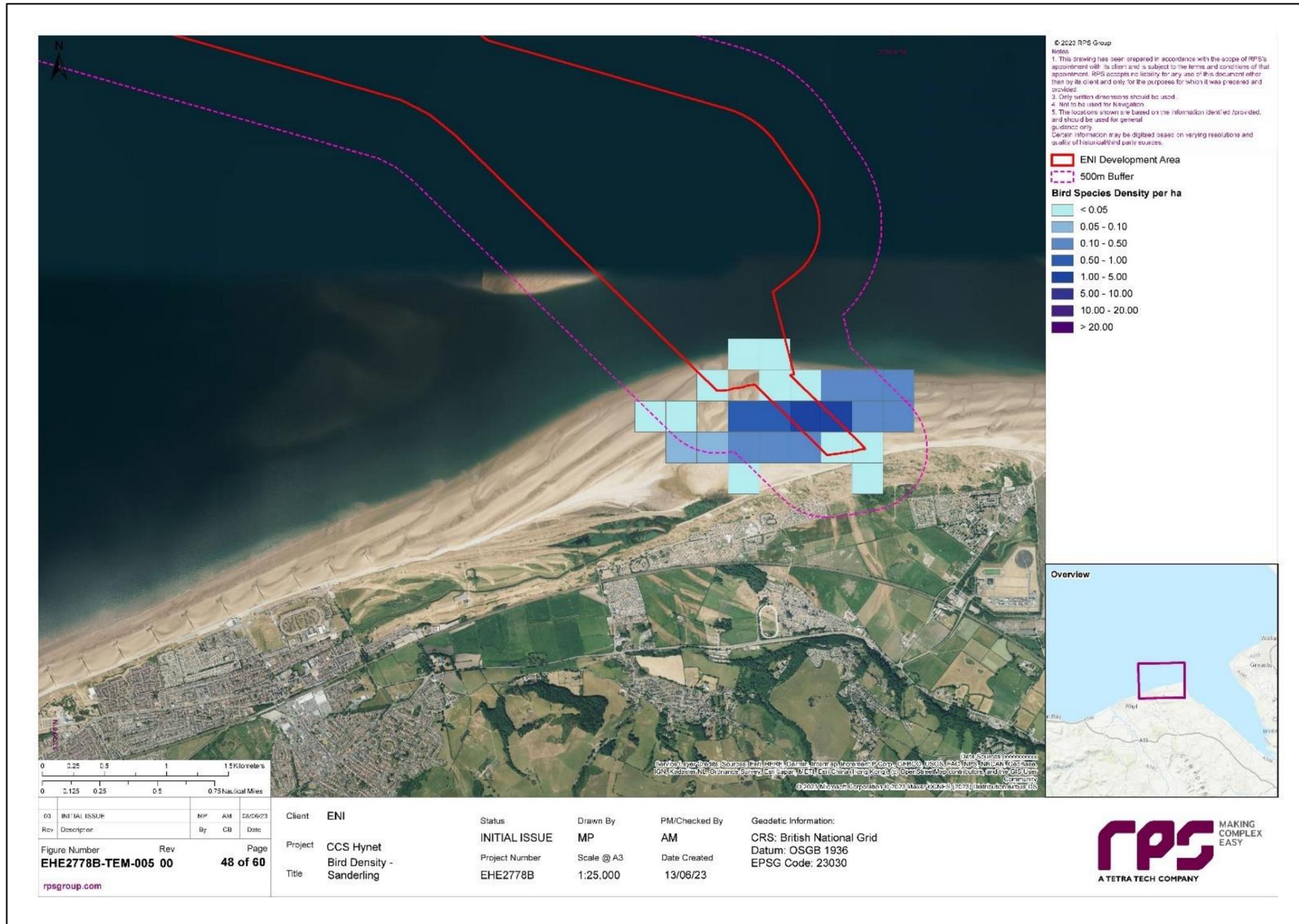


Figure 1.24: Average Density Of Sanderling Within The Survey Area

1.8.4.15 Turnstone



Turnstone are a species of rocky coasts (although they will feed on sandflats) and are often found around areas of pebbles and at man-made sea defences (groynes). Turnstone are present in the North Wirral Foreshore SSSI in nationally important numbers.

Only one turnstone was present and only during April 2023.

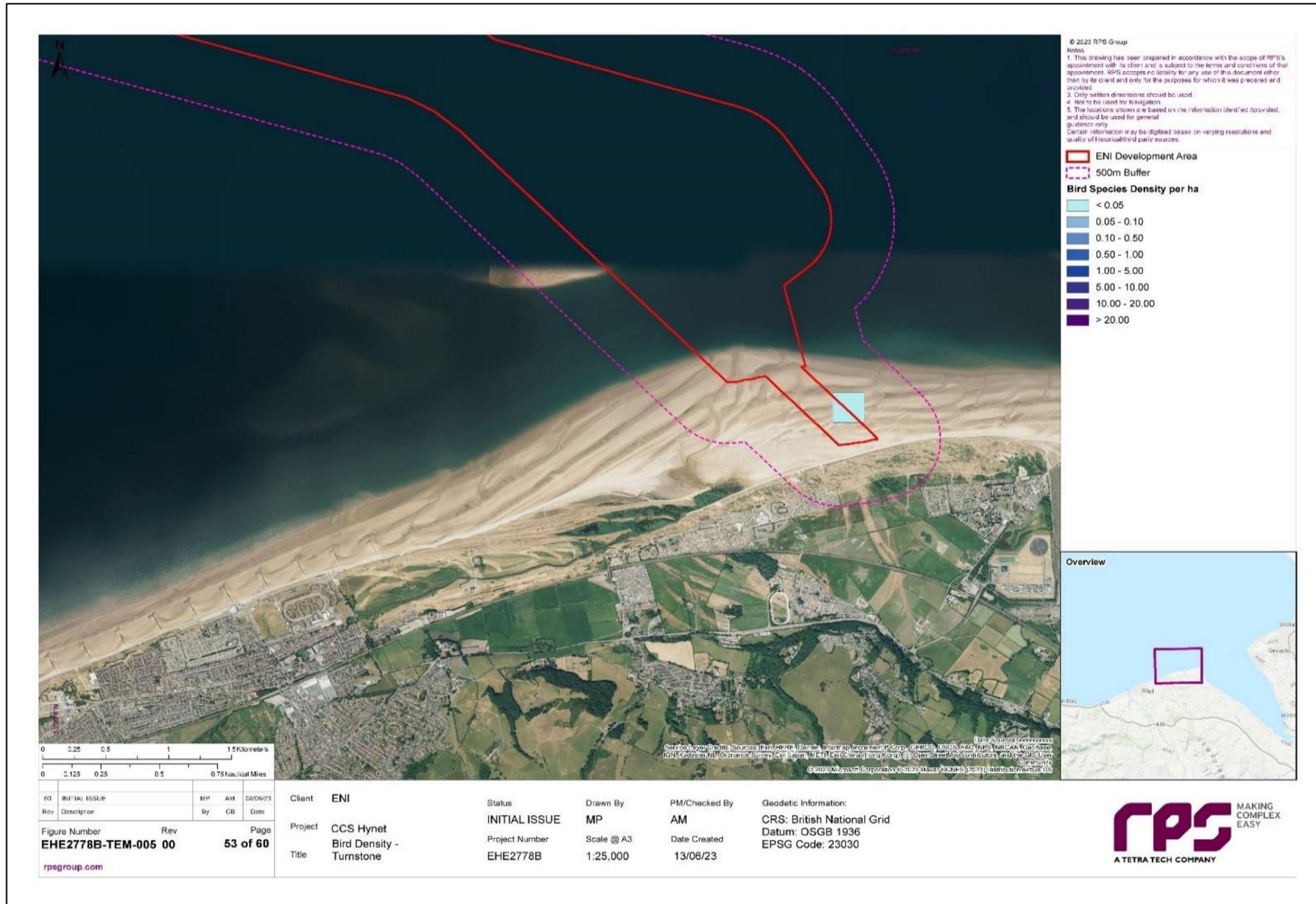
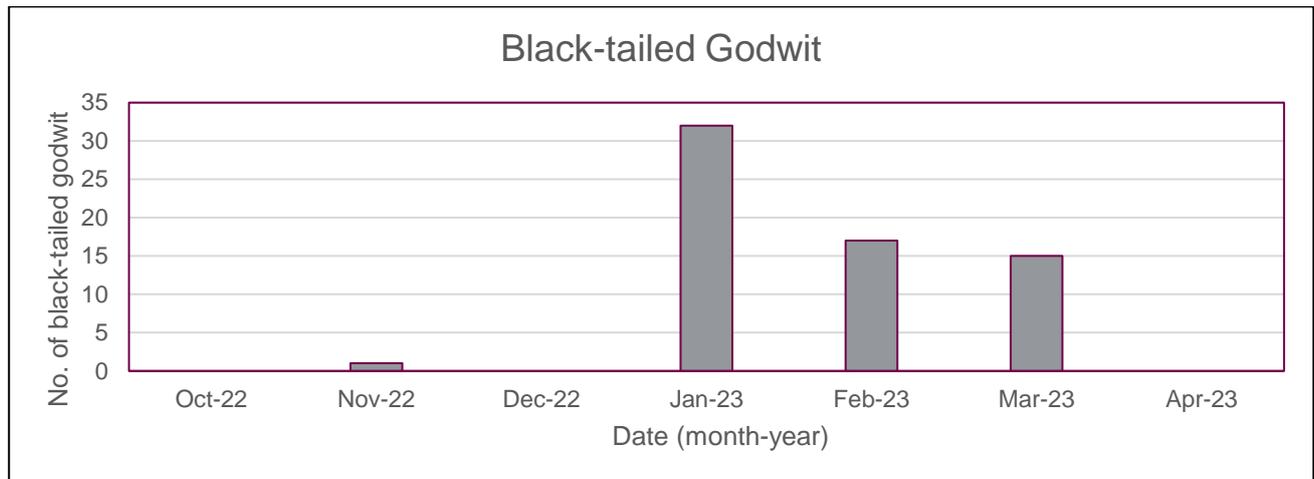


Figure 1.25: Average Density Of Turnstone Within The Survey Area

1.8.4.16 Black-tailed godwit



Black-tailed godwit are present in the Dee Estuary in internationally important numbers. They are named as a wintering feature but are also present during the passage period in large numbers and a non-breeding flock stays here throughout the breeding season. Black-tailed godwit do not normally forage on the intertidal instead preferring freshwater and brackish marshes, and flooded fields. Black-tailed godwit were present throughout the study period in relatively low numbers with a peak of 32 birds in January 2023. Their distribution is concentrated at the outflow of the Prestatyn Gutter.

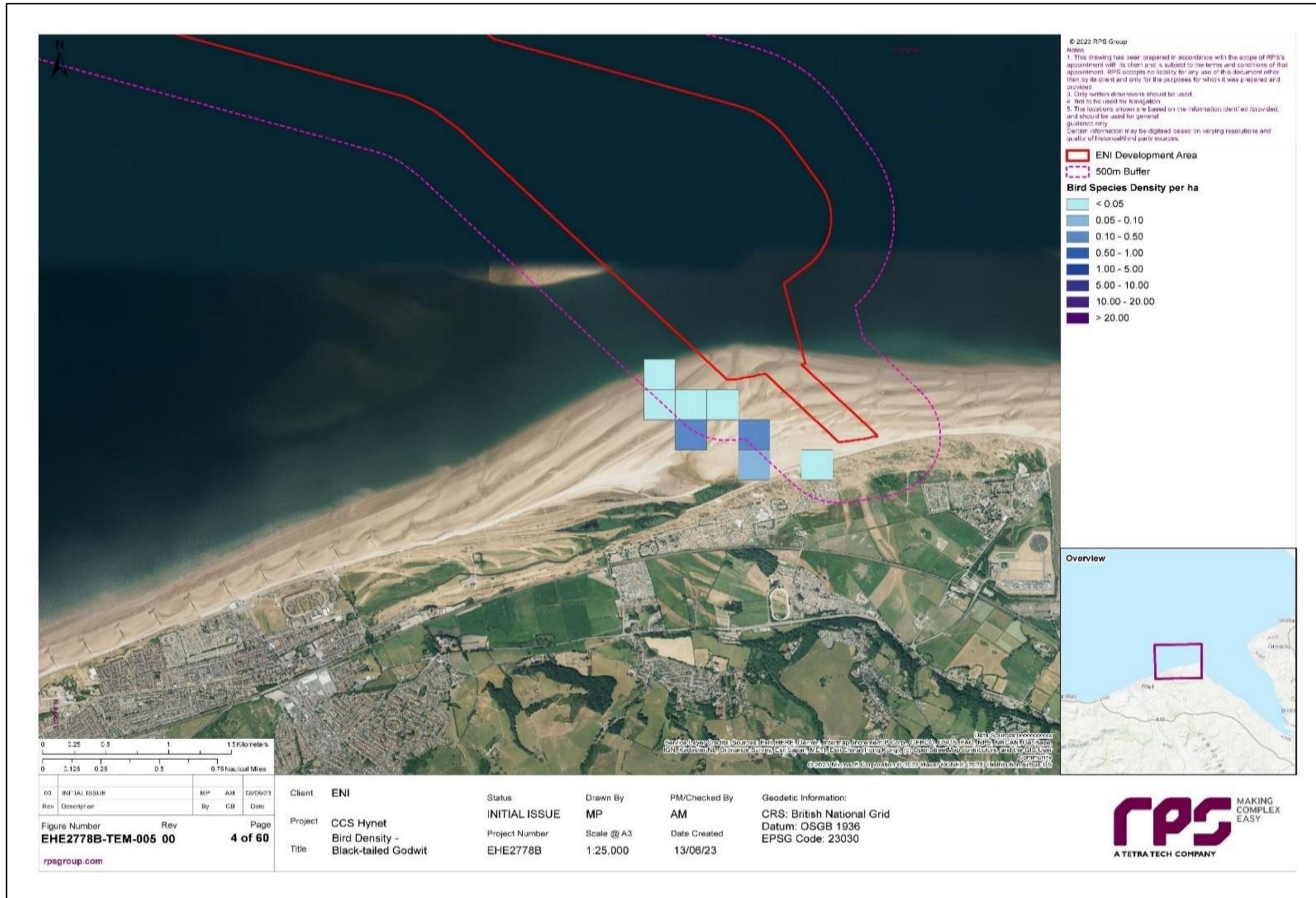
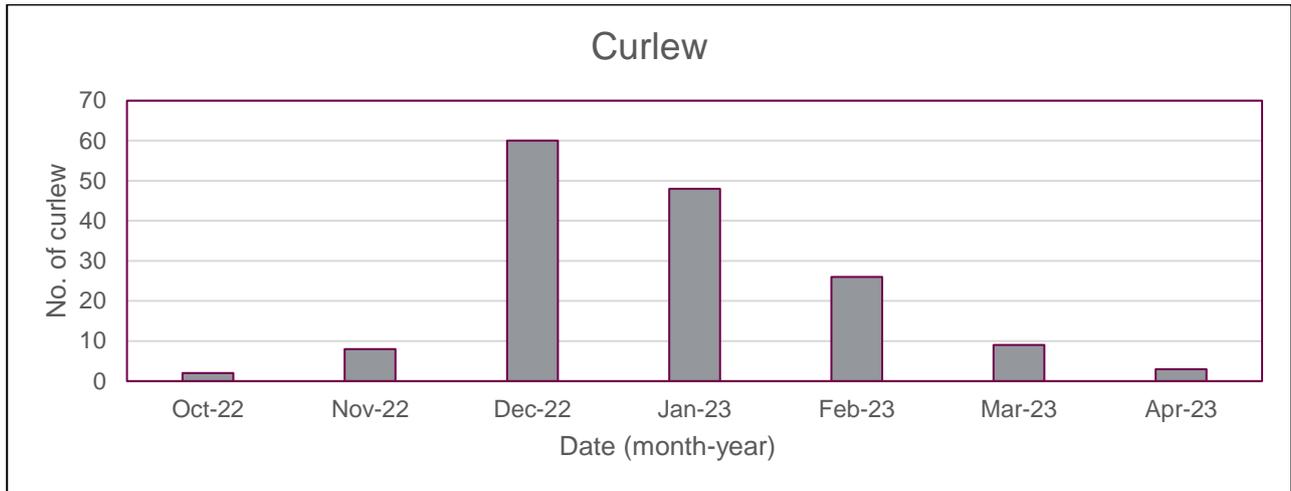


Figure 1.26: Average Density Of Black-Tailed Godwit Within The Survey Are

1.8.4.17 Curlew



Curlew are large waders which are present during winter in the Dee Estuary in internationally important numbers. Curlew were present throughout the study period in moderate (relative to the Dee Estuary population) numbers, although their numbers peaked during the colder months. Curlew often feed on adjacent flooded fields and freezing conditions on land may push them to forage on the intertidal where the high salt content means that the substrate stays unfrozen for longer. Curlew were evenly spaced on the intertidal zone indicating that they use the survey area for foraging.

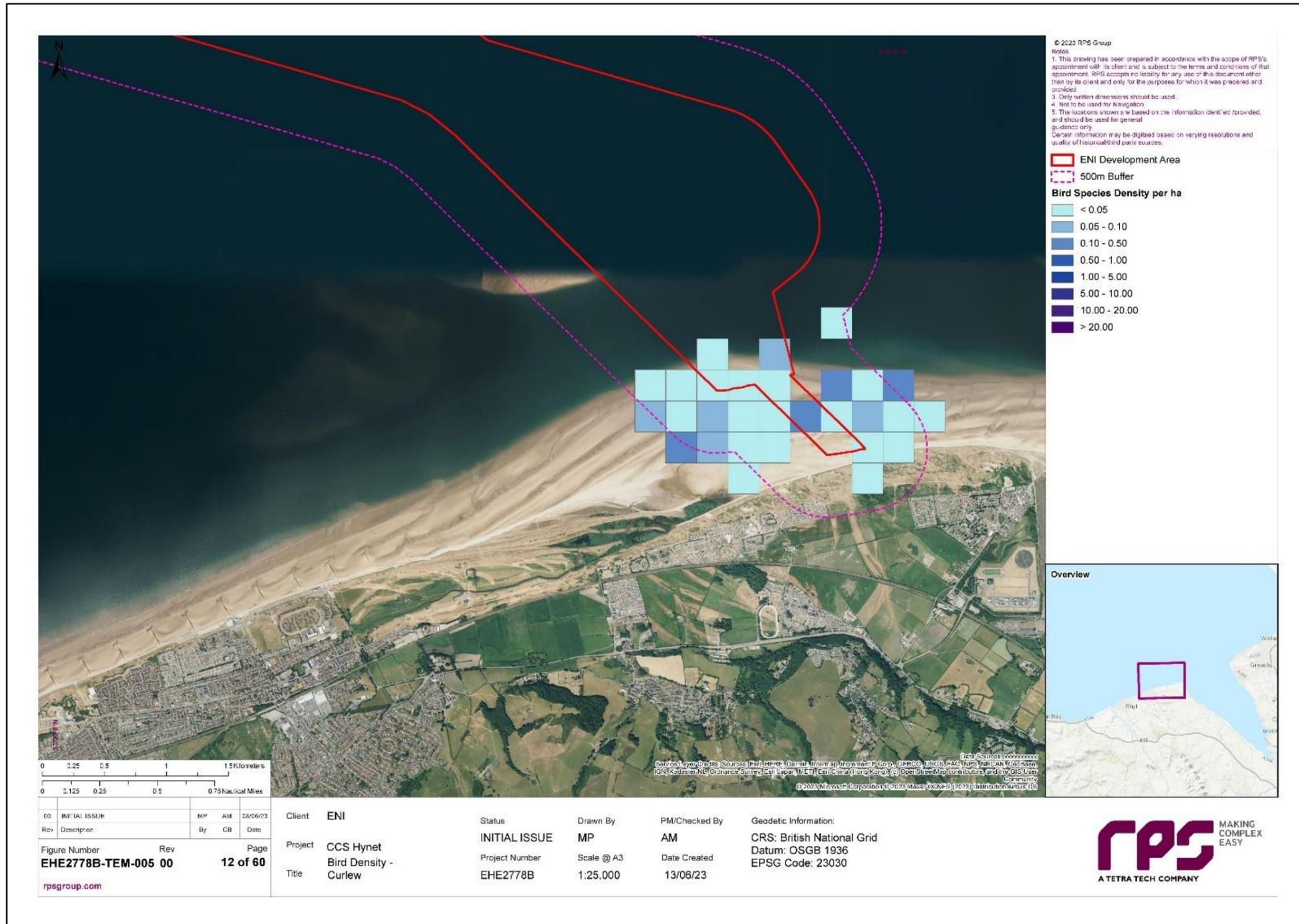
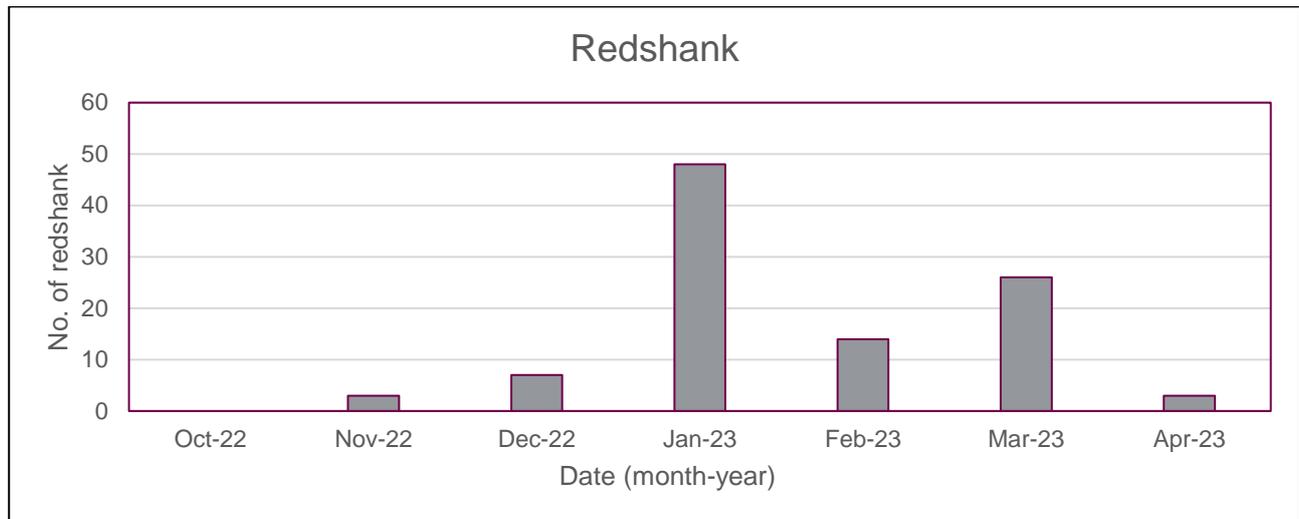


Figure 1.27: Average Density Of Curlew Within The Survey Area

1.8.4.18 Redshank



Redshank are medium sized waders that prefer feeding on muddy substrates. The Dee Estuary is of international importance to wintering and passage redshank and of national importance for its breeding redshank. Redshank were present throughout the winter in low numbers (relative to the Dee Estuary population). The highest densities were found at the mouth of the Prestatyn Gutter indicating that they may roost in this area. Outside the Prestatyn Gutter, average densities were low.

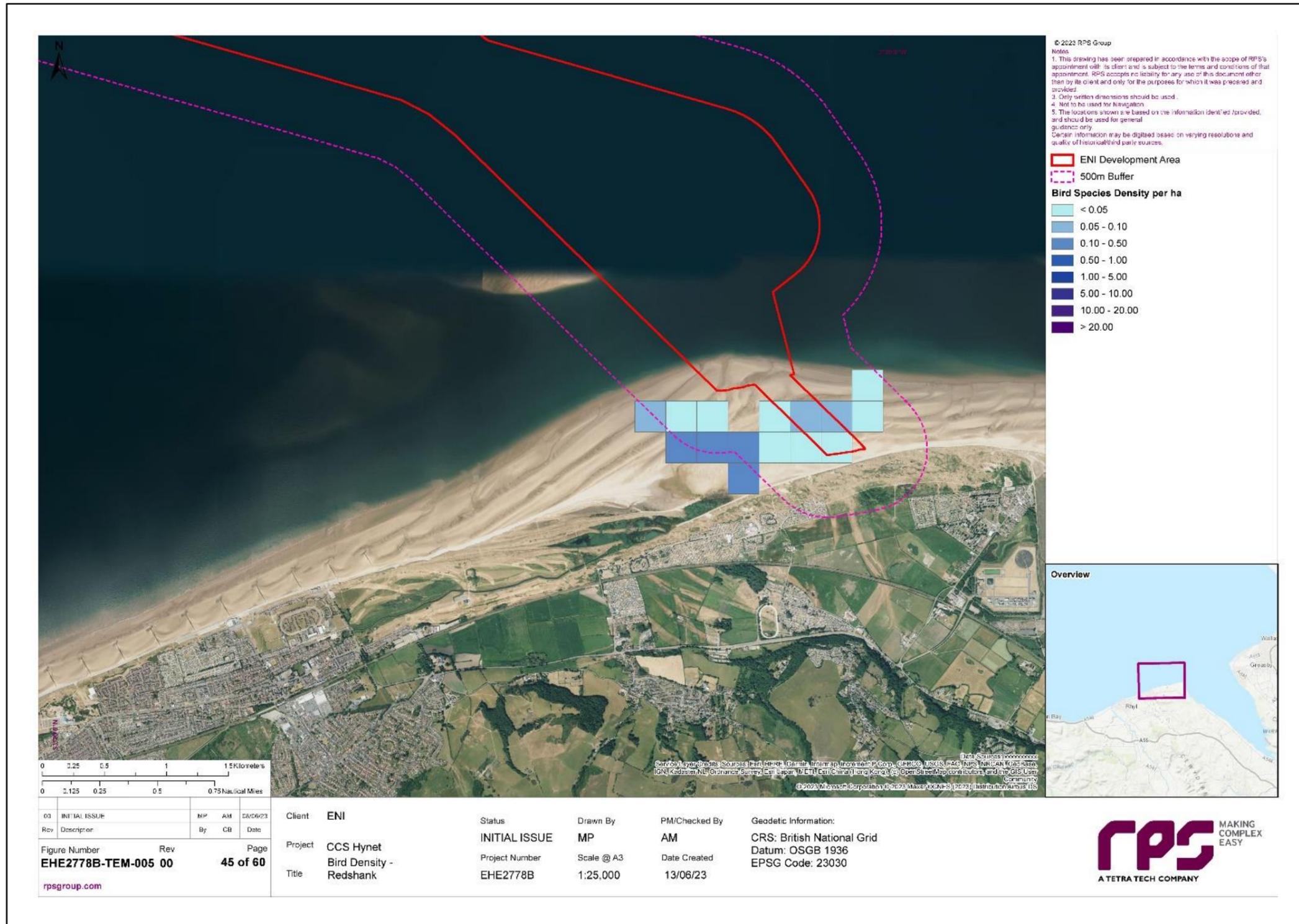
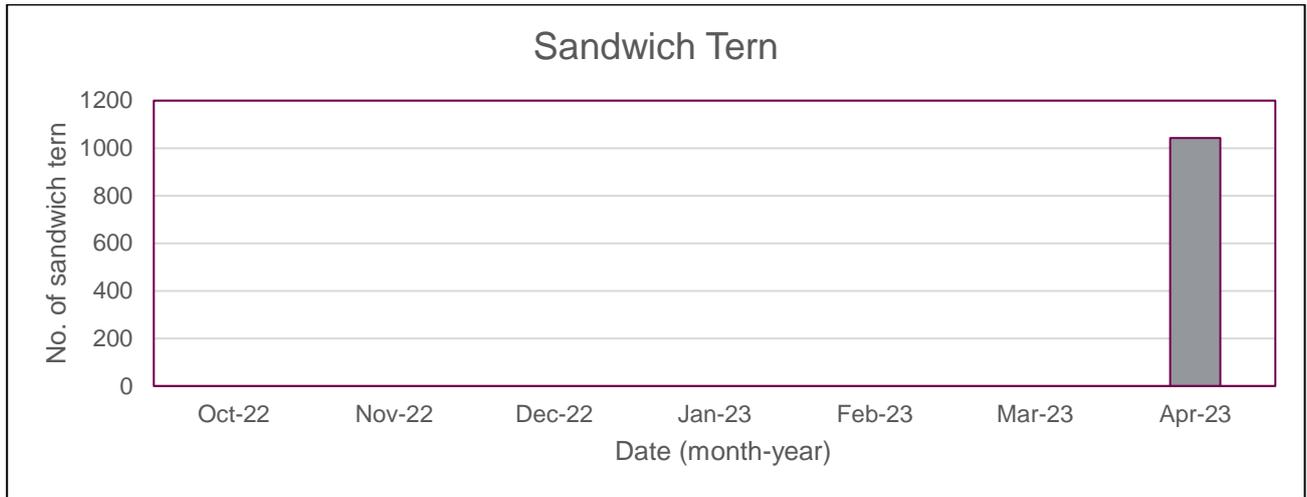


Figure 1.28: Average Density Of Redshank Within The Survey Area

1.8.4.19 Sandwich tern



Sandwich tern are present in the area in internationally important numbers during passage periods (Spring passage – April to June. Autumn passage – August to October (Stroud et al., 2013)). Relatively high numbers were reported in April during the spring passage. Birds were spread out over the nearshore waters with some roosting on the upper shore. They probably utilised the survey area as a stop off for resting and foraging whilst on their migration to known colonies in Cumbria, Scotland, and Northern Ireland.

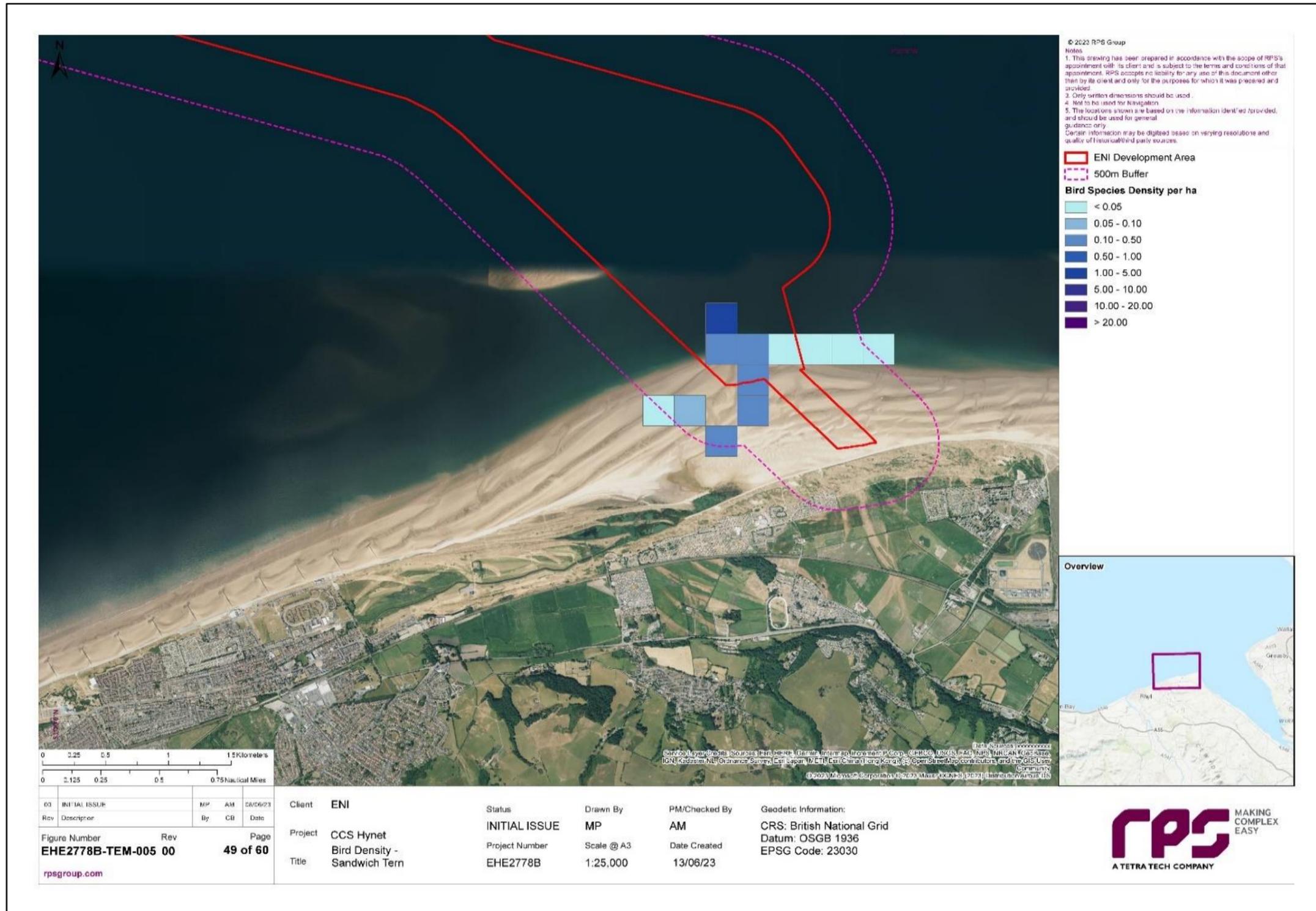


Figure 1.29: Average Density Of Sandwich Tern Within The Survey Area

1.8.4.20 Little tern



Gronant Dunes which is located to the east of the survey area is the location of Wales’s only little tern colony. The colony supported 211 pairs in 2022 (Denbighshire County Council, 2022) and the satellite colony at Point of Ayr contained 39 nests in 2022 (RSPB). Little tern mostly forage for sandeels and small clupeids in the nearshore waters within 5 km from their nest sites (Woodward et al., 2016). Little tern are not present during the winter period and were first recorded during April 2023 when 128 birds were seen. The little tern densities suggest that most sightings were from birds foraging in nearshore waters or birds loafing/roosting on the tideline.

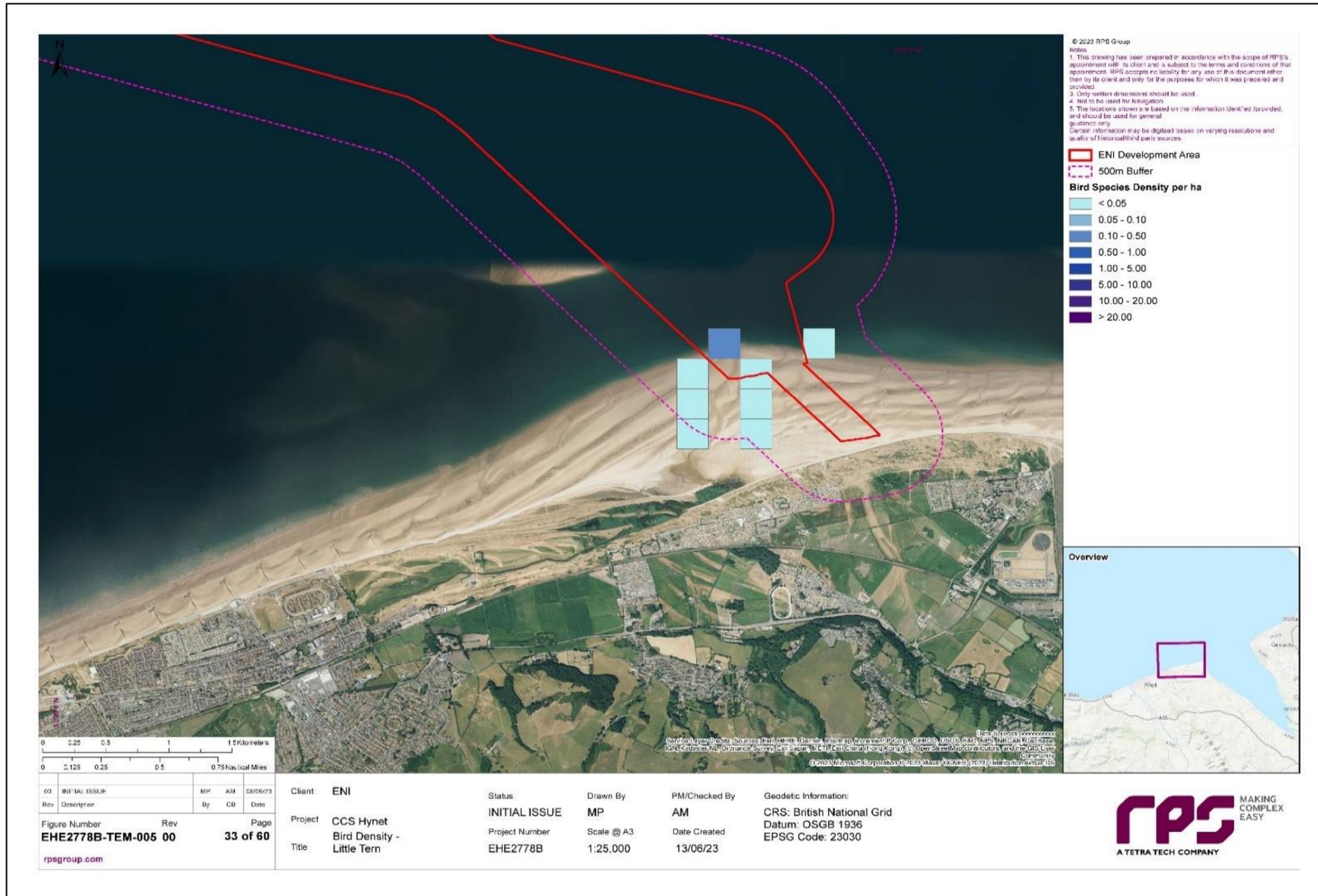
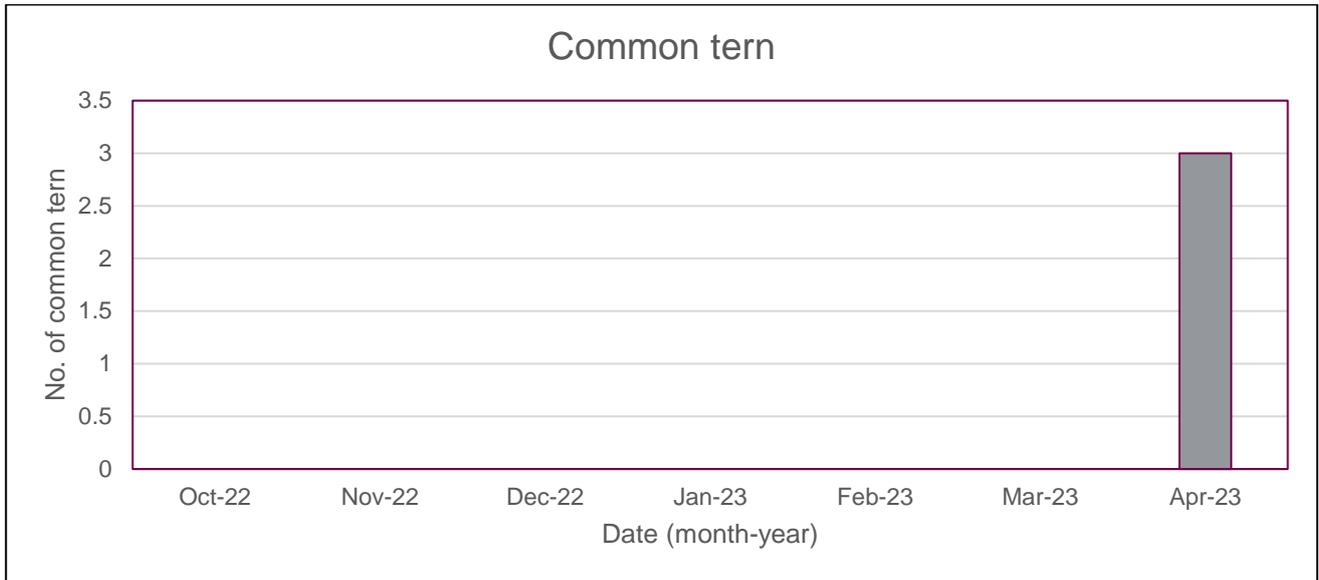


Figure 1.30: Average Density Of Little Tern Within The Survey Area

1.8.4.21 Common tern



Common tern were only present in low numbers during April 2023.

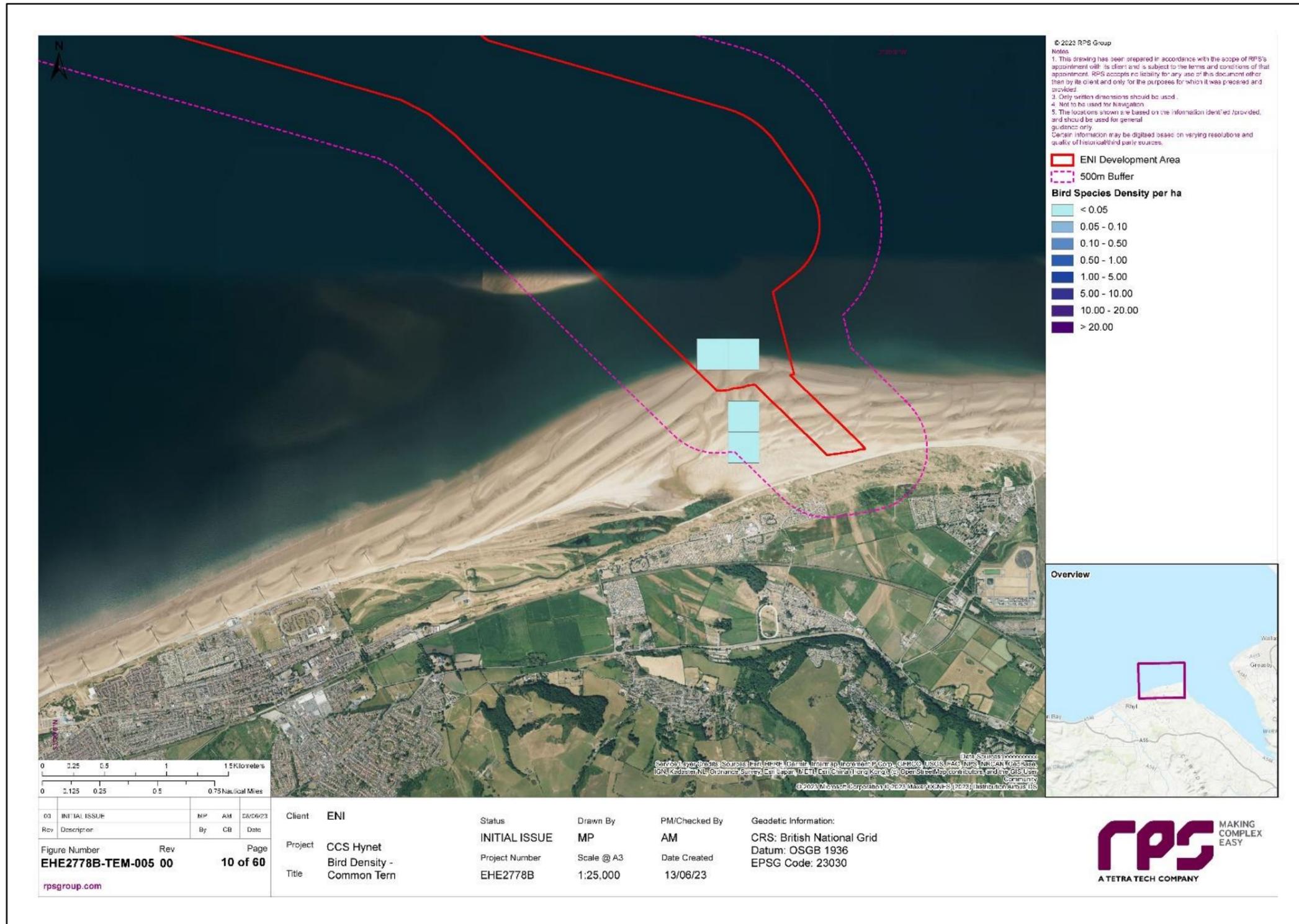


Figure 1.31: Average Density Of Common Tern Within The Survey Area

1.8.5 Spatial analysis of bird behaviour

As well as mapping and counting birds, surveyors noted down the birds' behaviour. This has been split into broad groupings of roosting and foraging. Seabirds (gannet, kittiwake, auks, seaducks and divers) have been omitted from this analysis as it is assumed that during the non-breeding season, they will both roost and forage on the sea surface.

Average densities of roosting and foraging behaviour was mapped to explore spatial differences.

Roosting as a behaviour showed a hotspot at the Prestatyn Gutter outflow. There were also roosting birds located in an area offshore (possibly on sand bars).

Foraging birds showed a different pattern and they were more spread out. As seabirds were omitted most foraging takes place above MLWS.

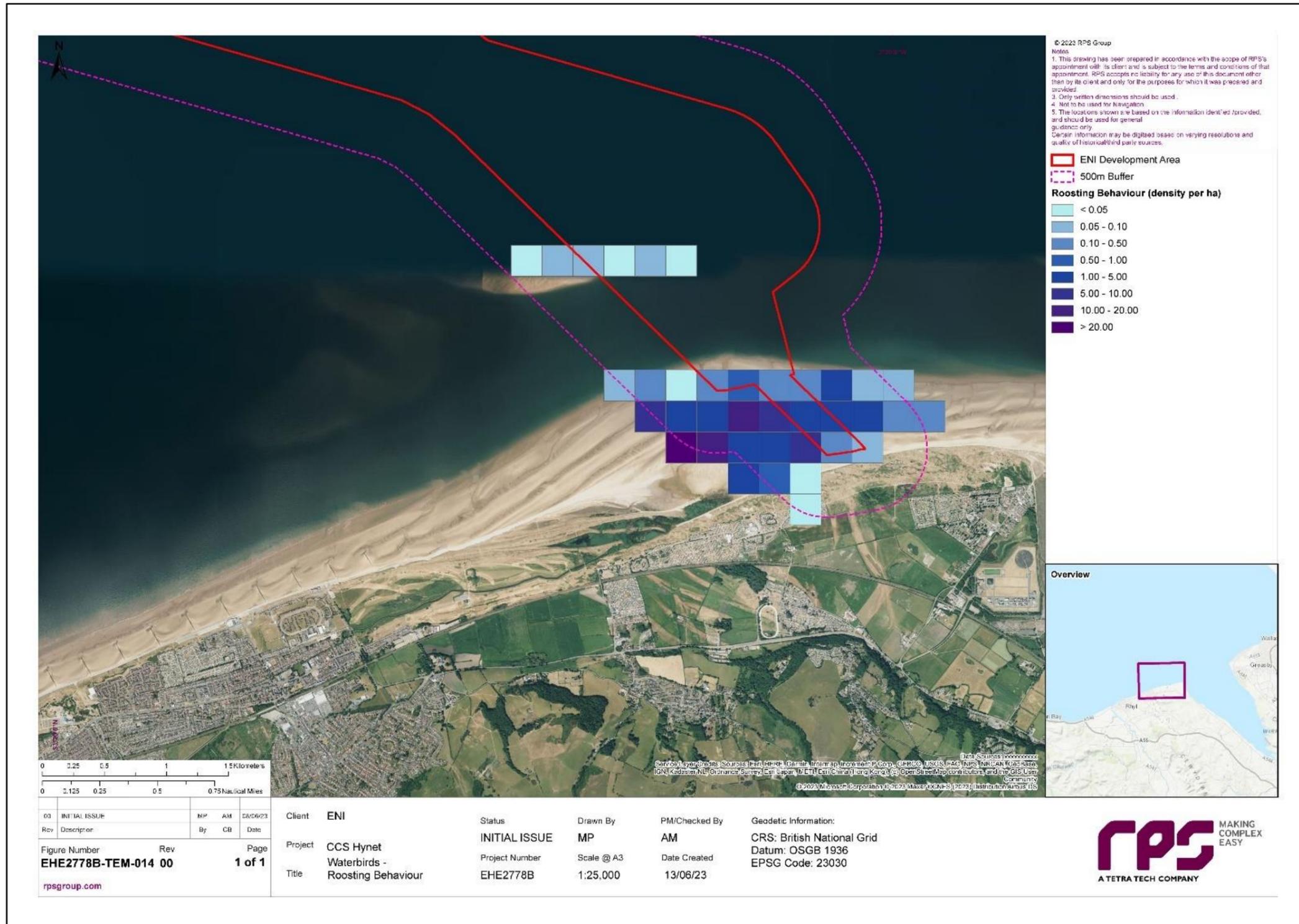


Figure 1.32: Average Density Of Roosting Waterbirds

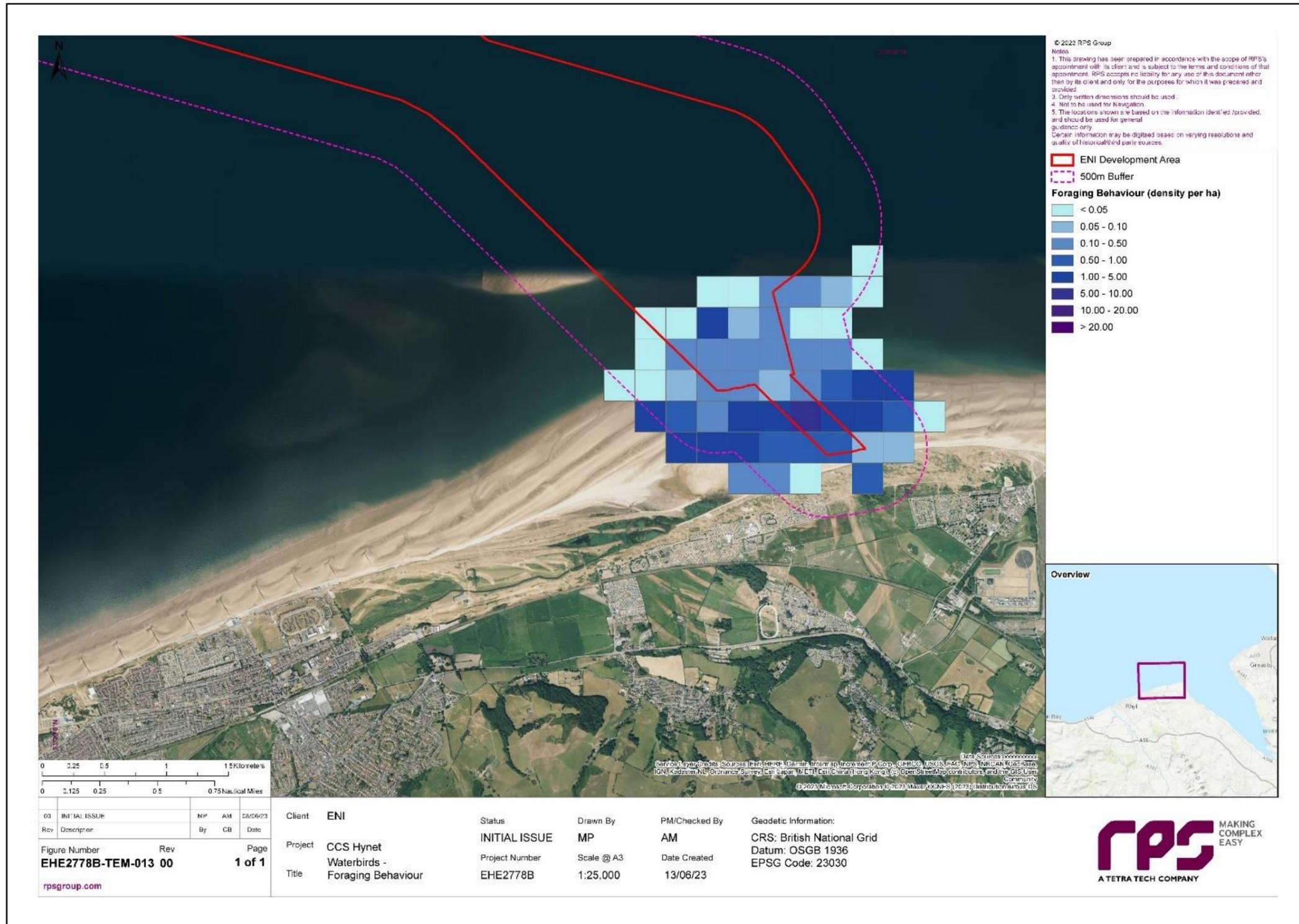


Figure 1.33: Average Density Of Foraging Waterbirds

1.9 Summary

- The landfall for the Proposed Development crosses both the nearshore waters of the Liverpool Bay SPA and the Dee Estuary SPA and Ramsar and its associated SSSIs.
- The Liverpool Bay SPA is designated for mostly seabird features. Both common scoter and red-throated diver (both named features) were present in the nearshore waters in low numbers during the site-specific surveys (relative to the SPA populations).
- A high species richness of waterbird species was found within the survey area. This was centred around the Prestatyn Gutter outflow.
- Many wader and wildfowl features of the Dee Estuary SPA were found to be utilising the survey area. Wildfowl were found in the highest densities around the Prestatyn Gutter outflow whereas waders were evenly distributed across the intertidal zone.
- Although Dunlin were the most abundant wader, sanderling were the wader species present in the most important numbers (relative to UK national importance threshold).
- High numbers of gulls utilise the survey area. Common gull in particular were found in high numbers.
- The nocturnal surveys found a similar assemblage of species to that of day time albeit in lower abundance. The exception to this was pink-footed geese which used the intertidal zone in relatively small numbers as a night-time roost during the second half of the winter.
- The WeBS results (which were centred on a much larger survey area) highlighted similar assemblage of species to the site-specific survey results albeit at higher abundances.
- The area surrounding the Prestatyn Gutter outflow contains roosting birds where gulls and wildfowl are concentrated. Both overall abundance of birds and species richness was concentrated in this area.
- The site-specific surveys indicate that many waders species use the area for foraging rather than roosting.
- Breeding SPA features (common and little tern) returned to the area in April.

1.10 References

- Anon. (2016) Assessing Connectivity with Special Protection Areas (SPAs). NatureScot. Guidance note
- Anon. (2022) Little Tern colony breaks seasonal records. Denbighshire County Council. Accessed: November 2022. Available at: [Little Tern colony breaks seasonal records | Denbighshire County Council](#)
- Anon. (2023) Wildlife on RSPB reserves in 2022. RSPB report
- Austin, G., Frost, T., Mellan, H. & Balmer, D. (2017) Results of the third Non-Estuarine Waterbird Survey, including Population Estimates for Key Waterbird Species. Research Report No. 697. BTO, Thetford.
- Austin, G.E., Calbrade, N.A., Birtles, G.A., Peck, K., Shaw, J.M. Wotton, S.R., Balmer, D.E. and Frost, T.M. (2023) Waterbirds in the UK 2021/22: The Wetland Bird Survey and Goose & Swan Monitoring Programme. BTO/RSPB/JNCC/NatureScot. Thetford.
- Bird Survey & Assessment Steering Group. (2022) Bird Survey Guidelines for assessing ecological impacts, v.1.0.0. Accessed: November 2022. Available at: <https://birdsurveyguidelines.org>.
- Cutts, N., Hemingway, K., Spencer, J., (2013) Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects. University of Hull Institute of Estuarine and Coastal Studies © University of Hull
- Gilbert, G., Gibbons, D.W., Evans, J., (1998) Bird Monitoring Methods. The Royal Society for the Protection of Birds. Reprinted in 2011 by Pelagic.
- Lawson, J., Kober, K., Win, I., Allcock, Z., Black, J. Reid, J.B., Way, L. & O'Brien, S.H. 2016. An assessment of the numbers and distribution of wintering waterbirds and seabirds in Liverpool Bay/Bae Lerpwl area of search. JNCC Report No 576. JNCC, Peterborough.
- Stroud, D.A., Bainbridge, I.P., Maddock, A., Anthony, S., Baker, H., Buxton, N., Chambers, D., Enlander, I., Hearn, R.D., Jennings, K.R, Mavor, R., Whitehead, S., Wilson, J.D., - on behalf of the UK SPA and Ramsar Scientific Working Group (eds.). (2016) The status of UK SPAs in the 2000s: the Third Network Review. Peterborough, JNCC.
- Voous, K. H., (1977), List of Recent Holarctic Species, BOU, London
- Woodward, I., Thaxter, C. B., Owen, E., Cook, A, S, C, P., (2019) Desk-based revision of foraging ranges used for HRA screening. BTO Research Report No. 724. BTO, Thetford

