

Rampion 2 Wind Farm

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**Ornithological and Marine Mammal Aerial Survey Results
of Rampion 2**

Rampion Extension Development Ltd

Annual Report: April 2020 to March 2021

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Issued July 2021

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1. Executive Summary

A programme of 12 monthly aerial digital surveys of Rampion Extension Development Ltd's (hereafter referred to as RED) proposed offshore wind farm, Rampion 2, in the English Channel were undertaken between April 2020 and March 2021. This constitutes the second year of surveys, following the first year April 2019 to March 2020 surveys. Surveys were carried out using APEM Ltd.'s high-resolution camera system to capture digital still imagery, to assess the abundance and distribution of birds and marine mammals of the Rampion 2 Survey Area. Raw counts and design-based abundance estimates of all species and incidental observations recorded during the surveys are presented here, as well as information on species distribution, flight height, and flight direction. The key findings from each of the monthly aerial digital surveys are summarised below.

- Survey 13 – April 2020
 - Large gulls were the most abundant species group recorded in the April survey (n=25), followed by gannets (n=10). In addition, auks (n=9), wildfowl (n=7), marine mammals (n=3), small gulls (n=2), and cormorants / shags (n=1) were also present.
- Survey 14 – May 2020
 - Large gulls were the most abundant species group recorded in the May survey (n=608), followed by gannets (n=22). In addition, auks (n=19), terns (n=13), fulmars (n=2), and large bony fish (n=1) were also present.
- Survey 15 – June 2020
 - Large gulls were the most abundant species group recorded in the June survey (n=87), followed by terns (n=39). In addition, small gulls (n=22), gannets (n=17), auks (n=12), and unclassified gulls (n=4) were also present.
- Survey 16 – July 2020
 - Large gulls were the most abundant species group recorded in the July survey (n=66), followed by gannets (n=7). In addition, fulmars (n=1), small gulls (n=1), and marine mammals (n=1) were also present.
- Survey 17 – August 2020
 - Large gulls were the most abundant species group recorded in the August survey (n=37), followed by marine mammals (n=6). In addition, gannets (n=4), small gulls (n=3), auks (n=2), fulmars (n=1), and terns (n=1) were also present.
- Survey 18 – September 2020
 - Large gulls were the most abundant species group recorded in the September survey (n=40), followed by gannets (n=4). In addition, small gulls (n=3), auks (n=3), passerines (n=3), and marine mammals (n=1) were also present.
- Survey 19 – October 2020

- Gannets were the most abundant species group recorded in the October survey (n=7), followed by large gulls (n=6) and auks (n=6). In addition, cormorants / shags (n=5), marine mammals (n=3), and terns (n=1) were also present.
- Survey 20 – November 2020
 - Auks were the most abundant species group recorded in the November survey (n=69), followed by small gulls (n=13). In addition, gannets (n=4), large gulls (n=4), fulmars (n=1), and marine mammals (n=1) were also present.
- Survey 21 – December 2020
 - Auks were the most abundant species group recorded in the December survey (n=1,410), followed by small gulls (n=269). In addition, large gulls (n=194), gannets (n=22), unclassified gulls (n=9), marine mammals (n=5), divers (n=3), fulmars (n=1), and herons (n=1) were also present.
- Survey 22 – January 2021
 - Auks were the most abundant species group recorded in the January survey (n=2,056), followed by small gulls (n=247). In addition, large gulls (n=171), gannets (n=121), unclassified gulls (n=3), divers (n=2), fulmars (n=1), and marine mammals (n=1) were also present.
- Survey 23 – February 2021
 - Auks were the most abundant species group recorded in the February survey (n=790), followed by large gulls (n=145). In addition, small gulls (n=96), marine mammals (n=14), gannets (n=12), unclassified gulls (n=7), cormorants / shags (n=6), and divers (n=4) were also present.
- Survey 24 – March 2021
 - Auks were the most abundant species group recorded in the March survey (n=1,792), followed by small gulls (n=320). In addition, large gulls (n=100), gannets (n=67), unclassified gulls (n=7), divers (n=2), cormorants / shags (n=2), fulmars (n=2), and marine mammals (n=2) were also present.

A summary of the raw counts for all species recorded in in April 2020 to March 2021 Rampion 2 survey, presented in four three month sections, is shown in **Table 1**.

Table 1 Number of individuals recorded in the Rampion 2 Survey Area for the second year of surveys grouped into three month sections

Species	Number of individuals per quarter			
	Q1 Apr-Jun	Q2 Jul-Sep	Q3 Oct-Dec	Q4 Jan-Mar
Common Scoter	7	0	0	0
Red-throated Diver	0	0	3	6
Diver sp. – unidentified	0	0	0	2
Cormorant	0	0	5	6
Cormorant / Shag	1	0	0	2
Fulmar	2	2	2	3
Little Egret	0	0	1	0
Gannet	49	15	33	200
Kittiwake	20	5	248	572
Black-headed Gull	0	0	0	2
Mediterranean Gull	0	0	1	1
Common Gull	0	0	29	41
Small Gull sp. - unidentified	4	2	4	47
Great Black-backed Gull	8	62	30	152
Herring Gull	349	68	173	203
Lesser Black-backed Gull	21	6	0	8
Black-backed Gull sp. - unidentified	7	0	1	6
Large Gull sp. - unidentified	335	7	0	47
Gull sp. - unidentified	4	0	9	17
Sandwich Tern	3	0	0	0
Little Tern	3	0	0	0
Common Tern	36	0	0	0
'Commic' ¹ Tern	10	1	1	0
Guillemot	22	2	435	249
Razorbill	2	1	489	1,831
Guillemot / Razorbill	15	1	557	2,547
Auk sp. - unidentified	1	1	4	11
Hirundine sp. - unidentified	0	3	0	0
Dolphin sp. – unidentified	0	0	2	0
Harbour Porpoise	0	6	0	15
Dolphin / Porpoise	3	1	7	0
Grey Seal	0	0	0	2
Seal sp. - unidentified	0	1	0	0
Ocean Sunfish	1	0	0	0

¹ 'Commic' refers to either Common or Arctic tern.

2. Introduction

RED requested APEM to undertake two years of monthly aerial digital surveys of the Rampion 2 Survey Area (964 km² total area) for the Rampion 2 Offshore Wind Farm for birds and marine mammals (**Figure 1**). The surveys commenced in April 2019 and concluded in March 2021. The purpose of the surveys is to provide baseline information on the abundance, distribution, and behaviour of birds and marine mammals as part of the ecological assessments in connection with the Rampion 2 Survey Area.

The Rampion 2 Survey Area is located within the English Channel, off the Sussex coast. The survey method has been designed to optimise the data collection for all bird and marine mammal species using a grid-based survey design at 2 cm ground sampling distance (GSD) to achieve approximately 10% coverage using a twin-engine aircraft (**Figure 2**). These surveys were carried out in order to meet the aims and objectives of the work required by RED to inform the Environmental Impact Assessment for the Rampion 2 Offshore Wind; the Scoping Boundary is presented in **Figure 1**.

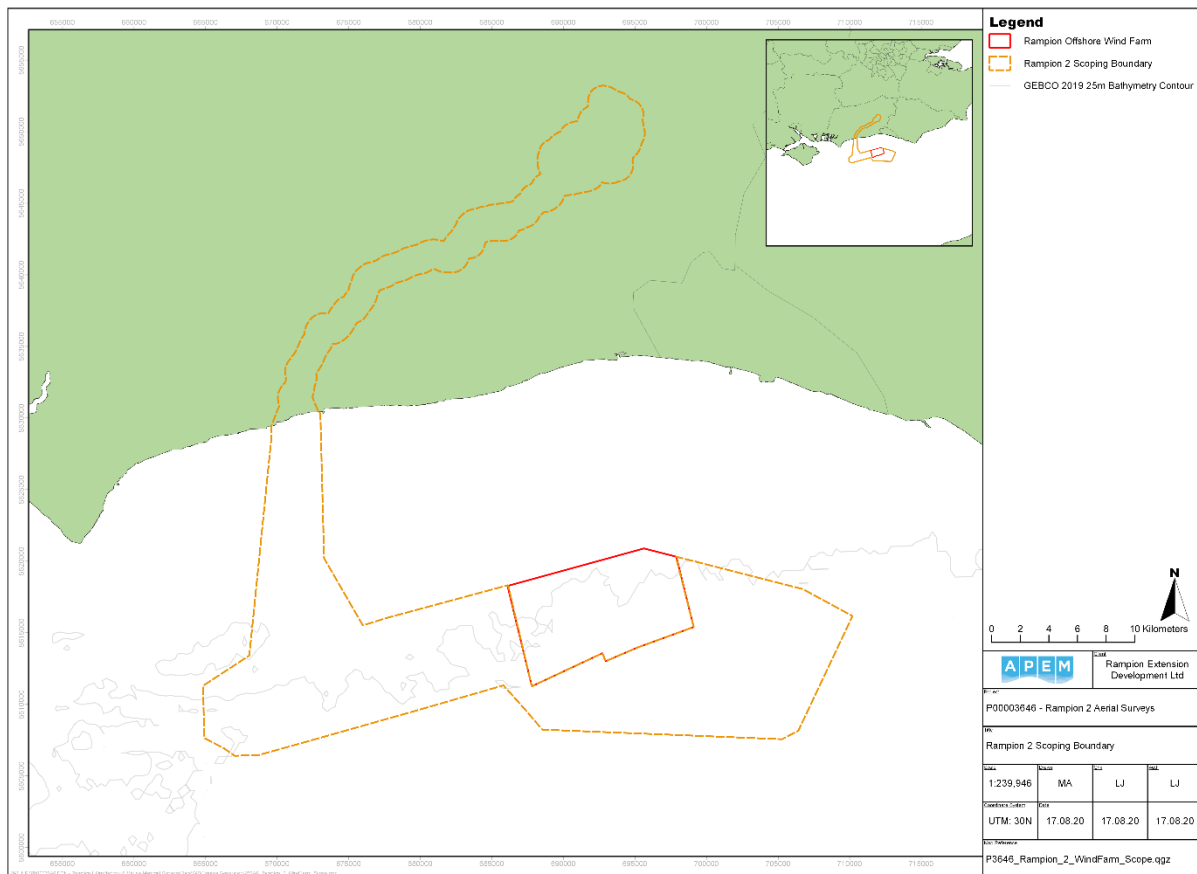


Figure 1 Rampion 2 Offshore Wind Farm Scoping Boundary

This annual report summarises the information collected following the completion of 12 monthly aerial digital surveys of the Rampion 2 Survey Area between April 2020 and March 2021.

The following information is provided in Section 3:

- The number of surveys conducted;
- The dates, start and end times, and weather conditions;
- Survey and analysis methodology; and
- Health and safety notes.

The following information is provided in Section 4:

- The number of bird species / taxonomic group;
- Maps showing the locations of birds and actual survey route; and
- Flight direction information.

Anecdotal observations, for example shipping information recorded visually from the aircraft or captured in the imagery, is provided in Section 5. Additionally, the locations of the vessels captured in the imagery are presented spatially within figures in Section 4.

3. Survey and Analysis Methodologies

3.1 Summary of Aerial Digital Surveys

For the second year of data collection, APEM completed a programme of twelve aerial digital surveys. In March 2020 the announcement of the COVID-19 pandemic and the nationwide lockdown restrictions were announced and as such a decision was made to attempt the April 2020 survey earlier (end of March 2020) due to the uncertainties that arose from the situation. As such, the second March survey is referred to throughout the report as April.

APEM has a bespoke camera system called “Shearwater IV” customised by in-house specialists for surveying the offshore environment. The camera system is integrated with custom flight planning software that allows each survey transect to be accurately mapped out before the aircraft leaves the ground. Each image capture node is precisely defined, allowing the system to fire the camera exposures at exactly the right location. This ensures that each survey is flown with the same transect orientation and the camera is triggered at the same position along each transect within set tolerances. APEM’s planning systems enable tolerances on flight path along survey lines to be set, automatically aborting survey lines that drift away from the aircraft’s planned flight line.

APEM’s on-board camera technician continually monitored the imagery as it was collected to ensure the data collected was fit for purpose. The camera technician would make the decision to cease data collection should the conditions become unsuitable for surveying and / or data collection. Subsequently, the survey would then be resumed at the next earliest opportunity.

The aerial digital surveys captured images along nine transect lines spaced approximately 3 km apart between image nodes within the Rampion 2 Survey Area (**Figure 2**). Data collected were 2 cm GSD digital still images using a GPS-linked bespoke flight management system to ensure the tracks were flown with a high degree of accuracy. The aircraft’s internal GPS and IMU systems record to an accuracy of +/- 3 to 5 m as standard.

Imagery was captured in raw format and post-processed to ensure optimal quality for the subsequent stage of image analysis, to extract information on marine fauna or other notable occurrences. When a survey is completed, the data are checked to ensure the number of lines and the number of images collected is correct, and that the quality of the imagery is acceptable. Once the image analysis is completed, further Quality Control (QC) processes take place (see **3.2 Summary of Quality Control**).

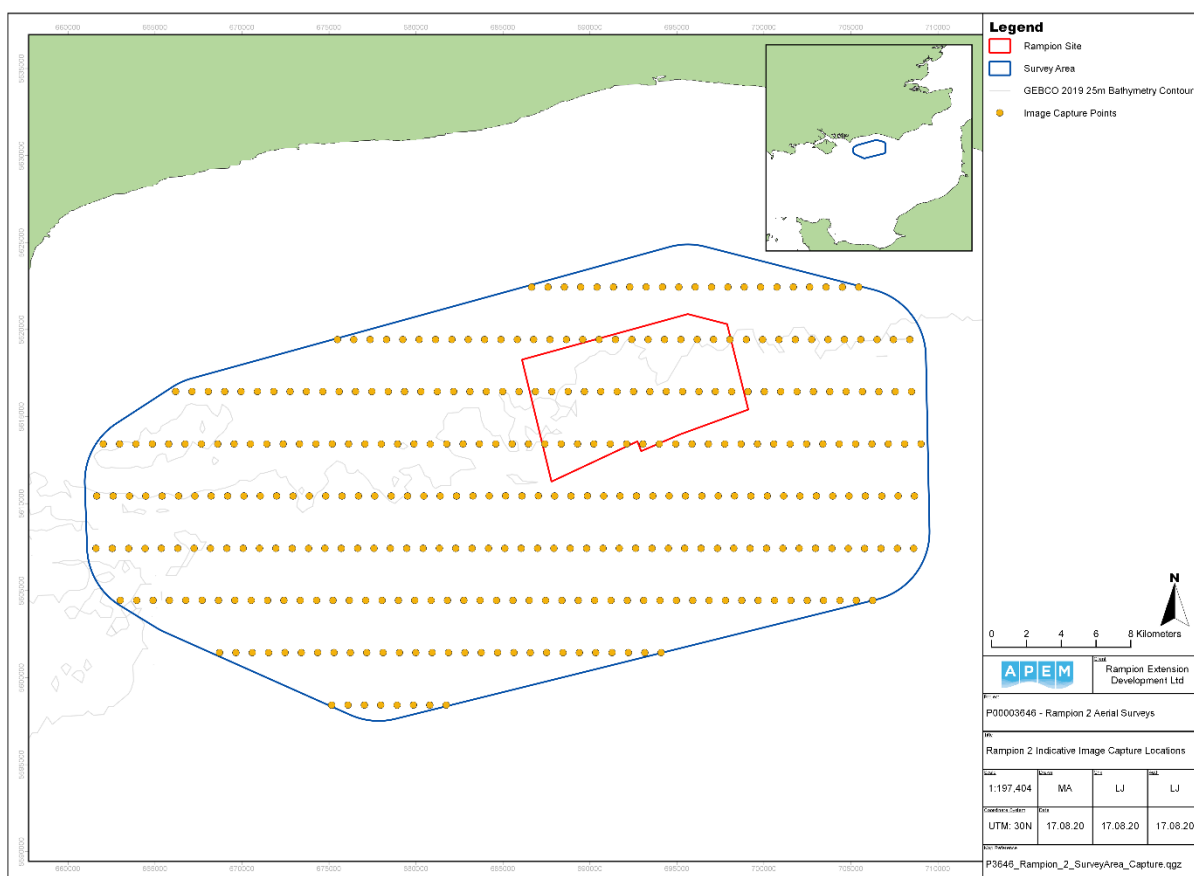


Figure 2 Flight lines and image capture points of the aerial digital still imagery at Rampion 1 Offshore Wind Farm and Rampion 2 Survey Area

No health or safety issues were reported during the surveys.

The date(s), and start and end times are provided for each aerial digital survey in **Table 2** with the corresponding weather conditions provided in **Table 3**.

Weather conditions during all surveys were conducive to collecting and analysing imagery for the purpose of providing data on the identification, distribution and abundance of bird species and marine fauna within the Rampion 2 Survey Area. Favourable conditions for surveying are defined as a cloud base of >1,700 ft, visibility of >5 km, wind speed of <30 knots, and sea state of 4 (moderate) or less. For safety reasons, no surveying takes place in icing conditions.

Measures are also taken to minimise glint and glare, when conditions may be subject to this, such as avoiding surveying around midday, when the sun angle has the greatest potential to impact image quality. Furthermore, additional imagery is collected through our survey method to provide an alternative data set that can be selected for analysis to ensure that sufficient coverage is achieved should images be negatively affected by glint or glare.

The number of images and coverage collected per survey is presented in **Table 4**.

Table 2 Date and start / end time (Coordinated Universal Time) for each flight for the April 2020 to March 2021 monthly surveys

Survey No.	Date	Flight Number	UTC Start Time (HH:MM)	UTC End Time (HH:MM)
13	26-03-20	1	11:09	13:20
14	29-05-20	1	10:48	12:51
		2	13:39	13:50
15	13-06-20	1	10:22	10:59
		2	13:19	14:48
16	14-07-20	1	12:19	14:38
17	04-08-20	1	08:15	10:13
18	01-09-20	1	15:15	17:16
19	07-10-20	1	11:14	13:19
20	11-11-20	1	10:22	12:43
21	02-12-20	1	09:48	11:53
22	18-01-21	1	10:48	12:51
23	26-02-21	1	09:58	12:01
24	08-03-21	1	15:30	17:19

Table 3 Weather conditions recorded for completed surveys: April 2020 to March 2021

Survey No.	Date	Douglas Sea State ¹	Turbidity ²	Wind Speed (knots) / Direction	Cloud Cover (%) ³	Visibility (km)	Air Temp (°C)
13	26-03-20	1	1	25 / E	0 – 10	>10	5
14	29-05-20	1	0 – 1	20 / SE	0	>10	16
15	13-06-20	2	1	20 – 30 / S	0 – 100	>10	17 – 18
16	14-07-20	1	0	5 / E & W	96 – 100	>10	12 – 17
17	05-08-20	0 – 2	0 – 1	5 – 10 / SW	0	>20	15
18	01-09-20	1	1 – 2	Calm – 5 N	0 – 20	>20	14
19	07-10-20	3	2	20 W	11 – 50	>10	10
20	11-11-20	3	2 – 3	20 SE	90 – 100	>10	10 – 11
21	02-11-20	0	1	10 W & SW	100	>10	6
22	18-01-21	1	2	25 / W	100	>10	5
23	26-02-21	0	0	Calm	0	>10	6 – 8
24	08-03-21	0	3	5 – 15 SW	50	>7	5

¹ 0 = Calm (Glassy); 1 = Calm (Rippled); 2 = Smooth; 3 = Slightly Moderate; 4 = Moderate

² 0 = Clear; 1 = Slightly Turbid; 2 = Moderately Turbid; 3 = Highly Turbid

³ 0 = Clear; 1-10 = Few; 11-50 = Scattered; 51-95 = Broken; 96-100 = Overcast

Table 4 Number of images and survey coverage for each monthly survey

Survey No.	Number of Images	Coverage (%)
13	2,164	11.16
14	2,103	10.84
15	2,174	11.20
16	2,174	11.20
17	2,168	11.18
18	2,172	11.19
19	2,172	11.19
20	2,175	11.21
21	2,061	10.62
22	2,061	10.62
23	2,061	10.62
24	2,061	10.62

3.2 Summary of Quality Control

Internal QA was carried out on the data collected from each of the surveys. Images were assessed in batches with a different staff member responsible for each batch. Each image containing birds was reviewed and checked by APEM's dedicated QA Manager, ensuring that 100% of birds found were subject to internal QA to ensure that species identification was correct. Marine mammal images were sent to SMRU for external QA. Images containing no birds and/or marine mammals were removed and kept separately for further internal QA. Of these 'blank' images, 10% were randomly selected for QA. If there was less than 90% agreement, the entire batch was re-analysed independently by a different staff member than who initially analysed the imagery.

3.3 Species Abundance Estimates

For each monthly aerial digital survey of the Rampion 2 Survey Area, geo-referenced locations of marine fauna, contained within each individual digital still image, were used to generate raw counts. Marine fauna locations contained within the boundaries of the two areas: the Rampion 2 Survey Area (which contains the Rampion 1 OWF), and the Rampion 1 OWF alone were then extracted using ArcGIS or QGIS, providing raw count data. These data are presented in this annual report for all species.

The raw counts were then divided by the number of images collected to give the mean number of animals per image (i). Population estimates (N) for each survey month were then generated by multiplying the mean number of animals per image by the total number of images required to cover the entire study area (A):

$$N = i A$$

Non-parametric bootstrap methods were used for variance estimation. A variability statistic was generated by re-sampling 999 times with replacement from the raw count data. The statistic was evaluated from each of these 999 bootstrap samples and upper and lower 95% confidence intervals of these 999 values were taken as the variability of the statistic over the population (Efron & Tibshirani, 1993).

A measure of precision was calculated using a Poisson estimator, suitable for a pseudo-Poisson over-dispersed distribution. This produced a CV based on the relationship of the standard error to the mean.

All analyses and data manipulation carried out by APEM were conducted in the R programming language (R Development Core Team, 2012) and non-parametric 95% confidence intervals were generated using the 'boot' library of function (Canty & Ripley, 2010). This results in species-specific monthly abundance estimates being calculated from the raw count data, with upper and lower confidence limits. Where appropriate, a level of precision is also presented for each monthly abundance estimate. Dividing the monthly abundance estimates by the size of the area covered (Rampion 2 Survey Area or Rampion 1 OWF) calculates the associated density (e.g. bird per km²) for any given species.

3.4 Species Distribution Maps

Each individual located by the surveys is geo-referenced and this allows those locations to be related to the boundary of the Rampion 2 Survey Area. Monthly distribution maps were produced for each species using QGIS (version 3.10.14) by separating each individual species recorded in a survey and then representing these individuals as a symbol on a map. Symbols are determined by the species group, with a relevant icon and a unique colour assigned on a

per species basis, the latter of which allows a differentiation across the board between species that use the same icon. For flying birds, as well as marine mammals, and any vessels where applicable, an indicator of direction of travel was also included. The collective results of these distribution maps are presented in Appendix II, with peak distribution months for each species also shown in Section 4.

3.5 Species Flight Direction Rose Diagrams

The flight direction of birds was recorded from all digital still images. Bearings of bird directions were plotted using Oriana to summarise overall directions of movement. The mean angle and mean vector is used to describe directional preferences and extent of 'agreement'. A Rayleigh test that assumes a null hypothesis of uniformity (i.e. scattered orientation in all directions) was used, where a significant test indicates directionality of movement.

3.6 Avian Flight Altitudes

Bird flight altitude was estimated from the digital still images. It was determined using bespoke APEM software that applies a set of rules developed in-house as well as trigonometry to provide an estimate of flight height above mean sea level (MSL). Flight height boxplot graphs were produced for each species, where possible, by combining the suitable flight height data collected from the survey programme. The 'box' is the interquartile range, with the middle bold line representing the median of the data. The 'whiskers' are the largest and smallest non-outliers. The range of the entire data includes the outliers represented by circles.

4. Species Accounts

The following species accounts present the raw counts, design-based abundance estimates, density estimates, behavioural and peak month distribution data from the 12-month programme of aerial digital surveys of the Rampion 1 OWF and the Rampion 2 Survey Area (which encompasses the Rampion 1 OWF). The density estimates provide the number of individuals per square kilometer (km²). For the purpose of this report, data are only presented for months where a species of bird or marine fauna were recorded. The separate abundance estimates for each of the two areas (Rampion 1 OWF, and the Rampion 2 Survey Area) are likely to differ due to the abundance estimates being calculated independently based on the numbers of recorded targets per location and the area covered by said locations. Scientific names and taxonomy of birds and marine fauna are provided in Appendix I. Auxiliary information pertaining to species behaviours, and also age identification of gannets and gulls is provided in Appendix III and Appendix IV respectively.

4.1 Common Scoter *Melanitta nigra*

Common scoters were recorded in April 2020 only, with a total raw count of seven individuals resulting in an abundance estimate of 69 for the Rampion 2 Survey Area (Table 5).

Common scoters were recorded in a single group in the central east of the buffer, south of the Rampion 1 OWF (Figure 3).

In April, a significant predominant direction of flight was recorded around the mean of 31° to the north-northeast (Raleigh test, $p < 0.001$, Figure 4).

Table 5 Raw counts and abundance and density estimates (No. estimated individuals per km²) of common scoters in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	7	69	7	207	0.38	0.07

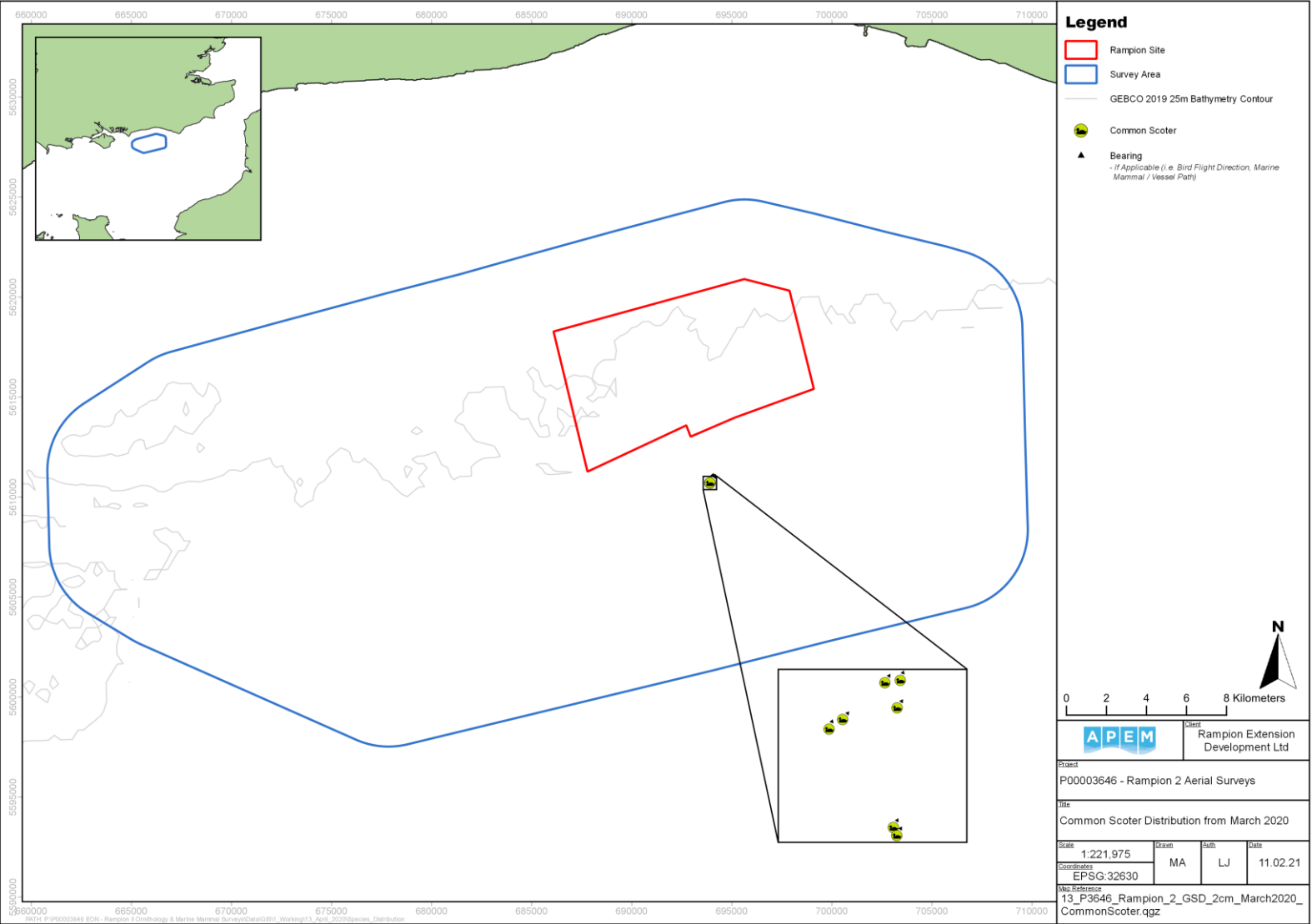


Figure 3 Distribution of common scoters recorded in the Rampion 2 Survey Area from April 2020



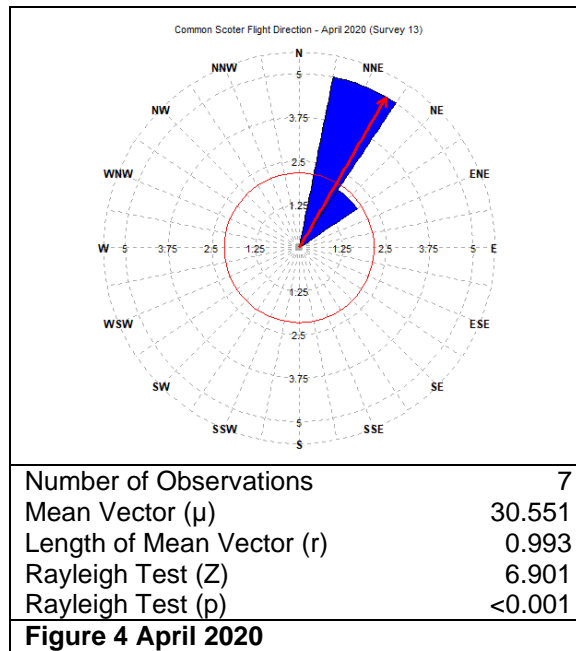


Figure 4 Summary of flight direction of common scoters during the survey period

4.2 Red-throated Diver *Gavia stellata*

Red-throated divers were recorded in December 2020, and January to March 2021, with a peak raw count of three in December and February, both resulting in an abundance estimate of 26 for the Rampion 2 Survey Area (**Table 6**).

In December and February, red-throated divers were located in the south of the buffer, with red-throated divers also present in the northwest for February (**Figure 5**). Red-throated divers were also located in the northwest of the buffer for March 2021, whilst for January 2021, were located in the west of the buffer (**Appendix II: Figure 3 & 5**). No red-throated divers were located in the Rampion 1 OWF.

In December, a significant predominant direction of flight was recorded around the mean of 71° to the east-northeast (Raleigh test, $p=0.037$, **Figure 6**).

Table 6 Raw counts and abundance and density estimates (No. estimated individuals per km²) of red-throated divers in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Dec-20	3	26	3	77	0.58	0.03
Jan-21	2	17	2	69	0.71	0.02
Feb-21	3	26	3	60	0.58	0.03
Mar-21	1	9	1	26	1.00	0.01

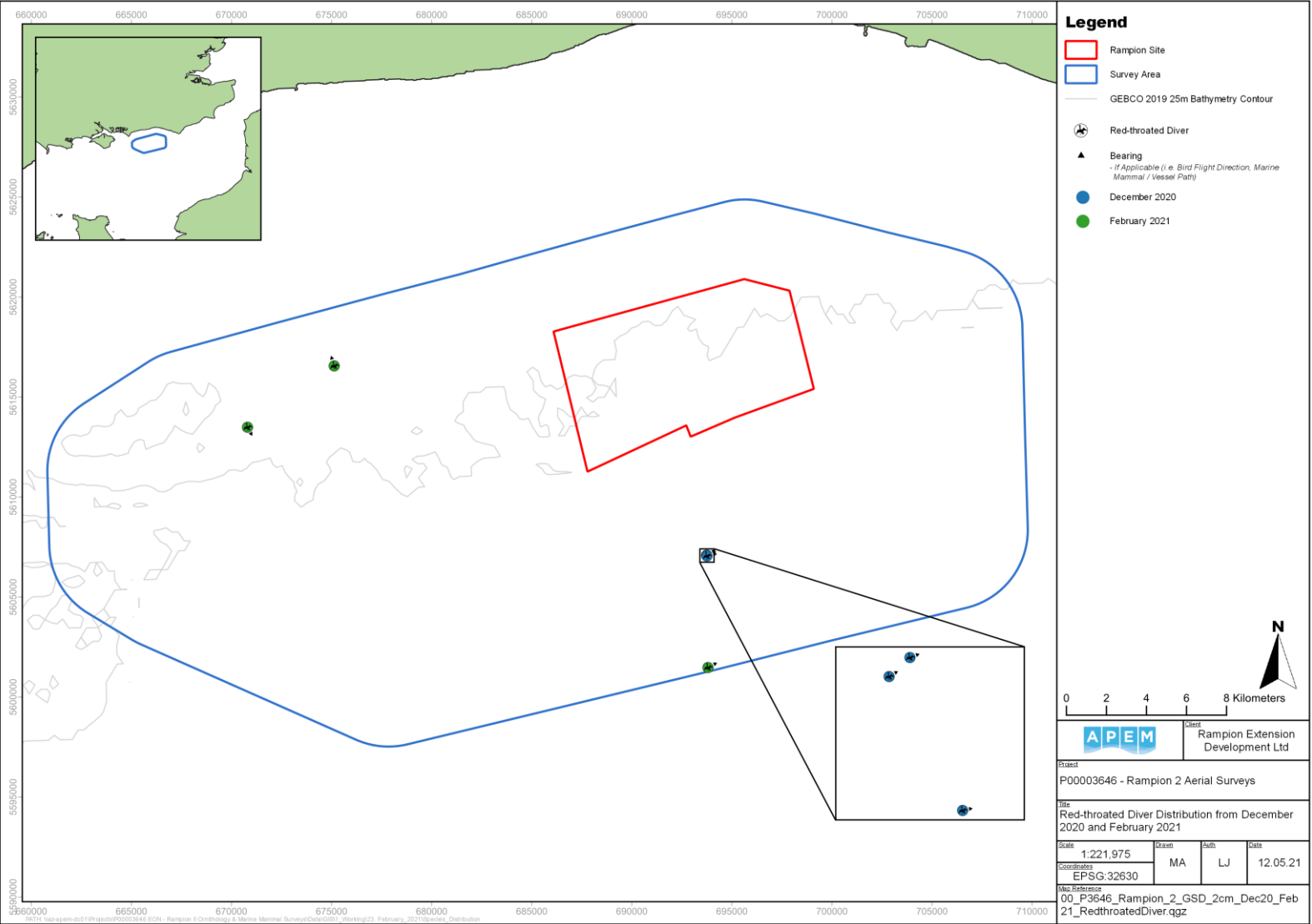


Figure 5 Distribution of red-throated divers recorded in the Rampion 2 Survey Area from December 2020 and February 2021



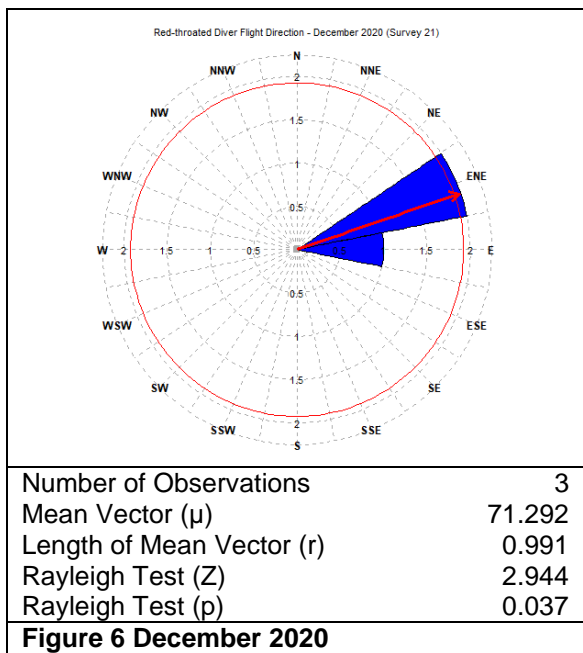


Figure 6 Summary of flight direction of red-throated divers during the survey period

4.3 Diver species – Unidentified *Gavia* spp.

Unidentified divers were recorded in February and March 2021 only, with a peak raw count of one recorded in both months, each resulting in an abundance estimate of nine for the Rampion 2 Survey Area (Table 7).

In February, the single unidentified diver was located in the central north of the buffer, whilst for March, the single unidentified diver was located in the central southwest of the buffer (Figure 7). No unidentified divers were located in the Rampion 1 OWF.

Table 7 Raw counts and abundance and density estimates (No. estimated individuals per km²) of unidentified divers in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Feb-21	1	9	1	34	1.00	0.01
Mar-21	1	9	1	26	1.00	0.01

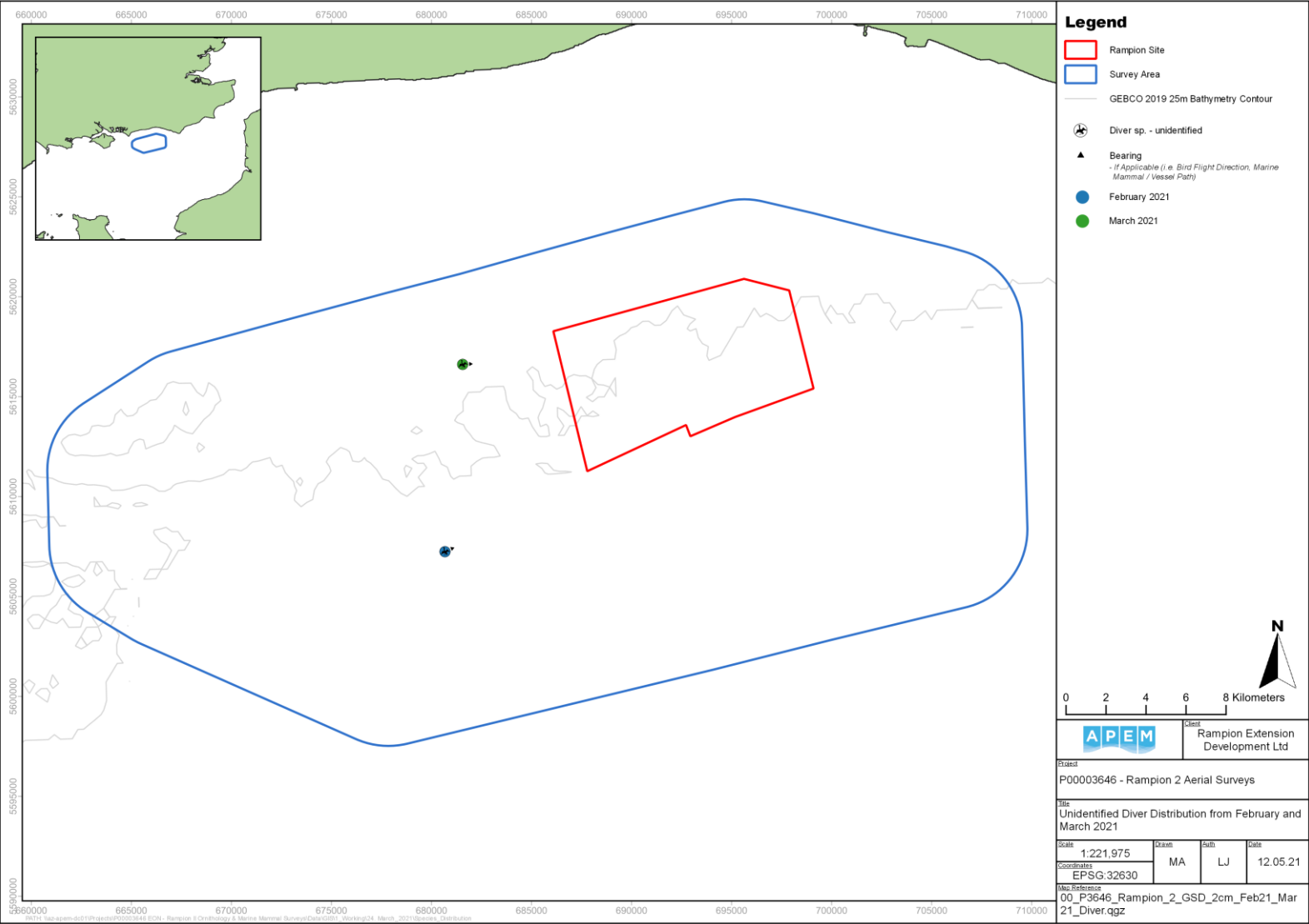


Figure 7 Locations of unidentified divers recorded in the Rampion 2 Survey Area from February and March 2021



4.4 Cormorant *Phalacrocorax carbo*

Cormorants were recorded in October 2020 and February 2021 only, with a peak raw count of six recorded in February 2021 resulting in an abundance estimate of 51 for the Rampion 2 Survey Area (Table 8).

In October, cormorants were recorded in the southwest of the Rampion 2 Survey Area (Appendix II: Figure 8), and for February, cormorants were located in the north of the Rampion 2 Survey Area (Figure 8). No cormorants were located in the Rampion 1 OWF.

In October, a significant predominant direction of flight was recorded around the mean of 211° to the south-southwest (Raleigh test, $p=0.001$, Figure 9).

Table 8 Raw counts and abundance and density estimates (No. estimated individuals per km²) of cormorants in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Oct-20	5	49	5	146	0.45	0.05
Feb-21	6	51	6	153	0.41	0.05

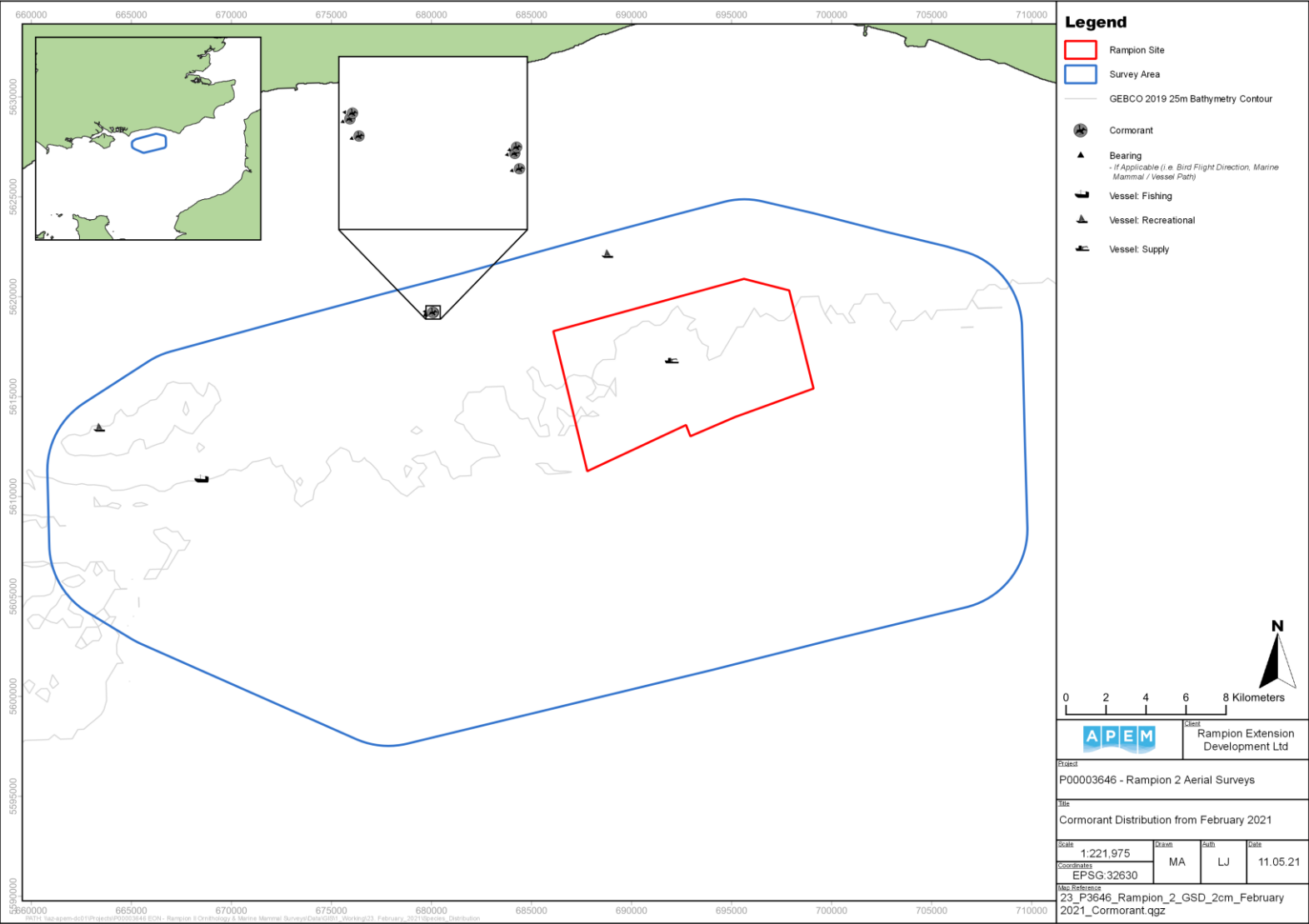


Figure 8 Distribution of cormorants recorded in the Rampion 2 Survey Area from February 2021



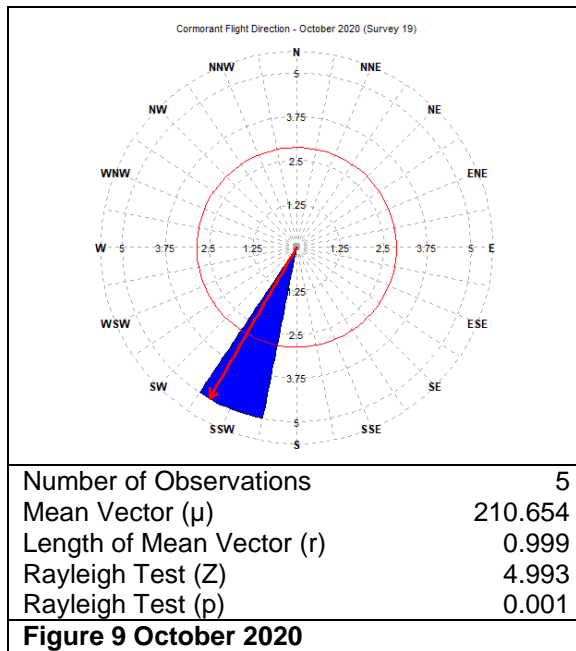


Figure 9 Summary of flight direction of cormorants during the survey period

4.5 Cormorant and / or Shag *Phalacrocorax carbo / aristotelis*

Cormorants and / or shags were recorded in April 2020 and March 2021 only, with a peak count of two in March, resulting in an abundance estimate of 17 for the Rampion 2 Survey Area (Table 9).

In April, the single cormorant and / or shag was located in the west of the Rampion 2 Survey Area (Appendix II: Figure 10), whilst for March, the two cormorants and / or shags were located in the southeast of the Rampion 1 OWF (Figure 10).

Table 9 Raw counts and abundance and density estimates (No. estimated individuals per km²) of cormorants and / or shags in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	1	10	1	30	1.00	0.01
Mar-21	2	17	2	51	0.71	0.02
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Mar-21	2	16	2	49	0.71	0.21

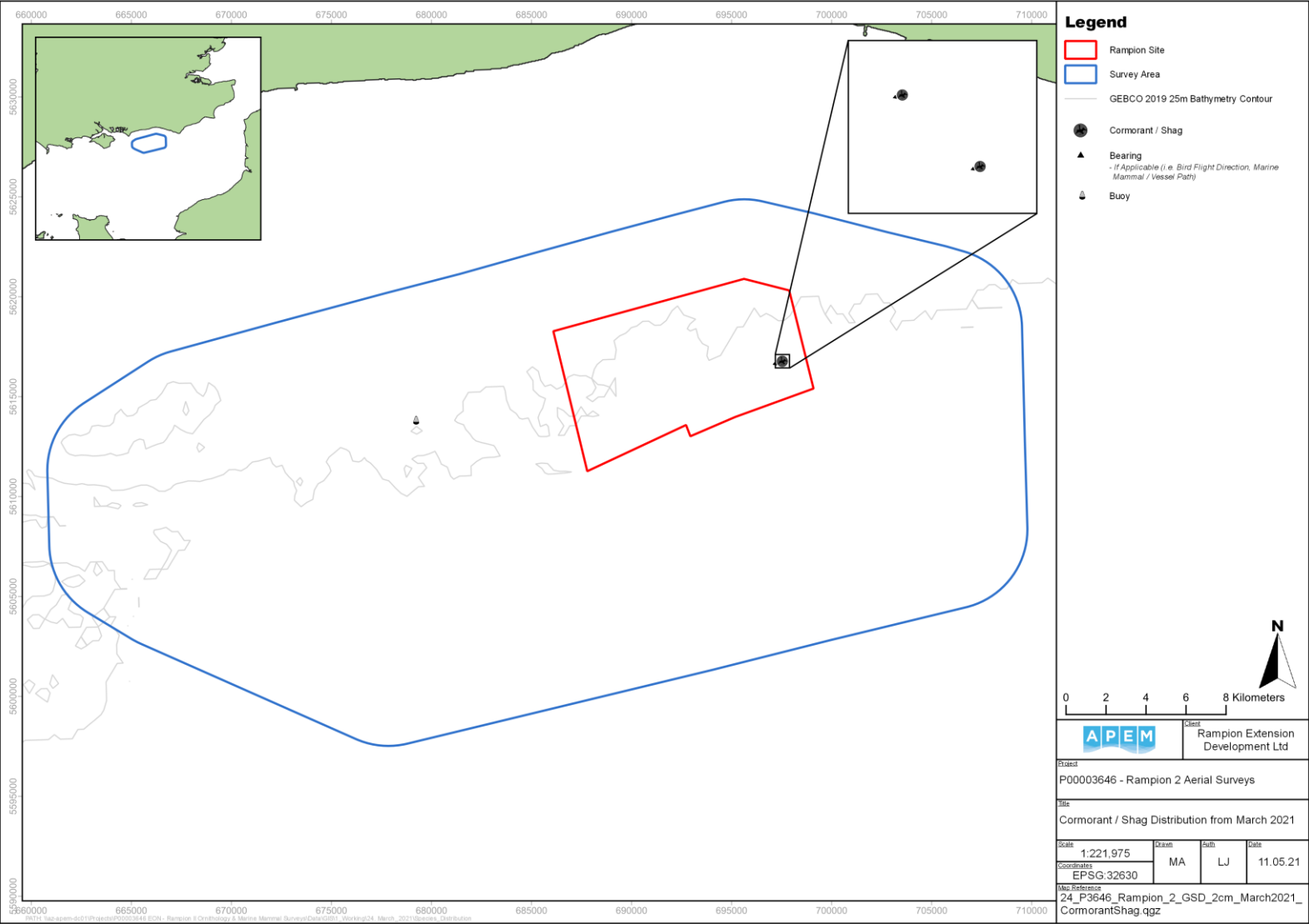


Figure 10 Distribution of cormorants and / or shags recorded in the Rampion 2 Survey Area from March 2021



4.6 Fulmar *Fulmarus glacialis*

Fulmars were recorded in May, July, August, November, and December 2020, and January and March 2021. A peak raw count of two from both May 2020 and March 2021 resulted in abundance estimates of 20 and 17, respectively, for the Rampion 2 Survey Area (Table 10).

Fulmars were located in the west of the Rampion 2 Survey Area for May, November, and December (Figure 11; Appendix II: Figure 15 & 16), and were located in the southeast of the Rampion 2 Survey Area for July and August (Appendix II: Figure 13 & 14). For January and March, fulmars were located in the south of the Rampion 2 Survey Area (Appendix II: Figure 17; Figure 11). No fulmars were recorded in the Rampion 1 OWF.

In May, July, August, and November 2020; one fulmar per survey was deemed suitable for flight height determination, resulting in a median altitude of 29 m relative to MSL (Figure 12).

In May, a single fulmar was recorded flying in a south-southeasterly direction (Figure 13a).

In July, a single fulmar was recorded flying in an easterly direction (Figure 13b).

In August, a single fulmar was recorded flying in an east-northeasterly direction (Figure 13c).

In November, a single fulmar was recorded flying in a south-easterly direction (Figure 13d).

Table 10 Raw counts and abundance and density estimates (No. estimated individuals per km²) of fulmars in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	2	20	2	50	0.71	0.02
Jul-20	1	10	1	29	1.00	0.01
Aug-20	1	10	1	29	1.00	0.01
Nov-20	1	10	1	30	1.00	0.01
Dec-20	1	9	1	26	1.00	0.01
Jan-21	1	9	1	26	1.00	0.01
Mar-21	2	17	2	43	0.71	0.02

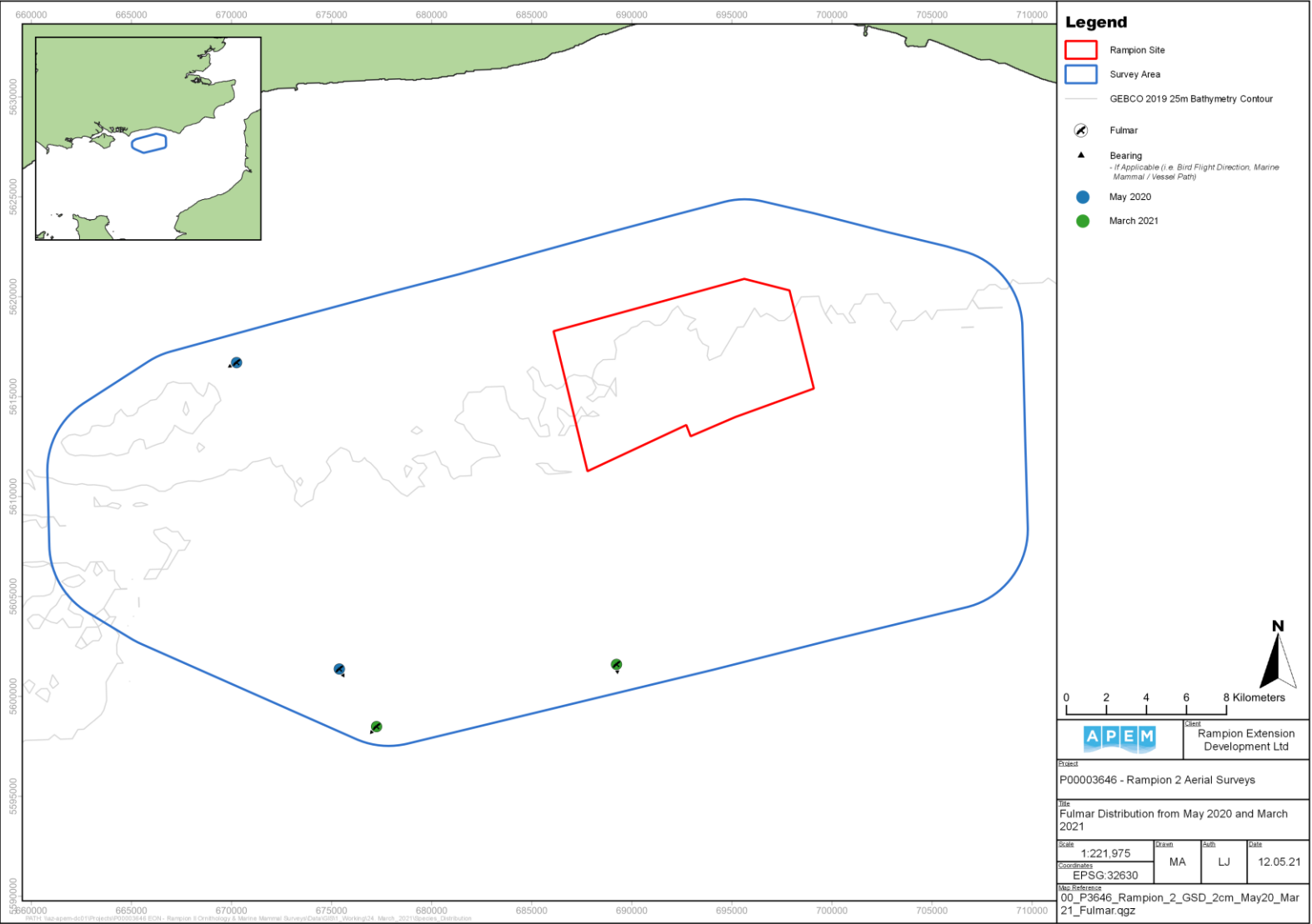


Figure 11 Distribution of fulmars recorded in the Rampion 2 Survey Area from May 2020 and March 2021



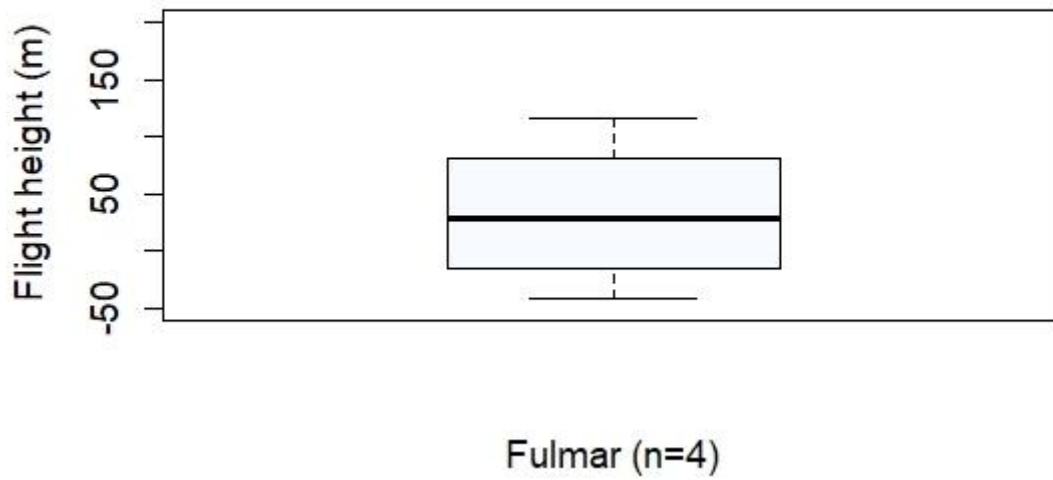
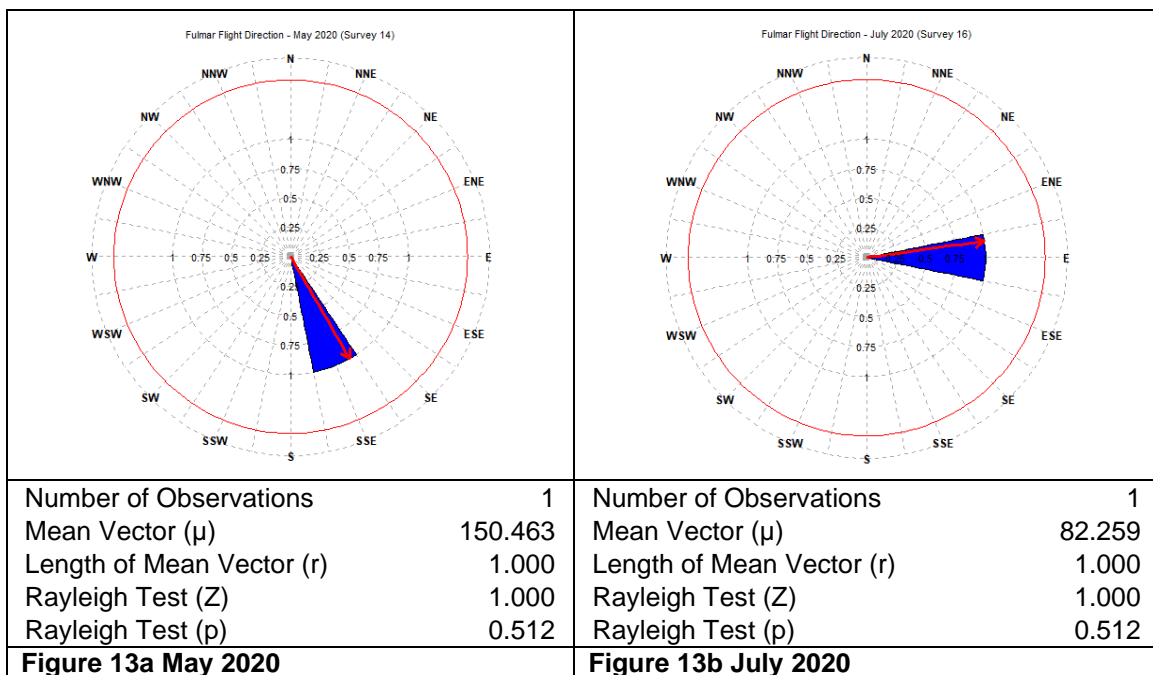


Figure 12 Flight heights of fulmars (n=4) recorded in the Rampion 2 Survey Area



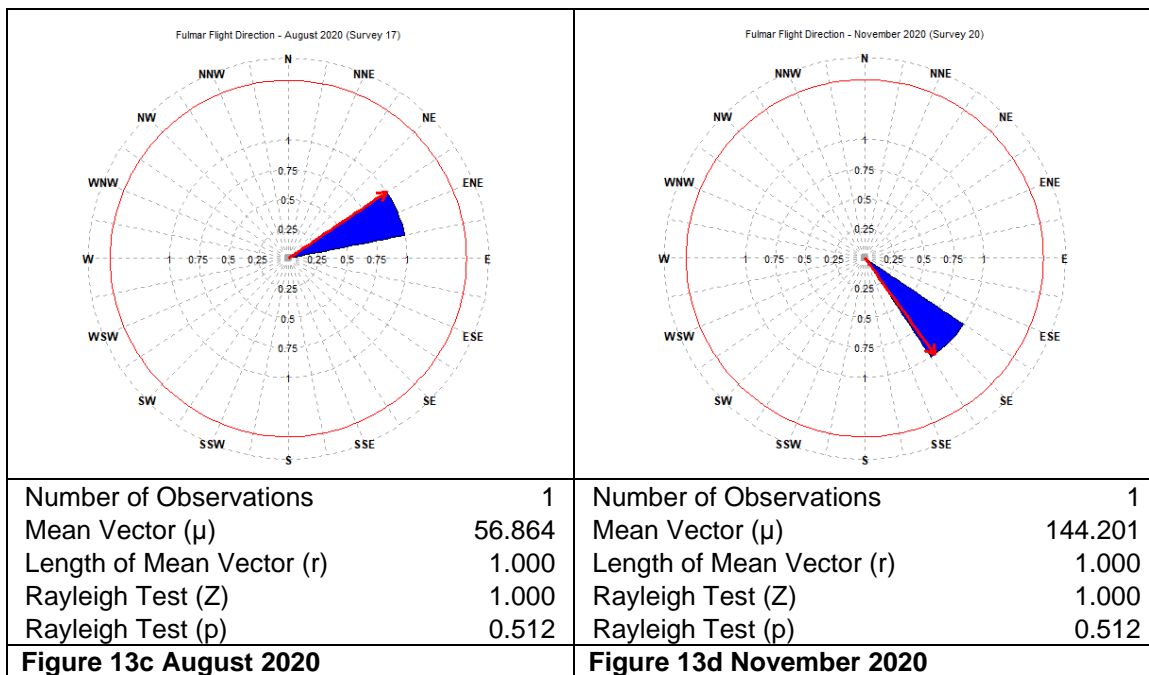


Figure 13 Summary of flight direction of fulmars during the survey period

4.7 Little Egret *Egretta garzetta*

A single little egret was recorded in December 2020 only, resulting in an abundance estimate of nine for the Rampion 2 Survey Area (Table 11).

The single little egret was located in the central east of the Rampion 2 Survey Area, southeast of the Rampion 1 OWF (Figure 14).

In December, a single little egret was recorded flying in a north-northeasterly direction (Figure 15).

Table 11 Raw counts and abundance and density estimates (No. estimated individuals per km²) of a little egret in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Dec-20	1	9	1	26	1.00	0.01

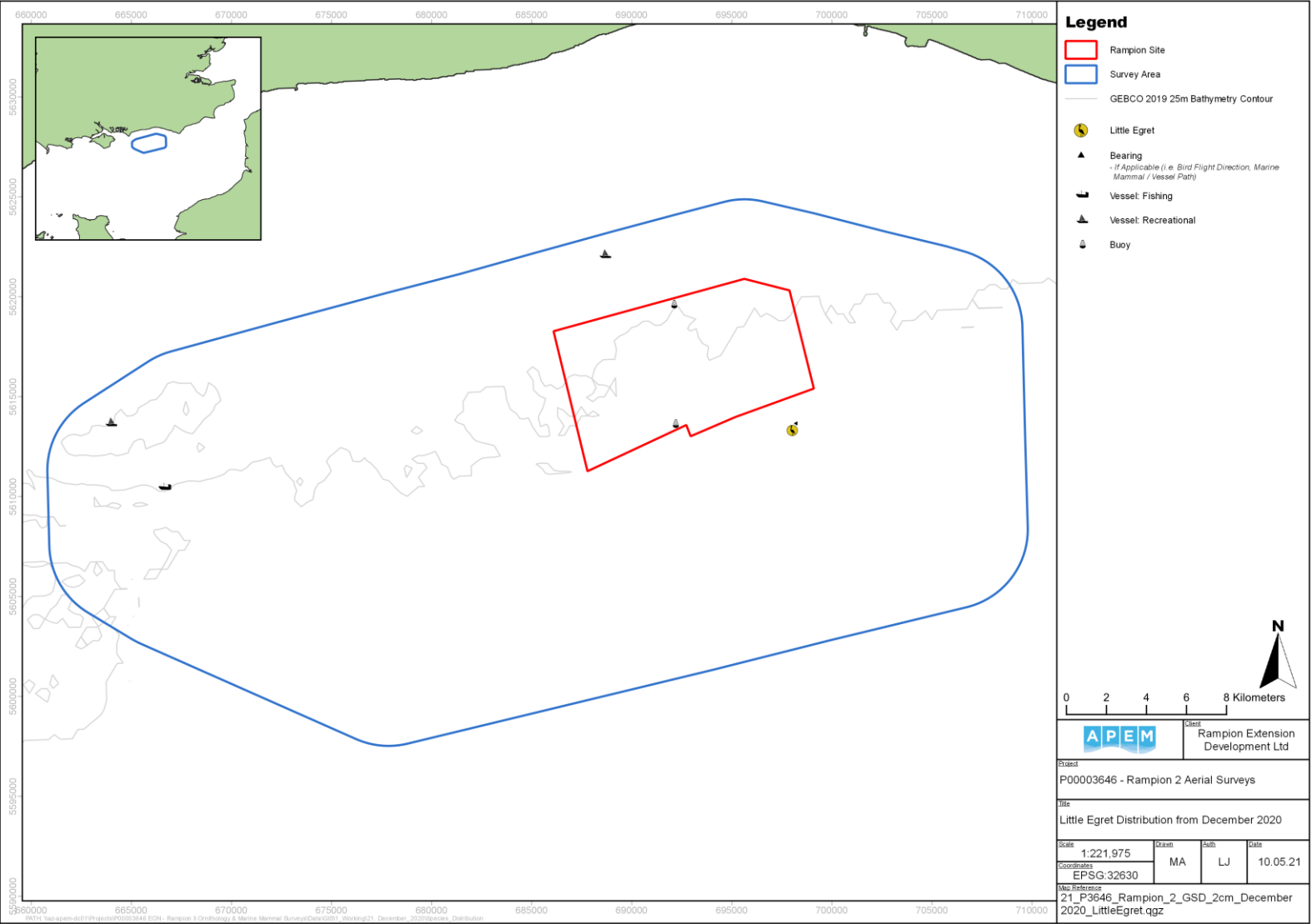


Figure 14 Location of a little egret recorded in the Rampion 2 Survey Area from December 2020

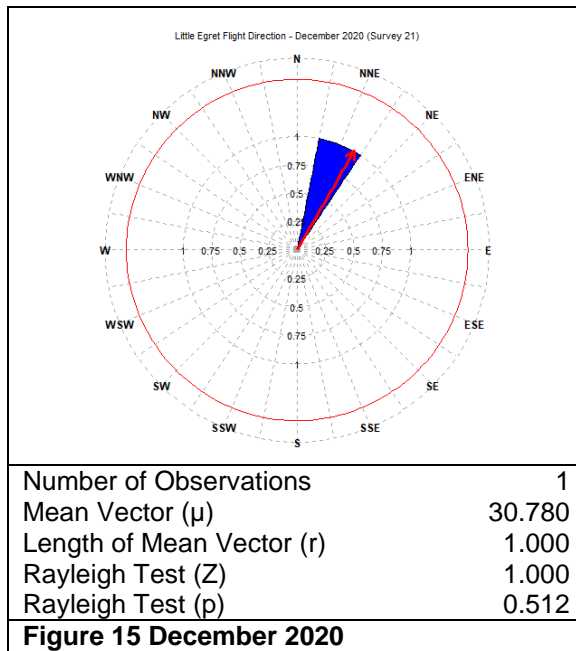


Figure 15 Summary of flight direction of a little egret during the survey period

4.8 Gannet *Morus bassanus*

Gannets were recorded in every month of the survey period from April 2020 to March 2021, with a peak raw count of 121 in January 2021, resulting in an abundance estimate of 1,042 for the Rampion 2 Survey Area (**Table 12**).

Gannets were predominantly loosely distributed across the Rampion 2 Survey Area minus Rampion 1 OWF throughout the survey period, though some months exhibited areas of higher densities. May featured a dense cluster of gannets in the northwest, whilst December showed greater densities in the east (**Appendix II: Figure 21 & 28**). January, February, and March all showed greater densities in the south of the Rampion 2 Survey Area, with January showing additional density in the west, and March showing additional densities in the east (**Figure 16; Appendix II: Figure 30 & 31**). No discernable distribution patterns were evident for the remaining survey months (**Appendix II: Figure 20, 22, 23, 24, 25, 26, 27 & 29**). No gannets were located in the Rampion 1 OWF.

In April, May, June, July, October to December 2020, and January to March 2021; five, two, two, two, one, one, one, six, 15, one, and eight flying gannets were deemed suitable for flight height determination respectively, resulting in a median altitude of 21 m relative to MSL (**Figure 17**).

In April, there was a significant predominant direction of flight around a mean of 77° to the east-northeast (Raleigh test, $p < 0.001$, **Figure 18a**).

In May, there was a significant predominant direction of flight around a mean of 171° to the south (Raleigh test, $p = 0.006$, **Figure 18b**).

In June, there was a significant predominant direction of flight around a mean of 99° to the east (Raleigh test, $p < 0.001$, **Figure 18c**).

In July, there was no significant predominant direction of flight (Raleigh test, $p = 0.426$, **Figure 18d**).

In August, there was no significant predominant direction of flight (Raleigh test, $p = 0.512$, **Figure 18e**).

In September, a single gannet was recorded flying in a south-easterly direction (**Figure 18f**).

In October, there was no significant predominant direction of flight (Raleigh test, $p = 0.653$, **Figure 18g**).

In November, there was no significant predominant direction of flight (Raleigh test, $p = 0.633$, **Figure 18h**).

In December, there was a significant predominant direction of flight around a mean of 215° to the southwest (Raleigh test, $p < 0.001$, **Figure 18i**).

In January, there was a significant predominant direction of flight around a mean of 227° to the southwest (Raleigh test, $p = 0.026$, **Figure 18j**).

In February, there was no significant predominant direction of flight (Raleigh test, $p = 0.159$, **Figure 18k**).

In March, there was no significant predominant direction of flight (Raleigh test, $p = 0.061$, **Figure 18l**).

Table 12 Raw counts and abundance and density estimates (No. estimated individuals per km²) of gannets in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	10	98	30	197	0.32	0.10
May-20	22	222	40	524	0.21	0.23
Jun-20	17	166	88	263	0.24	0.17
Jul-20	7	68	20	137	0.38	0.07
Aug-20	4	39	10	78	0.50	0.04
Sep-20	4	39	10	78	0.50	0.04
Oct-20	7	68	20	117	0.38	0.07
Nov-20	4	40	4	79	0.50	0.04
Dec-20	22	188	60	341	0.21	0.20
Jan-21	121	1042	370	2264	0.09	1.09
Feb-21	12	102	34	187	0.29	0.11
Mar-21	67	570	255	1021	0.12	0.60

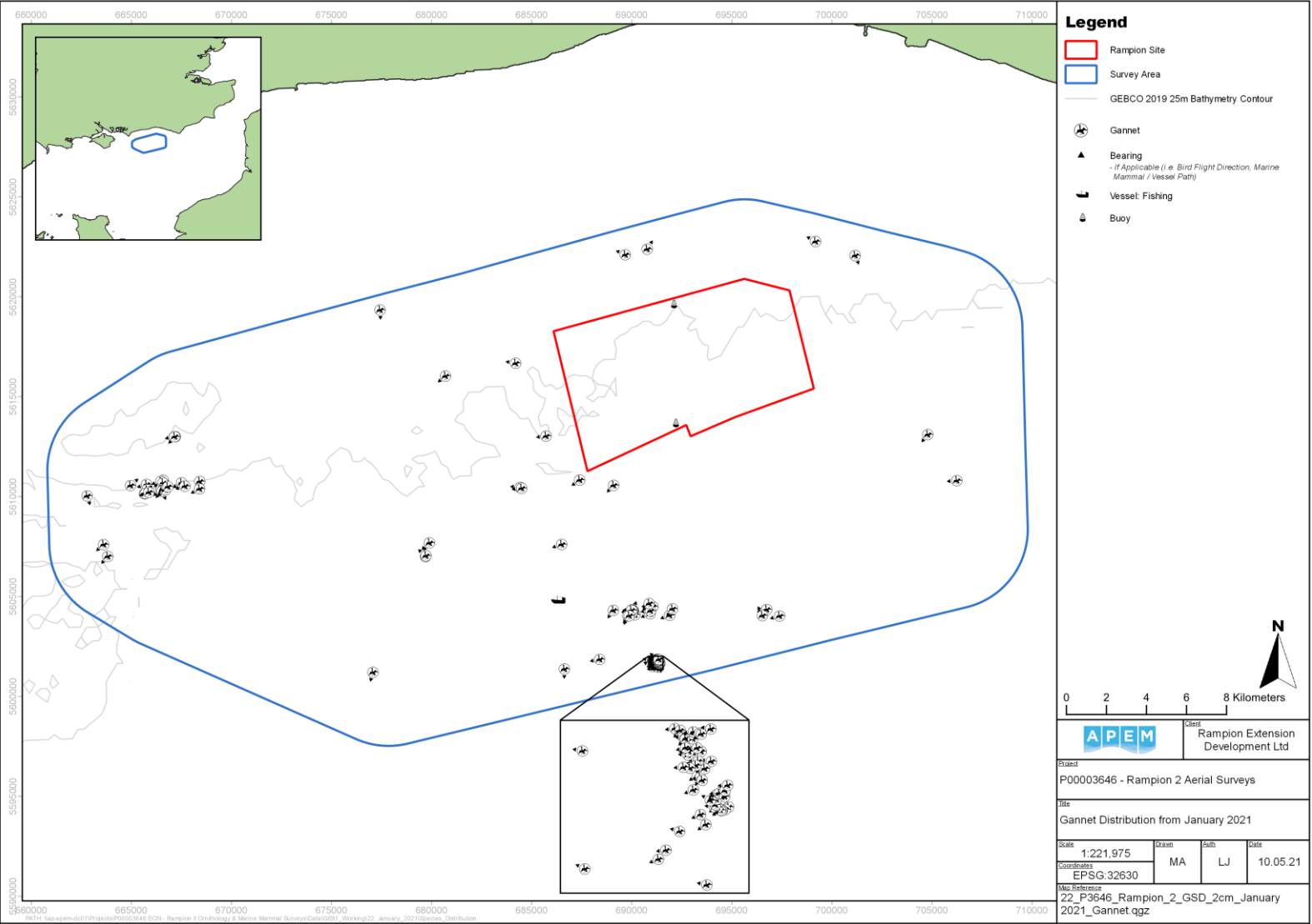


Figure 16 Distribution of gannets recorded in the Rampion 2 Survey Area from January 2021

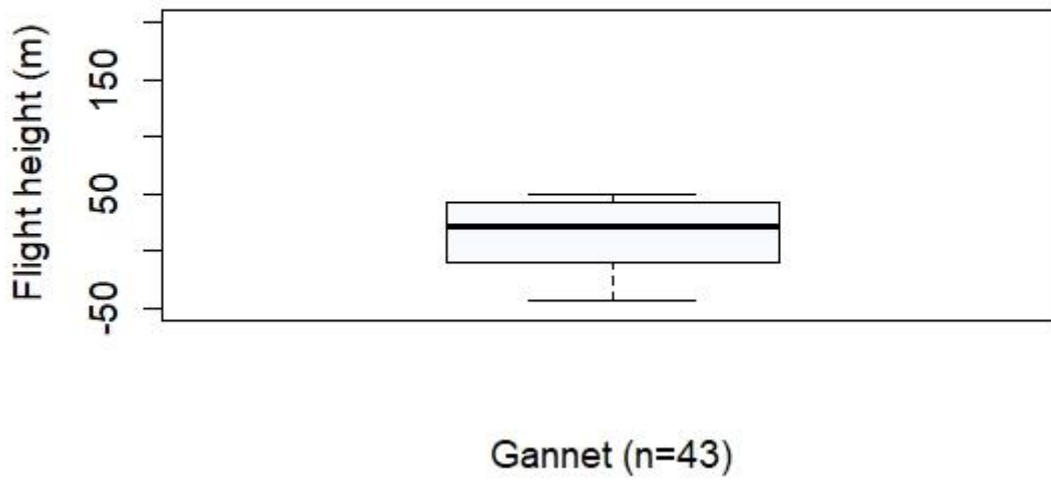
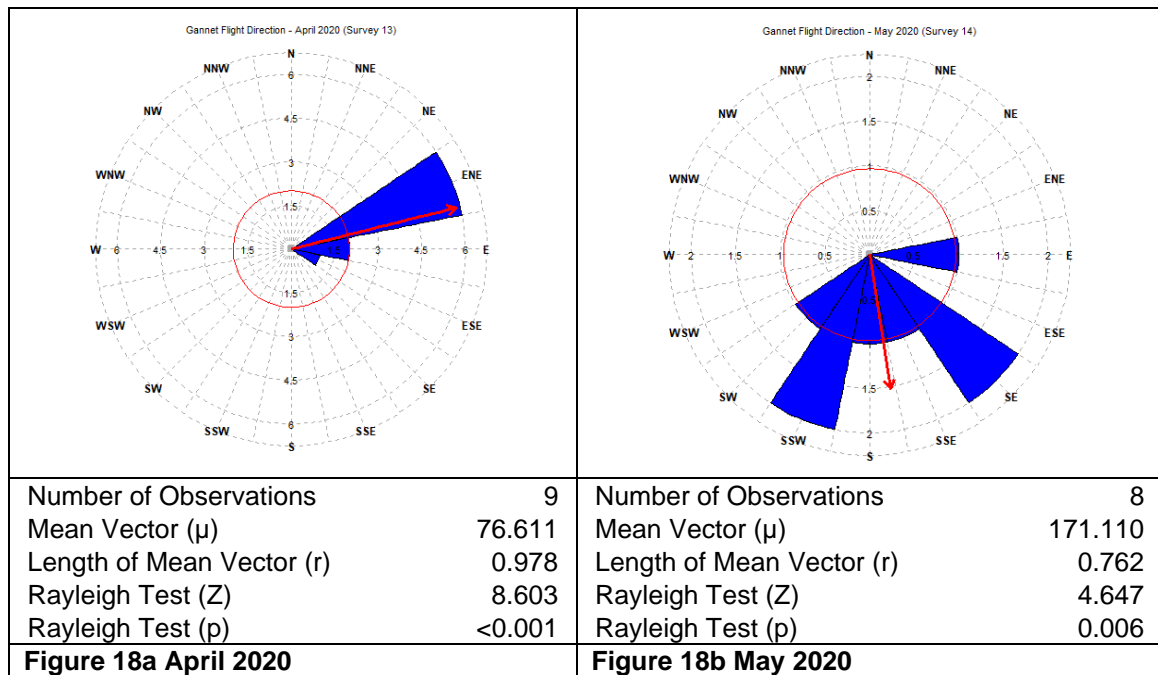


Figure 17 Flight heights of gannets (n=43) recorded in the Rampion 2 Survey Area



<p>Number of Observations 10 Mean Vector (μ) 99.273 Length of Mean Vector (r) 0.886 Rayleigh Test (Z) 7.850 Rayleigh Test (p) <0.001</p>	<p>Number of Observations 3 Mean Vector (μ) 348.707 Length of Mean Vector (r) 0.562 Rayleigh Test (Z) 0.948 Rayleigh Test (p) 0.426</p>
<p>Figure 18c June 2020</p>	<p>Figure 18d July 2020</p>
<p>Number of Observations 2 Mean Vector (μ) 220.233 Length of Mean Vector (r) 0.359 Rayleigh Test (Z) 0.258 Rayleigh Test (p) 0.817</p>	<p>Number of Observations 1 Mean Vector (μ) 127.753 Length of Mean Vector (r) 1.000 Rayleigh Test (Z) 1.000 Rayleigh Test (p) 0.512</p>
<p>Figure 18e August 2020</p>	<p>Figure 18f September 2020</p>
<p>Number of Observations 4</p>	<p>Number of Observations 2</p>

Mean Vector (μ)	298.651	Mean Vector (μ)	353.142
Length of Mean Vector (r)	0.344	Length of Mean Vector (r)	0.532
Rayleigh Test (Z)	0.473	Rayleigh Test (Z)	0.566
Rayleigh Test (p)	0.653	Rayleigh Test (p)	0.633
Figure 18g October 2020		Figure 18h November 2020	
Number of Observations	13	Number of Observations	23
Mean Vector (μ)	215.108	Mean Vector (μ)	227.461
Length of Mean Vector (r)	0.743	Length of Mean Vector (r)	0.394
Rayleigh Test (Z)	7.185	Rayleigh Test (Z)	3.577
Rayleigh Test (p)	<0.001	Rayleigh Test (p)	0.026
Figure 18i December 2020		Figure 18j January 2021	
Number of Observations	5	Number of Observations	8
Mean Vector (μ)	154.527	Mean Vector (μ)	137.261
Length of Mean Vector (r)	0.610	Length of Mean Vector (r)	0.583
Rayleigh Test (Z)	1.859	Rayleigh Test (Z)	2.719
Rayleigh Test (p)	0.159	Rayleigh Test (p)	0.061
Figure 18k February 2021		Figure 18l March 2021	

Figure 18 Summary of flight direction of gannets during the survey period

4.9 Kittiwake *Rissa tridactyla*

Kittiwakes were recorded in June, August, September, November, and December 2020, as well as January to March 2021, with a peak raw count of 302 in March 2021 resulting in an abundance estimate of 2,569 for the Rampion 2 Survey Area (**Table 13**).

In the Rampion 1 OWF kittiwakes were recorded from November 2020 to January 2021, with a peak raw count of 93 in December 2020 resulting in an abundance estimate of 779 for the Rampion 1 OWF (**Table 13**).

Kittiwakes occurred in relatively low numbers for the first half of the survey period from which they were recorded, with June showing a single group of kittiwakes located in the central east of the Rampion 2 Survey Area, south of the Rampion 1 OWF (**Appendix II: Figure 32**). August and September showed lowest numbers, with two kittiwakes located in the south of the Rampion 2 Survey Area for August, and two kittiwakes located in the north and one in the west for September (**Appendix II: Figure 33 & 34**). For November, distribution was loose, with the majority located in the western half of the Rampion 2 Survey Area, with one located in the southeast, and two located within the Rampion 1 OWF (**Appendix II: Figure 35**). The latter half of the survey period from which kittiwakes were recorded featured a marked increase in the totals and densities of kittiwakes. December featured loose kittiwake distribution across the Rampion 2 Survey Area, save for in the northeast of the Rampion 1 OWF where a large density of kittiwakes was recorded (**Appendix II: Figure 36**). Similar patterns were observed for the remaining three survey months, with the highest density areas varying between them. Highest densities were located in the centre and west of the Rampion 2 Survey Area for January, in the south and southeast for February, and in the centre and southeast for March (**Appendix II: 37 & 38; Figure 19**).

In June, September, November, and December 2020, and January to March 2021; one, one, four, 69, 98, 25, and 70 flying kittiwakes were deemed suitable for flight height determination respectively, resulting in a median altitude of 25 m relative to MSL (**Figure 20**).

In June, there was no significant predominant direction of flight (Raleigh test, $p=0.158$, **Figure 21a**).

In August, there was no significant predominant direction of flight (Raleigh test, $p=0.147$, **Figure 21b**).

In September, a single kittiwake was recorded flying in a northerly direction (**Figure 21c**).

In November, there was a significant predominant direction of flight around a mean of 125° to the southeast (Raleigh test, $p=0.002$, **Figure 21d**).

In December, there was a significant predominant direction of flight around a mean of 267° to the west (Raleigh test, $p<0.001$, **Figure 21e**).

In January, there was a significant predominant direction of flight around a mean of 265° to the west (Raleigh test, $p<0.001$, **Figure 21f**).

In February, there was a significant predominant direction of flight around a mean of 18° to the north-northeast (Raleigh test, $p=0.024$, **Figure 21g**).

In March, there was no significant predominant direction of flight (Raleigh test $p=0.412$, **Figure 21h**).

Table 13 Raw counts and abundance and density estimates (No. estimated individuals per km²) of kittiwakes in: a) Rampion 2 Survey Area; b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Jun-20	20	195	20	585	0.22	0.20
Aug-20	2	20	2	59	0.71	0.02
Sep-20	3	29	3	68	0.58	0.03
Nov-20	12	118	49	207	0.29	0.12
Dec-20	236	2014	1195	3404	0.07	2.11
Jan-21	216	1860	1378	2419	0.07	1.95
Feb-21	54	459	204	808	0.14	0.48
Mar-21	302	2569	1974	3258	0.06	2.69
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Nov-20	2	19	2	48	0.71	0.24
Dec-20	93	779	93	1952	0.10	10.00
Jan-21	23	192	117	267	0.21	2.47
Mar-21	12	98	16	204	0.29	1.26

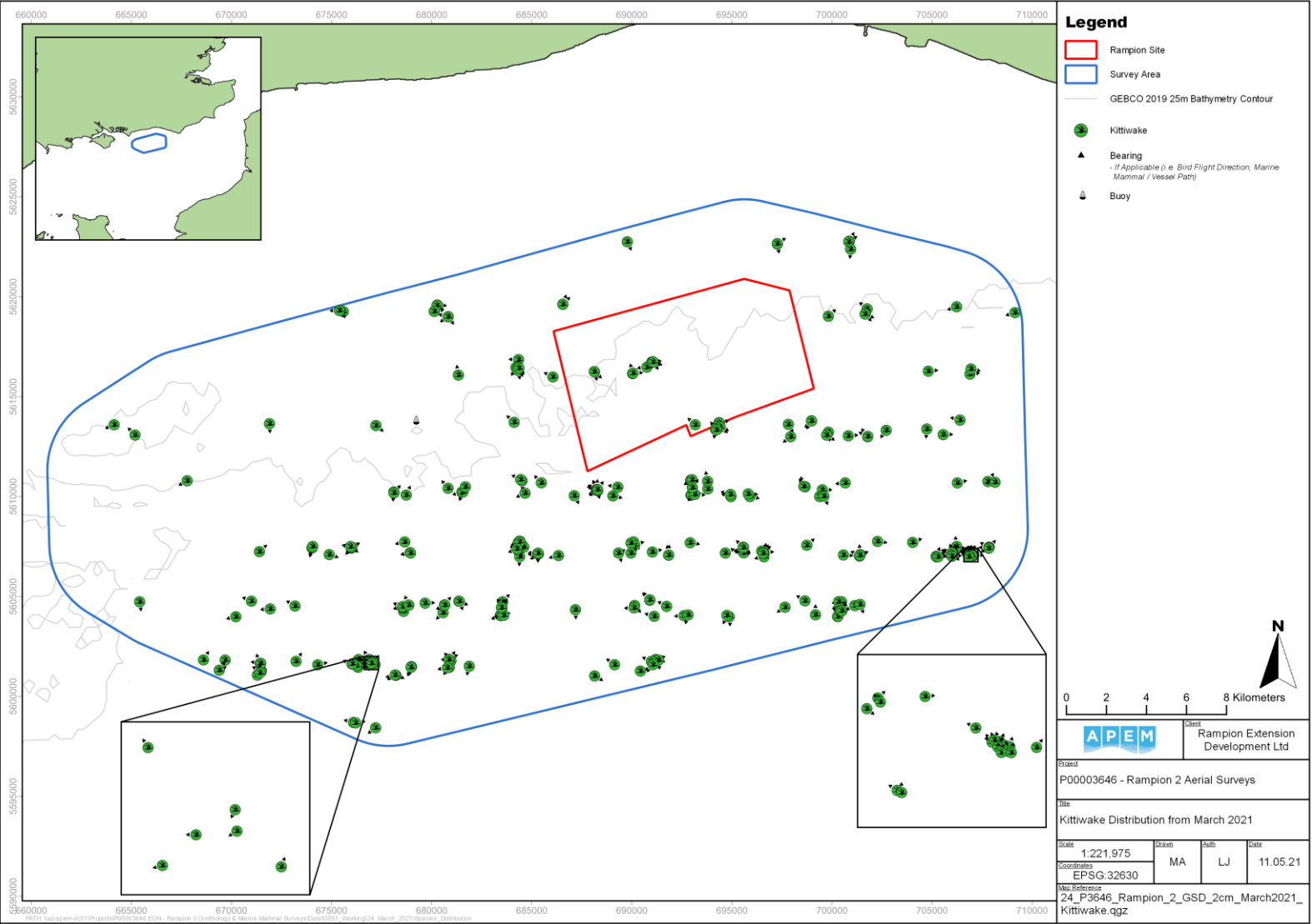


Figure 19 Distribution of kittiwakes recorded in the Rampion 2 Survey Area from March 2021



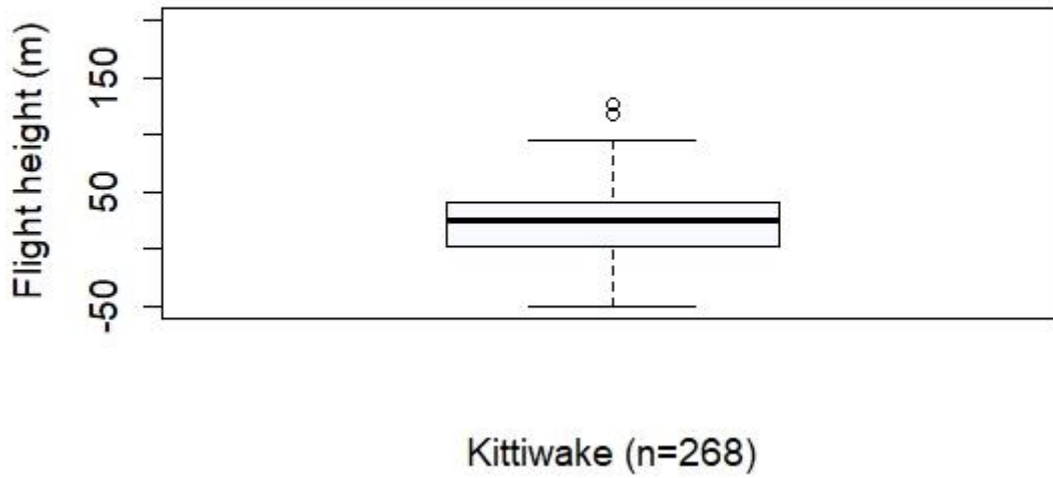
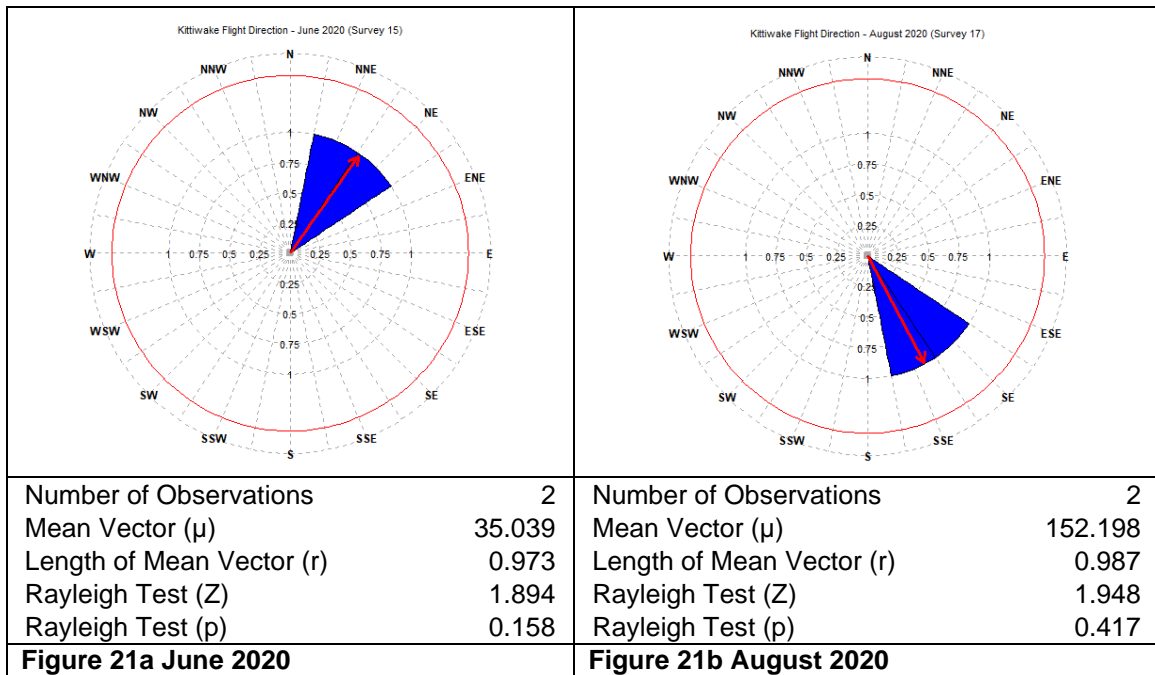


Figure 20 Flight heights of kittiwakes (n=268) recorded in the Rampion 2 Survey Area



<p>Number of Observations 1 Mean Vector (μ) 359.173 Length of Mean Vector (r) 1.000 Rayleigh Test (Z) 1.000 Rayleigh Test (p) 0.512</p>	<p>Number of Observations 6 Mean Vector (μ) 125.391 Length of Mean Vector (r) 0.907 Rayleigh Test (Z) 4.934 Rayleigh Test (p) 0.002</p>
<p>Figure 21c September 2020</p>	<p>Figure 21d November 2020</p>
<p>Number of Observations 140 Mean Vector (μ) 266.740 Length of Mean Vector (r) 0.512 Rayleigh Test (Z) 36.662 Rayleigh Test (p) <0.001</p>	<p>Number of Observations 155 Mean Vector (μ) 264.847 Length of Mean Vector (r) 0.482 Rayleigh Test (Z) 36.057 Rayleigh Test (p) <0.001</p>
<p>Figure 21e December 2020</p>	<p>Figure 21f January 2021</p>
<p>Number of Observations 29</p>	<p>Number of Observations 109</p>

Mean Vector (μ)	17.832	Mean Vector (μ)	219.240
Length of Mean Vector (r)	0.355	Length of Mean Vector (r)	0.090
Rayleigh Test (Z)	3.661	Rayleigh Test (Z)	0.887
Rayleigh Test (p)	0.024	Rayleigh Test (p)	0.412
Figure 21g February 2021		Figure 21h March 2021	

Figure 21 Summary of flight direction of kittiwakes during the survey period

4.10 Black-headed Gull *Chroicocephalus ridibundus*

A single black-headed gull was recorded in both January and March 2021, resulting in an abundance estimate of nine for the Rampion 2 Survey Area for both months (Table 14).

A single black-headed gull was located in the northwest of the Rampion 2 Survey Area for January, and a single black-headed gull was recorded in the central south of the Rampion 2 Survey Area for March (Figure 22). No black-headed gulls were recorded in the Rampion 1 OWF.

In January, a single black-headed gull was recorded flying in a south-southwesterly direction (Figure 23a).

In March, a single black-headed gull was recorded flying in a north-easterly direction (Figure 23b).

Table 14 Raw counts and abundance and density estimates (No. estimated individuals per km²) of black-headed gulls in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Jan-21	1	9	1	26	1.00	0.01
Mar-21	1	9	1	26	1.00	0.01

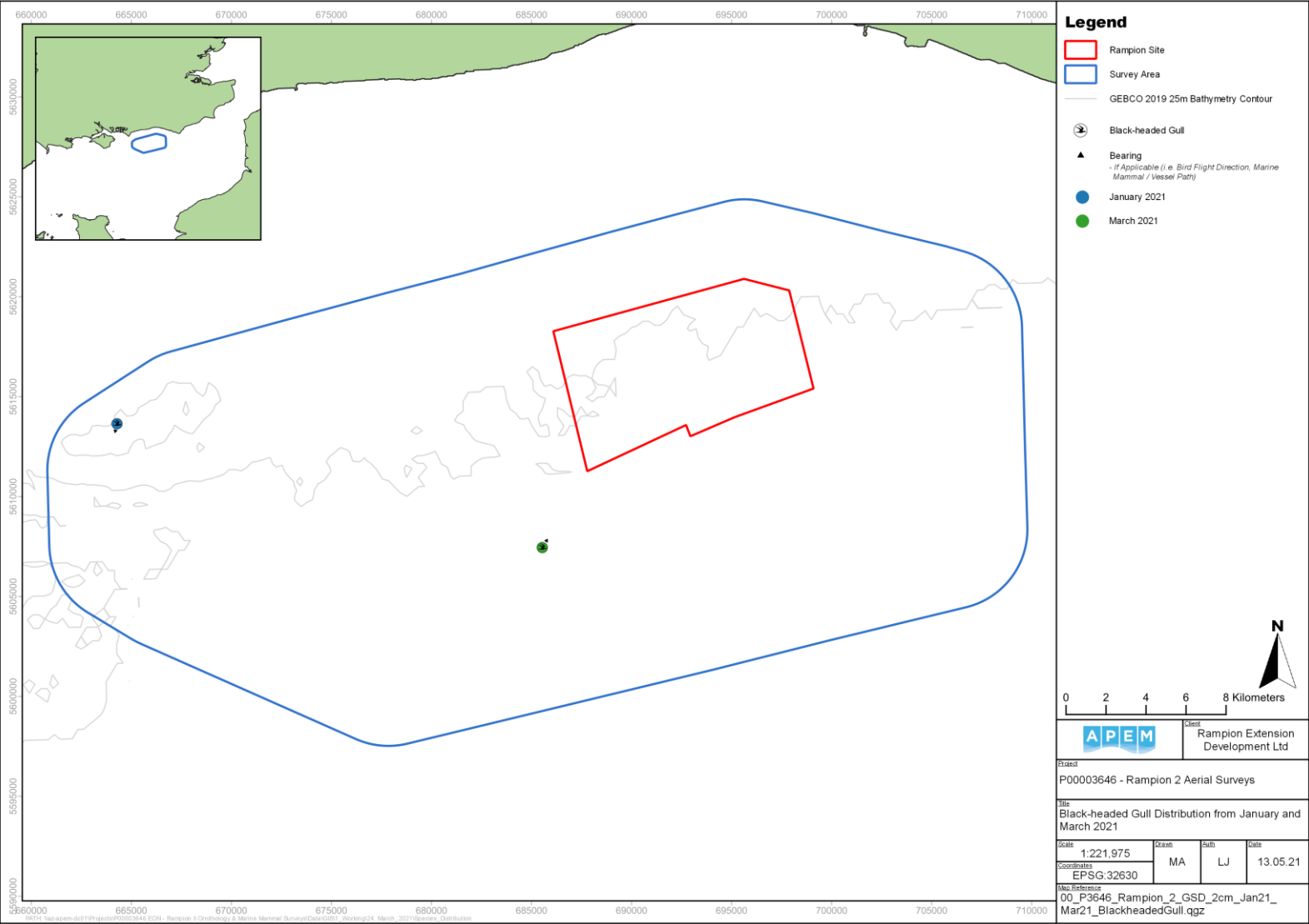


Figure 22 Locations of black-headed gulls recorded in the Rampion 2 Survey Area from January and March 2021



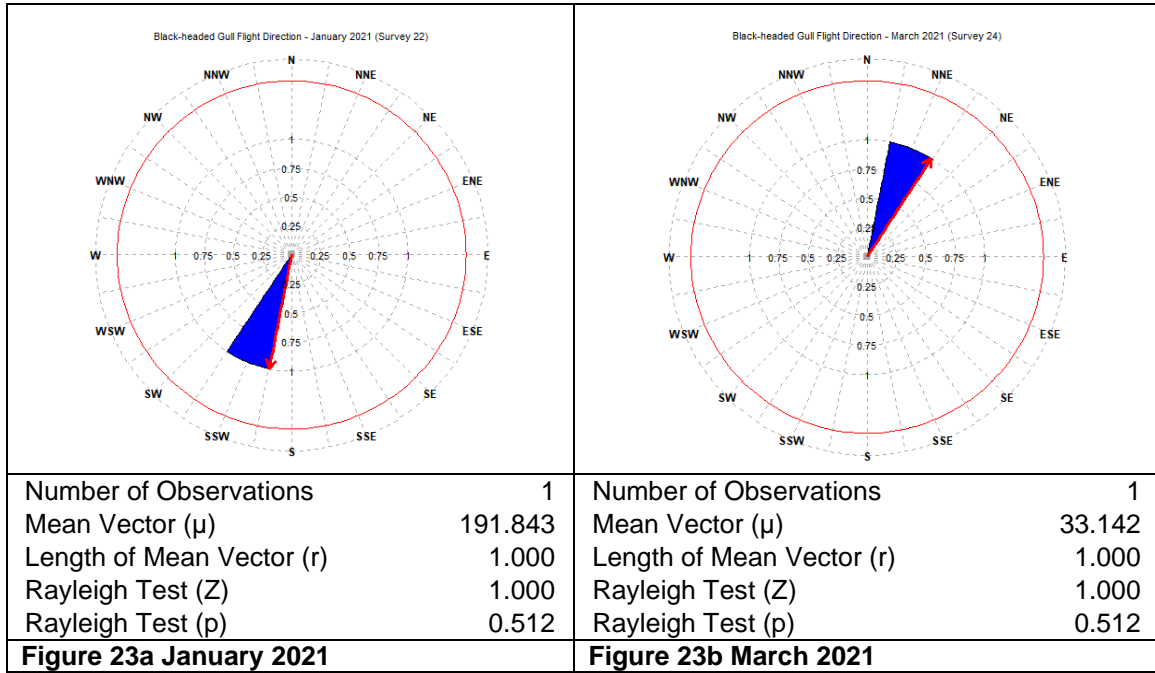


Figure 23 Summary of flight direction of unidentified black-headed gulls during the survey period

4.11 Mediterranean Gull *Larus melanocephalus*

Single Mediterranean gulls were recorded in both January and March 2021, resulting in an abundance estimate of nine for both months for the Rampion 2 Survey Area (**Table 15**).

A single Mediterranean gull was located in the northwest of the Rampion 2 Survey Area for December, and a single Mediterranean gull was located in the central southwest of the Rampion 2 Survey Area for February (**Figure 24**). No Mediterranean gulls were recorded in the Rampion 1 OWF.

In December, a single Mediterranean gull was recorded flying in a west-northwesterly direction (**Figure 25a**).

In February, a single Mediterranean gull was recorded flying in a west-southwesterly direction (**Figure 25b**).

Table 15 Raw counts and abundance and density estimates (No. estimated individuals per km²) of unknown Mediterranean gulls in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Jan-21	1	9	1	34	1.00	0.01
Mar-21	1	9	1	34	1.00	0.01

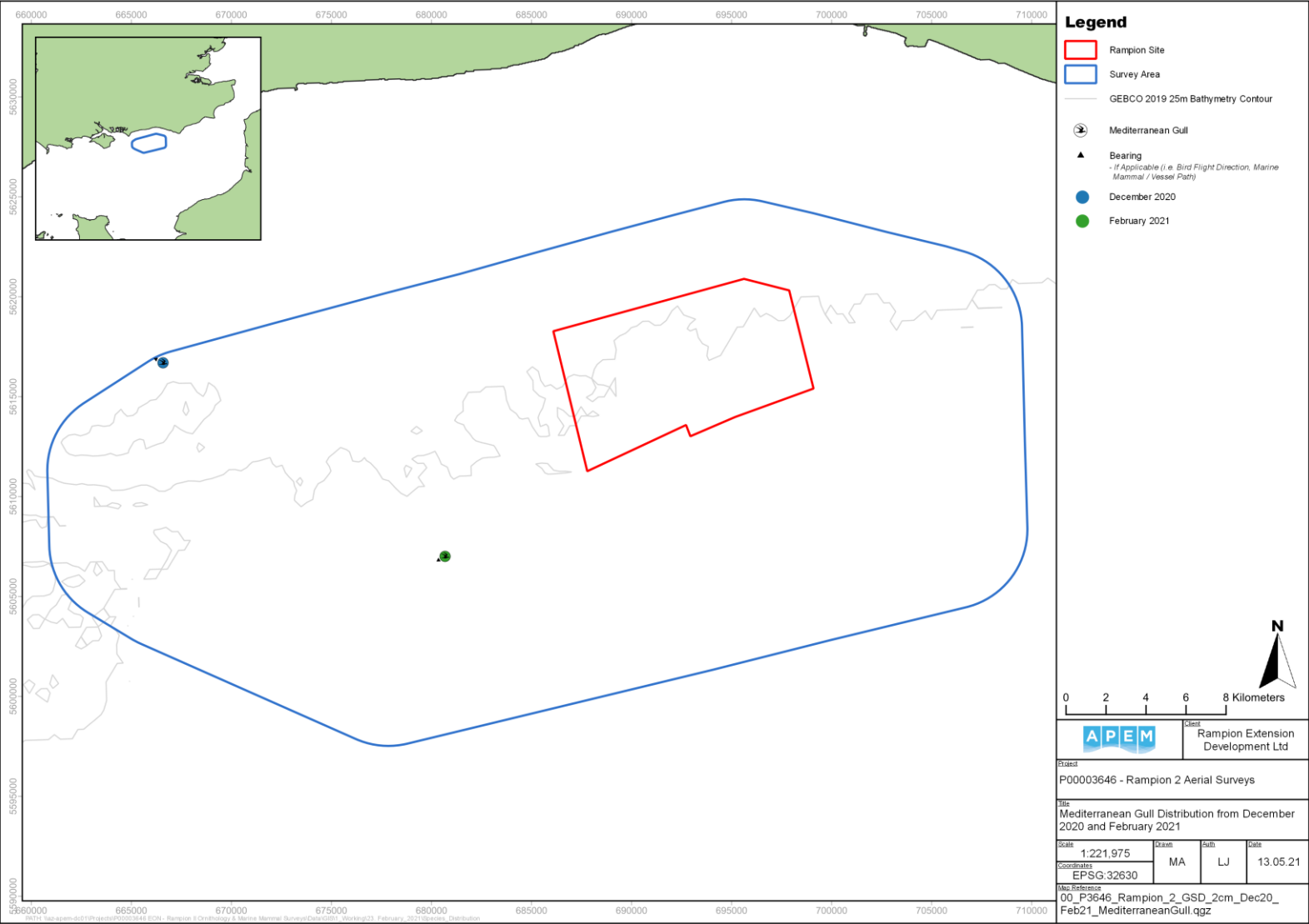


Figure 24 Locations of Mediterranean gulls recorded in the Rampion 2 Survey Area from December 2020 and February 2021



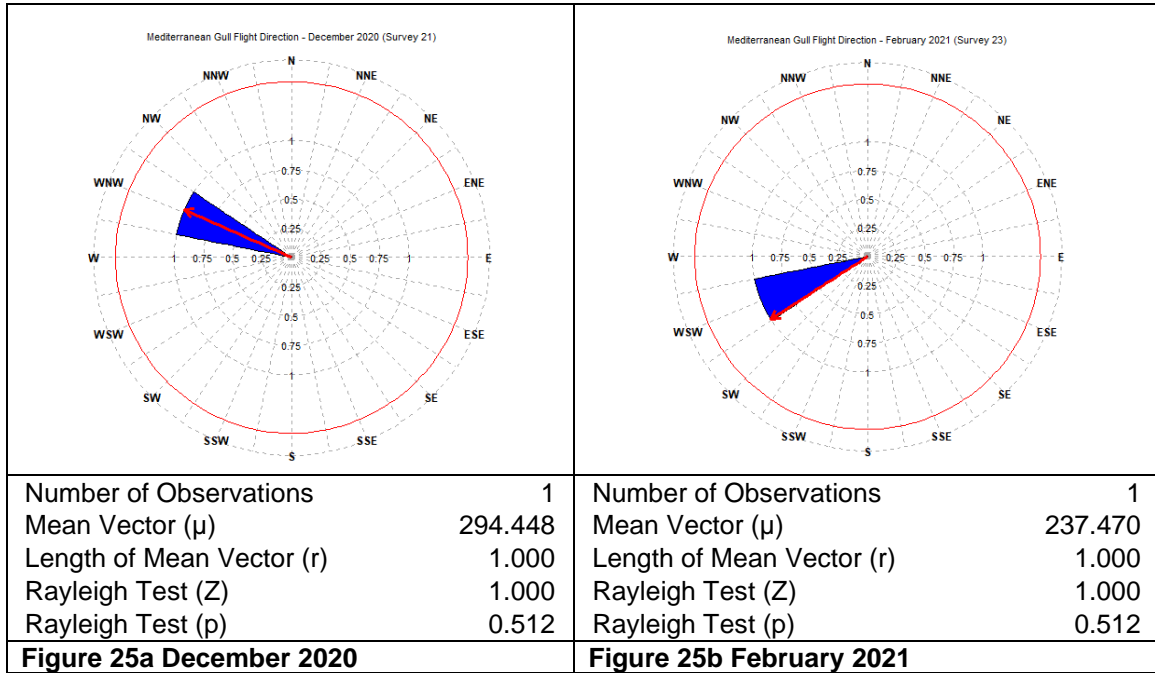


Figure 25 Summary of flight direction of Mediterranean gulls during the survey period

4.12 Common Gull *Larus canus*

Common gulls were recorded between November 2020 and March 2021, with a peak raw count of 28 in December 2020 resulting in an abundance estimate of 239 for the Rampion 2 Survey Area (Table 16).

In the Rampion 1 OWF common gulls were recorded December 2020 to February 2021, with a peak raw count of five in December 2020 resulting in an abundance estimate of 42 for the Rampion 1 OWF (Table 16).

The single common gull recorded in November was located in the southwest of the Rampion 2 Survey Area (Appendix II: Figure 44). The remaining survey months showed a distribution pattern for common gulls from the northwest across to the north-northeast of the Rampion 2 Survey Area, with occasional common gull distribution further south from this area (Figure 26; Appendix II: Figure 46, 47, & 48).

In November to December 2020, and January to March 2021; one, eleven, three, nine, and six flying common gulls were deemed suitable for flight height determination respectively, resulting in a median altitude of 28 m relative to MSL (Figure 27).

In November, a single common gull was recorded flying in a south-southwesterly direction (Figure 28a).

In December, there was a significant predominant direction of flight around a mean of 284° to the west-northwest (Raleigh test, $p < 0.001$, Figure 28b).

In January, there was a significant predominant direction of flight around a mean of 260° to the west (Raleigh test, $p = 0.006$, Figure 28c).

In February, there was no significant predominant direction of flight (Raleigh test, $p = 0.130$, Figure 28d).

In March, there was no significant predominant direction of flight (Raleigh test, $p = 0.363$, Figure 28e).

Table 16 Raw counts and abundance and density estimates (No. estimated individuals per km²) of common gulls in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Nov-20	1	10	1	30	1.00	0.01
Dec-20	28	239	119	384	0.19	0.25
Jan-21	6	52	9	112	0.41	0.05
Feb-21	21	179	94	281	0.22	0.19
Mar-21	14	119	51	221	0.27	0.12
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Dec-20	5	42	5	109	0.45	0.54

Jan-21	1	8	1	25	1.00	0.10
Feb-21	2	16	2	41	0.71	0.21
Mar-21	1	8	1	25	1	0.1

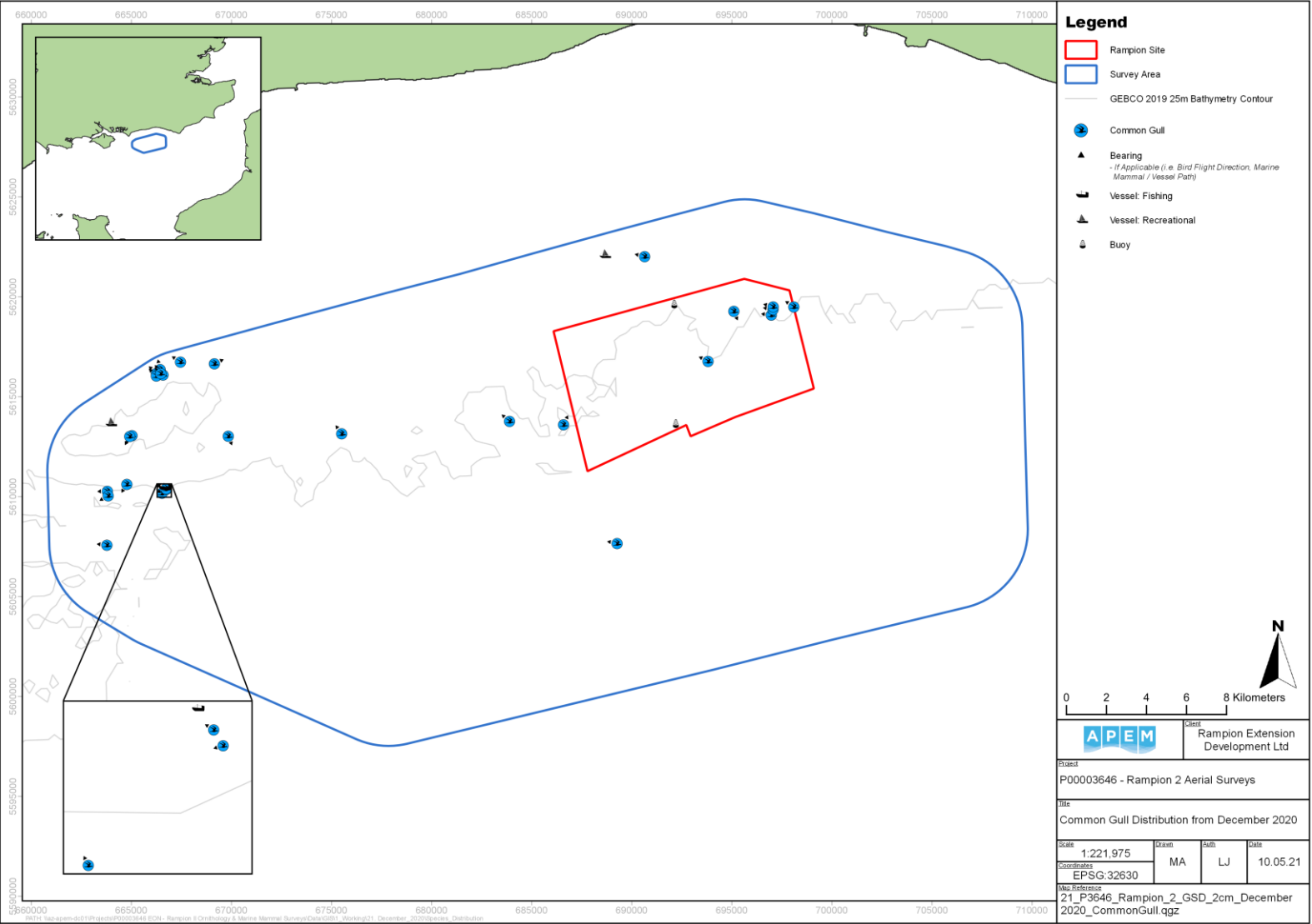


Figure 26 Distribution of common gulls recorded in the Rampion 2 Survey Area from December 2020 and February 2021



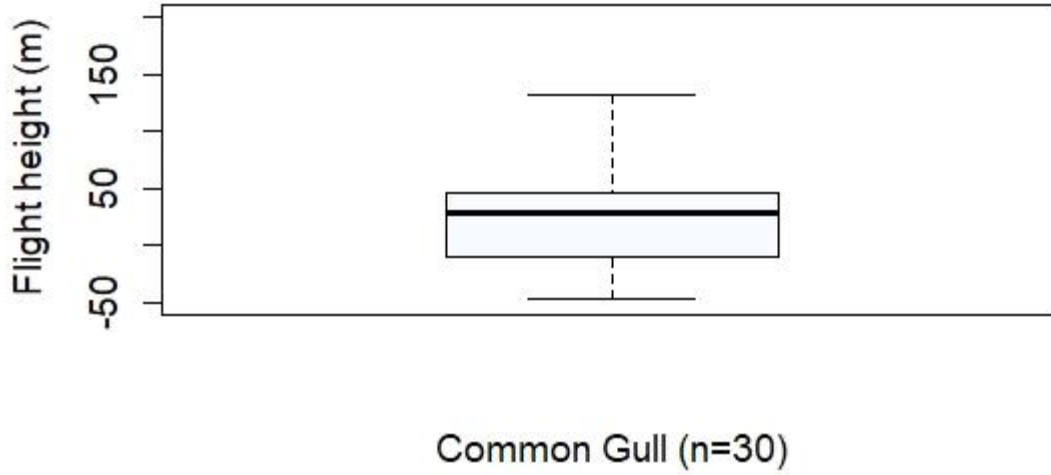
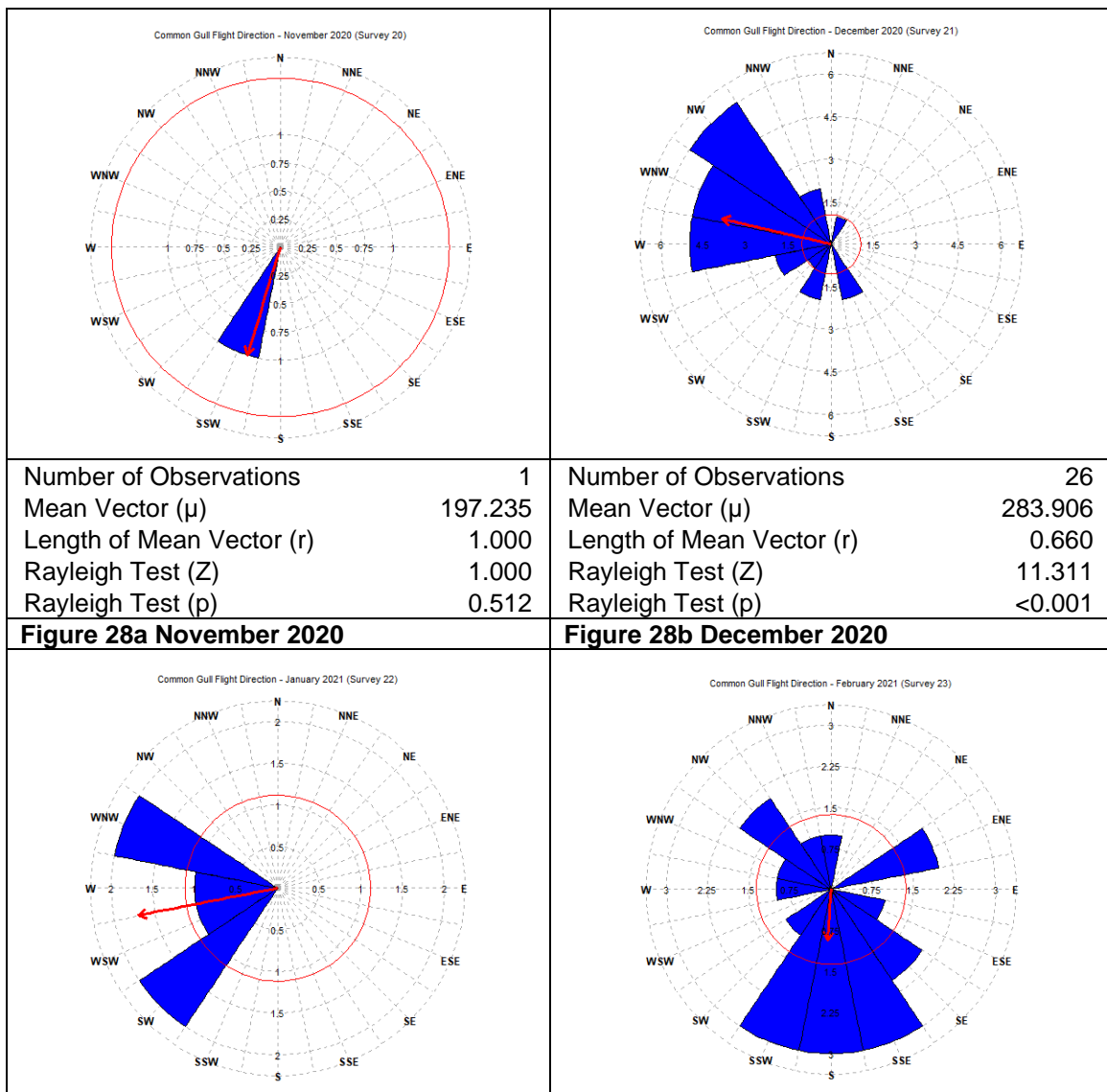


Figure 27 Flight heights of common gulls (n=30) recorded in the Rampion 2 Survey Area



Number of Observations	6	Number of Observations	21
Mean Vector (μ)	259.869	Mean Vector (μ)	184.283
Length of Mean Vector (r)	0.855	Length of Mean Vector (r)	0.312
Rayleigh Test (Z)	4.382	Rayleigh Test (Z)	2.041
Rayleigh Test (p)	0.006	Rayleigh Test (p)	0.130
Figure 28c January 2021		Figure 28d February 2021	

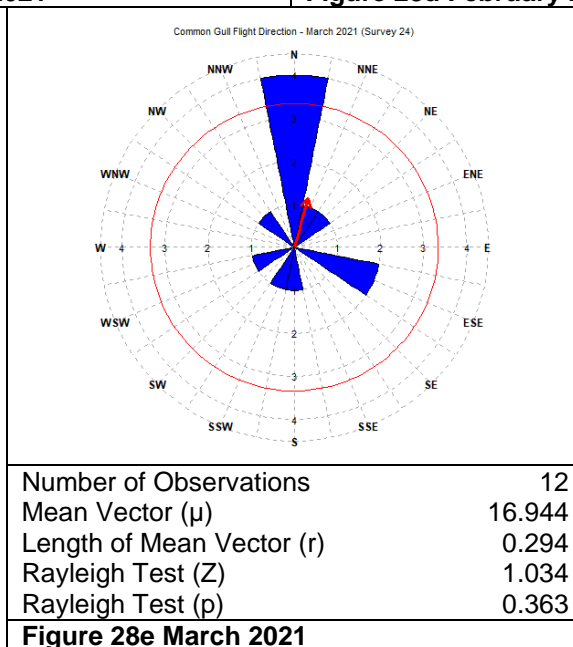


Figure 28 Summary of flight direction of common gulls during the survey period

4.13 Small Gull species – Unidentified Laridae

Unidentified small gull species were recorded in April, June, July, August, and December 2020, as well January to March 2021, with a peak raw count of 24 in January 2021 resulting in an abundance estimate of 207 for the Rampion 2 Survey Area (**Table 17**).

In the Rampion 1 OWF unidentified small gull species were recorded in December 2020 only with a raw peak count of two, resulting in an abundance estimate of 17 for the Rampion 1 OWF (**Table 17**).

Unidentified small gulls were loosely distributed in low numbers for the majority of surveys (**Appendix II: Figure 49, 50, 51, 52, 53, & 56**), with January and February recording higher numbers and densities. For January, the majority of small gulls were recorded in the west of the Rampion 2 Survey Area in distinct groups of varying density, with one small gull located in the southeast (**Figure 29**). For February, the majority of small gulls were located in the south of the Rampion 2 Survey Area, again with varying group densities, with additional gulls also grouped in the northwest (**Appendix II: Figure 55**).

In June, a single unidentified small gull was recorded flying in a northeasterly direction (**Figure 30a**).

In December, a single unidentified small gull was recorded flying in a northwesterly direction (**Figure 30b**).

In February, a single unidentified small gull was recorded flying in an easterly direction (**Figure 30c**).

In March, a single unidentified small gull was recorded flying in an easterly direction (**Figure 30d**).

Table 17 Raw counts and abundance and density estimates (No. estimated individuals per km²) of small gull species in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	2	20	2	49	0.71	0.02
Jun-20	2	19	2	59	0.71	0.02
Jul-20	1	10	1	29	1.00	0.01
Aug-20	1	10	1	29	1.00	0.01
Dec-20	4	34	4	85	0.50	0.04
Jan-21	24	207	26	491	0.20	0.22
Feb-21	20	170	60	315	0.22	0.18
Mar-21	3	26	3	60	0.58	0.03
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Dec-20	2	17	2	50	0.71	0.22

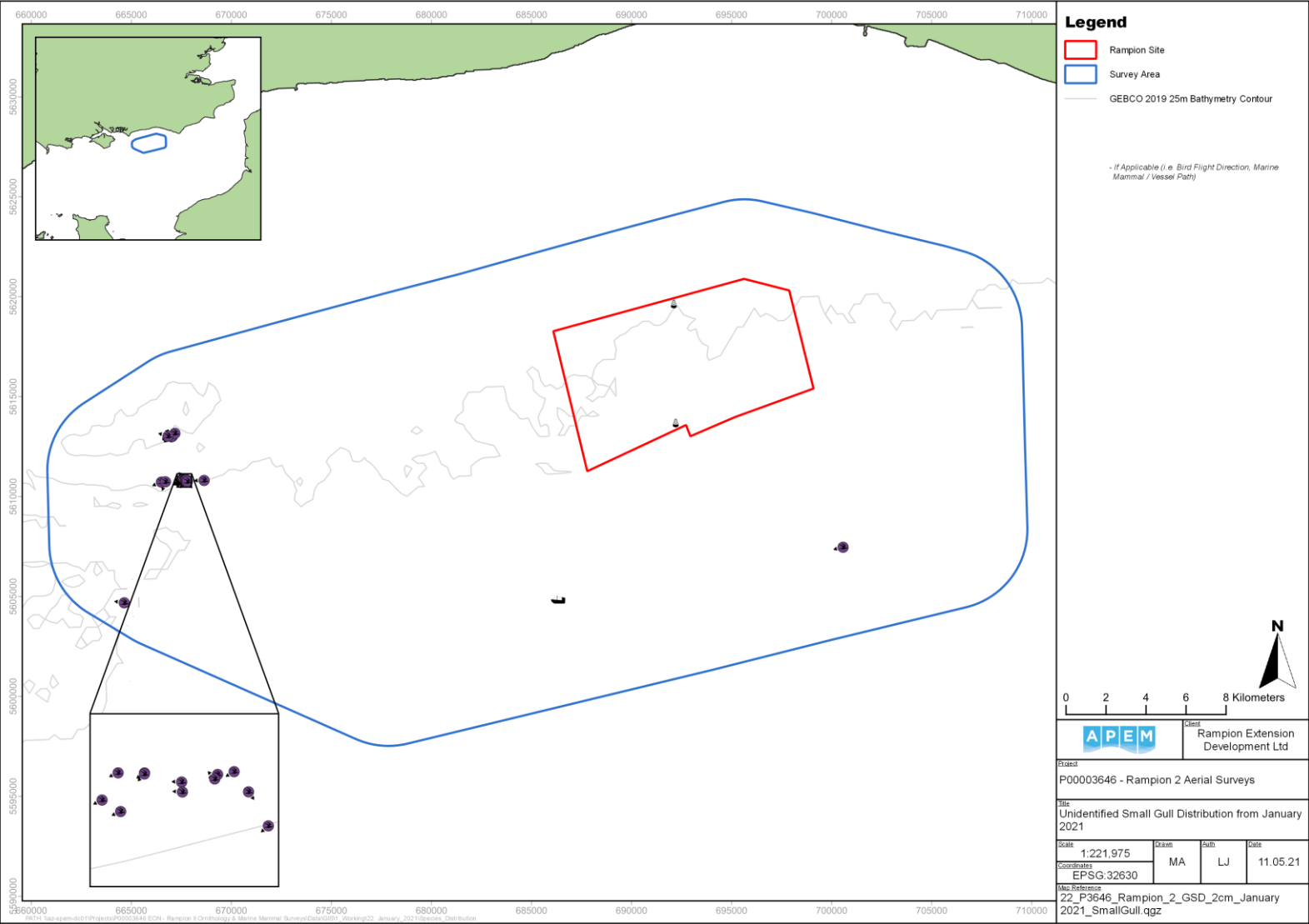


Figure 29 Distribution of unidentified small gulls recorded in the Rampion 2 Survey Area from January 2021



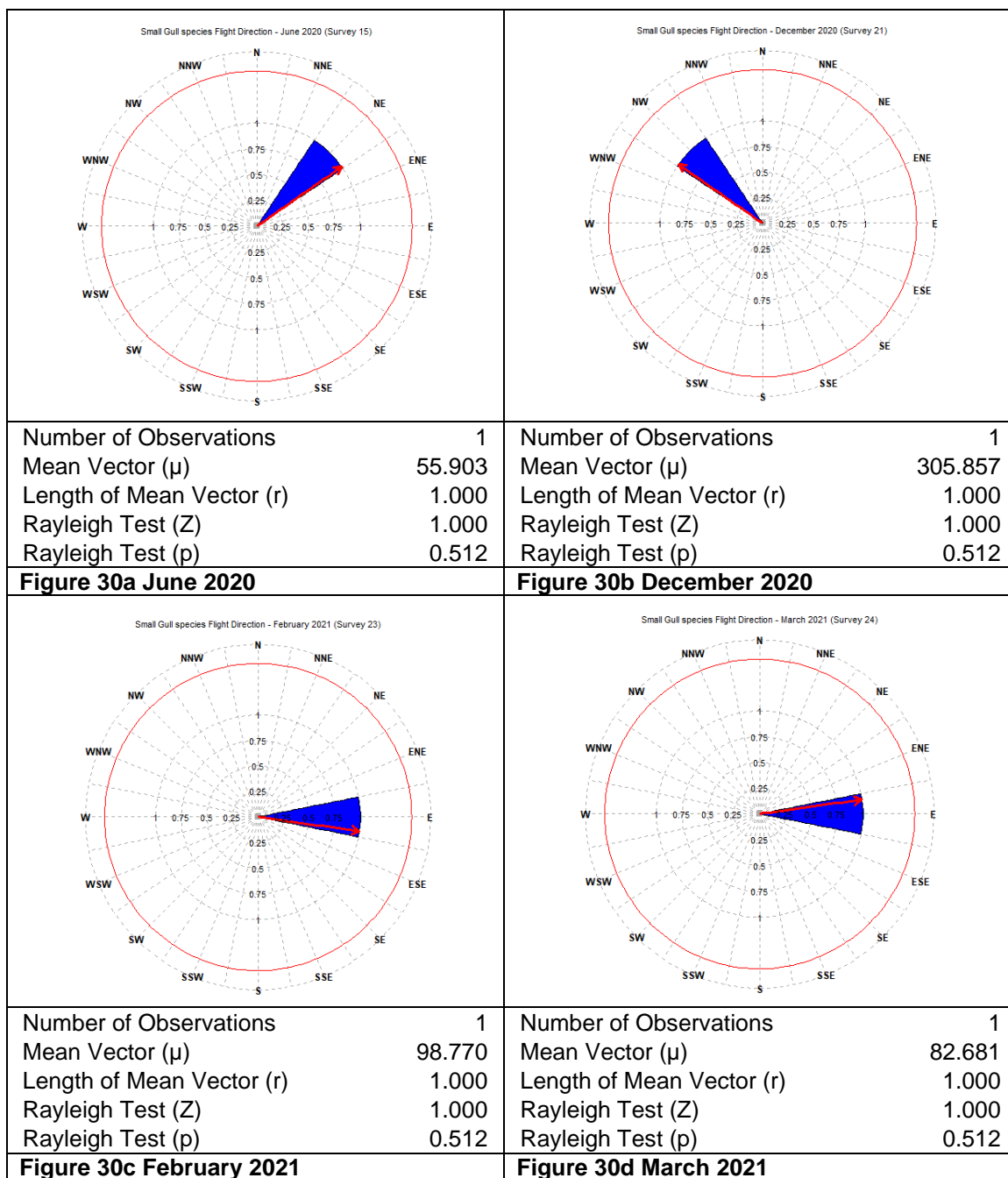


Figure 30 Summary of flight direction of unidentified small gulls during the survey period

4.14 Great Black-backed Gull *Larus marinus*

Great black-backed gulls were recorded in April and July to December 2020, as well as January to March 2021 with a peak raw count of 90 in January 2021 resulting in an abundance estimate of 775 for the Rampion 2 Survey Area (**Table 18**).

In the Rampion 1 OWF great black-backed gulls were recorded in April and July to December 2020, as well as January to March 2021, with a peak raw count of 16 in September 2020 resulting in an abundance estimate of 159 for the Rampion 1 OWF (**Table 18**).

Great black-backed gulls were predominantly loosely distributed across the Rampion 2 Survey Area (**Appendix II: Figure 57, 58, 59, 61, 62, & 63**). For September, the majority of great black-backed gulls were located in the east of the Rampion 2 Survey Area and across the Rampion 1 OWF (**Appendix II: Figure 60**). The greatest area of density recorded occurred in January, with a large number of great black-backed gulls concentrated in the south of the Rampion 2 Survey Area (**Figure 31**). February and March also featured highest densities in the south of the Rampion 2 Survey Area, though occurring in comparatively fewer numbers (**Appendix II: Figure 65 & 66**).

In March, July, September, and December 2020, and January to March 2021; three, two, one, three, eight, one, and four flying great black-backed gulls were deemed suitable for flight height determination respectively, resulting in a median altitude of 36 m relative to MSL (**Figure 32**).

In April, there was no significant predominant direction of flight (Raleigh test, $p=0.922$, **Figure 33a**).

In July, there was no significant predominant direction of flight (Raleigh test, $p=0.926$, **Figure 33b**).

In August, there was no significant predominant direction of flight (Raleigh test, $p=0.330$, **Figure 33c**).

In September, there was no significant predominant direction of flight (Raleigh test, $p=0.100$, **Figure 33d**).

In November, a single great black-backed gull was recorded flying in an east-southeasterly direction (**Figure 33e**).

In December, there was no significant predominant direction of flight (Raleigh test, $p=0.248$, **Figure 33f**).

In January, there was a significant predominant direction of flight around a mean of 262° to the west (Raleigh test, $p=0.008$, **Figure 33g**).

In February, there was a significant predominant direction of flight around a mean of 317° to the northwest (Raleigh test, $p=0.011$, **Figure 33h**).

In March, there was no significant predominant direction of flight (Raleigh test, $p=0.624$, **Figure 33i**).

Table 18 Raw counts and abundance and density estimates (No. estimated individuals per km²) of great black-backed gulls in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	8	79	20	148	0.35	0.08
Jul-20	11	108	39	205	0.30	0.11
Aug-20	16	157	68	254	0.25	0.16
Sep-20	35	342	166	548	0.17	0.36
Oct-20	3	29	3	68	0.58	0.03
Nov-20	2	20	2	49	0.71	0.02
Dec-20	25	213	102	350	0.20	0.22
Jan-21	90	775	215	1799	0.11	0.81
Feb-21	33	281	85	561	0.17	0.29
Mar-21	29	247	68	553	0.19	0.26
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	1	10	1	29	1.00	0.13
Jul-20	3	29	3	87	0.58	0.37
Aug-20	6	58	10	135	0.41	0.74
Sep-20	16	159	50	288	0.25	2.04
Oct-20	2	19	2	48	0.71	0.24
Nov-20	1	10	1	29	1.00	0.13
Dec-20	8	67	8	176	0.35	0.86
Jan-21	2	17	2	42	0.71	0.22
Feb-21	9	74	9	172	0.33	0.95

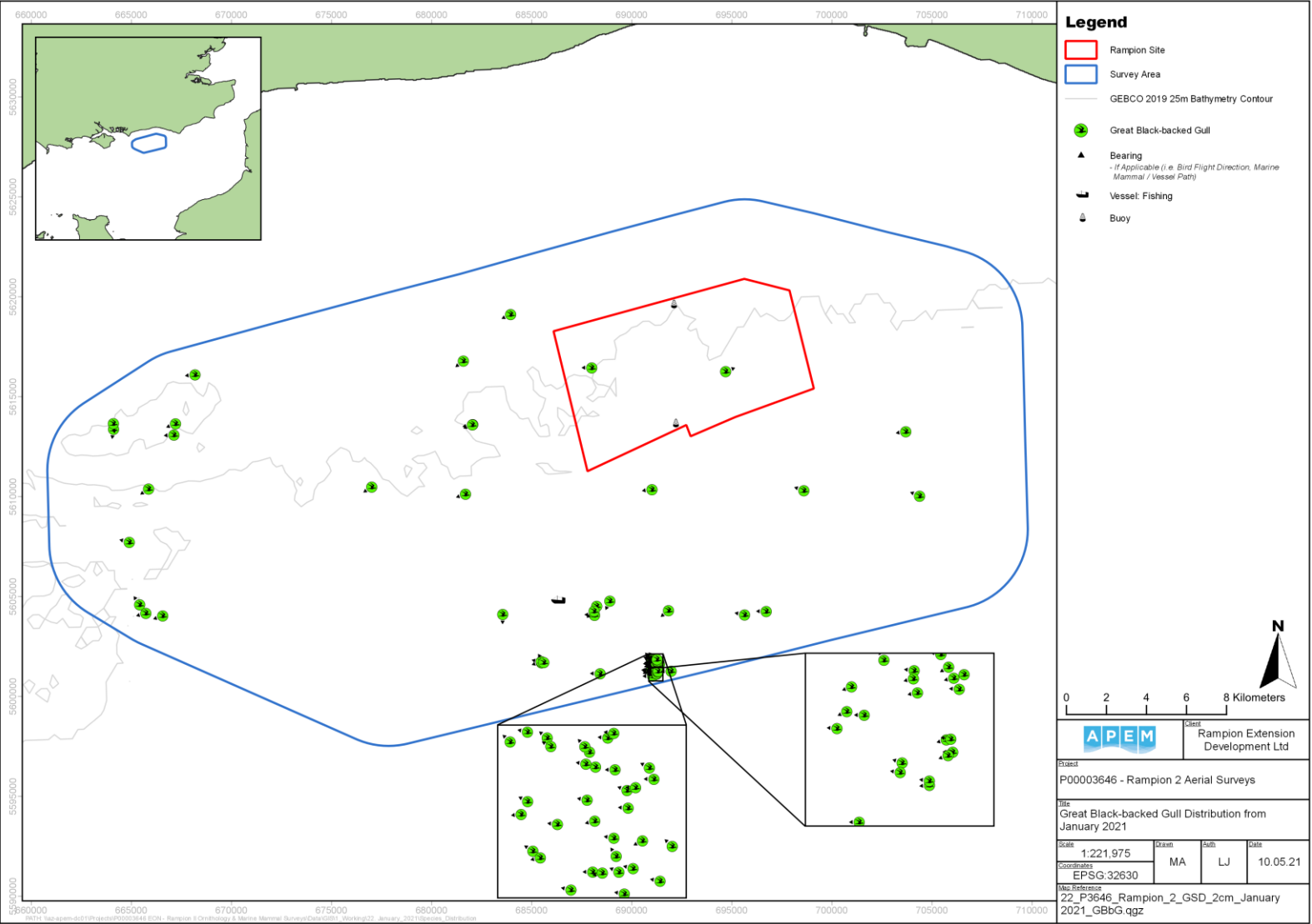
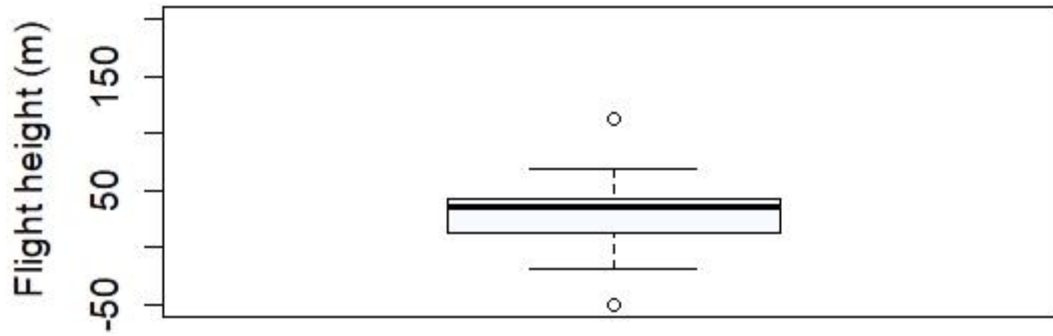


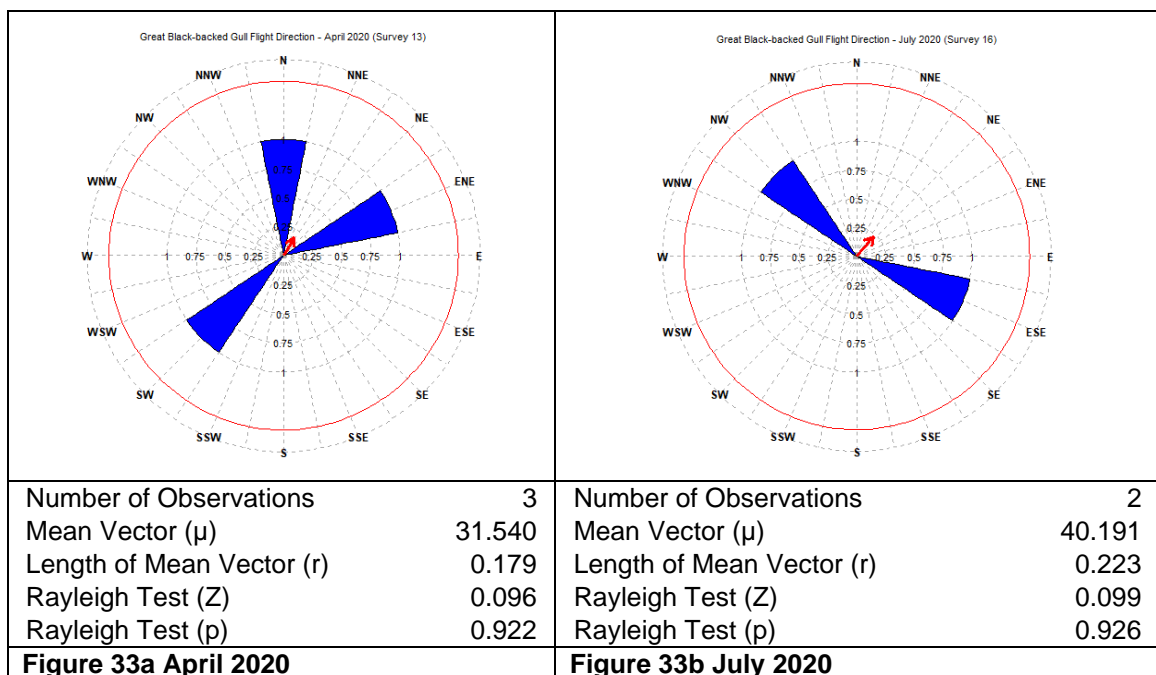
Figure 31 Distribution of great black-backed gulls recorded in the Rampion 2 Survey Area from January 2021

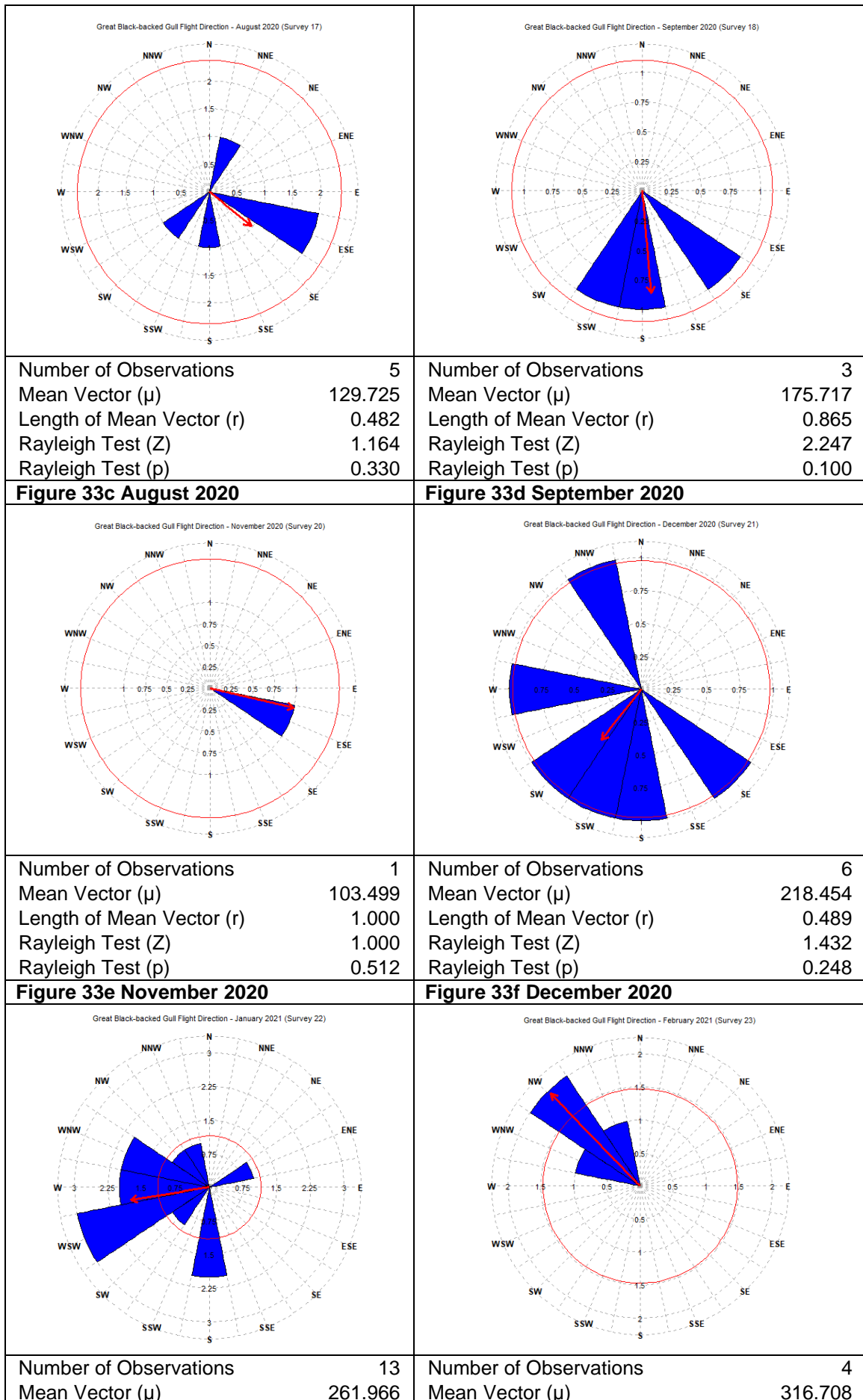




Great Black-backed Gull (n=35)

Figure 32 Flight heights of great black-backed gulls (n=35) recorded in the Rampion 2 Survey Area





Length of Mean Vector (r)	0.591	Length of Mean Vector (r)	0.972
Rayleigh Test (Z)	4.542	Rayleigh Test (Z)	3.778
Rayleigh Test (p)	0.008	Rayleigh Test (p)	0.011
Figure 33g January 2021		Figure 33h February 2021	

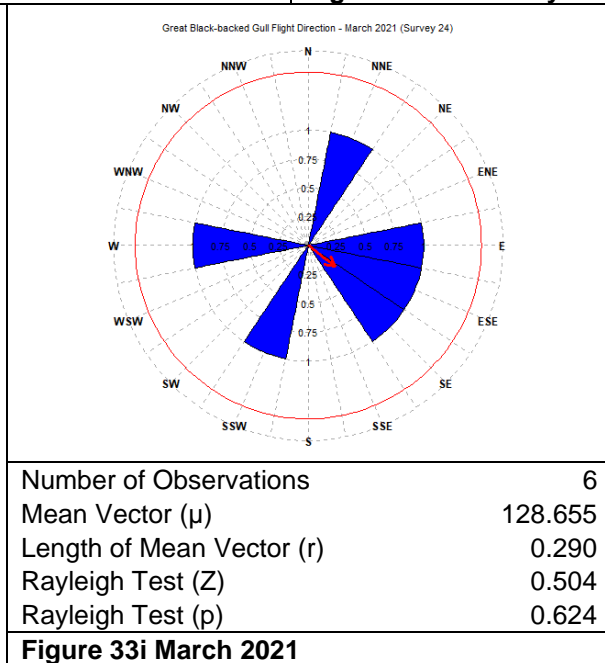


Figure 33 Summary of flight direction of great black-backed gulls during the survey period

4.15 Herring Gull *Larus argentatus*

Herring gulls were recorded in every month of the survey period from April 2020 to March 2021, with a peak raw count of 263 in May 20 resulting in an abundance estimate of 2,651 for the Rampion 2 Survey Area (**Table 19**).

In the Rampion 1 OWF, herring gulls were recorded May to August, October, and December 2020, as well as January and February 2021, with a peak raw count of 221 in May 2020 resulting in an abundance estimate of 2,830 for the Rampion 1 OWF (**Table 19**).

For April, herring gulls were distributed in the northeast of the Rampion 2 Survey Area only, with no records within the Rampion 1 OWF (**Appendix II: Figure 67**). May exhibited the largest concentration of herring gulls during the survey period, with the vast majority of herring gulls located in the north of the Rampion 1 OWF (**Figure 34**). June featured a high concentration of herring gulls just south of and oriented towards the Rampion 1 OWF (**Appendix II: Figure 69**), whilst December, January, and February featured highest densities in the west, west and south, and south of the Rampion 2 Survey Area respectively (**Appendix II: Figure 75, 76, & 77**). The remaining surveys showed comparatively looser distribution across the Rampion 2 Survey Area (**Appendix II: Figure 70, 71, 72, 73, 74, & 78**).

In March, May to October, December 2020, and January to March 2021; four, eleven, five, 24, seven, one, one, 21, 11, 11, and 11 flying herring gulls were deemed suitable for flight height determination respectively, resulting in a median altitude of 18 m relative to MSL (**Figure 35**).

In April, there was a significant predominant direction of flight around a mean of 72° to the east-northeast (Raleigh test, $p=0.017$, **Figure 36a**).

In May, there was a significant predominant direction of flight around a mean of 89° to the east (Raleigh test, $p<0.001$, **Figure 36b**).

In June, there was a significant predominant direction of flight around a mean of 76° to the east-northeast (Raleigh test, $p=0.017$, **Figure 36c**).

In July, there was a significant predominant direction of flight around a mean of 239° to the west-southwest (Raleigh test, $p<0.001$, **Figure 36d**).

In August, there was a significant predominant direction of flight around a mean of 197° to the south-southwest (Raleigh test, $p<0.001$, **Figure 36e**).

In September, there was no significant predominant direction of flight (Raleigh test, $p=0.385$, **Figure 36f**).

In October, there was no significant predominant direction of flight (Raleigh test, $p=0.660$, **Figure 36g**).

In November, a single herring gull was recorded flying in an east-southeasterly direction (**Figure 36h**).

In December, there was a significant predominant direction of flight around a mean of 38° to the northeast (Raleigh test, $p<0.001$, **Figure 36i**).

In January, there was a significant predominant direction of flight around a mean of 258° to the west-southwest (Raleigh test, $p=0.026$, **Figure 36j**).

In February, there was no significant predominant direction of flight (Raleigh test, $p=0.131$, **Figure 36k**).

In March, there was a significant predominant direction of flight around a mean of 215° to the southwest (Raleigh test, $p<0.001$, **Figure 36l**).

Table 19 Raw counts and abundance and density estimates (No. estimated individuals per km^2) of herring gulls in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	9	89	20	177	0.33	0.09
May-20	263	2651	575	6229	0.06	2.78
Jun-20	77	751	205	1687	0.11	0.79
Jul-20	48	469	264	714	0.14	0.49
Aug-20	18	176	59	342	0.24	0.18
Sep-20	2	20	2	49	0.71	0.02
Oct-20	3	29	3	59	0.58	0.03
Nov-20	1	10	1	30	1.00	0.01
Dec-20	169	1442	520	2585	0.08	1.51
Jan-21	69	594	284	1007	0.12	0.62
Feb-21	72	612	323	995	0.12	0.64
Mar-21	62	527	272	834	0.13	0.55
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	221	2830	397	6493	0.07	36.34
Jun-20	18	172	19	402	0.24	2.21
Jul-20	6	58	10	116	0.41	0.74
Aug-20	2	19	2	48	0.71	0.24
Oct-20	2	19	2	48	0.71	0.24
Dec-20	12	101	17	226	0.29	1.30
Jan-21	7	58	17	117	0.38	0.74
Feb-21	15	123	33	254	0.26	1.58
Mar-21	2	16	2	41	0.71	0.21

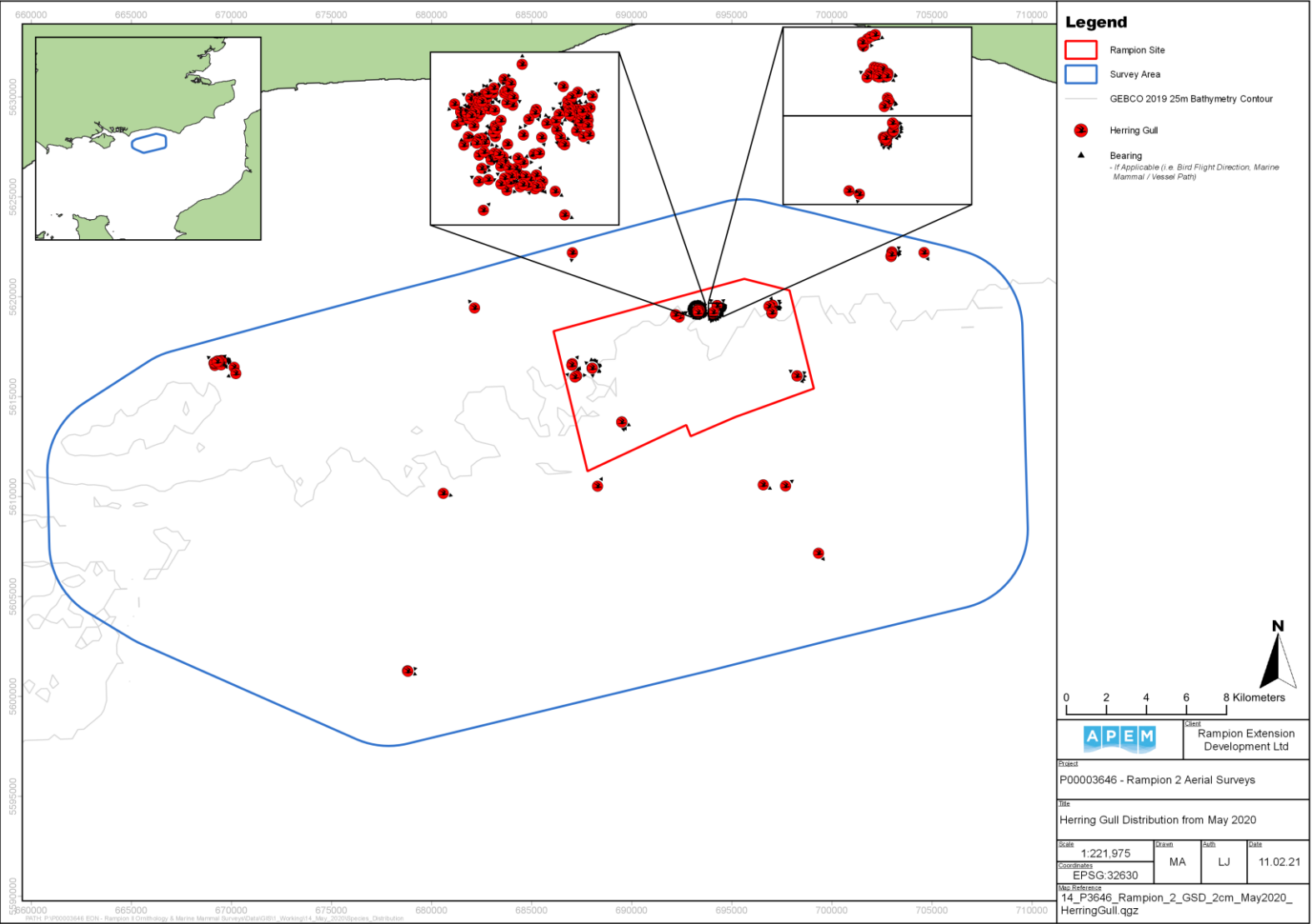
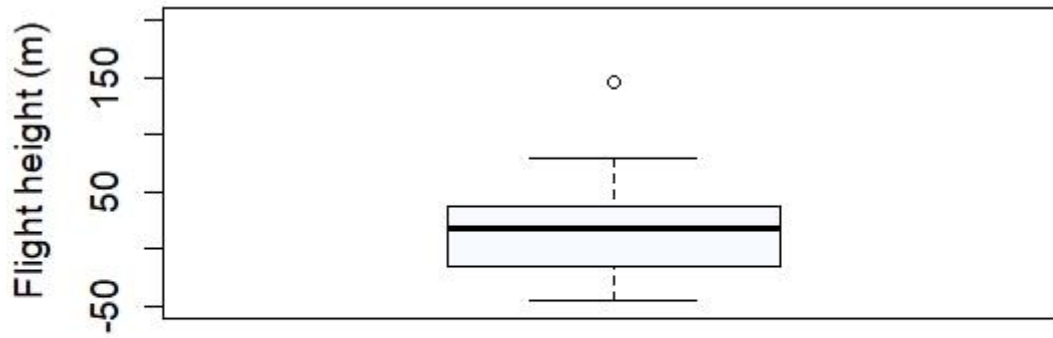


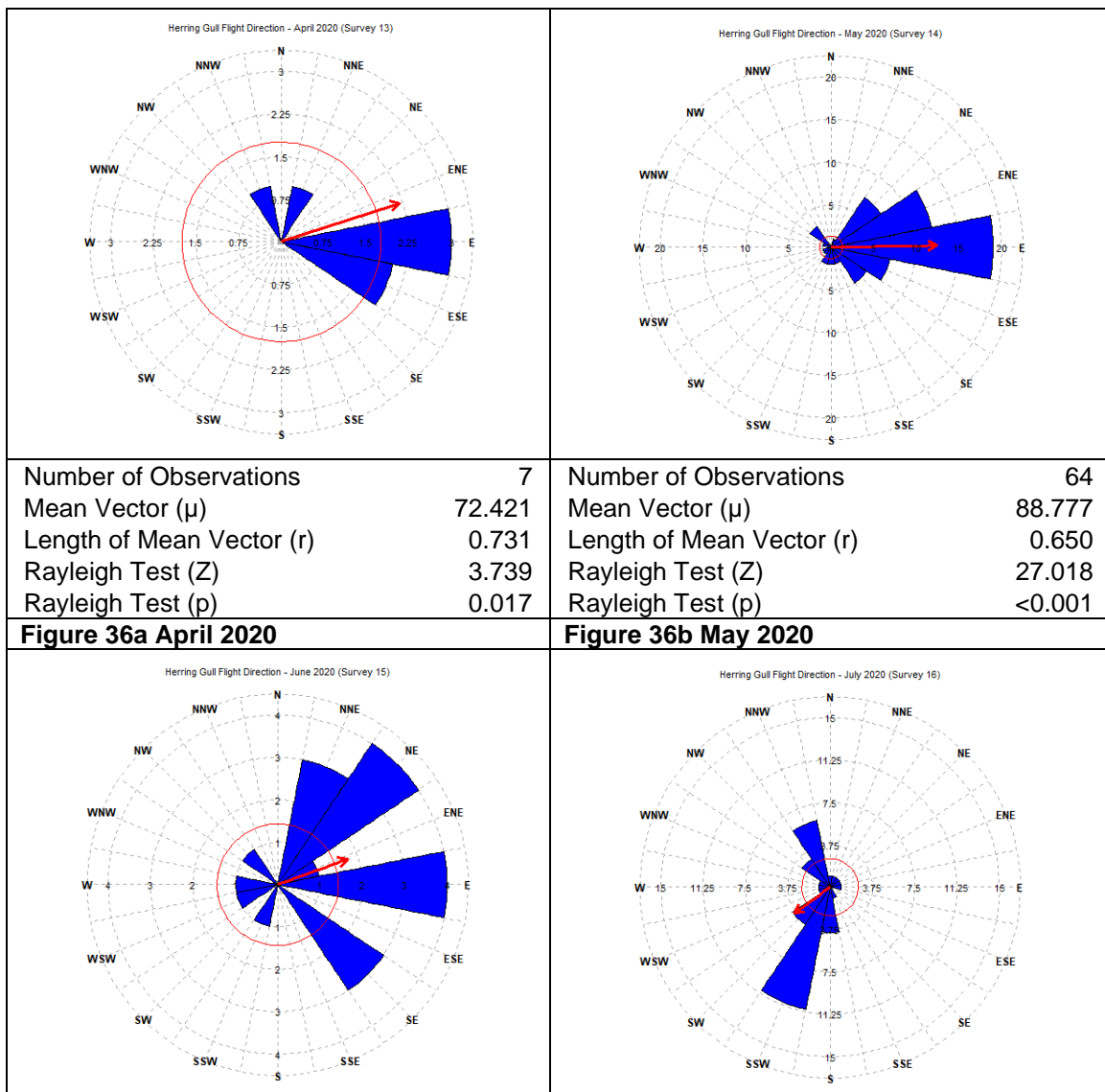
Figure 34 Distribution of herring gulls recorded in the Rampion 2 Survey Area from May 2020





Herring Gull (n=107)

Figure 35 Flight heights of herring gulls (n=107) recorded in the Rampion 2 Survey Area



Number of Observations	20	Number of Observations	42
Mean Vector (μ)	76.026	Mean Vector (μ)	239.440
Length of Mean Vector (r)	0.446	Length of Mean Vector (r)	0.416
Rayleigh Test (Z)	3.983	Rayleigh Test (Z)	7.260
Rayleigh Test (p)	0.017	Rayleigh Test (p)	<0.001
Figure 36c June 2020		Figure 36d July 2020	
Number of Observations	15	Number of Observations	2
Mean Vector (μ)	197.229	Mean Vector (μ)	90.833
Length of Mean Vector (r)	0.726	Length of Mean Vector (r)	0.744
Rayleigh Test (Z)	7.908	Rayleigh Test (Z)	1.107
Rayleigh Test (p)	<0.001	Rayleigh Test (p)	0.385
Figure 36e August 2020		Figure 36f September 2020	
Number of Observations	2	Number of Observations	1
Mean Vector (μ)	353.066	Mean Vector (μ)	116.613
Length of Mean Vector (r)	0.508	Length of Mean Vector (r)	1.000
Rayleigh Test (Z)	0.517	Rayleigh Test (Z)	1.000
Rayleigh Test (p)	0.660	Rayleigh Test (p)	0.512
Figure 36g October 2020		Figure 36h November 2020	

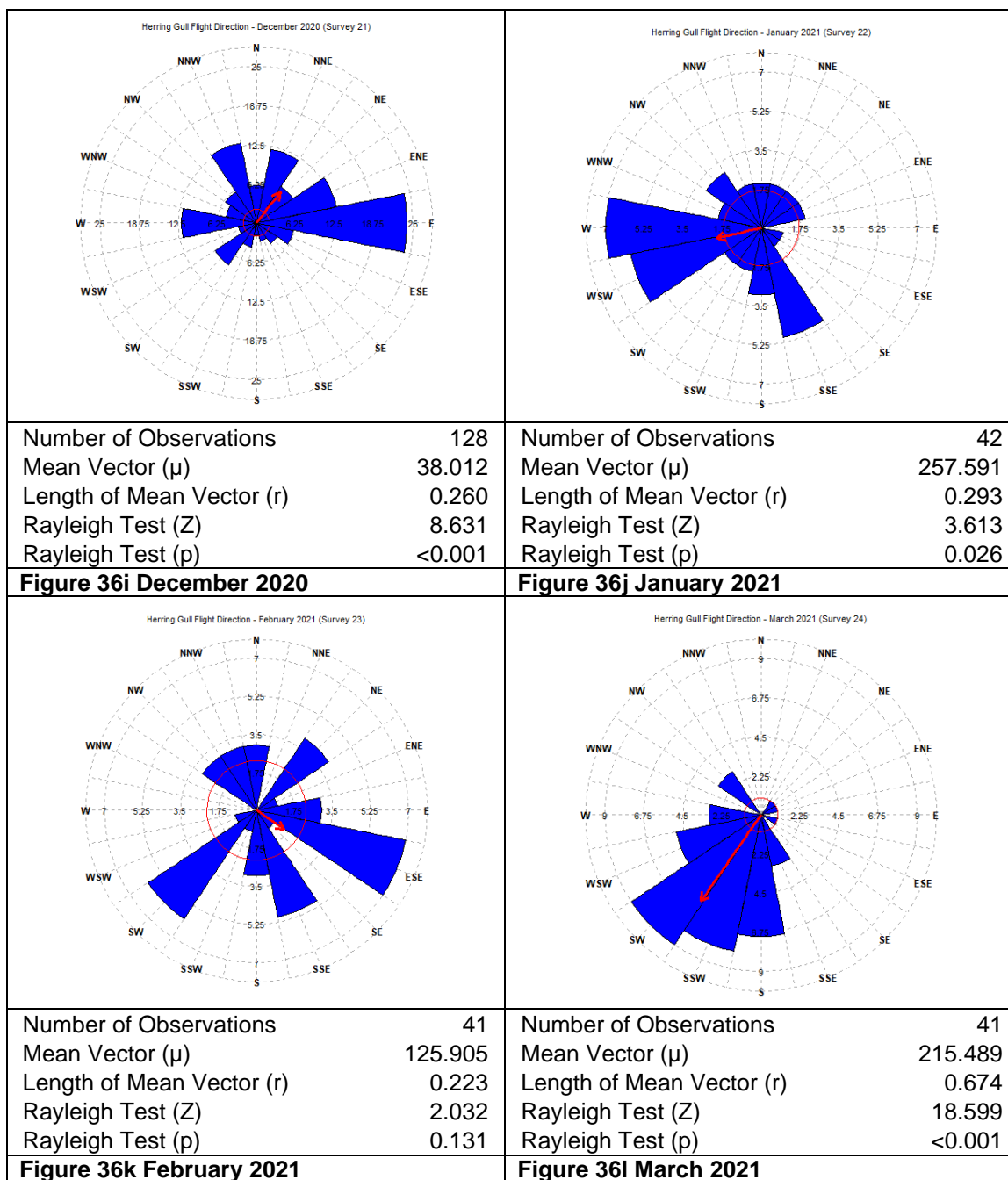


Figure 36 Summary of flight direction of herring gulls during the survey period

4.16 Lesser Black-backed Gull *Larus fuscus*

Lesser black-backed gulls were recorded from April to September 2020, as well as January to March 2021, with a peak raw count of 13 in May 2020 resulting in an abundance estimate of 131 for the Rampion 2 Survey Area (**Table 20**).

In the Rampion 1 OWF lesser black-backed gulls were recorded in April, June, and August 2020, as well as February 2021, with a peak raw count of three in February 2021 resulting in an abundance estimate of 25 for the Rampion 1 OWF (**Table 20**).

Lesser black-backed gull distribution was loose across the Rampion 2 Survey Area, with no discernible pattern evident, owing to the relatively low numbers recorded (**Appendix II: Figure 79, 81, 82, 83, 84, 85, 86, & 87**). The May survey, however, did feature a localised concentration of lesser black-backed gulls in the northwest of the Rampion 2 Survey Area (**Figure 37**).

In March, May, August, and September 2020, and January and March 2021; four, one, two, one, one, and one flying lesser black-backed gulls were deemed suitable for flight height determination respectively, resulting in a median altitude of 19 m relative to MSL (**Figure 38**).

In April, there was a significant predominant direction of flight around a mean of 48° to the northeast (Raleigh test, $p=0.031$, **Figure 39a**).

In May, there was a significant predominant direction of flight around a mean of 74° to the east-northeast (Raleigh test, $p<0.001$, **Figure 39b**).

In June, there was no significant predominant direction of flight (Raleigh test, $p=0.474$, **Figure 39c**).

In August, there was no significant predominant direction of flight (Raleigh test, $p=0.849$, **Figure 39d**).

In September, a single lesser black-backed gull was recorded flying in an easterly direction (**Figure 39e**).

In January, a single lesser black-backed gull was recorded flying in an east-northeasterly direction (**Figure 39f**).

In February, there was a significant predominant direction of flight around a mean of 170° to the south (Raleigh test, $p=0.029$, **Figure 39g**).

In March, a single lesser black-backed gull was recorded flying in a north-westerly direction (**Figure 39h**).

Table 20 Raw counts and abundance and density estimates (No. estimated individuals per km²) of lesser black-backed gulls in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density

Apr-20	6	59	20	108	0.41	0.06
May-20	13	131	13	373	0.28	0.14
Jun-20	2	19	2	49	0.71	0.02
Jul-20	1	10	1	29	1.00	0.01
Aug-20	3	29	3	68	0.58	0.03
Sep-20	2	20	2	49	0.71	0.02
Jan-21	1	9	1	26	1.00	0.01
Feb-21	5	43	9	94	0.45	0.05
Mar-21	2	17	2	43	0.71	0.02
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	1	10	1	29	1.00	0.13
Jun-20	1	10	1	29	1.00	0.13
Aug-20	1	10	1	29	1.00	0.13
Feb-21	3	25	3	66	0.58	0.32

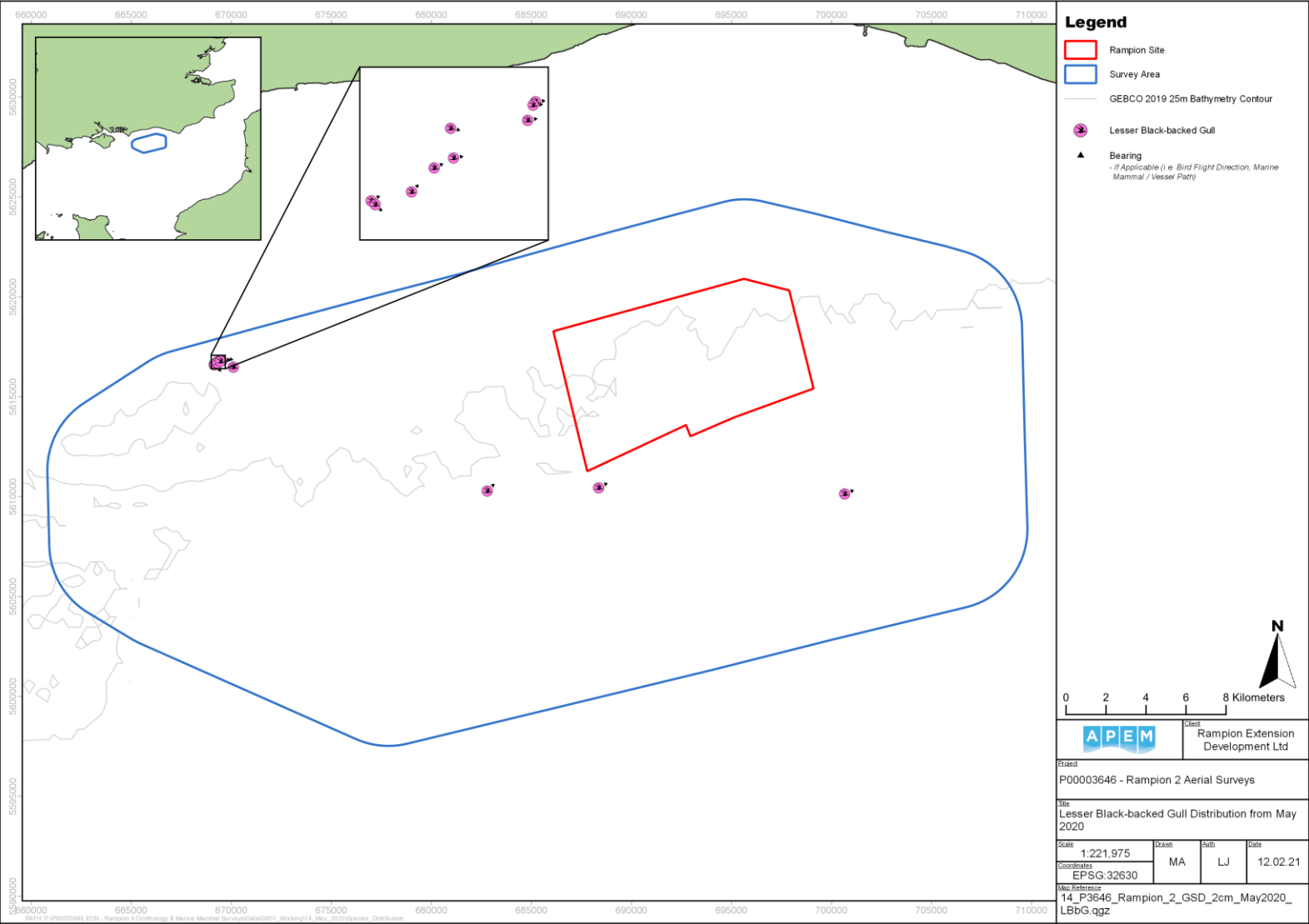
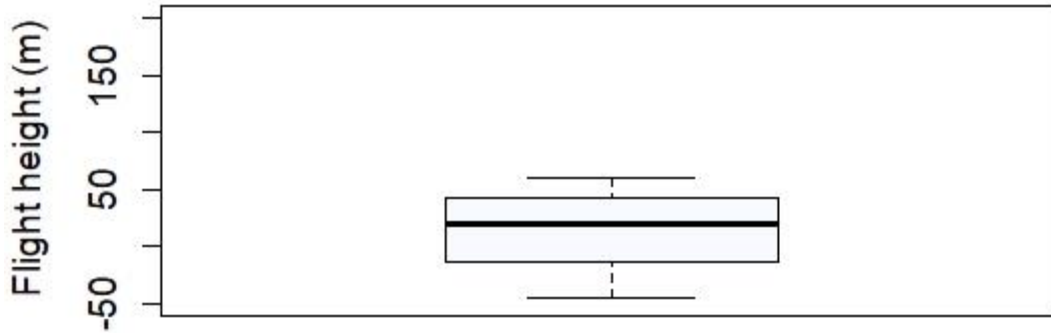


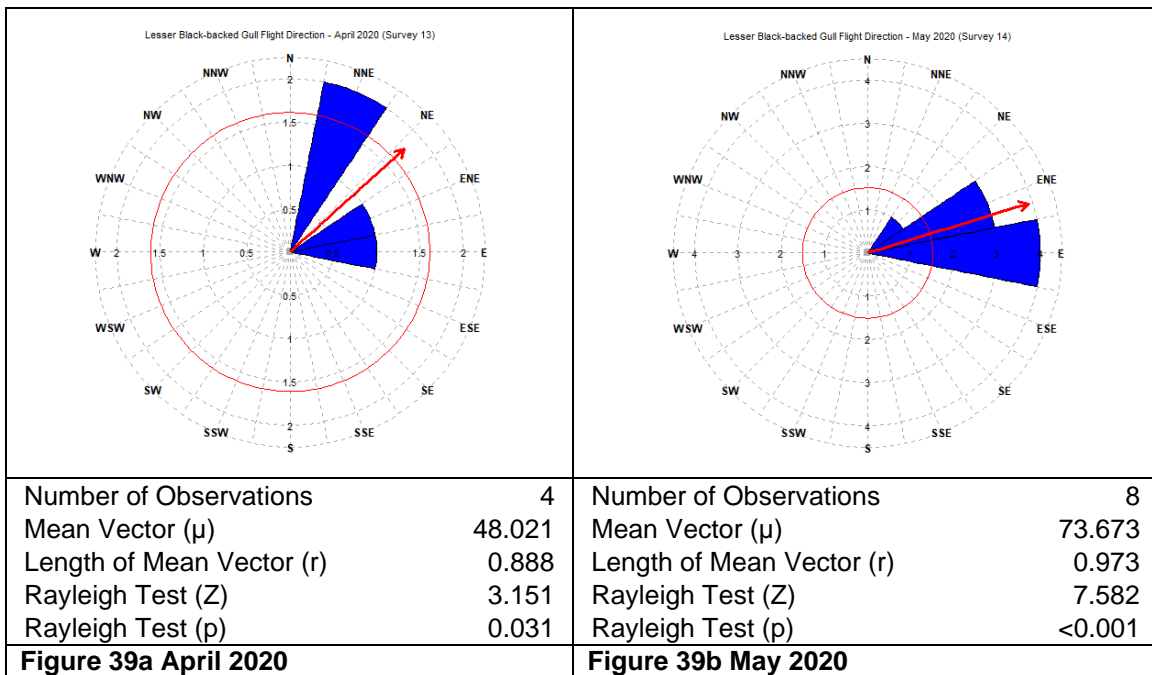
Figure 37 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area from May 2020





Lesser Black-backed Gull (n=17)

Figure 38 Flight heights of lesser black-backed gulls (n=17) recorded in the Rampion 2 Survey Area



<p>Lesser Black-backed Gull Flight Direction - June 2020 (Survey 15)</p>	<p>Lesser Black-backed Gull Flight Direction - August 2020 (Survey 17)</p>																				
<table border="0"> <tr> <td>Number of Observations</td> <td style="text-align: right;">2</td> </tr> <tr> <td>Mean Vector (μ)</td> <td style="text-align: right;">163.230</td> </tr> <tr> <td>Length of Mean Vector (r)</td> <td style="text-align: right;">0.667</td> </tr> <tr> <td>Rayleigh Test (Z)</td> <td style="text-align: right;">0.889</td> </tr> <tr> <td>Rayleigh Test (p)</td> <td style="text-align: right;">0.474</td> </tr> </table>	Number of Observations	2	Mean Vector (μ)	163.230	Length of Mean Vector (r)	0.667	Rayleigh Test (Z)	0.889	Rayleigh Test (p)	0.474	<table border="0"> <tr> <td>Number of Observations</td> <td style="text-align: right;">2</td> </tr> <tr> <td>Mean Vector (μ)</td> <td style="text-align: right;">270.321</td> </tr> <tr> <td>Length of Mean Vector (r)</td> <td style="text-align: right;">0.324</td> </tr> <tr> <td>Rayleigh Test (Z)</td> <td style="text-align: right;">0.209</td> </tr> <tr> <td>Rayleigh Test (p)</td> <td style="text-align: right;">0.849</td> </tr> </table>	Number of Observations	2	Mean Vector (μ)	270.321	Length of Mean Vector (r)	0.324	Rayleigh Test (Z)	0.209	Rayleigh Test (p)	0.849
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<p>Figure 39c June 2020</p>	<p>Figure 39d August 2020</p>																				
<p>Lesser Black-backed Gull Flight Direction - September 2020 (Survey 18)</p>	<p>Lesser Black-backed Gull Flight Direction - January 2021 (Survey 22)</p>																				
<table border="0"> <tr> <td>Number of Observations</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Mean Vector (μ)</td> <td style="text-align: right;">99.986</td> </tr> <tr> <td>Length of Mean Vector (r)</td> <td style="text-align: right;">1.000</td> </tr> <tr> <td>Rayleigh Test (Z)</td> <td style="text-align: right;">1.000</td> </tr> <tr> <td>Rayleigh Test (p)</td> <td style="text-align: right;">0.512</td> </tr> </table>	Number of Observations	1	Mean Vector (μ)	99.986	Length of Mean Vector (r)	1.000	Rayleigh Test (Z)	1.000	Rayleigh Test (p)	0.512	<table border="0"> <tr> <td>Number of Observations</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Mean Vector (μ)</td> <td style="text-align: right;">72.600</td> </tr> <tr> <td>Length of Mean Vector (r)</td> <td style="text-align: right;">1.000</td> </tr> <tr> <td>Rayleigh Test (Z)</td> <td style="text-align: right;">1.000</td> </tr> <tr> <td>Rayleigh Test (p)</td> <td style="text-align: right;">0.512</td> </tr> </table>	Number of Observations	1	Mean Vector (μ)	72.600	Length of Mean Vector (r)	1.000	Rayleigh Test (Z)	1.000	Rayleigh Test (p)	0.512
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Length of Mean Vector (r)	1.000																				
Rayleigh Test (Z)	1.000																				
Rayleigh Test (p)	0.512																				
<p>Figure 39e September 2020</p>	<p>Figure 39f January 2021</p>																				
<p>Lesser Black-backed Gull Flight Direction - February 2021 (Survey 23)</p>	<p>Lesser Black-backed Gull Flight Direction - March 2021 (Survey 24)</p>																				
<table border="0"> <tr> <td>Number of Observations</td> <td style="text-align: right;">5</td> </tr> <tr> <td>Mean Vector (μ)</td> <td style="text-align: right;">169.550</td> </tr> </table>	Number of Observations	5	Mean Vector (μ)	169.550	<table border="0"> <tr> <td>Number of Observations</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Mean Vector (μ)</td> <td style="text-align: right;">322.283</td> </tr> </table>	Number of Observations	1	Mean Vector (μ)	322.283												
Number of Observations	5																				
Mean Vector (μ)	169.550																				
Number of Observations	1																				
Mean Vector (μ)	322.283																				

Length of Mean Vector (r)	0.806	Length of Mean Vector (r)	1.000
Rayleigh Test (Z)	3.252	Rayleigh Test (Z)	1.000
Rayleigh Test (p)	0.029	Rayleigh Test (p)	0.512
Figure 39g February 2021		Figure 39h March 2021	

Figure 39 Summary of flight direction of lesser black-backed gulls during the survey period

4.17 Black-backed Gull species – *Larus marinus / fuscus*

Unidentified black-backed gull species were recorded in May and November 2020, as well as January and March 2021, with a peak raw count of seven in May 2020 resulting in an abundance estimate of 71 for the Rampion 2 Survey Area (**Table 21**).

Unidentified black-backed gulls were located in the west of the Rampion 2 Survey Area for May and November (**Figure 40; Appendix II: Figure 89**), and in the south of the Rampion 2 Survey Area for January and March, with an additional gull located in the east of the Rampion 1 OWF for March (**Appendix II: Figure 90 & 91**).

In November, a single unidentified black-backed gull was recorded flying in a south-easterly direction (**Figure 41a**).

In March, there was no significant predominant direction of flight (Rayleigh test, $p=0.933$, **Figure 41b**).

Table 21 Raw counts and abundance and density estimates (No. estimated individuals per km²) of black-backed gull species in: a) Rampion 2 Survey Area; b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	7	71	7	212	0.38	0.07
Nov-20	1	10	1	30	1.00	0.01
Jan-21	3	26	3	77	0.58	0.03
Mar-21	3	26	3	60	0.58	0.03
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Mar-21	1	8	1	25	1	0.1

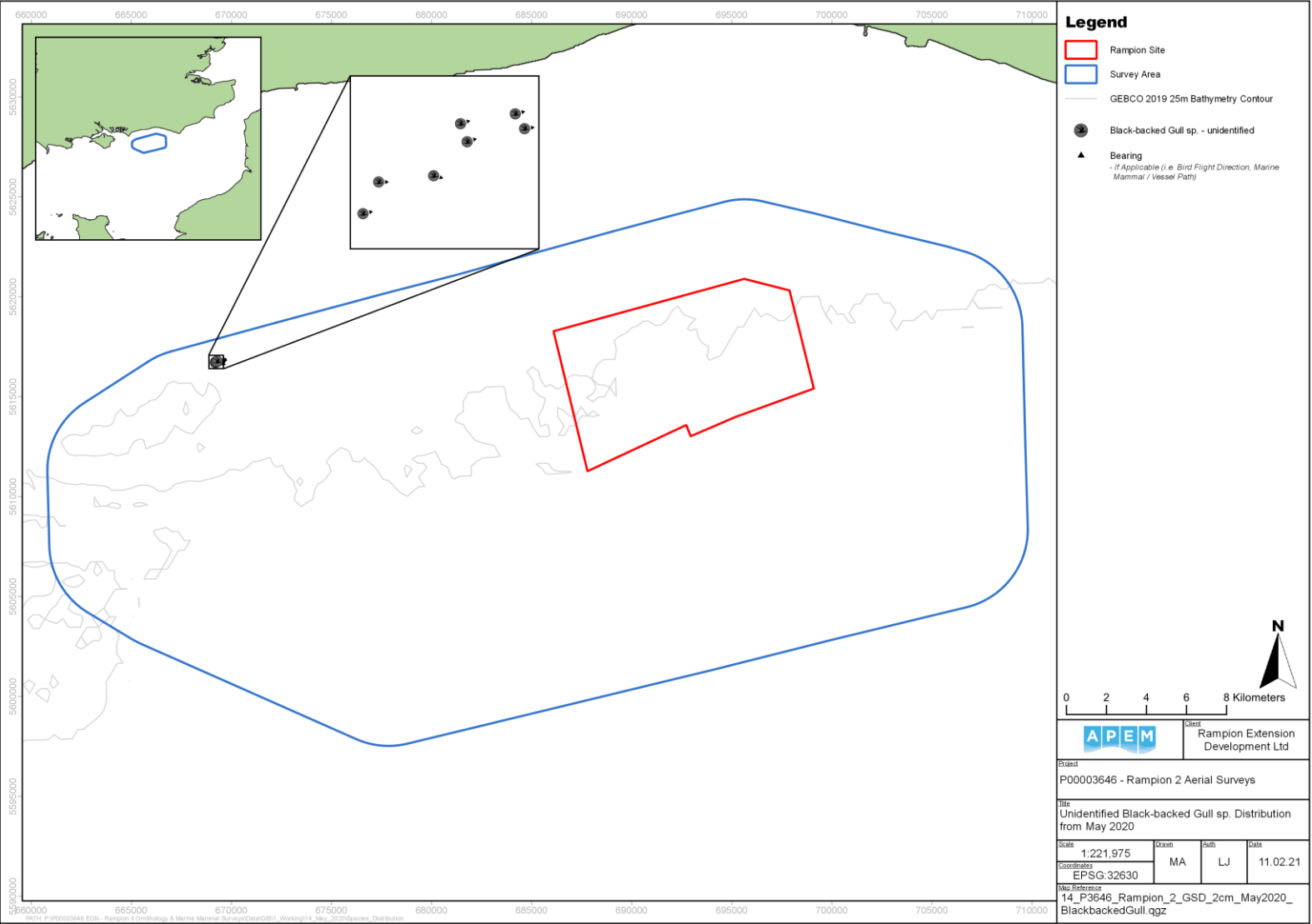


Figure 40 Distribution of unidentified black-backed gulls recorded in the Rampion 2 Survey Area from May 2020



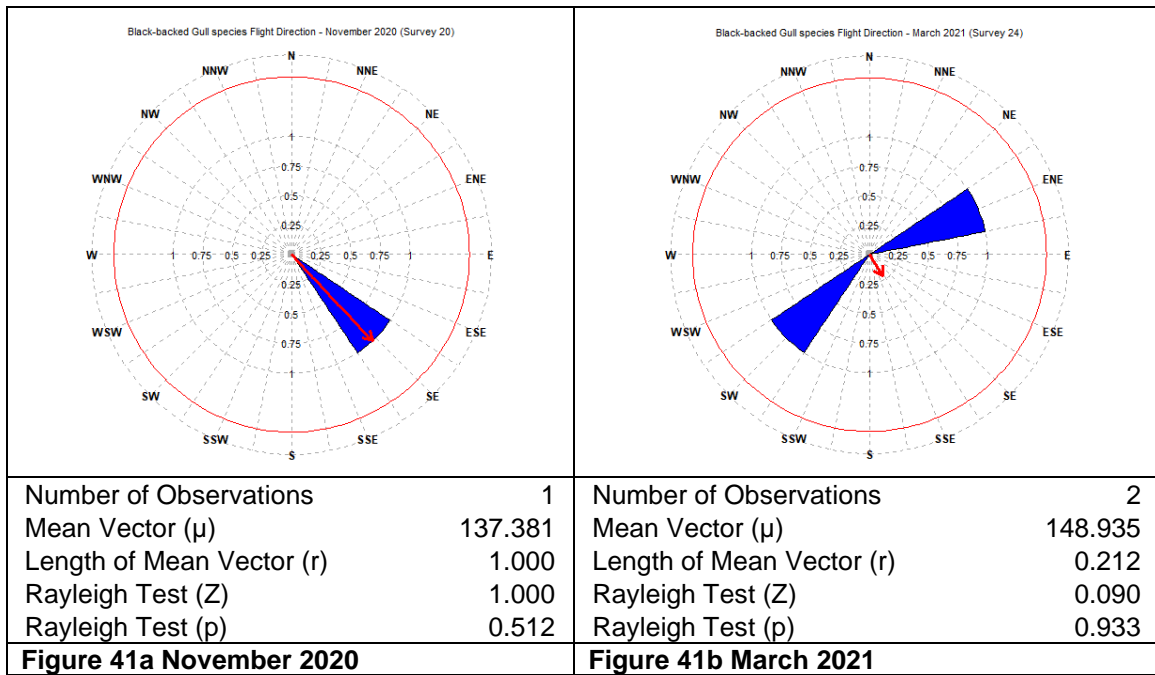


Figure 41 Summary of flight direction of unidentified black-backed gulls during the survey period

4.18 Large Gull species – Unidentified Laridae

Unidentified large gull species were recorded from April to September 2020 and from January to March 2021 with a peak raw count of 325 in May 2020, resulting in an abundance estimate of 3,276 for the Rampion 2 Survey Area (**Table 22**).

In the Rampion 1 OWF unidentified large gull species were recorded in May and June 2020, as well as January and February 2021, with a peak raw count of 216 in May 2020 resulting in an abundance estimate of 2,766 for the Rampion 1 OWF (**Table 22**).

Unidentified large gulls were loosely distributed across the Rampion 2 Survey Area for the majority of survey months (**Appendix II: Figure 92, 94, 95, 96, 97, & 99**). For the May survey, two major groups of unidentified large gull densities were apparent; one in the northwest of the Rampion 2 Survey Area, and one in the west of the Rampion 1 OWF, with additional smaller densities to the northeast of the Rampion 1 OWF (**Figure 42**). For the February survey, two small groups of large gulls were apparent; one in the north of the Rampion 2 Survey Area, and one in the central south of the Rampion 2 Survey Area, with additional loose distribution across the Rampion 2 Survey Area (**Appendix II: Figure 98**).

In May, there was no significant predominant direction of flight (Raleigh test, $p=0.449$, **Figure 43a**).

In June, there was no significant predominant direction of flight (Raleigh test, $p=0.226$, **Figure 43b**).

In September, a single unidentified large gull was recorded flying in a south-southeasterly direction (**Figure 43c**).

In February, there was no significant predominant direction of flight (Raleigh test, $p=0.235$, **Figure 43d**).

In March, there was no significant predominant direction of flight (Raleigh test, $p=0.806$, **Figure 43e**).

Table 22 Raw counts and abundance and density estimates (No. estimated individuals per km²) of large gull species in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	2	20	2	49	0.71	0.02
May-20	325	3276	325	7631	0.06	3.44
Jun-20	8	78	29	146	0.35	0.08
Jul-20	6	59	10	137	0.41	0.06
Sep-20	1	10	1	29	1.00	0.01
Jan-21	8	69	17	138	0.35	0.07
Feb-21	35	298	43	638	0.17	0.31
Mar-21	4	34	4	85	0.50	0.04

b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	216	2766	218	7364	0.07	35.52
Jun-20	2	19	2	48	0.71	0.24
Jan-21	2	17	2	42	0.71	0.22
Feb-21	5	41	5	98	0.45	0.53

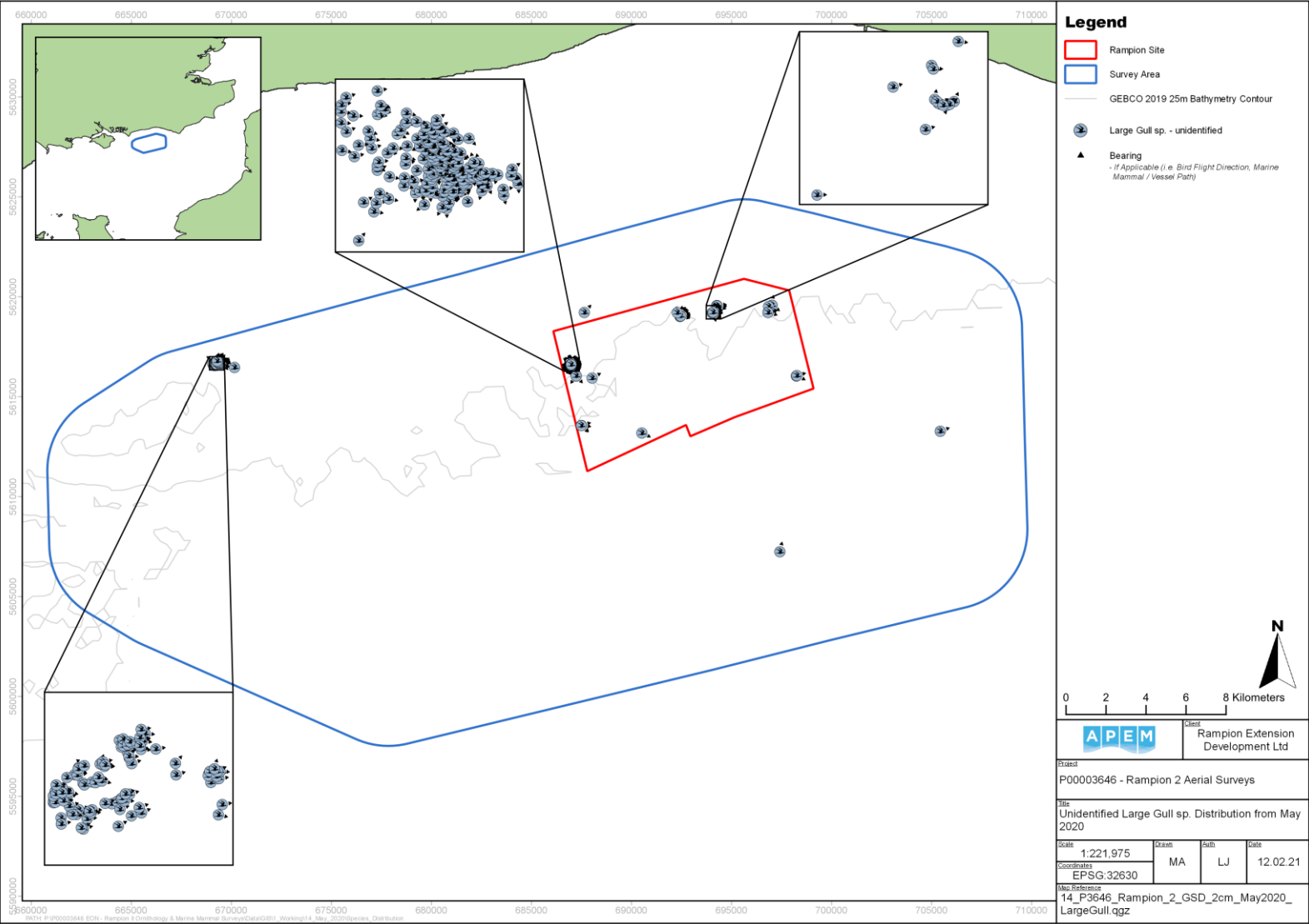
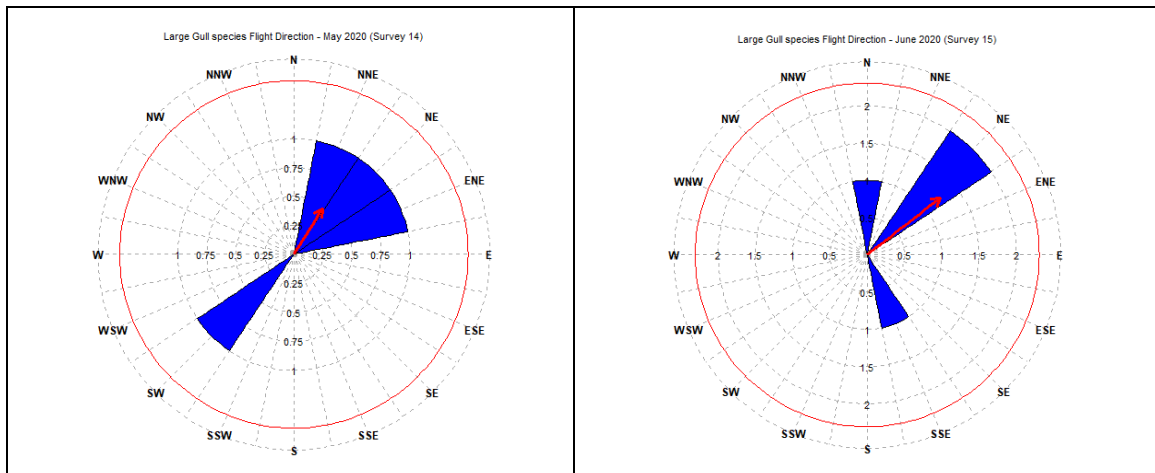


Figure 42 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area from May 2020



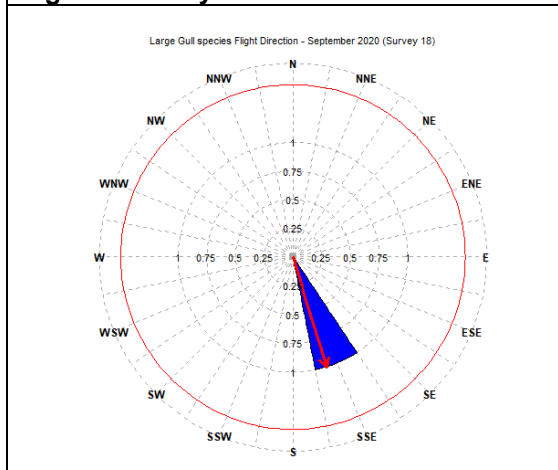


Number of Observations	4
Mean Vector (μ)	32.892
Length of Mean Vector (r)	0.466
Rayleigh Test (Z)	0.868
Rayleigh Test (p)	0.449

Figure 43a May 2020

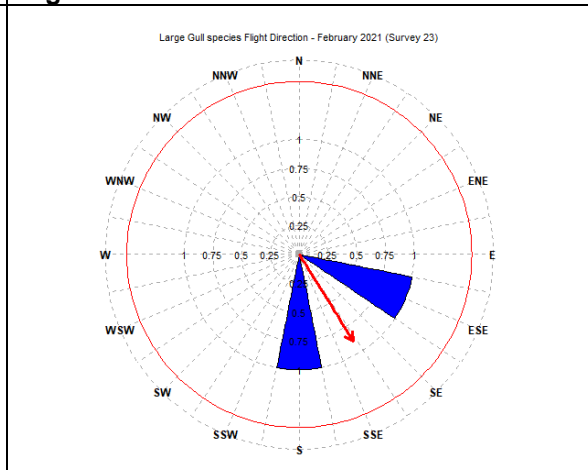
Number of Observations	4
Mean Vector (μ)	52.570
Length of Mean Vector (r)	0.620
Rayleigh Test (Z)	1.540
Rayleigh Test (p)	0.226

Figure 43b June 2020



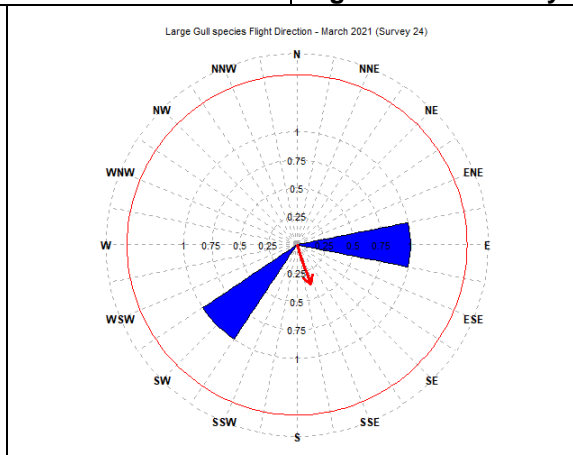
Number of Observations	1
Mean Vector (μ)	163.005
Length of Mean Vector (r)	1.000
Rayleigh Test (Z)	1.000
Rayleigh Test (p)	0.512

Figure 43c September 2020



Number of Observations	2
Mean Vector (μ)	148.606
Length of Mean Vector (r)	0.886
Rayleigh Test (Z)	1.569
Rayleigh Test (p)	0.235

Figure 43d February 2021



Number of Observations	2
Mean Vector (μ)	161.484

Length of Mean Vector (r)	0.371
Rayleigh Test (Z)	0.275
Rayleigh Test (p)	0.806
Figure 43e March 2021	

Figure 43 Summary of flight direction of unidentified large gulls during the survey period

4.19 Gull species – Unclassified Laridae

Unclassified gulls were recorded in June and December 2020, as well as January to March 2021, with a peak raw count of nine in December 2020 resulting in an abundance estimate of 77 for the Rampion 2 Survey Area (**Table 23**).

In the Rampion 1 OWF unclassified gulls were recorded in December 2020 only with a raw peak count of three, resulting in an abundance estimate of 25 for the Rampion 1 OWF (**Table 23**).

Unclassified gulls were loosely distributed across the Rampion 2 Survey Area for all months, with densities consisting of no more than three individuals throughout the survey period (**Figure 44; Appendix II: Figure 100, 102, 103, & 104**).

In December, there was no significant predominant direction of flight (Raleigh test, $p=0.763$, **Figure 45a**).

In February, a single unclassified gull was recorded flying in an easterly direction (**Figure 45b**).

In March, there was no significant predominant direction of flight (Raleigh test, $p=0.566$, **Figure 45c**).

Table 23 Raw counts and abundance and density estimates (No. estimated individuals per km²) of unclassified gulls in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Jun-20	4	39	4	107	0.50	0.04
Dec-20	9	77	17	154	0.33	0.08
Jan-21	3	26	3	69	0.58	0.03
Feb-21	7	60	17	119	0.38	0.06
Mar-21	7	60	17	119	0.38	0.06
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Dec-20	3	25	3	75	0.58	0.32
Mar-21	2	16	2	41	0.71	0.21

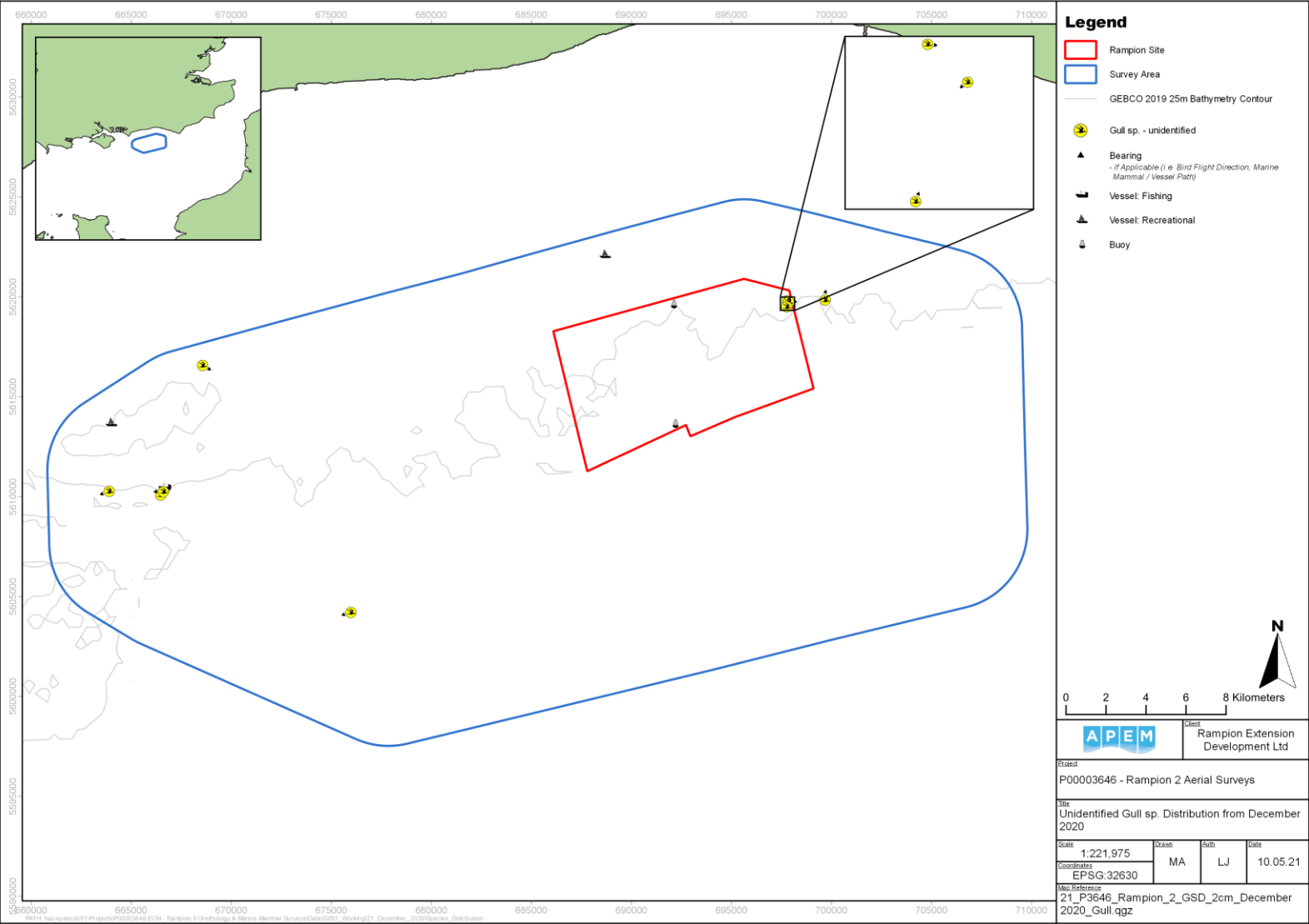


Figure 44 Distribution of unclassified gulls recorded in the Rampion 2 Survey Area from December 2020



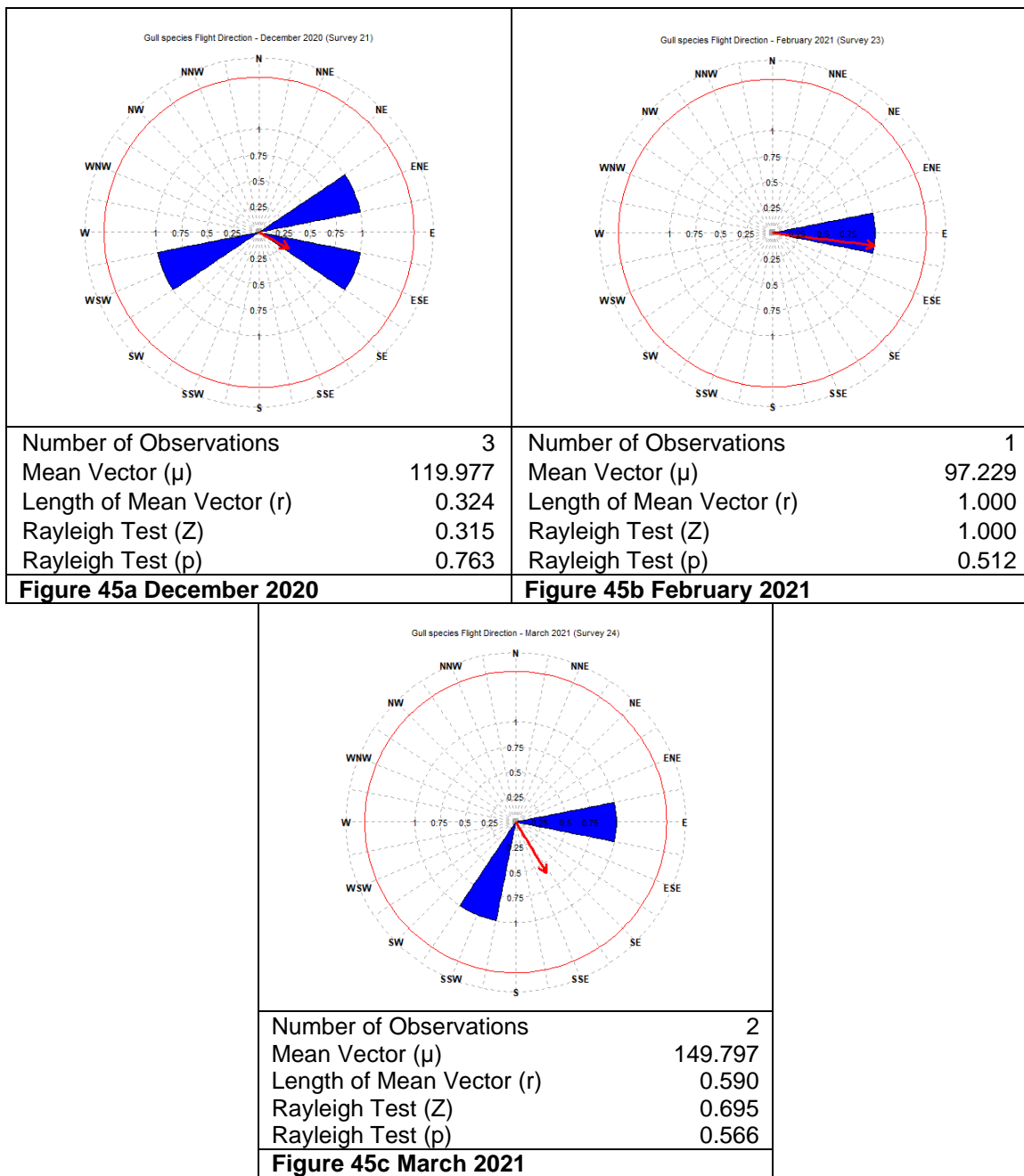


Figure 45 Summary of flight direction of unclassified gulls during the survey period

4.20 Sandwich Tern *Thalasseus sandvicensis*

Sandwich terns were recorded in May 2020 only with a peak raw count of three, resulting in an abundance estimate of 30 for the Rampion 2 Survey Area (**Table 24**).

The three Sandwich terns were distributed in the northwest of the Rampion 2 Survey Area (**Figure 46**). No Sandwich terns were recorded in the Rampion 1 OWF.

In May, there was no significant predominant direction of flight (Raleigh test, $p=0.638$, **Figure 47**).

Table 24 Raw counts and abundance and density estimates (No. estimated individuals per km²) of Sandwich terns in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	3	30	3	71	0.58	0.03

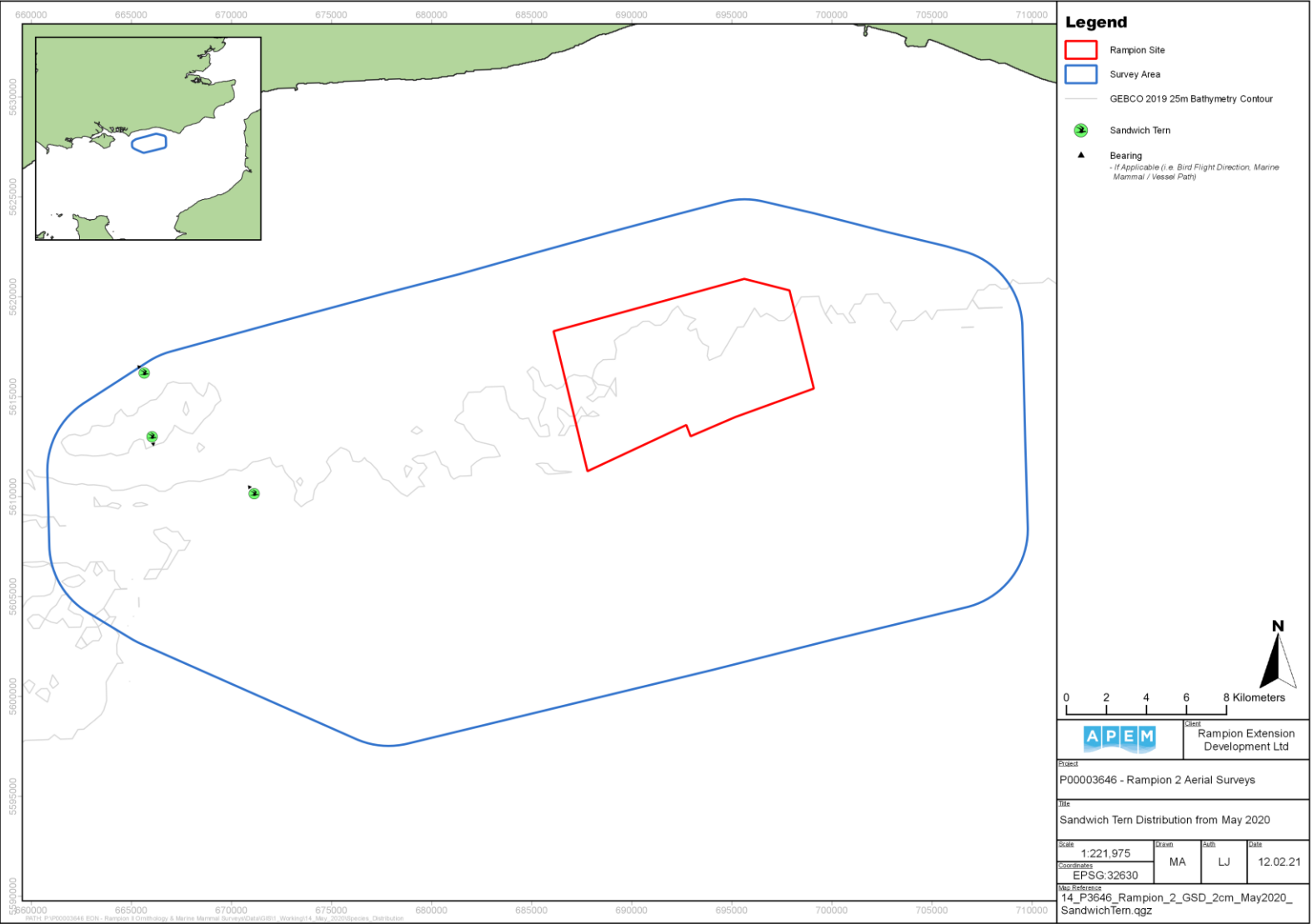


Figure 46 Distribution of Sandwich terns recorded in the Rampion 2 Survey Area from May 2020



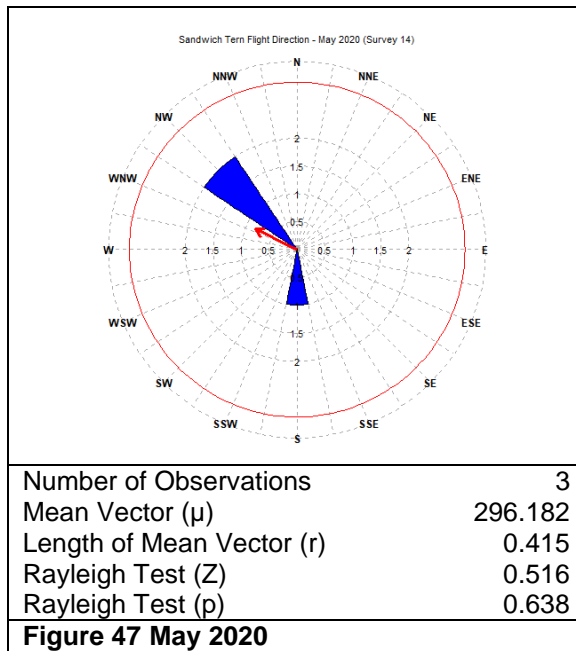


Figure 47 Summary of flight direction of Sandwich terns during the survey period

4.21 'Commic' [Common or Arctic] Tern *Sterna hirundo / paradisaea*

'Commic' terns were recorded in May, August, and October 2020 with a peak raw count of 10 in May 2020, resulting in an abundance estimate of 101 for the Rampion 2 Survey Area (Table 25).

'Commic' terns in May were exclusively distributed in the west of the Rampion 2 Survey Area (Figure 48), whilst the single 'commic' tern in August was located in the central south of the Rampion 2 Survey Area, and the single 'commic' tern in October was located in the northwest (Appendix II: Figure 107 & 108). No 'commic' terns were recorded in the Rampion 1 OWF.

In May and October 2020, two and one flying 'commic' terns were deemed suitable for flight height determination respectively, resulting in a median altitude of -17 m above MSL.

In May, there was a significant predominant direction of flight around a mean of 114° to the east-southeast (Raleigh test, $p=0.012$, Figure 49a).

In August, a single 'commic' tern was recorded flying in a west-southwesterly direction (Figure 49b).

In October, a single 'commic' tern was recorded flying in a south-southwesterly direction (Figure 49c).

Table 25 Raw counts and abundance and density estimates (No. estimated individuals per km²) of 'commic' terns in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	10	101	30	202	0.32	0.11
Aug-20	1	10	1	29	1.00	0.01
Oct-20	1	10	1	29	1.00	0.01

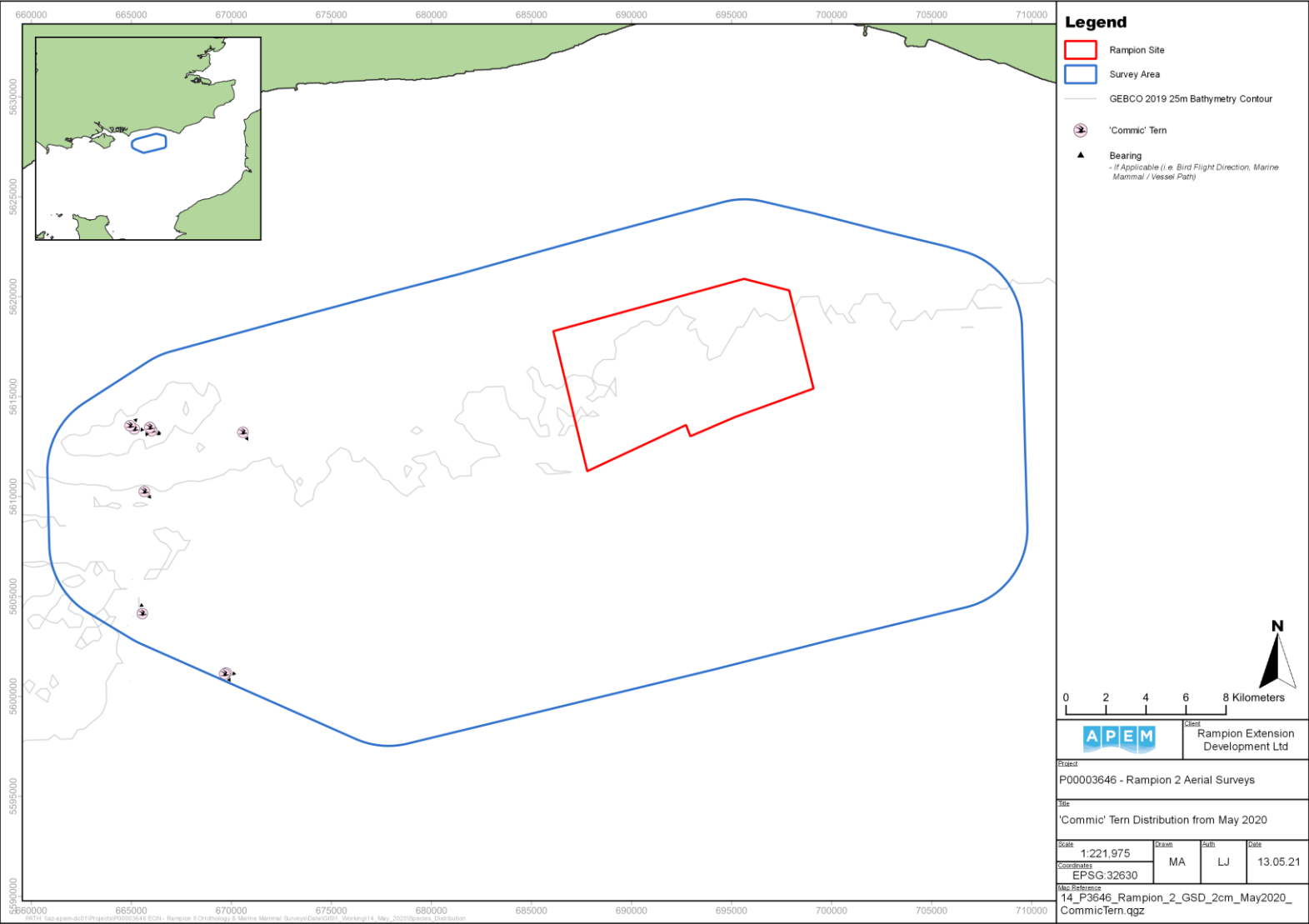


Figure 48 Distribution of 'commic' terns recorded in the Rampion 2 Survey Area from May 2020



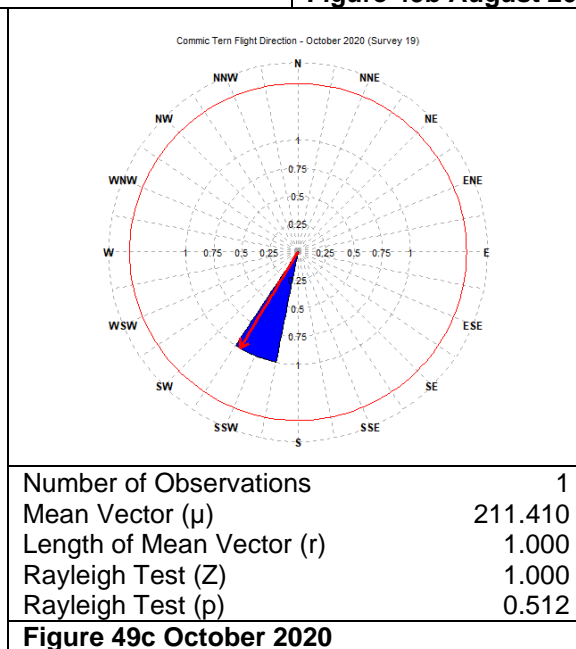
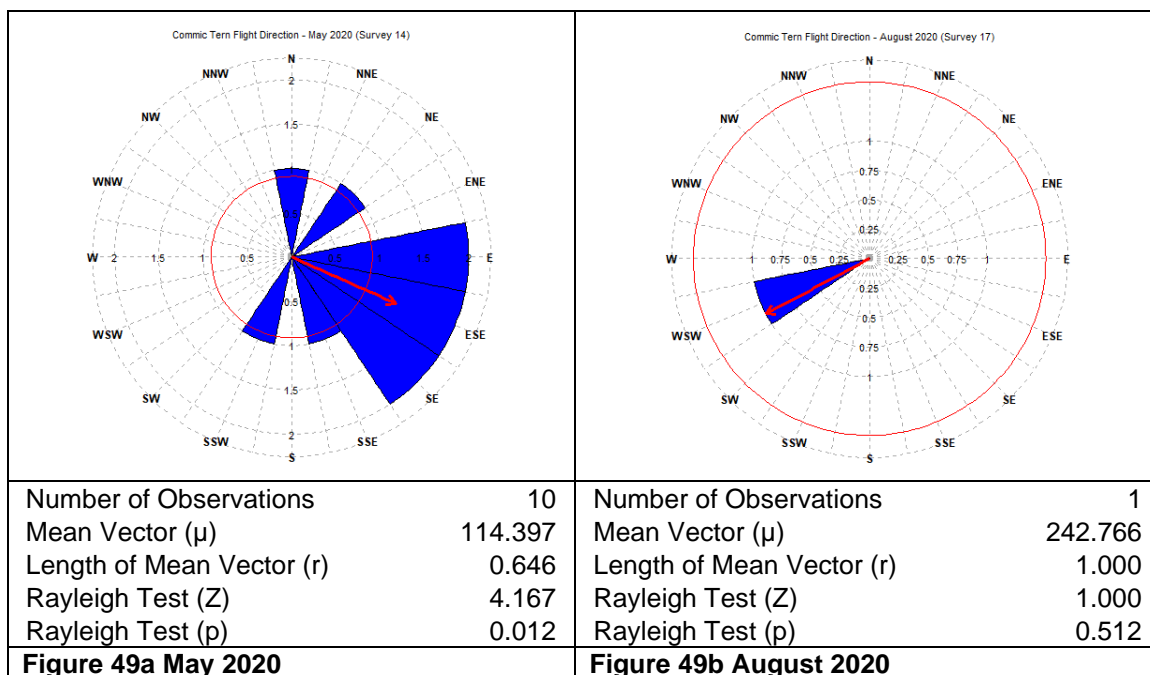


Figure 49 Summary of flight direction of 'commic' terns during the survey period

4.22 Common Tern *Sterna hirundo*

Common terns were recorded in June 2020 only with a peak raw count of 36, resulting in an abundance estimate of 351 for the Rampion 2 Survey Area (Table 26).

Common terns were predominantly distributed in two groups in the south of the Rampion 2 Survey Area, the furthest east of which contained the greatest density of common terns. An additional two common terns were located in the northwest of the Rampion 2 Survey Area (Figure 50). No common terns were recorded in the Rampion 1 OWF.

In June, there was a significant predominant direction of flight around a mean of 87° to the east (Raleigh test, $p < 0.001$, Figure 51).

Table 26 Raw counts and abundance and density estimates (No. estimated individuals per km²) of common terns in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Jun-20	36	351	36	946	0.17	0.37

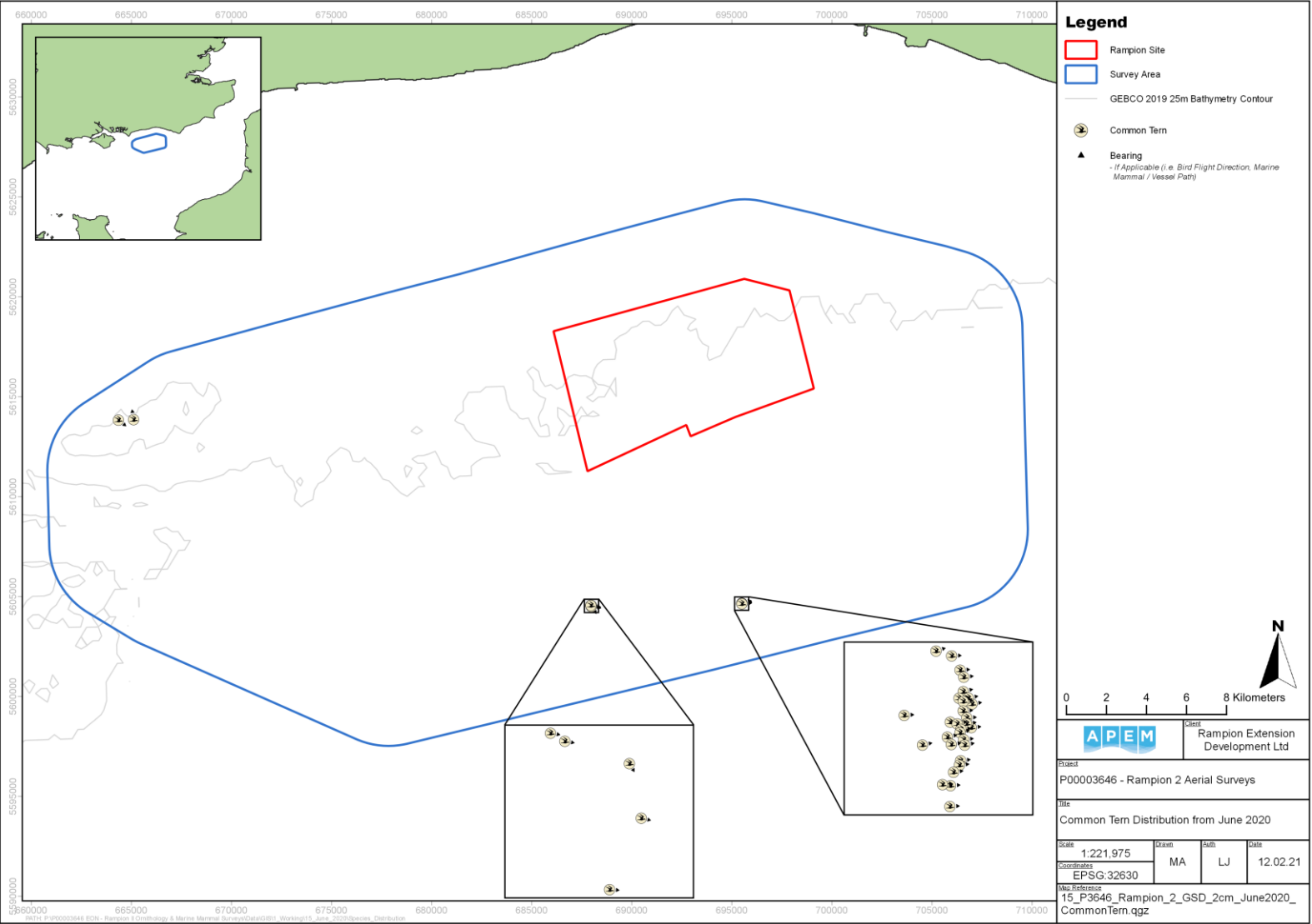


Figure 50 Distribution of common terns recorded in the Rampion 2 Survey Area from June 2020



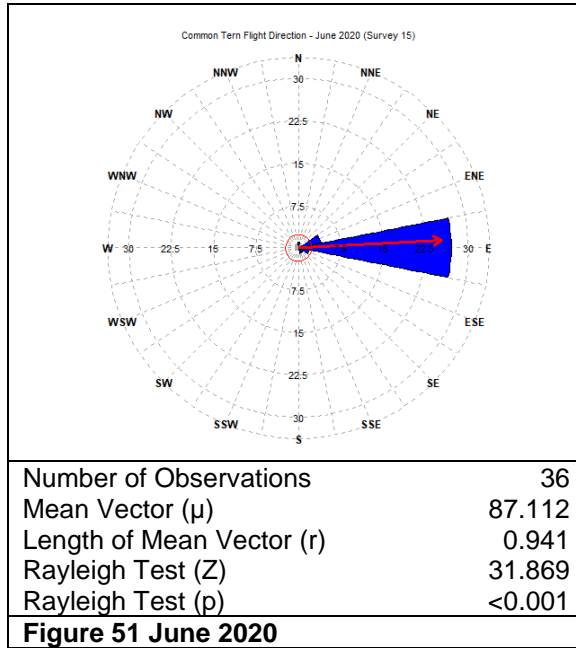


Figure 51 Summary of flight direction of common terns during the survey period

4.23 Little Tern *Sternula albifrons*

Little terns were recorded in June 2020 only with a peak raw count of three, resulting in an abundance estimate of 29 for the Rampion 2 Survey Area (Table 27).

All three little terns were located in the south-southeast of the Rampion 2 Survey Area (Figure 52). No little terns were recorded in the Rampion 1 OWF.

In June, a significant predominant direction of flight was recorded around a mean of 87° to the east (Raleigh test, $p=0.034$, Figure 53).

Table 27 Raw counts and abundance and density estimates (No. estimated individuals per km²) of little terns in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Jun-20	3	29	3	88	0.58	0.03

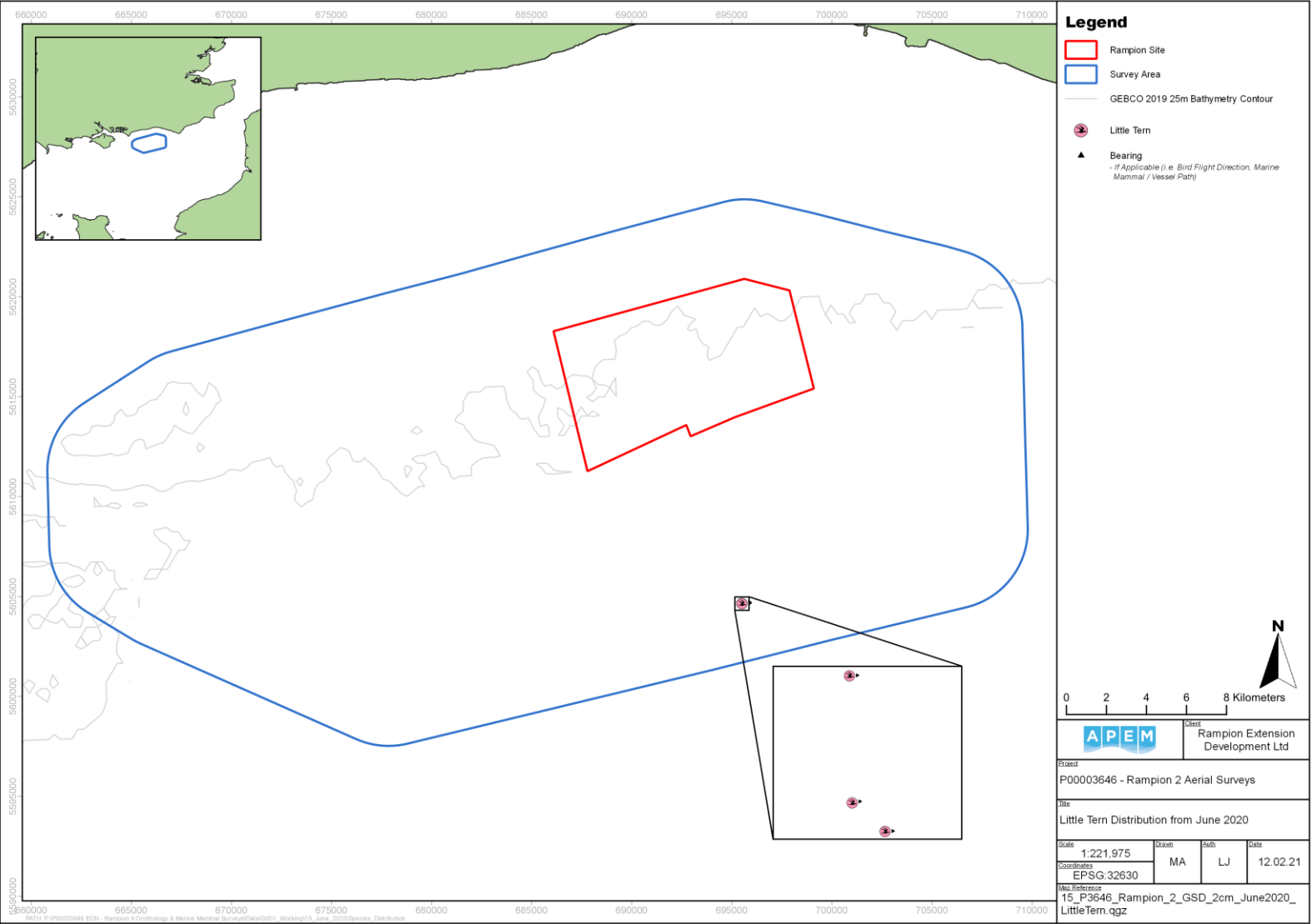


Figure 52 Distribution of little terns recorded in the Rampion 2 Survey Area from June 2020



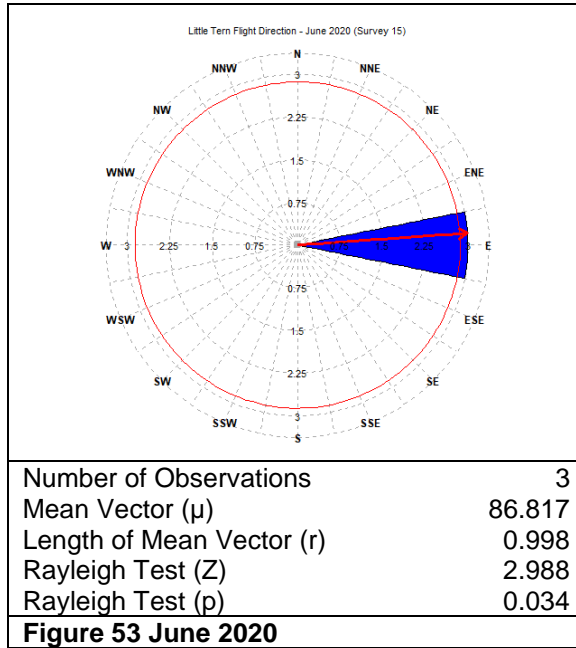


Figure 53 Summary of flight direction of little terns during the survey period

4.24 Guillemot *Uria aalge*

Guillemots were recorded in May, June, September, November, and December 2020, as well as from January to March 2021, with a peak raw count of 400 in December 2020 resulting in an abundance estimate of 3,413 for the Rampion 2 Survey Area (**Table 28**).

In the Rampion 1 OWF guillemots were recorded from November 2020 to February 2021, with a peak raw count of six in December 2020 resulting in an abundance estimate of 50 for the Rampion 1 OWF (**Table 28**).

Guillemots were loosely distributed across the Rampion 2 Survey Area and in low densities for May, June, September, November, January, and February (**Appendix II: Figure 111, 112, 113, 114, 116, & 117**). For December, guillemot distribution was consistent across the Rampion 2 Survey Area, save for most notably southeast of the Rampion 2 Survey Area and the majority of the Rampion 1 OWF area. Highest density area for guillemots occurred in the southwest, the northeast, and the east-southeast (**Figure 54**). For March, the overwhelming majority of guillemots occurred in the southern half of the Rampion 2 Survey Area, particularly in the east and southeast (**Appendix II: Figure 118**).

In November, there was no significant direction of flight (Raleigh test, $p=0.396$, **Figure 55a**).

In December, there was a significant predominant direction of flight around a mean of 279° to the west (Raleigh test, $p=0.005$, **Figure 55b**).

In January, there was a significant predominant direction of flight around a mean of 277° to the west (Raleigh test, $p=0.008$, **Figure 55c**).

In February, there was no significant predominant direction of flight (Raleigh test, $p=0.447$, **Figure 55d**).

Table 28 Raw counts and abundance and density estimates (No. estimated individuals per km^2) of guillemots in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	15	151	50	272	0.26	0.16
Jun-20	7	68	10	137	0.38	0.07
Sep-20	2	20	2	49	0.71	0.02
Nov-20	35	346	217	474	0.17	0.36
Dec-20	400	3413	2773	4172	0.05	3.58
Jan-21	54	465	301	654	0.14	0.49
Feb-21	81	689	442	978	0.11	0.72
Mar-21	114	970	664	1310	0.09	1.02
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Nov-20	2	19	2	58	0.71	0.24
Dec-20	6	50	8	109	0.41	0.64

Jan-21	2	17	2	42	0.71	0.22
Feb-21	3	25	3	74	0.58	0.32

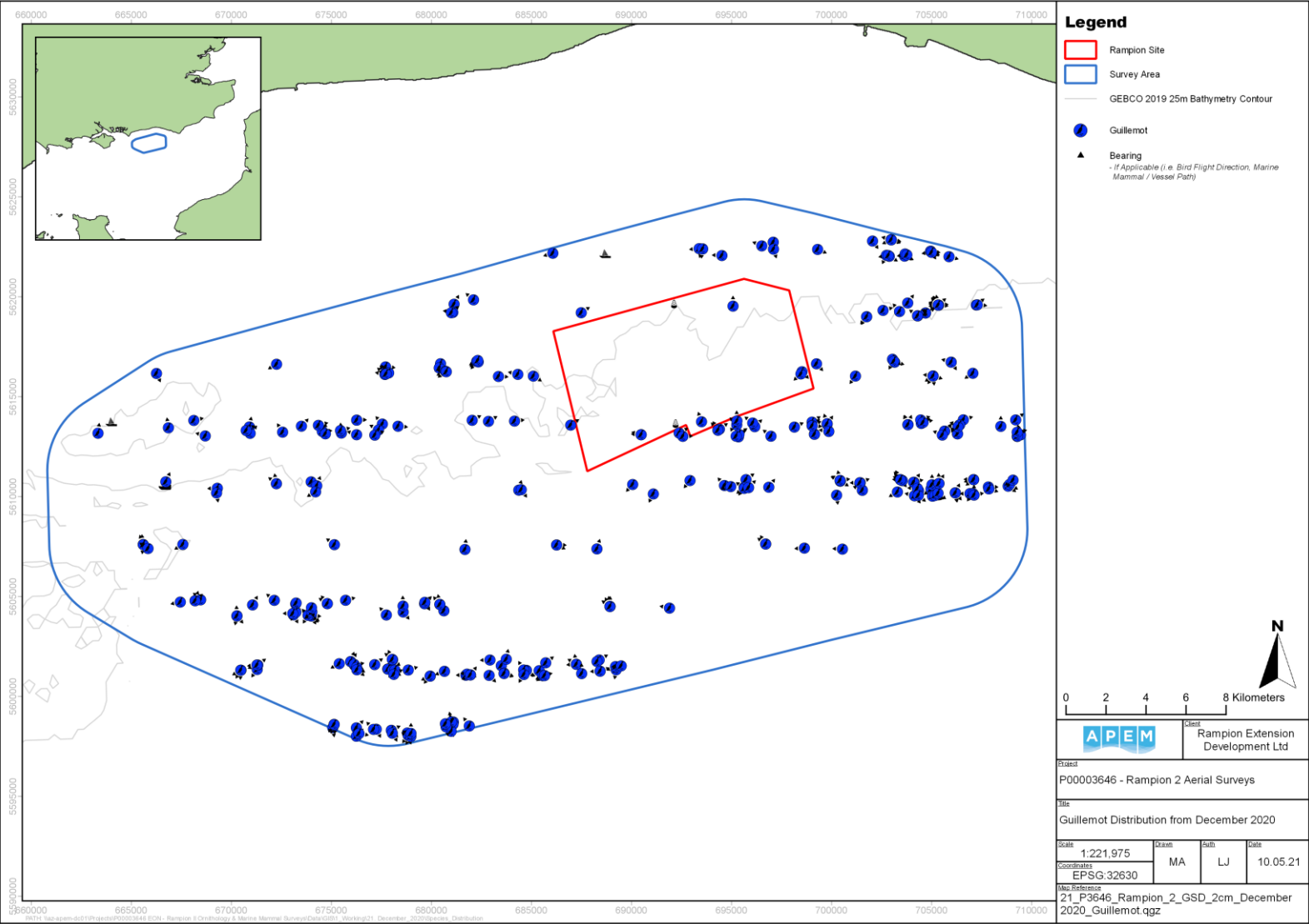
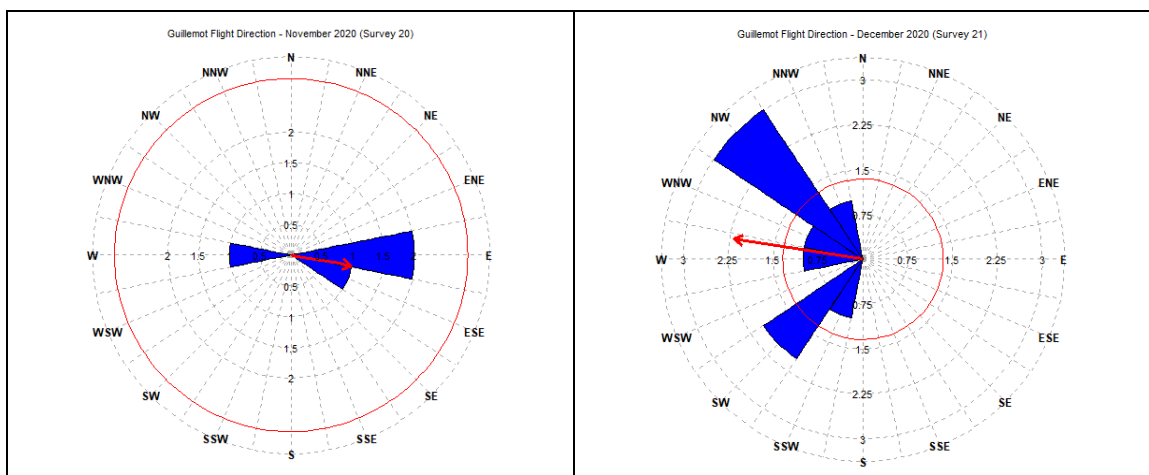


Figure 54 Distribution of guillemots recorded in the Rampion 2 Survey Area from December 2020



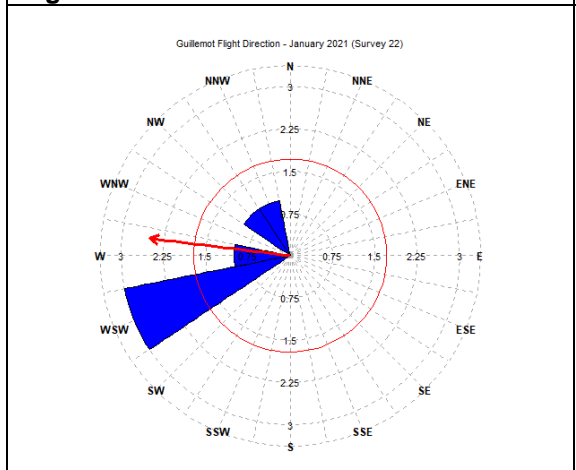


Number of Observations	4
Mean Vector (μ)	100.805
Length of Mean Vector (r)	0.499
Rayleigh Test (Z)	0.994
Rayleigh Test (p)	0.396

Figure 55a November 2020

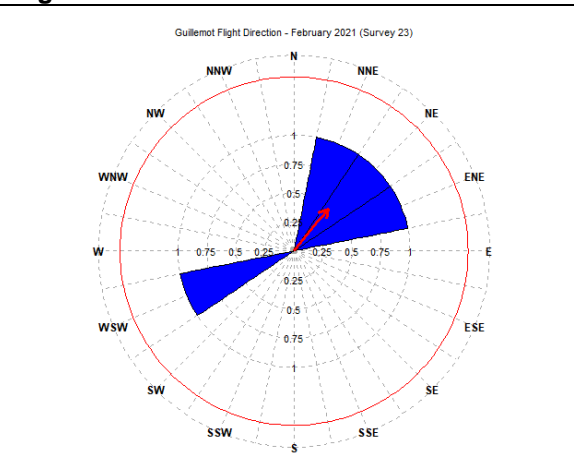
Number of Observations	9
Mean Vector (μ)	279.387
Length of Mean Vector (r)	0.730
Rayleigh Test (Z)	4.800
Rayleigh Test (p)	0.005

Figure 55b December 2020



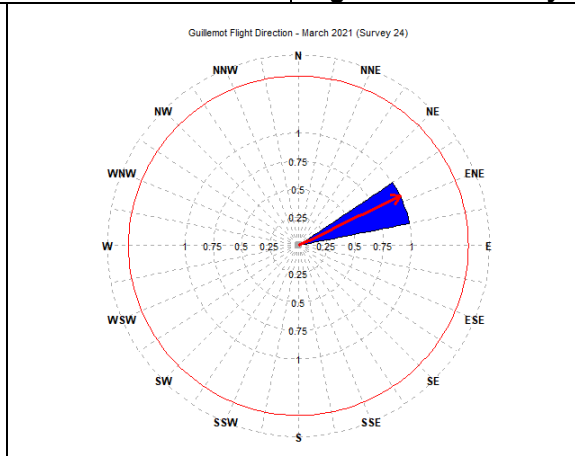
Number of Observations	6
Mean Vector (μ)	277.279
Length of Mean Vector (r)	0.836
Rayleigh Test (Z)	4.196
Rayleigh Test (p)	0.008

Figure 55c January 2021



Number of Observations	4
Mean Vector (μ)	39.629
Length of Mean Vector (r)	0.467
Rayleigh Test (Z)	0.873
Rayleigh Test (p)	0.447

Figure 55d February 2021



Number of Observations	1
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Mean Vector (μ)	64.472
Length of Mean Vector (r)	1.000
Rayleigh Test (Z)	1.000
Rayleigh Test (p)	0.512
Figure 55e March 2021	

Figure 55 Summary of flight direction of guillemots during the survey period

4.25 Razorbill *Alca torda*

Razorbills were recorded in April, August, November, and December 2020, as well as January to March 2021, with a peak raw count of 1,105 in January 2021 resulting in an abundance estimate of 9,514 for the Rampion 2 Survey Area (**Table 29**).

In the Rampion 1 OWF Razorbills were recorded from November 2020 to February 2021 with a peak raw count of 20 in February 2021, resulting in an abundance estimate of 164 for the Rampion 1 OWF (**Table 29**).

Razorbills were loosely distributed in low densities for April, August, and November (**Appendix II: Figure 119, 120, & 121**). December 2020 through March 2021 experienced a marked increase in razorbills, with consistent occurrence throughout the majority of the Rampion 2 Survey Area. December exhibited high densities in the southwest and northeast of the Rampion 2 Survey Area, whilst March 2021 exhibited highest densities in the southwest to southeast (**Appendix II: Figure 122 & 125**). January featured notably higher densities of razorbills in the west of the Rampion 2 Survey Area (**Figure 56**), whilst February featured highest densities in the north through to the south, save for within the Rampion 1 OWF (**Appendix II: Figure 124**). Throughout the survey period, low numbers of razorbills were recorded within the Rampion 1 OWF.

In December, there was a significant predominant direction of flight around a mean of 246° to the southwest (Raleigh test, $p < 0.001$, **Figure 57a**).

In January, there was no significant predominant direction of flight (Raleigh test, $p = 0.226$, **Figure 57b**).

In February, there was no significant predominant direction of flight (Raleigh test, $p = 0.126$, **Figure 57c**).

In March, a single razorbill was flying in a northerly direction (**Figure 57d**).

Table 29 Raw counts and abundance and density estimates (No. estimated individuals per km²) of razorbills in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	2	20	2	49	0.71	0.02
Aug-20	1	10	1	29	1.00	0.01
Nov-20	30	296	128	484	0.18	0.31
Dec-20	459	3916	3234	4736	0.05	4.11
Jan-21	1105	9514	5950	13879	0.03	9.98
Feb-21	475	4039	3112	5034	0.05	4.24
Mar-21	251	2135	1650	2782	0.06	2.24
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Nov-20	1	10	1	29	1.00	0.13

Dec-20	7	59	8	126	0.38	0.76
Jan-21	18	150	33	300	0.24	1.93
Feb-21	20	164	20	410	0.22	2.11
Mar-21	6	49	6	139	0.41	0.63

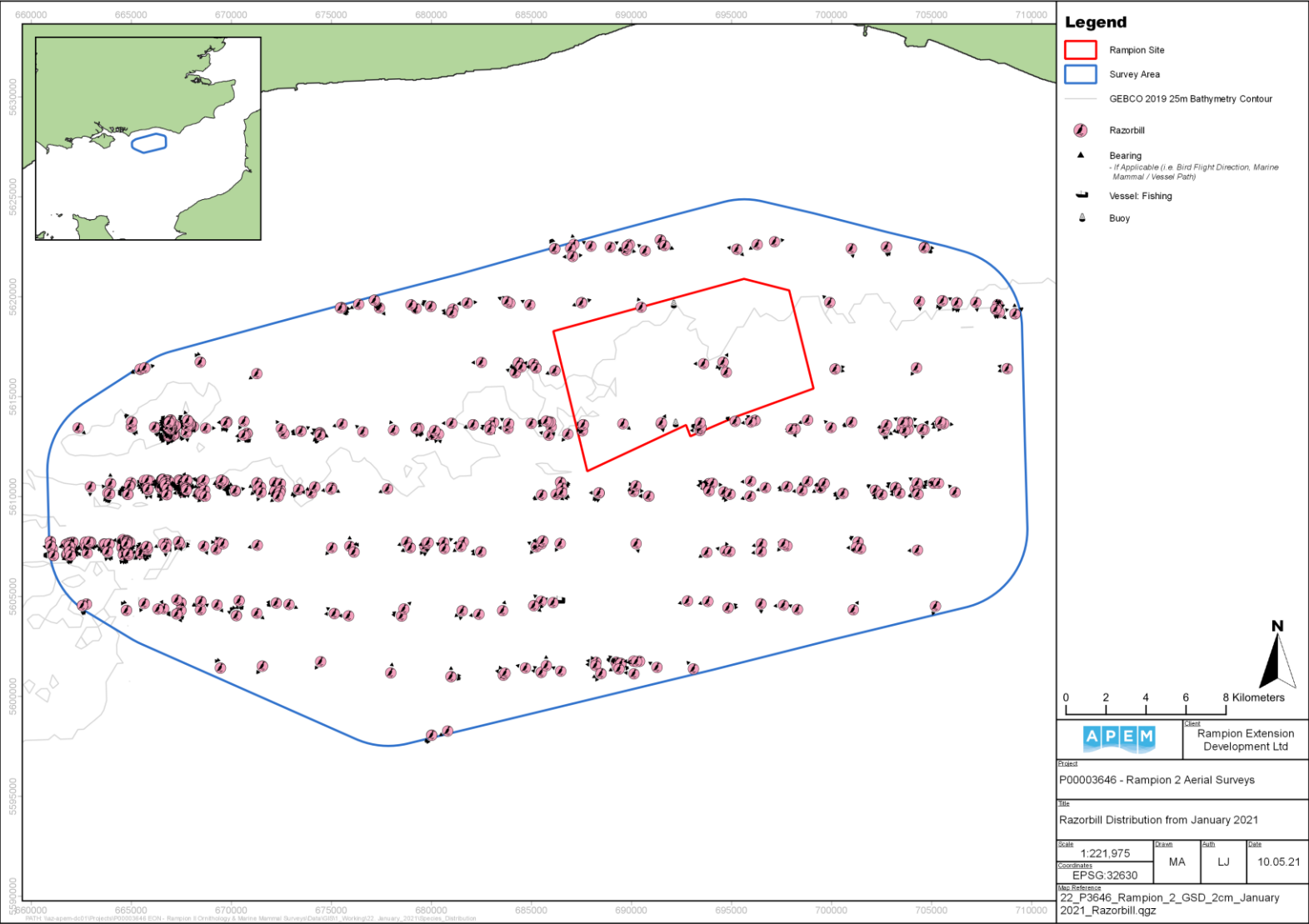


Figure 56 Distribution of razorbills recorded in the Rampion 2 Survey Area from January 2021



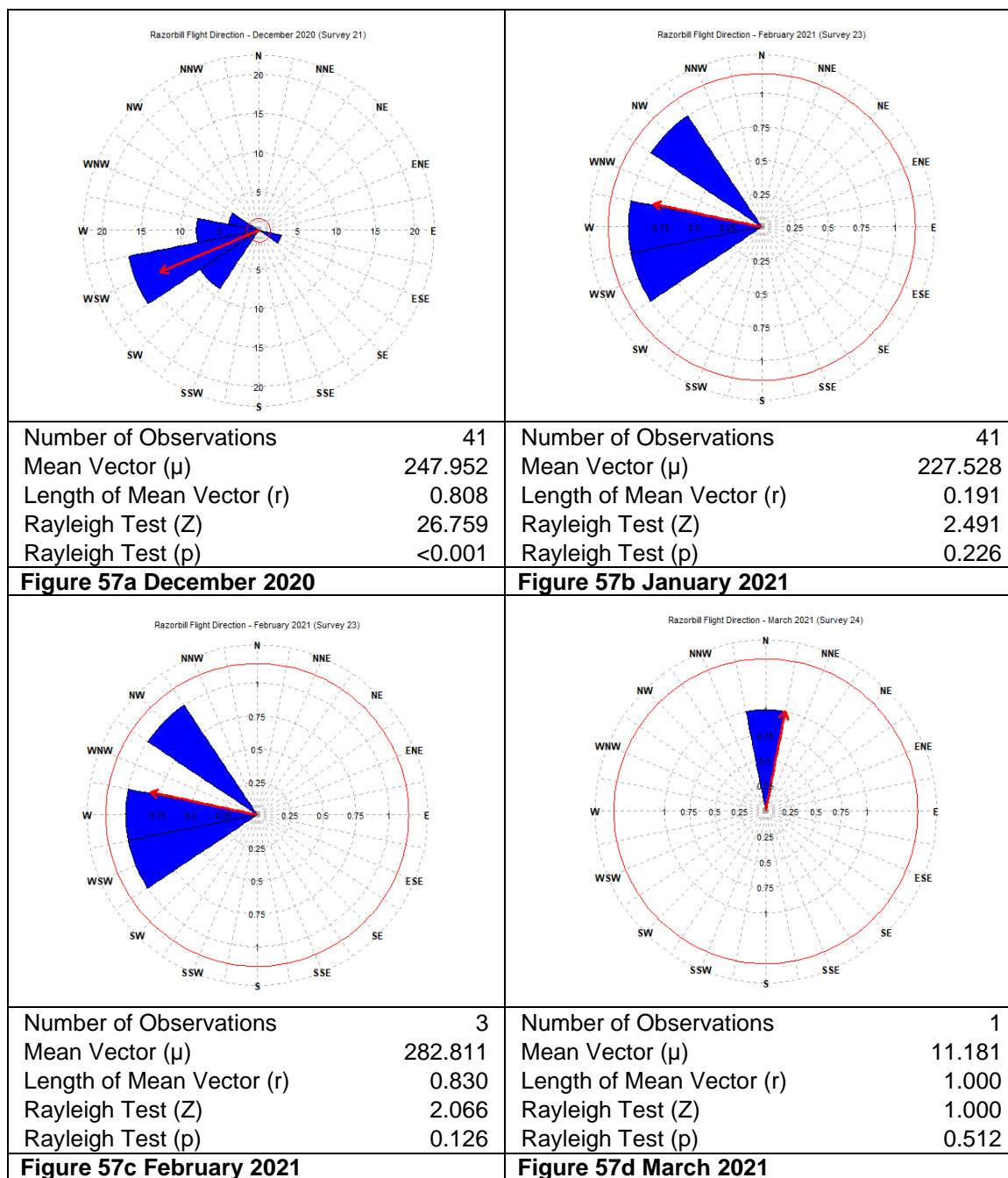


Figure 57 Summary of flight direction of razorbills during the survey period

4.26 Guillemot / Razorbill *Uria aalge* / *Alca torda*

Birds identified as either guillemots or razorbills were recorded in April, May, June, August, October, and December 2020, as well as January to March 2021, with a peak raw count of 1,427 in March 2021 resulting in an abundance estimate of 12,139 for the Rampion 2 Survey Area (Table 30).

In the Rampion 1 OWF, guillemots and / or razorbills were recorded in October and December 2020, as well as January 2021, with a peak raw count of 34 in January 2021 resulting in an abundance estimate of 283 for the Rampion 1 OWF (Table 30).

Guillemots and / or razorbills were loosely distributed alone or in low densities for the first two thirds of the survey period (Appendix II: Figure 126, 127, 128, 129, & 130). In December, guillemot and / or razorbill distribution was throughout the southern half of the Rampion 2 Survey Area, with highest densities in the south and east (Appendix II: Figure 131), similar to February when the majority were distributed in the southern half, with high densities in the south and southeast (Appendix II: Figure 133). In January, distribution was consistent across the Rampion 2 Survey Area, with areas of particularly concentrated density in the west and centre to north of the Rampion 2 Survey Area (Appendix II: Figure 132). For March, guillemots and / or razorbills were considerably more prevalent in the southwest through to the east of the Rampion 2 Survey Area, with much fewer individuals recorded in the north and particularly the northwest. Highest densities were evident east of the Rampion 1 OWF, as well as in the southeast, south, and southwest of the Rampion 2 Survey Area (Figure 58). As with razorbills, occurrence within the Rampion 1 OWF remained low throughout the survey period.

In December, there was a significant predominant direction of flight around a mean of 217° to the southwest (Raleigh test, $p < 0.001$, Figure 59a).

In January, there was a significant predominant direction of flight around a mean of 239° to the west-southwest (Raleigh test, $p < 0.001$, Figure 59b).

In February, there was no significant predominant direction of flight (Raleigh test, $p = 0.463$, Figure 59c).

Table 30 Raw counts and abundance and density estimates (No. estimated individuals per km²) of guillemots and / or razorbills in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	6	59	20	108	0.41	0.06
May-20	4	40	4	101	0.50	0.04
Jun-20	5	49	10	107	0.45	0.05
Aug-20	1	10	1	29	1.00	0.01
Oct-20	6	59	6	156	0.41	0.06
Dec-20	551	4701	3831	5555	0.04	4.93
Jan-21	887	7637	6320	9170	0.03	8.01
Feb-21	233	1981	1352	2713	0.07	2.08

Mar-21	1427	12139	9800	14394	0.03	12.73
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Oct-20	2	19	2	57	0.71	0.24
Dec-20	1	8	1	25	1.00	0.10
Jan-21	34	283	133	500	0.17	3.63
Mar-21	12	98	25	221	0.29	1.26

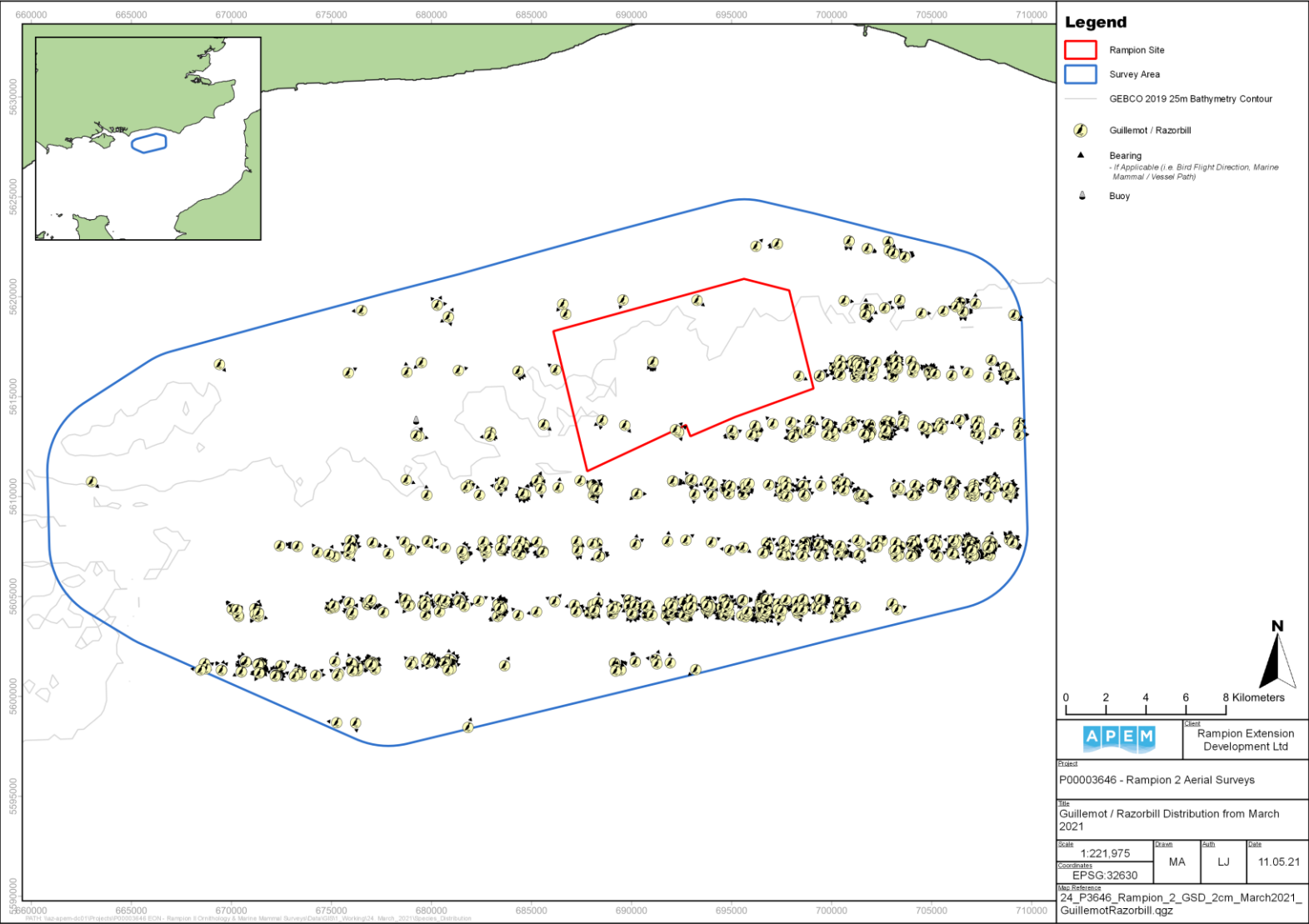


Figure 58 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area from March 2021



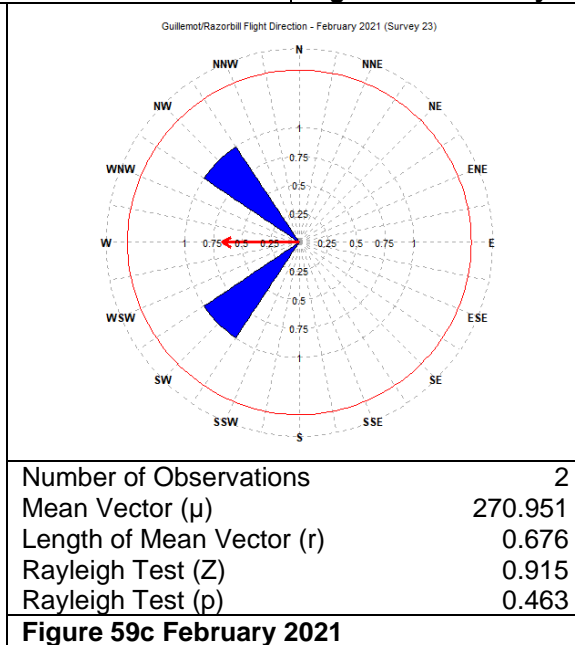
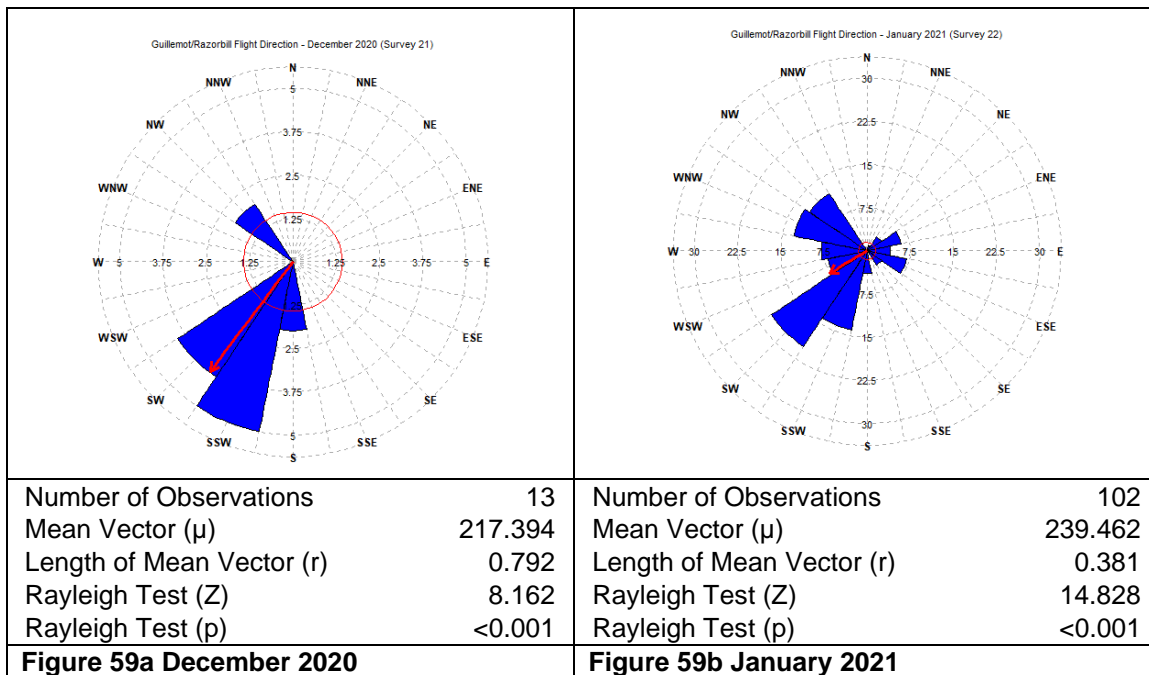


Figure 59 Summary of flight direction of guillemots and / or razorbills during the survey period

4.27 Auk species – Unidentified Alcidae

Unidentified auks were recorded in April, September, and November 2020, as well as January and February 2021, with a peak raw count of 10 in January 2021 resulting in an abundance estimate of 86 for the Rampion 2 Survey Area (**Table 31**).

Unidentified auks exhibited low numbers with no discernible distribution patterns across the Rampion 2 Survey Area (**Appendix II: Figure 135, 136, 137, & 139**). For January, unidentified auks were recorded in small groups of no more than four around the centre to central west of the Rampion 2 Survey Area (**Figure 60**). No unidentified auks were recorded within the Rampion 1 OWF.

Table 31 Raw counts and abundance and density estimates (No. estimated individuals per km²) of unidentified auks in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	1	10	1	30	1.00	0.01
Sep-20	1	10	1	29	1.00	0.01
Nov-20	4	40	4	89	0.50	0.04
Jan-21	10	86	10	198	0.32	0.09
Feb-21	1	9	1	26	1.00	0.01

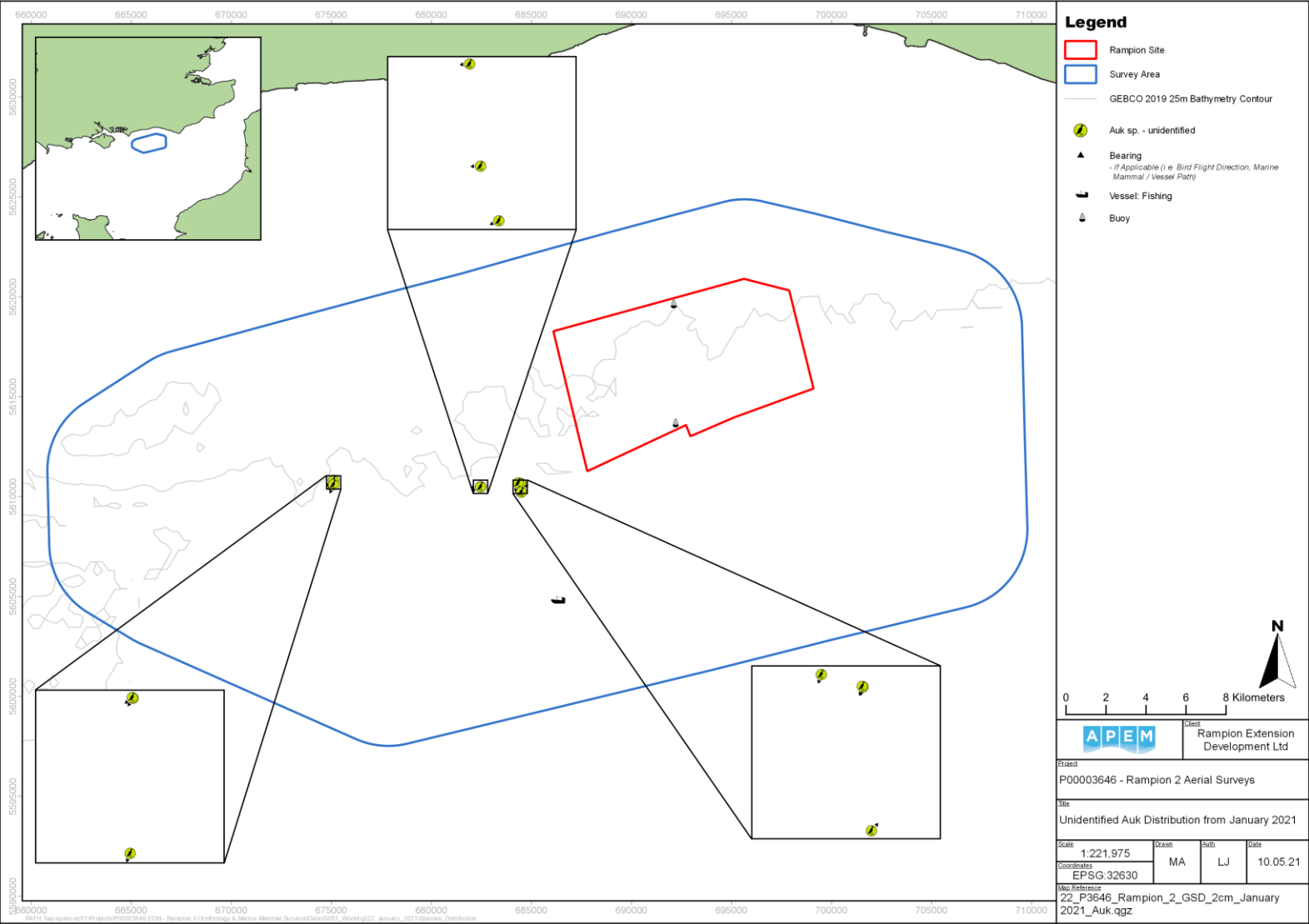


Figure 60 Distribution of unidentified auks recorded in the Rampion 2 Survey Area from January 2021



4.28 Hirundine species – Unidentified Hirundinidae

Unidentified hirundinids were recorded in September 2020 only, with a peak raw count of three resulting in an abundance estimate of 29 for the Rampion 2 Survey Area (Table 32).

The three unidentified hirundinids were located in the northwest of the Rampion 2 Survey Area (Figure 61). No unidentified hirundinids were recorded in the Rampion 1 OWF.

In September, there was a significant predominant direction of flight around a mean of 320° to the northwest (Raleigh test, $p=0.042$, Figure 62).

Table 32 Raw counts and abundance and density estimates (No. estimated individuals per km²) of hirundinids in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Sep-20	3	29	3	88	0.58	0.03

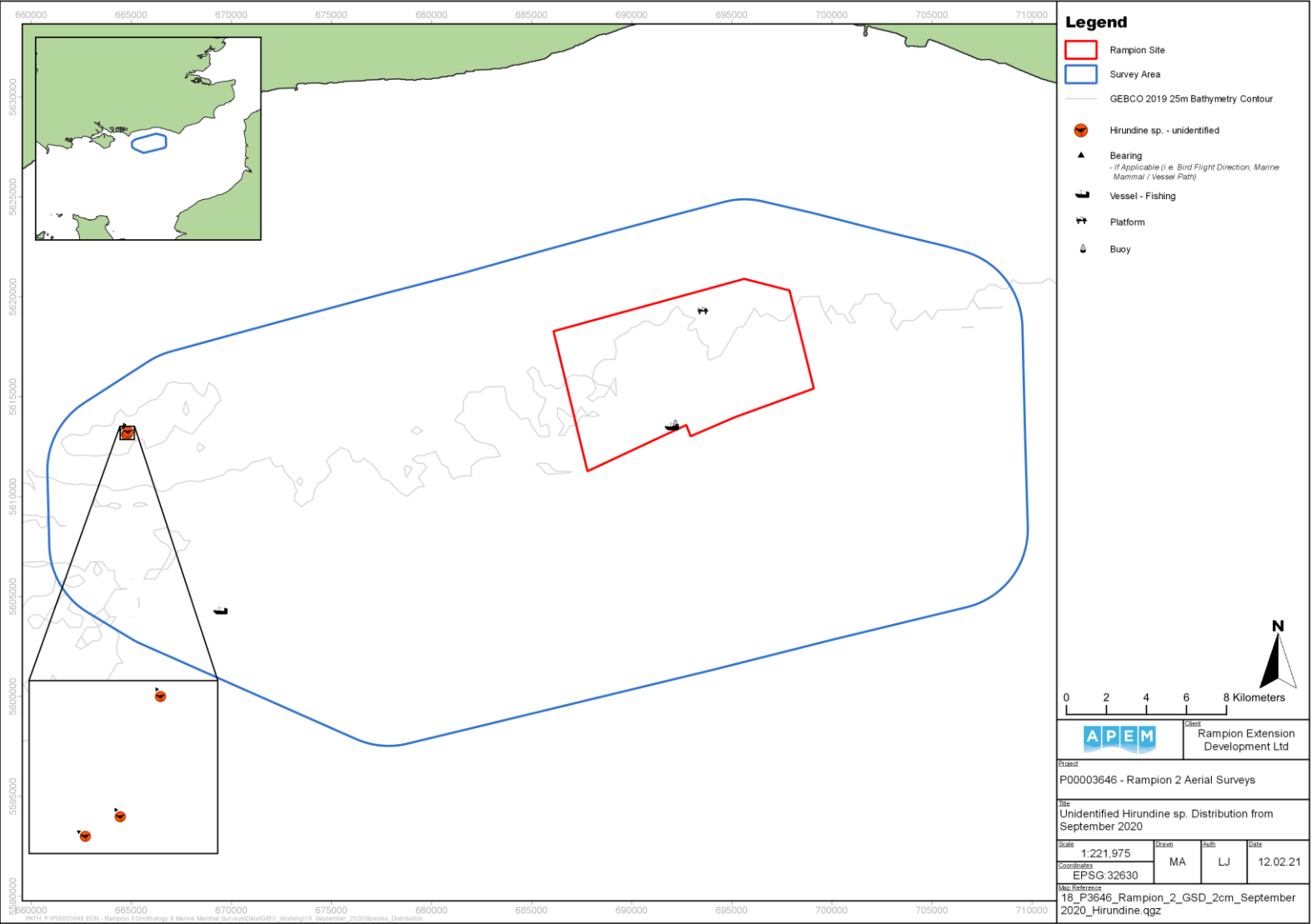


Figure 61 Distribution of unidentified hirundinids recorded in the Rampion 2 Survey Area from September 2020



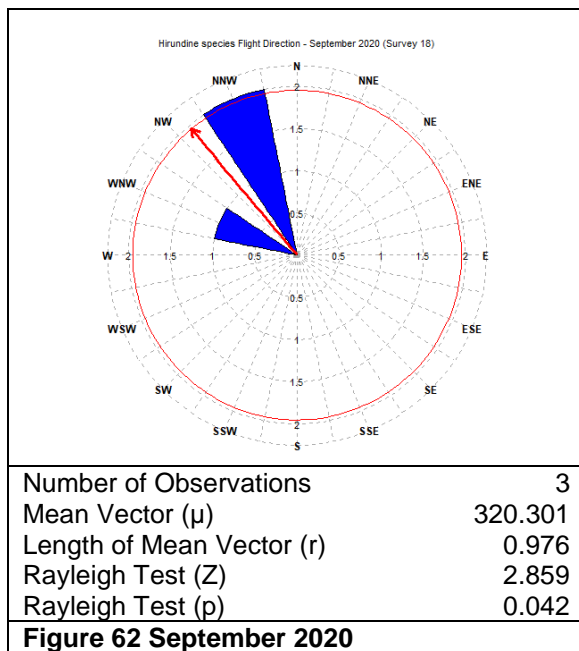


Figure 62 Summary of flight direction of unidentified hirundinids during the survey period

4.29 Dolphin species – Unidentified Delphinidae

Unidentified dolphins were recorded in October 2020 only with a peak raw count of two, resulting in an abundance estimate of 20 for the Rampion 2 Survey Area (Table 33).

The two unidentified dolphins were located together in the south of the Rampion 2 Survey Area (Figure 63). No unidentified dolphins were recorded in the Rampion 1 OWF.

Table 33 Raw counts and abundance and density estimates (No. estimated individuals per km²) of dolphin species in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Oct-20	2	20	2	59	0.71	0.02

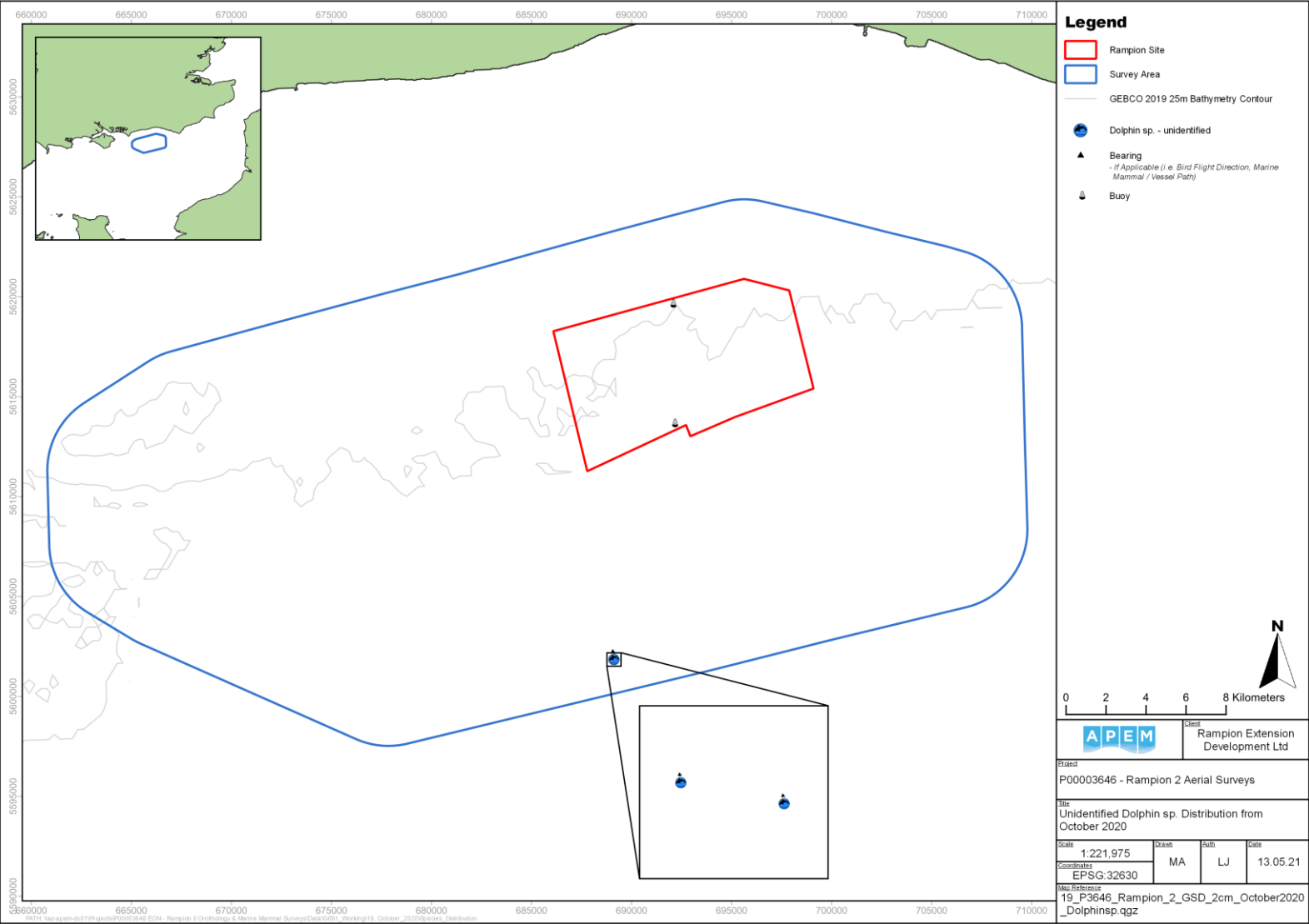


Figure 63 Distribution of unidentified dolphins recorded in the Rampion 2 Survey Area from September 2020



4.30 Harbour Porpoise *Phocoena phocoena*

Harbour porpoises were recorded in August and September 2020, as well as February and March 2021 with a peak raw count of 14 in February 2021 resulting in an abundance estimate of 119 for the Rampion 2 Survey Area (**Table 34**).

In the Rampion 1 OWF a single harbour porpoise was recorded in both August 2020 and February 2021, resulting in abundance estimates of 10 and 8, respectively for the Rampion 1 OWF (**Table 34**).

Harbour porpoises were single individuals or loosely distributed across the Rampion 2 Survey Area for the majority of survey months (**Appendix II: 143 & 145; Figure 64**), and for August, harbour porpoises were distributed around the centre of the Rampion 2 Survey Area, as well as featuring a group of three individuals (**Appendix II: Figure 142**).

Table 34 Raw counts and abundance and density estimates (No. estimated individuals per km²) of harbour porpoise in: a) Rampion 2 Survey Area; and b) Rampion 1 OWF

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Aug-20	5	49	5	127	0.45	0.05
Sep-20	1	10	1	29	1.00	0.01
Feb-21	14	119	60	196	0.27	0.12
Mar-21	1	9	1	26	1.00	0.01
b) Rampion 1 OWF						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Aug-20	1	10	1	29	1.00	0.13
Feb-21	1	8	1	25	1.00	0.10

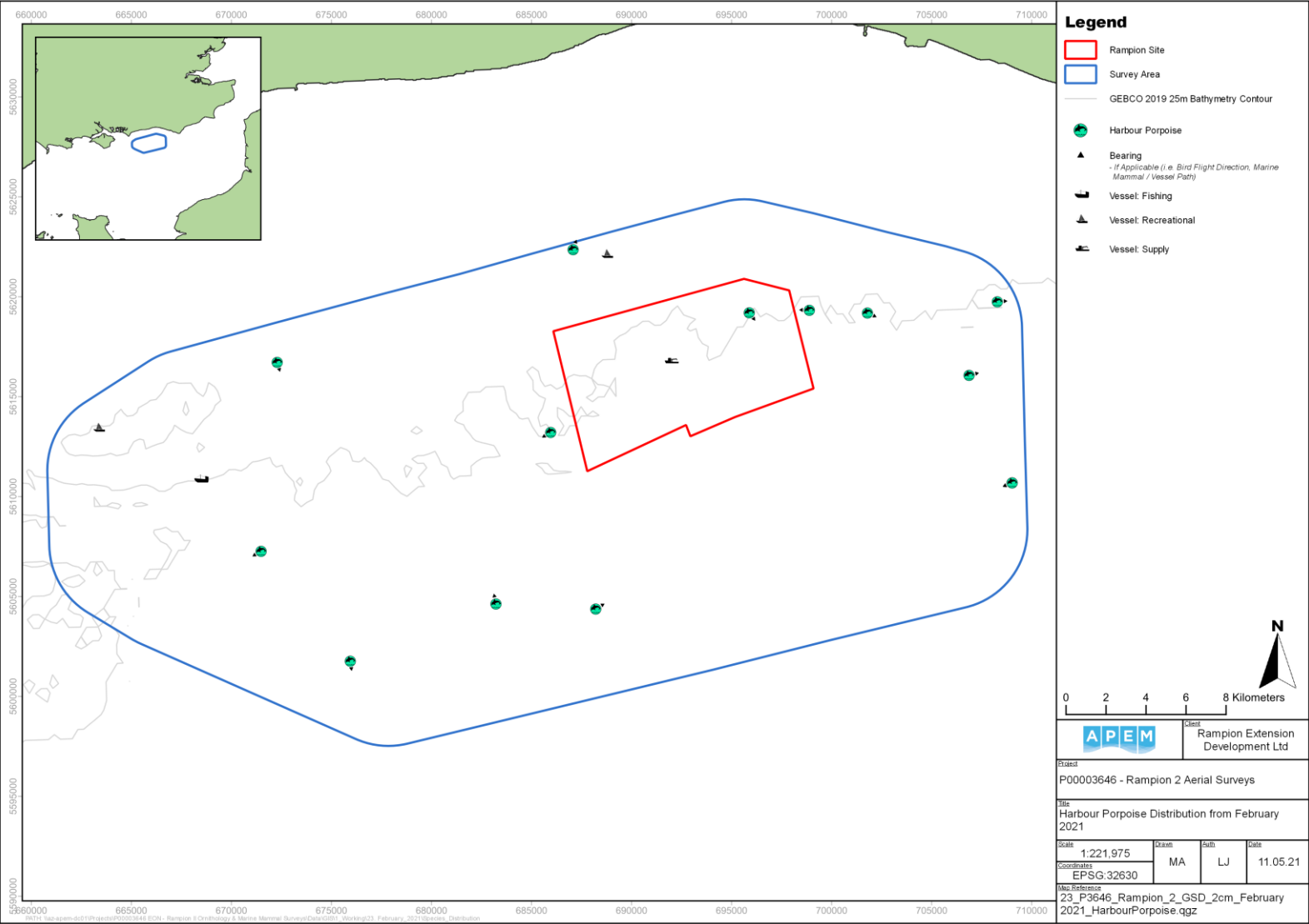


Figure 64 Distribution of harbour porpoises recorded in the Rampion 2 Survey Area from February 2021



4.31 Dolphin / Porpoise species – Unidentified Delphinoidea

Marine mammals identified as either dolphins or porpoises were recorded in April, July, October, November, and December 2020 with a peak raw count of five in December 2020, resulting in an abundance estimate of 43 for the Rampion 2 Survey Area (Table 35).

Unidentified dolphins and / or porpoises were loosely distributed in the Rampion 2 Survey Area for the majority of surveys (Appendix II: Figure 147, 148, & 149), with only April and December featuring densities of dolphins and / or porpoises; in the north of the Rampion 2 Survey Area for April, and in the northwest for December (Appendix II: Figure 146; Figure 65). No unidentified dolphins and / or porpoises were recorded in the Rampion 1 OWF.

Table 35 Raw counts and abundance and density estimates (No. estimated individuals per km²) of dolphins and / or porpoises in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Apr-20	3	29	3	79	0.58	0.03
Jul-20	1	10	1	29	1.00	0.01
Oct-20	1	10	1	29	1.00	0.01
Nov-20	1	10	1	30	1.00	0.01
Dec-20	5	43	5	102	0.45	0.05

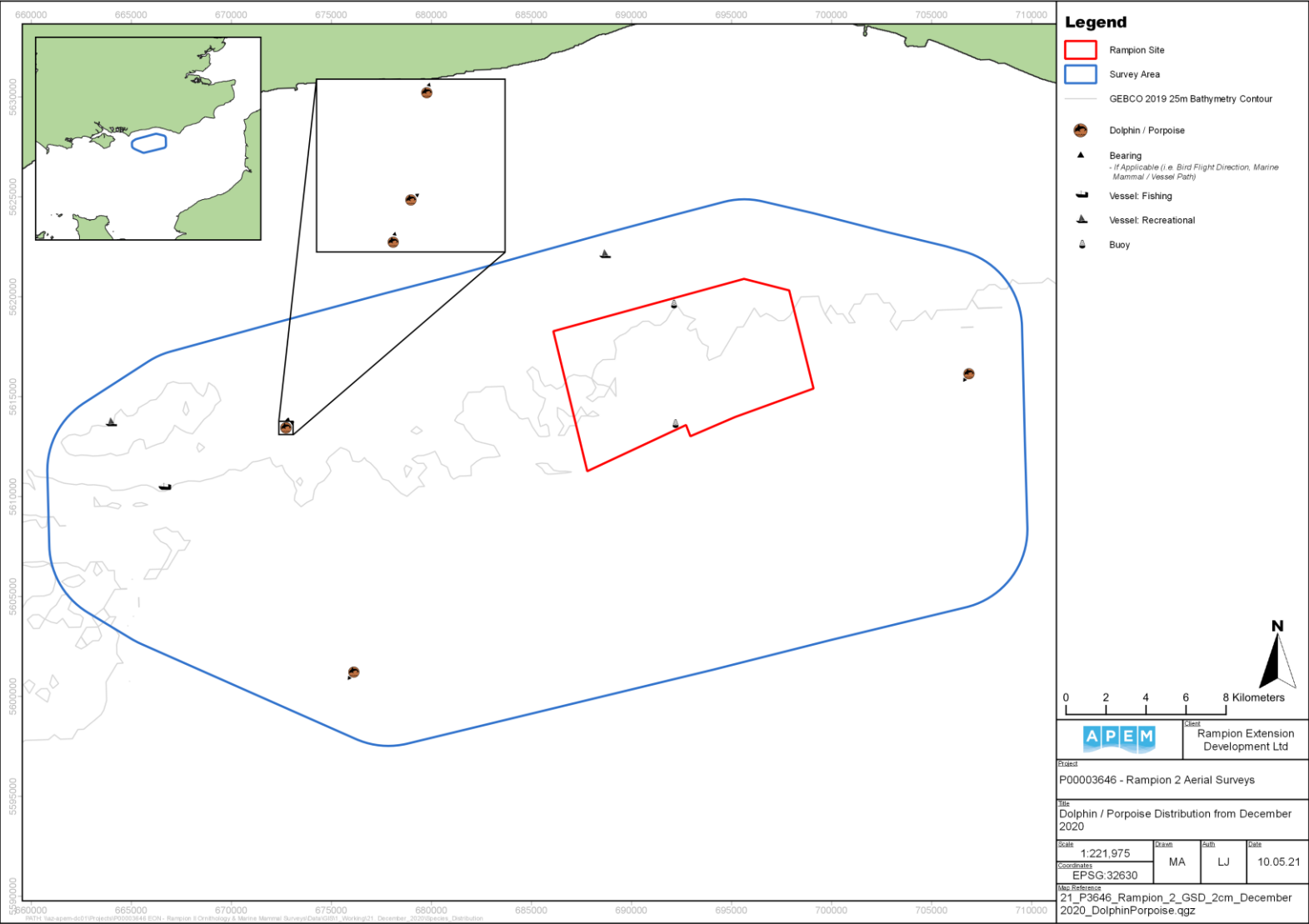


Figure 65 Distribution of unidentified dolphins and / or porpoises recorded in the Rampion 2 Survey Area from December 2020



4.32 Grey Seal *Halichoerus grypus*

A single grey seal was recorded in both January and March 2021, both resulting in an abundance estimate of nine for the Rampion 2 Survey Area (Table 36).

The single grey seal in January was located in the southeast of the Rampion 2 Survey Area, and the single grey seal in March was located in the west (Figure 66). No grey seals were recorded in the Rampion 1 OWF.

Table 36 Raw counts and abundance and density estimates (No. estimated individuals per km²) of grey seals in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Jan-21	1	9	1	26	1.00	0.01
Mar-21	1	9	1	26	1.00	0.01

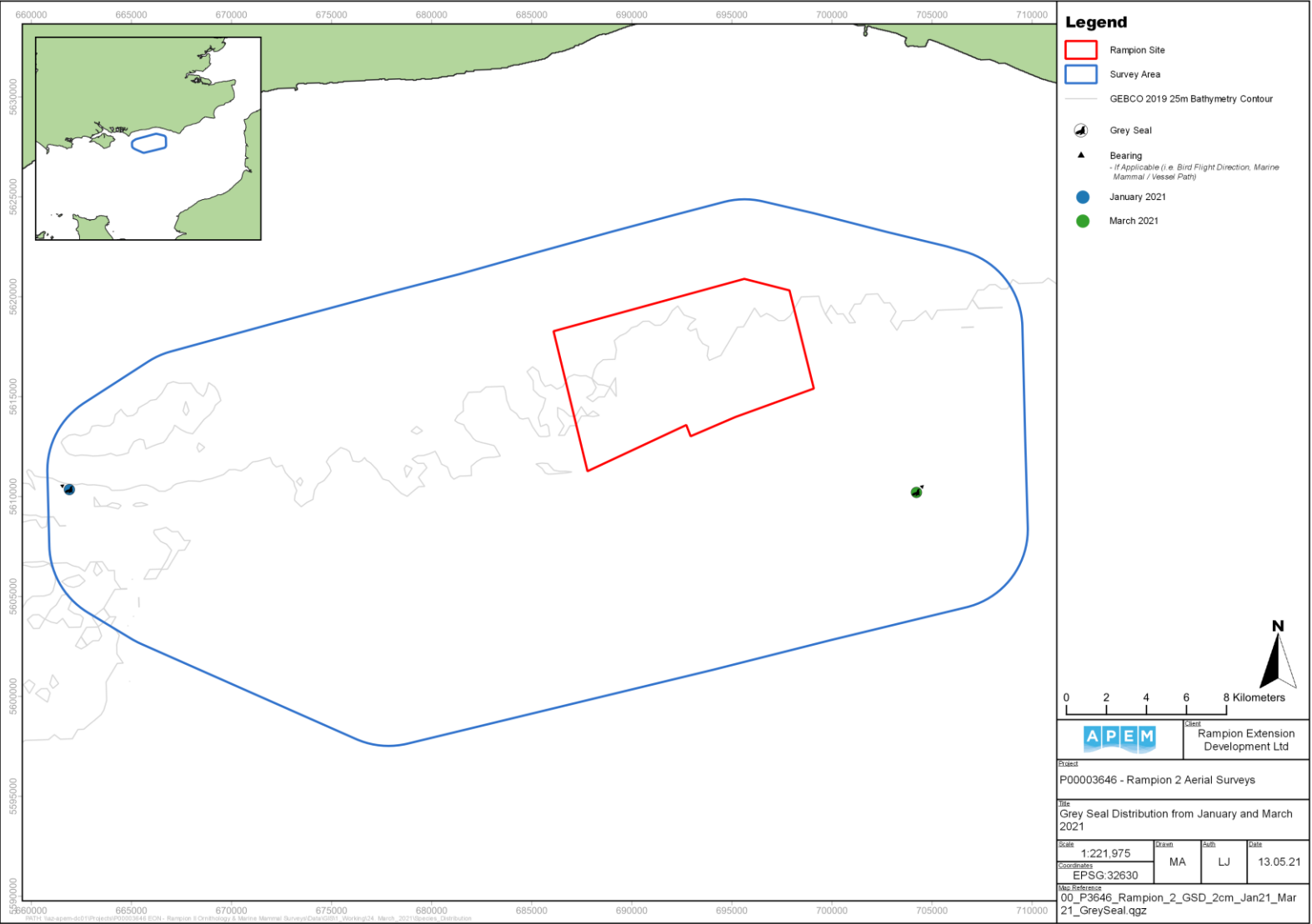


Figure 66 Locations of grey seals recorded in the Rampion 2 Survey Area from January and March 2021



4.33 Seal species – Unidentified Phocidae

A single unidentified seal was recorded in August 2020 only, resulting in an abundance estimate of 10 for the Rampion 2 Survey Area (Table 37).

The single unidentified seal was located in the south-southwest of the Rampion 2 Survey Area (Figure 67).

Table 37 Raw counts and abundance and density estimates (No. estimated individuals per km²) of unidentified seals in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
Aug-20	1	10	1	29	1.00	0.01

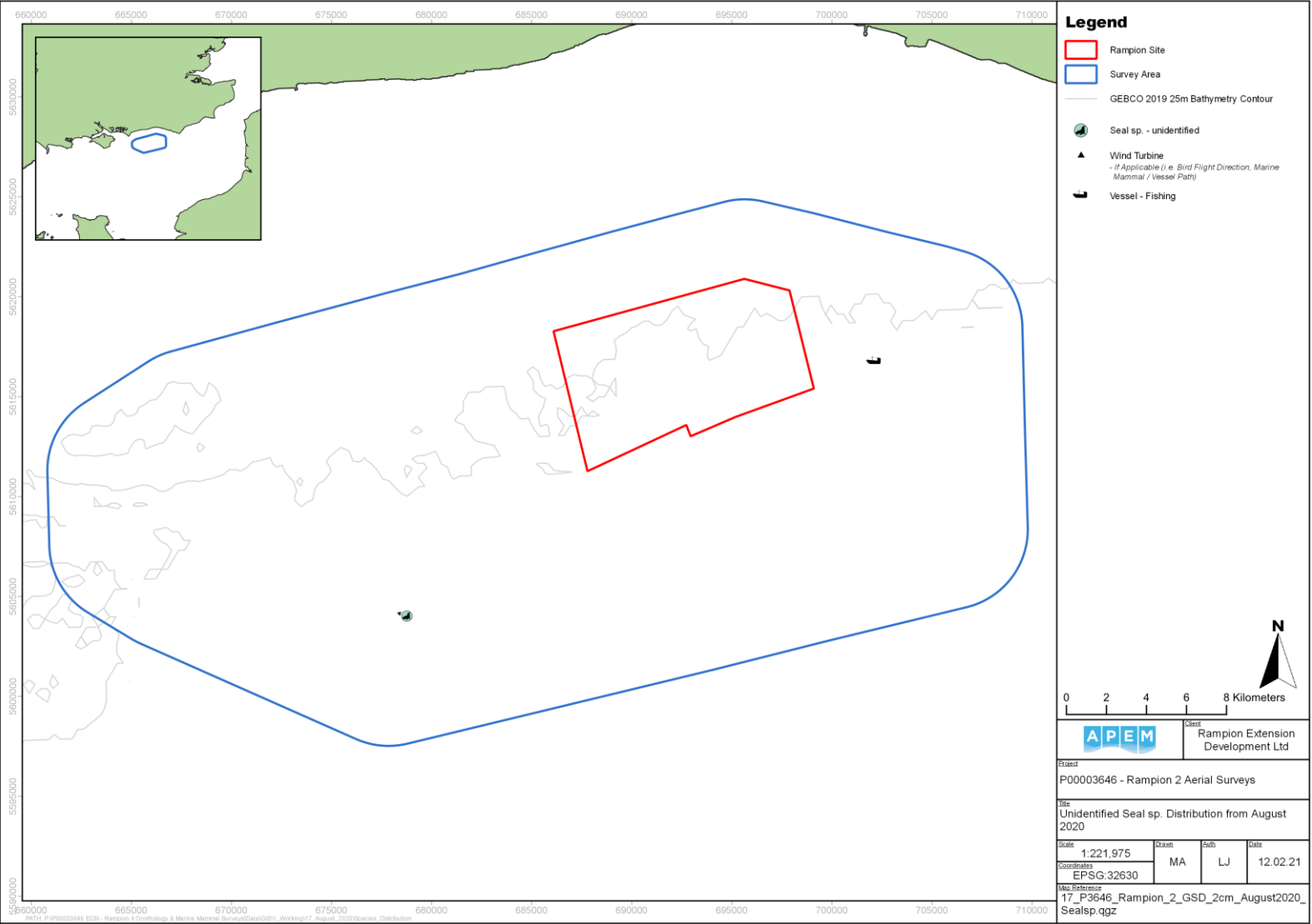


Figure 67 Location of an unidentified seal recorded in the Rampion 2 Survey Area from August 2020



4.34 Ocean Sunfish *Mola mola*

A single ocean sunfish was recorded in May 2020 only, resulting in an abundance estimate of 10 for the Rampion 2 Survey Area (Table 38).

The single ocean sunfish was located in the northwest of the Rampion 2 Survey Area (Figure 68).

Table 38 Raw counts and abundance and density estimates (No. estimated individuals per km²) of ocean sunfish in: a) Rampion 2 Survey Area

a) Rampion 2 Survey Area						
Survey	Raw Count	Abundance	Lower CI	Upper CI	Precision	Density
May-20	1	10	1	30	1.00	0.01

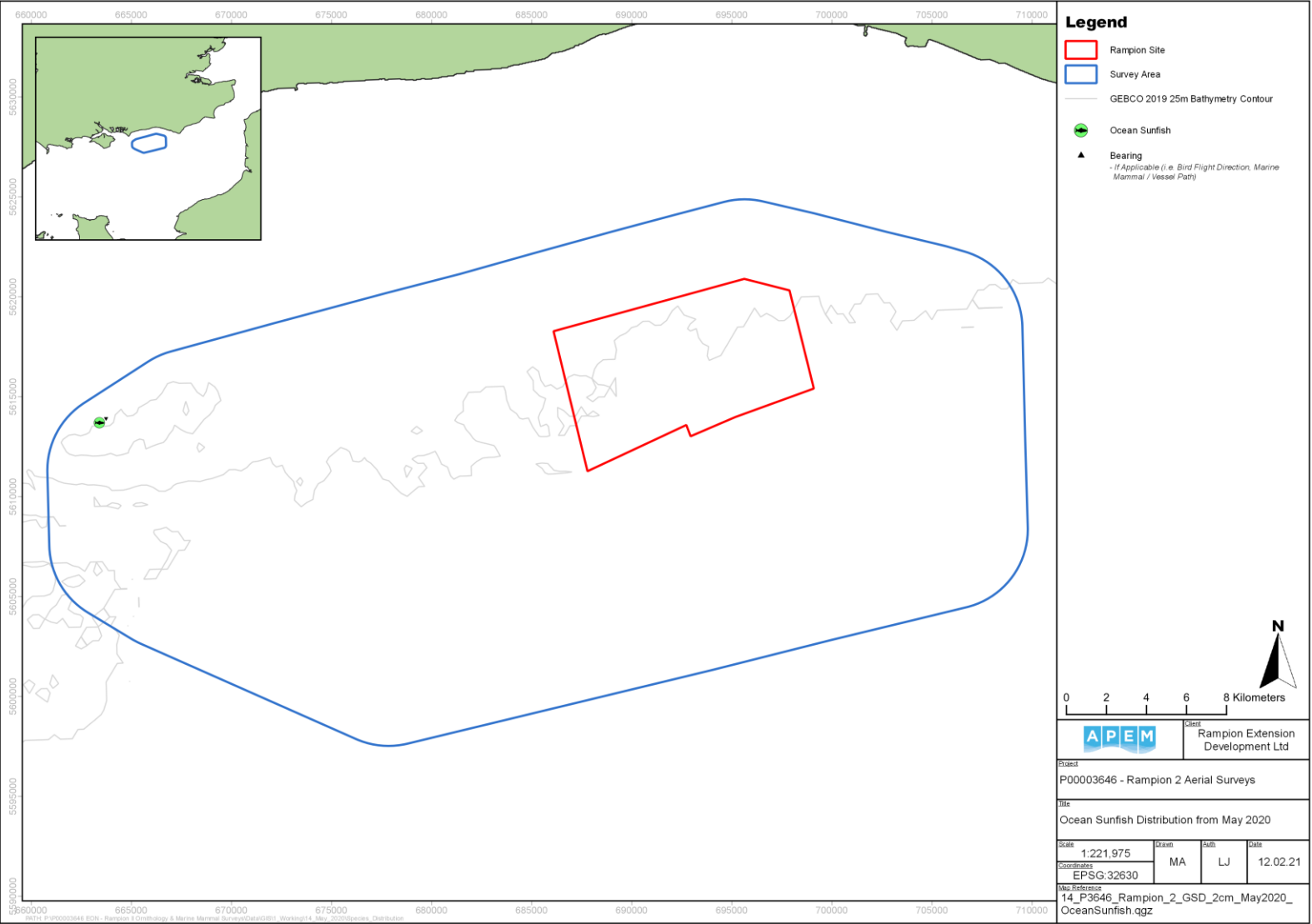


Figure 68 Location of an ocean sunfish recorded in the Rampion 2 Survey Area from May 2020



5. Observations of Abiotic Structures

In April 2020, no vessels were recorded in the imagery. No vessels were recorded visually from the aircraft.

In May 2020, no vessels were recorded in the imagery. No vessels were recorded visually from the aircraft.

In June 2020, no vessels were recorded in the imagery. Three vessels, identified as one recreational sailing vessel, and two cargo vessels, were recorded visually from the aircraft.

In July 2020, two recreational vessels were recorded in the imagery. One vessel, identified as a cargo vessel, was recorded visually from the aircraft.

In August 2020, one fishing vessel was recorded in the imagery. No vessels were recorded visually from the aircraft.

In September 2020, three vessels were recorded in the imagery, identified as a recreational sailing vessel, and two fishing vessels. No vessels were recorded visually from the aircraft.

In October 2020, no vessels were recorded in the imagery. No vessels were recorded visually from the aircraft.

In November 2020, an unidentified vessel was recorded in the imagery. No vessels were recorded visually from the aircraft.

In December 2020, six vessels were recorded visually from the aircraft, identified as two pleasure yachts, a trawler, a fishing vessel, a ferry, and a car ferry. Two vessels were recorded in the imagery; a fishing vessel, and a recreational fishing vessel.

In January 2021, three vessels were recorded visually from the aircraft, identified as two trawlers, and a wind farm support vessel. One vessel, identified as a fishing vessel, was present in the imagery.

In February 2021, no vessels were recorded visually from the aircraft. Two vessels were recorded in the imagery, identified as a supply vessel, and a sailing boat.

In March 2021, one vessel was recorded visually from the aircraft, identified as a fishing vessel. No vessels were recorded in the imagery.

6. Summary and Discussion

A summary of the main abundance findings and distribution patterns, if any, are presented below. For each species group, cross-referencing with relevant literature has been performed to inform the findings of the surveys, as well as form a basis for expectations of species occurrence and seasonality where applicable.

For the findings of the first annual report, peak raw counts for species were often recorded in February 2020. This comparative increase in bird numbers, when compared with other months, was likely attributed to the influence of 'Storm Ciara' that occurred in the succeeding days of the survey flight.

Species groups that were recorded during Year 1 surveys but were not recorded during Year 2 included storm-petrels, shearwaters, grebes, and skuas. Likewise, hirundine species, little egrets, and ocean sunfish were recorded during Year 2 surveys but were not recorded during Year 1.

6.1 Wildfowl

A total of seven common scoters were recorded during the survey period. Common scoters were not recorded during the Year 1 surveys. No other wildfowl species occurred during Year 2 which was in contrast to Year 1 where brent geese and common shelduck were recorded. Common scoters were recorded in April 2020 only. The peak raw count for common scoters (n=7) resulted in a peak abundance estimate of 69 for the Rampion 2 Survey Area. No common scoters were recorded within the Rampion 1 OWF.

Common scoters were recorded flying in a single group in the central east of the Rampion 2 Survey Area, south of the Rampion 1 OWF. Common scoter rarely breed in the UK (averaging 50 pairs per year) and are almost exclusively coastal outside of the breeding season, with up to 100,000 individuals wintering in the country (Sterry and Stancliffe, 2015). They can be seen on passage, heading to and from breeding grounds in Scandinavia, and wintering grounds such as the Bay of Biscay, Denmark, and other European shores (Blohm Dahl, Breife, and Holmström, 2003; Sterry and Stancliffe, 2015).

6.2 Divers

Divers consisted of red-throated divers and unidentified divers, with totals of nine and two, respectively, recorded during the survey period. Great northern divers were recorded during the Year 1 surveys but were not recorded during Year 2. Red-throated divers occurred December 2020 to March 2021, and unidentified divers occurred in February and March 2021. Peak raw counts for red-throated divers were recorded in December 2020, and February 2021 (n=3), resulting in a peak abundance estimate of 26 for the Rampion 2 Survey Area, whereas during Year 1 the peak occurred in January with an abundance estimate of 42. Peak raw counts of unidentified divers were recorded in February and March 2021 (n=1; n=1), resulting in a peak abundance estimate of nine for the Rampion 2 Survey Area which coincided with results from Year 1. No divers were recorded within the Rampion 1 OWF.

In February, the single unidentified diver was located in the central north section of the Rampion 2 Survey Area, whilst in March the single unidentified diver was located in the central southwest section. Red-throated divers winter at the coast (Hume *et al.*, 2016) which is supported by their highest abundance for the Rampion 2 Survey Area being recorded during winter months. Unidentified divers may have consisted of red-throated, great northern, or black-throated divers. Great northern divers are scarce visitors between August and May,

predominantly recorded at sea (Hume *et al.*, 2016), and black-throated divers can also be encountered off British coasts in the winter, albeit in comparative scarcity (Hume *et al.*, 2016).

6.3 Cormorants and Shags

Cormorants and shags consisted of cormorants, and unidentified cormorants / shags, with totals of 11 and three, respectively, recorded during the survey period. Cormorants occurred in October 2020 and February 2021. Unidentified cormorants / shags occurred in April 2020 and March 2021. Peak raw counts for cormorants were recorded in February 2021 (n=6), resulting in a peak abundance estimate of 51 for the Rampion 2 Survey Area, whereas during Year 1 the peak occurred in September with an abundance estimate of 18. Peak raw counts of unidentified cormorants / shags were recorded in March 2021 (n=2), resulting in a peak abundance estimate of 17 for the Rampion 2 Survey Area, whereas during Year 1 the peak occurred in August with an abundance estimate of nine. No identified cormorants were recorded within the Rampion 1 OWF.

Cormorants and unidentified cormorants / shags showed no clear patterns of distribution, being recorded in the north, southeast, southwest, and west of the Rampion 2 Survey Area. Both cormorants and shags are common and widespread around the British coastline, with the winter period experiencing peak abundance (Hume *et al.*, 2016), which the Year 2 survey results align with, though records remained low throughout.

6.4 Fulmars

A total of nine fulmars were recorded during the survey period. Fulmars occurred in May, July, August, November, and December 2020, and January and March 2021. Peak raw counts for fulmars were recorded in both May 2020 and March 2021 (n=2) resulting in peak abundance estimates of 20 and 17, respectively, for the Rampion 2 Survey Area, whereas during Year 1 the peak occurred in August with an abundance estimate of 104. No fulmars were recorded within the Rampion 1 OWF.

Fulmars showed no distinct distribution patterns across the survey period, with individuals occurring in the west, southeast, and south of the Rampion 2 Survey Area. Fulmars are considered to be mostly non-breeders on the West Sussex coast, though both East Sussex and the Isle of Wight have confirmed breeding populations (Robinson, 2005). As pelagic foragers, fulmars are found year-round off British waters, supported by the findings of the Year 2 survey results, though they are more widely found further offshore (Hume *et al.*, 2016).

6.5 Little Egret

A single little egret was recorded in December 2020 only, resulting in an abundance estimate of nine for the Rampion 2 Survey Area. The individual was recorded in the central east section. No little egrets were recorded in the Rampion 1 OWF.

Historically a rarity in Britain, little egrets are now considered common residents on estuaries and coastal rivers in southern England (Sterry and Stancliffe, 2015). The breeding population averages 700 pairs, with numbers boosted from Europe to *circa* 7,500 individuals every winter (Sterry and Stancliffe, 2015).

6.6 Gannets

A total of 278 gannets were recorded during the survey period. Gannets were recorded in every month of the survey period from April 2020 to March 2021. Peak raw counts for gannets were recorded in January 2021 (n=121), resulting in a peak abundance estimate of 1,042 for

the Rampion 2 Survey Area whereas during Year 1 the peak occurred in February with an abundance estimate of 590. No gannets were recorded within the Rampion 1 OWF.

Gannet records varied considerably between months, both in numbers of individuals and in geographic distribution within the Rampion 2 Survey Area. May featured a dense cluster of gannets in the northwest; December showed greater densities in the east; and January, February, and March all showed greater densities in the south of the Rampion 2 Survey Area, with January showing additional density in the west, and March showing additional densities in the east. No discernable distribution patterns were evident for the remaining survey months. Around the British coastline gannets are often consistently present, but the species is also a common summer and autumn migrant (Hume *et al.*, 2016).

6.7 Small Gulls

Small gulls consisted of kittiwakes, black-headed gulls, Mediterranean gulls, common gulls, and unidentified small gulls, with totals of 845, two, two, 70, and 57, respectively, recorded during the survey period. Little gulls were not recorded during the Year 2 surveys. Kittiwakes were recorded in the Rampion 2 Survey Area in June, August, September, November, and December 2020, as well as January to March 2021. Peak raw counts for kittiwakes in the Rampion 2 Survey Area were recorded in March 2021 (n=302), resulting in an abundance estimate of 2,569 whereas during Year 1 the peak occurred in February with an abundance estimate of 2,931. A single black-headed gull was recorded in both January and March 2021, resulting in an abundance estimate of nine for the Rampion 2 Survey Area for both months. Black-headed gulls were not recorded during the Year 1 surveys. Single Mediterranean gulls were recorded in both January and March 2021, resulting in an abundance estimate of nine for both months for the Rampion 2 Survey Area which generally coincided with Year 1 survey results. Common gulls were recorded in the Rampion 2 Survey Area between November 2020 and March 2021 which coincided with the Year 1 results. Peak raw counts for common gulls in the Rampion 2 Survey Area were recorded in December (n=28), resulting in an abundance estimate of 239 whereas during Year 1 the peak occurred in February with an abundance estimate of 3,203. Unidentified small gull species were recorded in April, June, July, August, and December 2020, as well as January to March 2021. Peak raw counts for unidentified small gulls occurred in January 2021 (n=24), resulting in an abundance estimate of 170 for the Rampion 2 Survey Area whereas during Year 1 the peak occurred in March with an abundance estimate of 142.

Small gulls were recorded throughout the majority of the year with the exception of May and October 2020. March 2021 had the highest numbers of small gulls recorded. Of these, kittiwakes were the most numerous species with common gulls the next most numerous identified species, especially in winter. Outside the breeding season, common gull numbers are boosted by influxes from mainland Europe from 48,000 pairs to approximately 700,000 individuals (Sterry and Stancliffe, 2015), in line with the lack of breeding season records in the Year 2 survey results. Similarly, during the non-breeding period most Kittiwakes occur out at sea (Blohm Dahl, Breife, and Holmström, 2003; Sterry and Stancliffe, 2015), which the Year 2 survey results align with.

Kittiwakes, common gulls, and unidentified small gull species were the only small gulls recorded within the Rampion 1 OWF. Of these, kittiwakes were recorded in the highest densities within the Rampion 1 OWF in December 2020. Kittiwakes were also recorded in the highest densities across the total Rampion 2 Survey Area, with the majority distributed in the west of the Rampion 2 Survey Area in November, and the northeast in December. Similar patterns were observed for the remaining three survey months, with the highest density areas varying between them. High densities were located in the center and west of the Rampion 2 Survey Area for January, in the south and southeast for February, and in the center and southeast for March.

Mediterranean gulls occurred in low numbers, which would be expected due to the species being a scarce visitor, though Mediterranean gull records have been seen to be increasing in recent years (Hume *et al.*, 2016). Black-headed gulls are resident breeders in the UK (c. 130,000 pairs), with numbers boosted to over 2 million individuals during the winter months by influxes from mainland Europe (Sterry and Stancliffe, 2015). However, the species favours freshwater habitats (Sterry and Stancliffe, 2015), which reflects the low numbers of records in this instance.

6.8 Large Gulls

Large gulls consisted of great black-backed gulls, herring gulls, lesser black-backed gulls, unidentified black-backed gull species, and unidentified large gulls, with totals of 252, 793, 35, 14, and 389, respectively, recorded during the survey period. Great black-backed gulls occurred in every month of the twelve month survey period between April 2020 and March 2021, with a peak raw count in January 2021 (n=90), resulting in a peak abundance estimate of 775 whereas during the Year 1 surveys the peak occurred in February with an abundance estimate of 399. Herring gulls also occurred in every survey month, with a peak raw count in May 2020 (n=263), resulting in a peak abundance estimate of 2,651 whereas during the Year 1 surveys the peak occurred in February with an abundance estimate of 2,423. Lesser black-backed gulls occurred from April to September 2020, and January to March 2021, with a peak raw count in March 2020 (n=13), resulting in a peak abundance estimate of 131 which coincided with Year 1 results, although the estimated abundance was approximately half (50). Unidentified black-backed gull species were recorded in May and November 2020, as well as January and March 2021, with a peak raw count in May 2020 (n=7), resulting in an abundance estimate of 71. Unidentified large gulls occurred from April to July and September 2020, as well as February and March 2021, with a peak raw count in May 2020 (n=325), resulting in a peak abundance estimate of 3,276.

Large gulls tended to occur mostly within the eastern half of the Rampion 2 Survey Area, with areas of particularly dense grouping occurring in the Rampion 1 OWF, outside of and to the south and east of the Rampion 1 OWF, and in the south-southeast of the Rampion 2 Survey Area. Herring gulls were the most numerous of the large gull species recorded, in line with their tendency to be common and widespread throughout the British Isles (Hume *et al.*, 2016). Great black-backed gulls are more widespread during the winter months (Hume *et al.*, 2016) and of the seasons they were recorded in for the survey, their numbers were consistently higher during the winter. Lesser black-backed gulls occurred in comparatively lower numbers to herring and great black-backed gulls and, although the species is generally more numerous in the winter months (Hume *et al.*, 2016), the Year 2 survey results do not reflect this

6.9 Unclassified Gulls

Unclassified gulls consisted of unidentified gulls, with a total of 30 recorded during the survey period. Unidentified gulls occurred in June and December 2020, as well as January to March 2021, with peak raw counts recorded in December 2020 (n=9), resulting in a peak abundance estimate of 77.

Unclassified gulls were loosely distributed across the Rampion 2 Survey Area for all months, with densities consisting of no more than three individuals throughout the survey period. Three individuals were recorded within the Rampion 1 OWF in total, while the remainder were generally in the west of the Rampion 2 Survey Area.

6.10 Terns

Terns consisted of Sandwich terns, 'commic' terns, common terns, and little terns, with totals of three, 12, 36, and three, respectively, recorded during the survey period. Little terns were not recorded during the Year 1 surveys. Sandwich terns occurred in May 2020 only (n=3), resulting in a peak abundance estimate of 30 where during Year 1 the peak occurred in September with an abundance estimate of 36. 'Commic' terns occurred in May, August, and October 2020, with a peak raw count in May 2020 (n=10), resulting in a peak abundance estimate of 101 which coincided with the Year 1 results, although the abundance estimate was approximately half (58). Common terns occurred in June 2020 only (n=36), resulting in a peak abundance estimate of 351 which coincided with Year 1 surveys. They were only recorded during July however, with an estimated abundance of 17. Little terns occurred in June 2020 only, with a peak raw count and total of three, resulting in an abundance estimate of 29.

Sandwich terns and 'commic' terns were all loosely distributed in the west of the Rampion 2 Survey Area, whereas common terns were distributed in two dense groups in the south of the Rampion 2 Survey Area, with two single individuals recorded in the northwest. The little terns recorded were grouped in the south-southeast of the Rampion 2 Survey Area.

Both common and Arctic terns are common summer visitors to the British coast, of which the West Sussex coast is an area where common terns are deemed locally common (Hume *et al.*, 2016). Sandwich terns are also locally common summer visitors to the south coast of England (Hume *et al.*, 2016) which the Year 2 survey results support, with terns only being recorded in summer. Little terns are a locally common breeding species (c. 1,900 pairs) (Sterry and Stancliffe, 2015), which reflects the low numbers recorded during the summer.

6.11 Auks

Auk species that occurred consisted of guillemots, razorbills, guillemot / razorbills, and unidentified auks, with totals of 708, 2,323, 3,120, and 17, respectively, recorded during the survey period. Guillemots occurred in May, June, September, November, and December 2020, as well as January to March 2021, with a peak raw count recorded in December 2020 (n=400), resulting in a peak abundance estimate of 3,413 whereas during the Year 1 surveys the peak occurred in April with an abundance estimate of 247. Razorbills occurred in April, August, November, and December 2020, as well as January to March 2021, with a peak raw count in January 2021 (n=1,105), resulting in a peak abundance estimate of 9,514 whereas during the Year 1 surveys the peak occurred in July with an abundance estimate of 26. Guillemot / razorbills occurred in April, May, June, August, October, and December 2020, as well as January to March 2021, with a peak raw count in March 2021 (n=1,427) resulting in a peak abundance estimate of 12,139 whereas during the Year 1 surveys the peak occurred in February with an abundance estimate of 20,941. Unidentified auk species occurred in April, September, and November 2020, as well as January and February 2021, with a peak raw count in January 2021 (n=10) resulting in a peak abundance estimate of 86.

Auks were the most numerous of species groups recorded, though the majority of occurrences were during the winter months. The tendency for guillemots and razorbills to be scarce at inshore sites during winter (Hume *et al.*, 2016) supports the findings of the Year 2 survey. Auks were widely distributed across the Rampion 2 Survey Area, although in notably higher densities outside the Rampion 1 OWF. Guillemot / razorbills were the most numerous species designation, as well as occurring most consistently throughout the year compared with other auks.

6.12 Hirundine Species

A total of three unidentified hirundine species were recorded in September 2020 only, in the northwest of the Rampion 2 Survey Area, resulting in an abundance estimate of 29. The records are likely of migrating individuals following the breeding season, as hirundine species commonly overwinter in Africa (Sterry and Stancliffe, 2015).

6.13 Dolphin / Porpoise species

Dolphin / porpoise species that occurred consisted of harbour porpoises, unidentified dolphins / porpoises, and unidentified dolphins, with totals of 21, 11, and two, respectively, recorded during the survey period. Common dolphins were recorded during Year 1 but were not recorded in Year 2. Harbour porpoises occurred in August and September 2020, as well as February and March 2021, with a peak raw count recorded in February 2021 (n=14), resulting in a peak abundance estimate of 119 whereas during Year 1 the peak occurred in June with an abundance estimate of 20. Unidentified dolphins / porpoises were recorded in April, July, October, November, and December 2020, with a peak raw count in December 2020 (n=5), resulting in an abundance estimate of 43 for the Rampion 2 Survey Area, whereas during Year 1 the peak occurred in September with an abundance estimate of 63. Two unidentified dolphins occurred together in October 2020 in the south of the Rampion 2 Survey Area, resulting in an abundance estimate of 20.

Harbour porpoises were recorded as single individuals or loosely distributed groups across the Rampion 2 Survey Area for the majority of months. During August 2020, records include both a group of three individuals together, as well as distribution focused around the centre of the Rampion 2 Survey Area. Unidentified dolphins and / or porpoises were loosely distributed in the Rampion 2 Survey Area for the majority of surveys, with densities only recorded during April and December 2020 in the north of the Rampion 2 Survey Area and in the northwest, respectively.

Cetaceans occurred across all seasons, with peak numbers recorded during the winter months. As many cetacean species are generally found offshore during the summer months, and the Rampion 2 Survey Area is located in inshore waters, this aligns with the Year 2 survey data. Note that cetacean numbers were low throughout, with a maximum of 14 individuals recorded in any one month.

6.14 Seals

A single grey seal was recorded in both January and March 2021, resulting in an abundance estimate of 29 for each month. Grey seals were not recorded during the Year 1 surveys. A single unidentified seal was recorded during the survey period in August 2020, resulting in a peak abundance estimate of 10 whereas during Year 1 the peak occurred in July with an abundance estimate of 43.

Vincent *et al.* (2017) found that the majority of seals sighted from aerial surveys at sea were located in the northeast of the English channel, with only low densities of specifically grey seals recorded at the location of Rampion 2, which would support the low numbers of seals recorded during the Year 2 surveys.

6.15 Ocean sunfish

A single ocean sunfish was recorded in May 2020 only in the northwest of the Rampion 2 Survey Area, resulting in an abundance estimate of 10.

7. References

- Blomdahl, A., Breife, B., Holmström, N. (2003). *Flight Identification of European Seabirds*. Christopher Helm: London.
- Breuner, C.W., Sprague, R.S., Patterson, S.H., Woods, A.H. (2013). *Environment, behavior and physiology: do birds use barometric pressure to predict storms?* Journal of Experimental Biology **216**:1982-1990 | doi:10.1242/jeb.081067
- Canty, A., Ripley, B. (2010). *boot: bootstrap R (S-Plus) functions*. R package version 1.2-42.
- Efron, B., Tibshirani, R.J. (1993). *An introduction to the bootstrap*. Chapman & Hall, London.
- R Development Core Team (2012). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, <http://www.R-project.org/>.
- Hume, R., Still, R., Swash, A., Harrop, H., Tipling, D. (2016). *Britain's Birds: An identification guide to the birds of Britain and Ireland*. Woodstock: Princeton University Press.
- Robinson, R.A. (2005). BirdFacts: profiles of birds occurring in Britain & Ireland. BTO, Thetford (<http://www.bto.org/birdfacts>, accessed on 13 May 2021).
- Sterry, S., Stancliffe, A. (2015). *Collins BTO Guide to British Birds*. William Collins: London.
- Vincent, C., Huon, M., Caurant, F., Dabin, W., Deniau, A., Dixneuf, S., Dupuis, L., Elder, J-F., Fremau, M-H., Hassani, S., Hemon, A., Karpouzopoulos, J., Lefeuvre, C., McConnell, B.J., Moss, S.E.W., Provost, P., Spitz, J., Turpin, Y., Ridoux, V. (2017). 'Grey and harbour seals in France: distribution at sea, connectivity and trends in abundance at haulout sites', Deep Sea Research Part II: Topical Studies in Oceanography, vol. 141, pp. 294-305 . <https://doi.org/10.1016/j.dsr2.2017.04.004>.

Appendix I Scientific Names and Taxonomy

Common Name	Scientific Name	Family	Class
Common Scoter	<i>Melanitta nigra</i>	Anatidae	Aves
Kittiwake	<i>Rissa tridactyla</i>	Laridae	Aves
Common Gull	<i>Larus canus</i>	Laridae	Aves
Great Black-backed Gull	<i>Larus marinus</i>	Laridae	Aves
Herring Gull	<i>Larus argentatus</i>	Laridae	Aves
Lesser Black-backed Gull	<i>Larus fuscus</i>	Laridae	Aves
Sandwich Tern	<i>Thalasseus sandvicensis</i>	Laridae	Aves
Little Tern	<i>Sternula albifrons</i>	Laridae	Aves
Common Tern	<i>Sterna hirundo</i>	Laridae	Aves
Arctic Tern	<i>Sterna paradisaea</i>	Laridae	Aves
Guillemot	<i>Uria aalge</i>	Alcidae	Aves
Razorbill	<i>Alca torda</i>	Alcidae	Aves
Fulmar	<i>Fulmarus glacialis</i>	Procellariidae	Aves
Gannet	<i>Morus bassanus</i>	Sulidae	Aves
Shag	<i>Phalacrocorax aristotelis</i>	Phalacrocoracidae	Aves
Cormorant	<i>Phalacrocorax carbo</i>	Phalacrocoracidae	Aves
Hirundine	<i>Hirundo spp.</i>	Hirundinidae	Aves
Harbour Porpoise	<i>Phocoena phocoena</i>	Phocoenidae	Mammalia
Ocean Sunfish	<i>Mola mola</i>	Molidae	Actinopterygii

Appendix II Species Distribution Maps per Month Recorded

Species / species group designation recorded between April 2020 and March 2021:

• Common Scoter.....	(Figure 1)
• Red-throated Diver.....	(Figure 2 – 5)
• Diver sp. – unidentified.....	(Figure 6 – 7)
• Cormorant.....	(Figure 8 – 9)
• Cormorant and / or Shag.....	(Figure 10 – 11)
• Fulmar.....	(Figure 12 – 18)
• Little Egret.....	(Figure 19)
• Gannet.....	(Figure 20 – 31)
• Kittiwake.....	(Figure 32 – 39)
• Black-headed Gull.....	(Figure 40 – 41)
• Mediterranean Gull.....	(Figure 42 – 43)
• Common Gull.....	(Figure 44 – 48)
• Small Gull sp. – unidentified.....	(Figure 49 – 56)
• Great Black-backed Gull.....	(Figure 57 – 66)
• Herring Gull.....	(Figure 67 – 78)
• Lesser Black-backed Gull.....	(Figure 79 – 87)
• Black-backed Gull sp. – unidentified.....	(Figure 88 – 91)
• Large Gull sp. – unidentified.....	(Figure 92 – 99)
• Gull sp. – unidentified.....	(Figure 100 – 104)
• Sandwich Tern.....	(Figure 105)
• ‘Commic’ Tern.....	(Figure 106 – 108)
• Common Tern.....	(Figure 109)
• Little Tern.....	(Figure 110)
• Guillemot.....	(Figure 111 – 118)
• Razorbill.....	(Figure 119 – 125)
• Guillemot and / or Razorbill.....	(Figure 126 – 134)
• Auk species – unidentified.....	(Figure 135 – 139)
• Hirundine species – unidentified.....	(Figure 140)
• Dolphin species – unidentified.....	(Figure 141)
• Harbour Porpoise.....	(Figure 142 – 145)
• Dolphin and / or Porpoise – unidentified.....	(Figure 146 – 150)
• Grey Seal.....	(Figure 151 – 152)
• Seal species – unidentified.....	(Figure 153)
• Ocean Sunfish.....	(Figure 154)

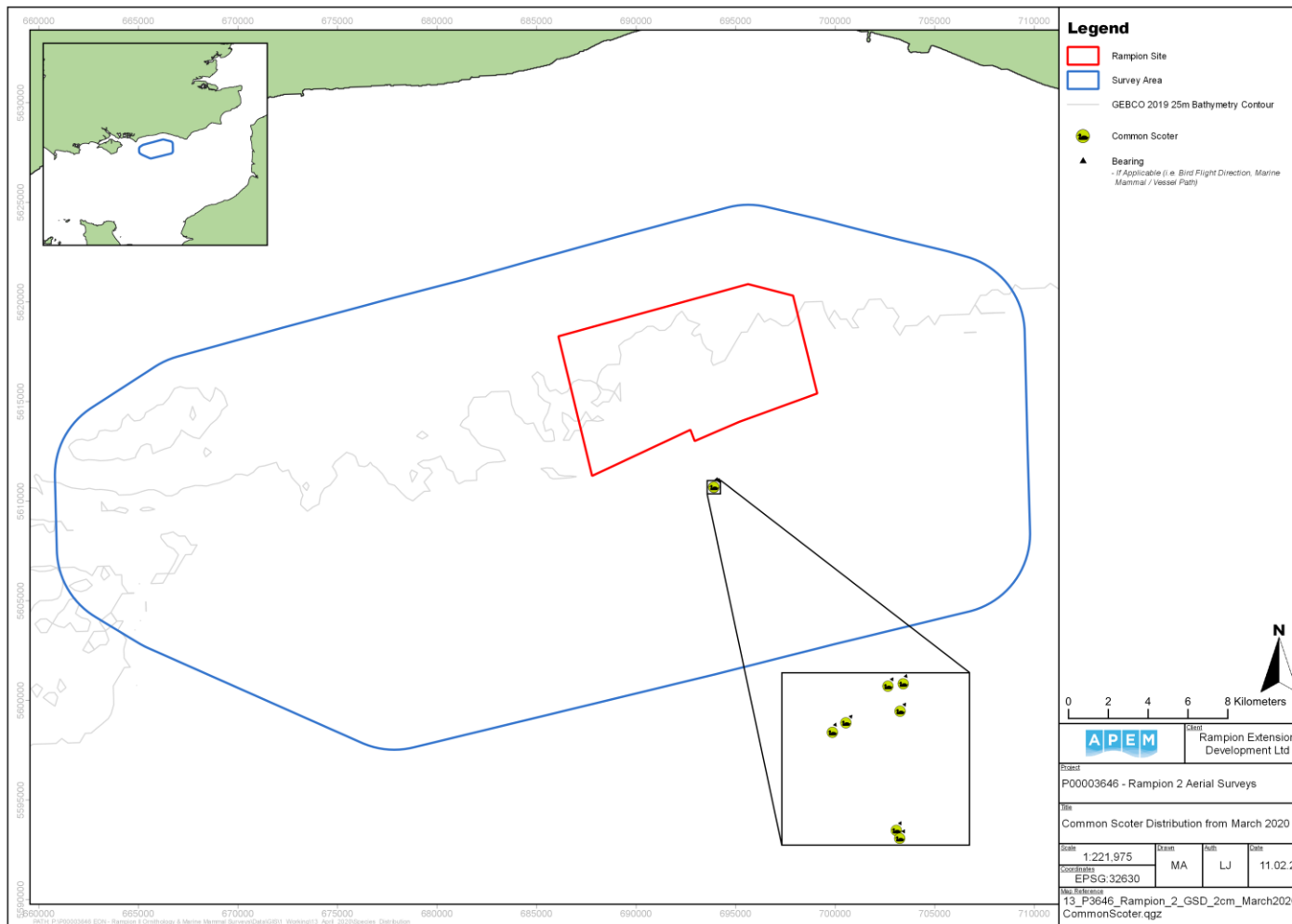


Figure 1 Distribution of common scoters recorded in the Rampion 2 Survey Area in April 2020

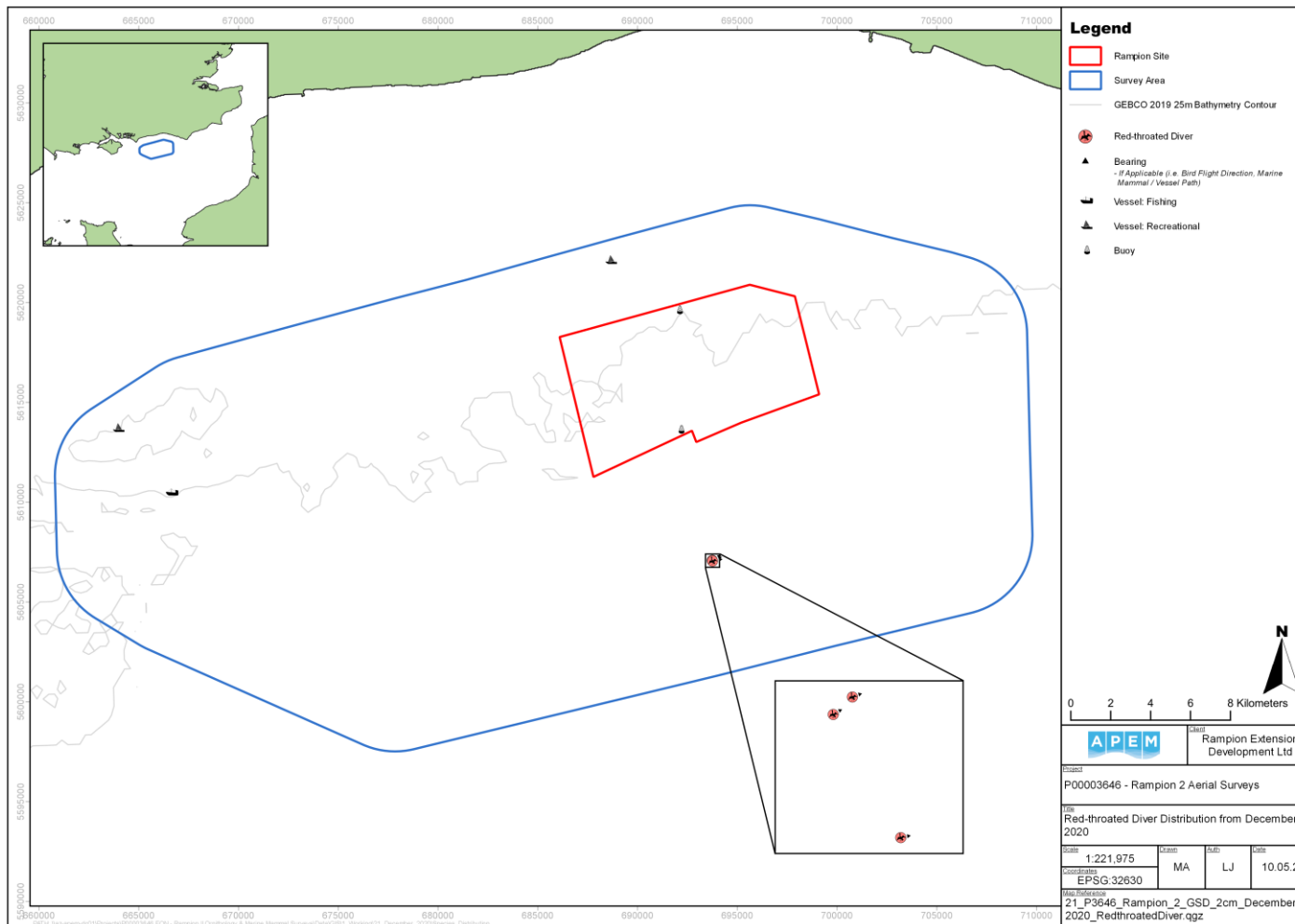


Figure 2 Distribution of red-throated divers recorded in the Rampion 2 Survey Area in December 2020

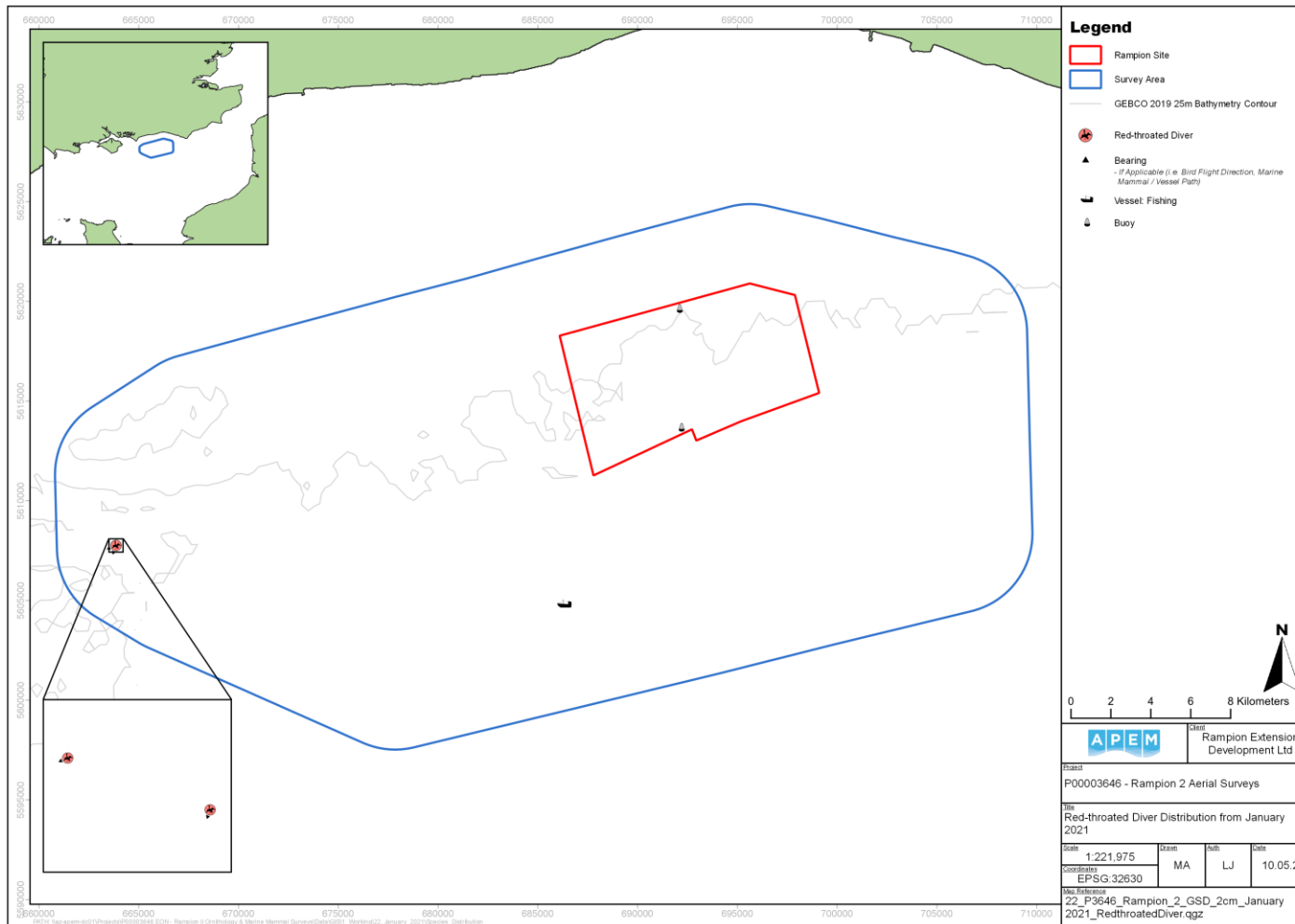


Figure 3 Distribution of red-throated divers recorded in the Rampion 2 Survey Area in January 2021

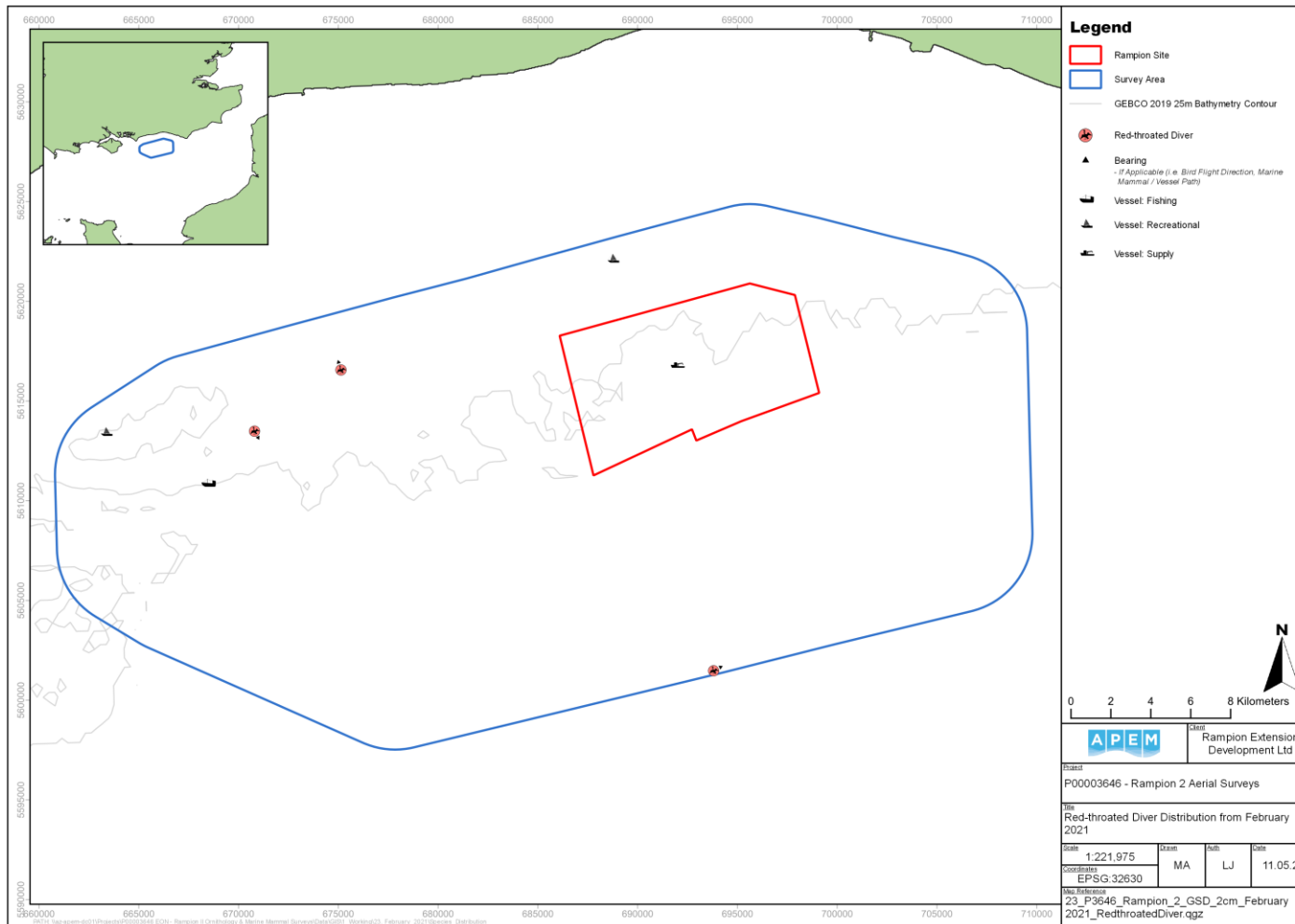


Figure 4 Distribution of red-throated divers recorded in the Rampion 2 Survey Area in February 2021

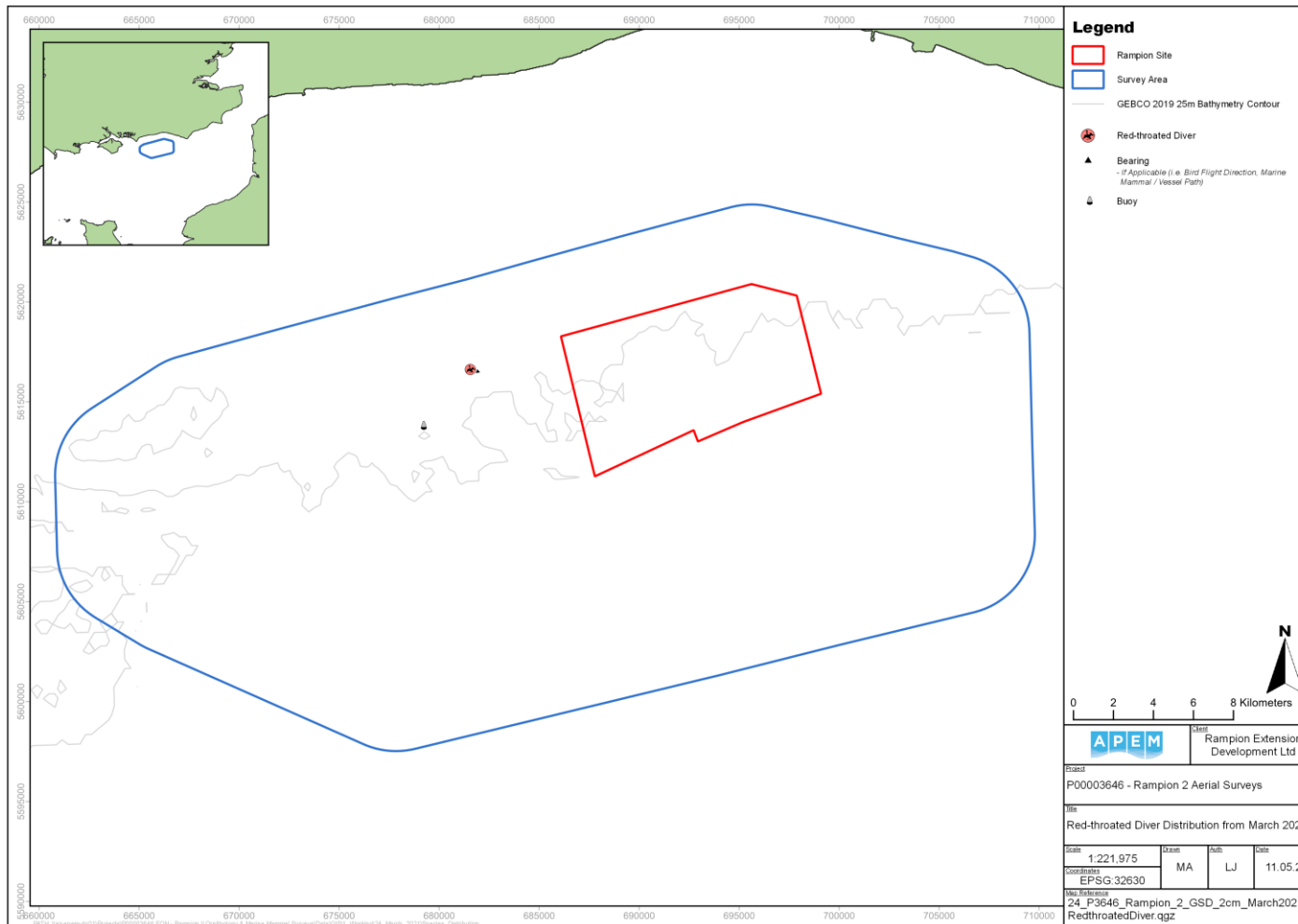


Figure 5 Location of a red-throated diver recorded in the Rampion 2 Survey Area in March 2021

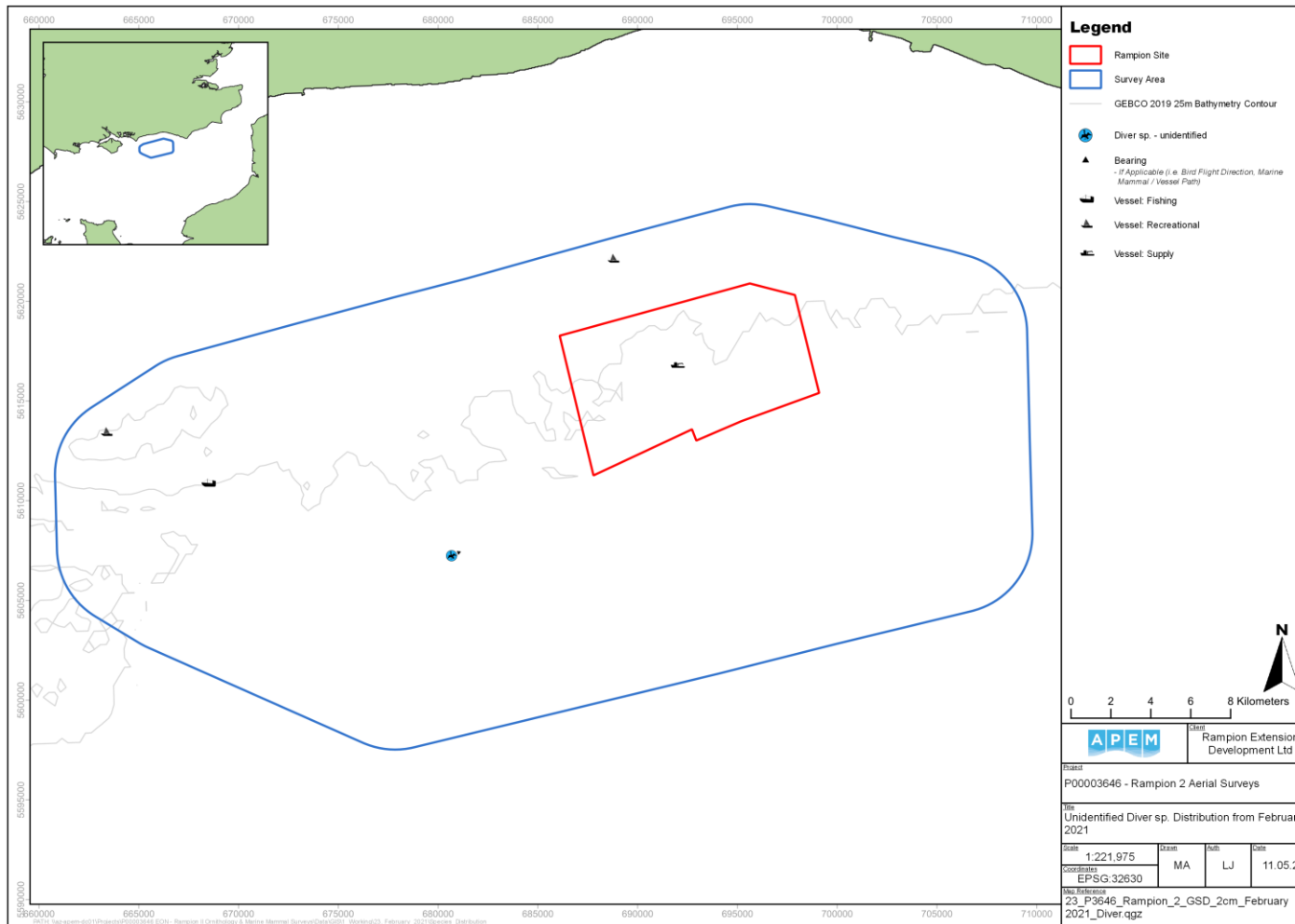


Figure 6 Location of an unidentified diver recorded in the Rampion 2 Survey Area in February 2021

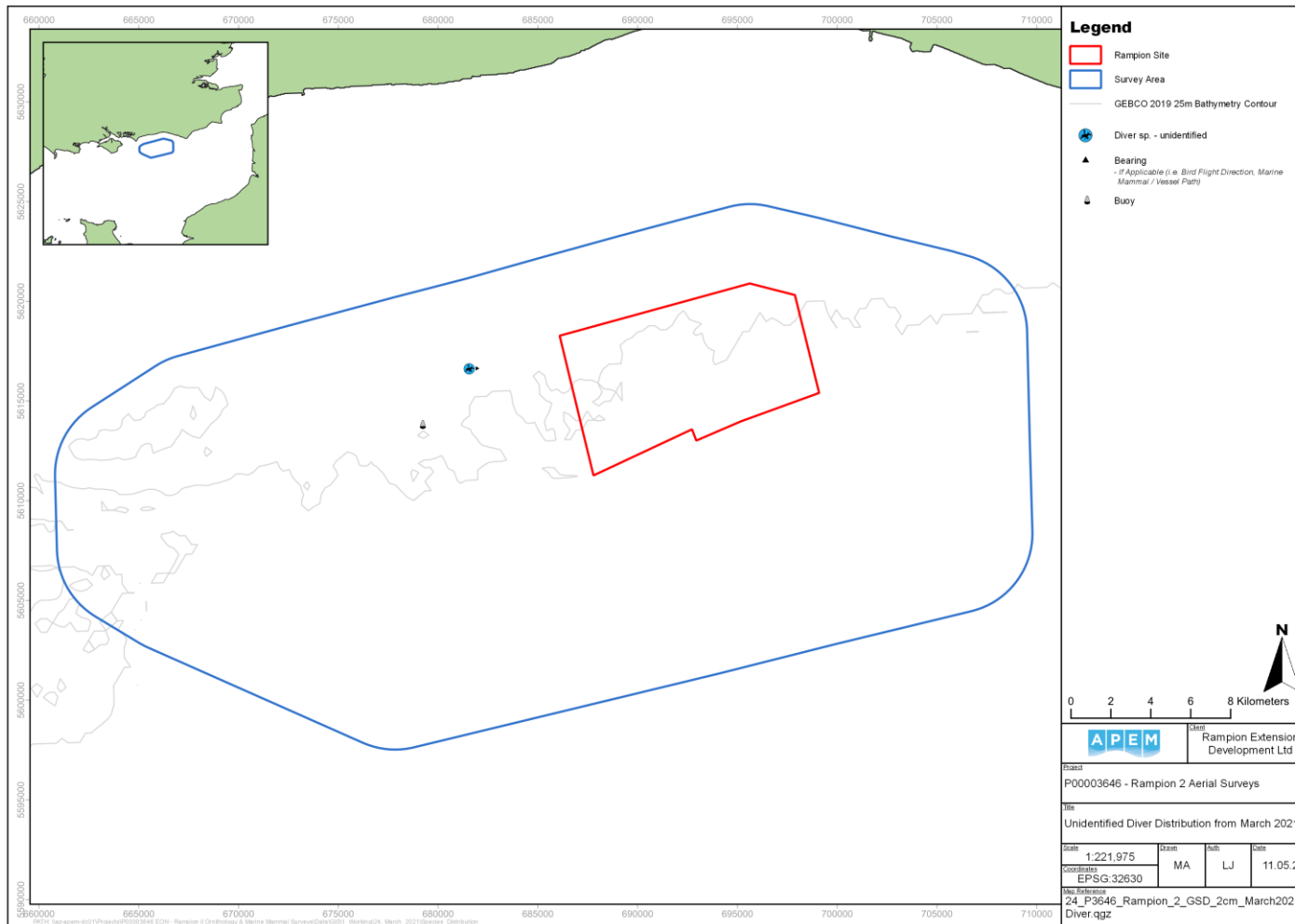


Figure 7 Location of an unidentified diver recorded in the Rampion 2 Survey Area in March 2021

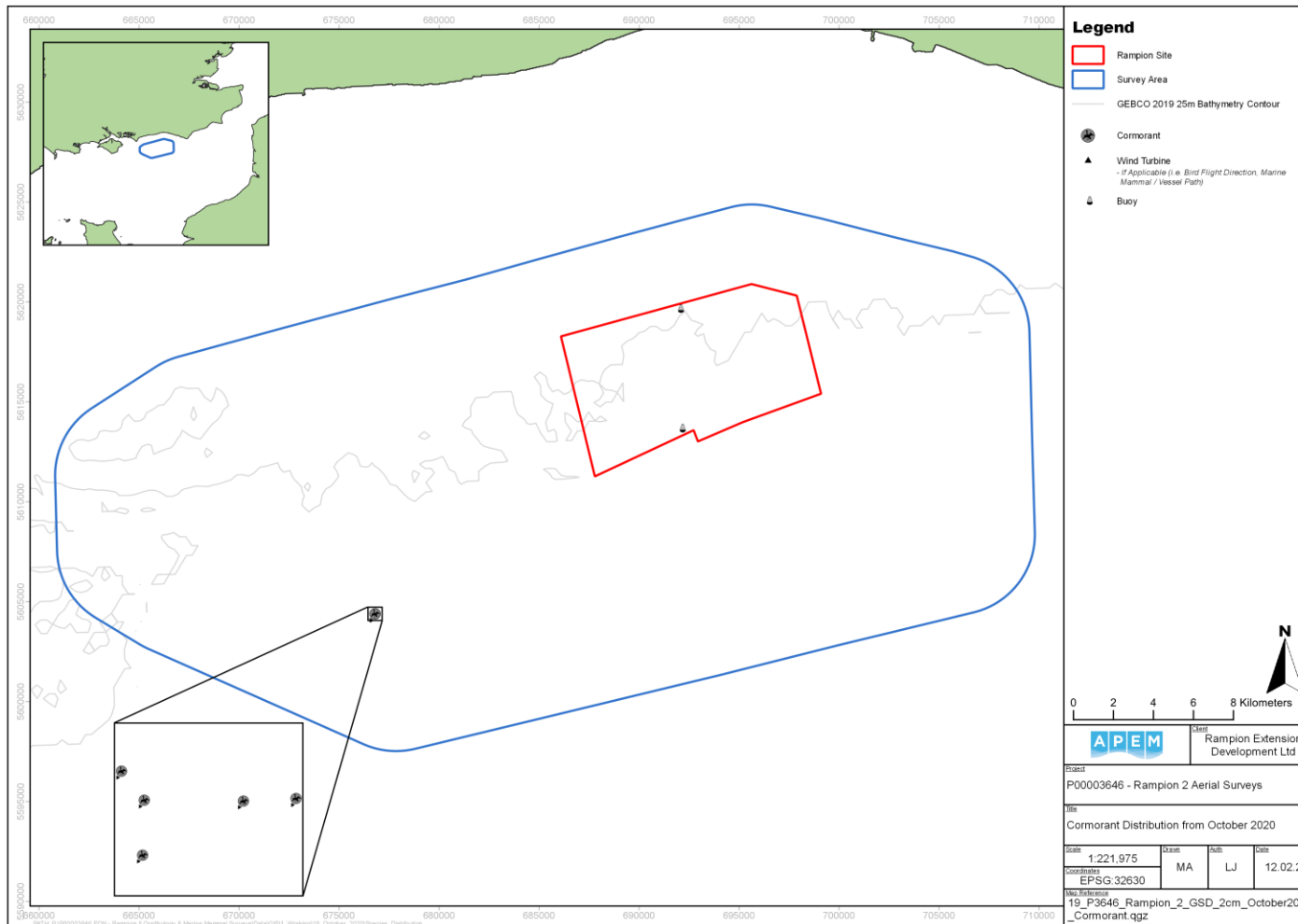


Figure 8 Distribution of cormorants recorded in the Rampion 2 Survey Area in October 2020

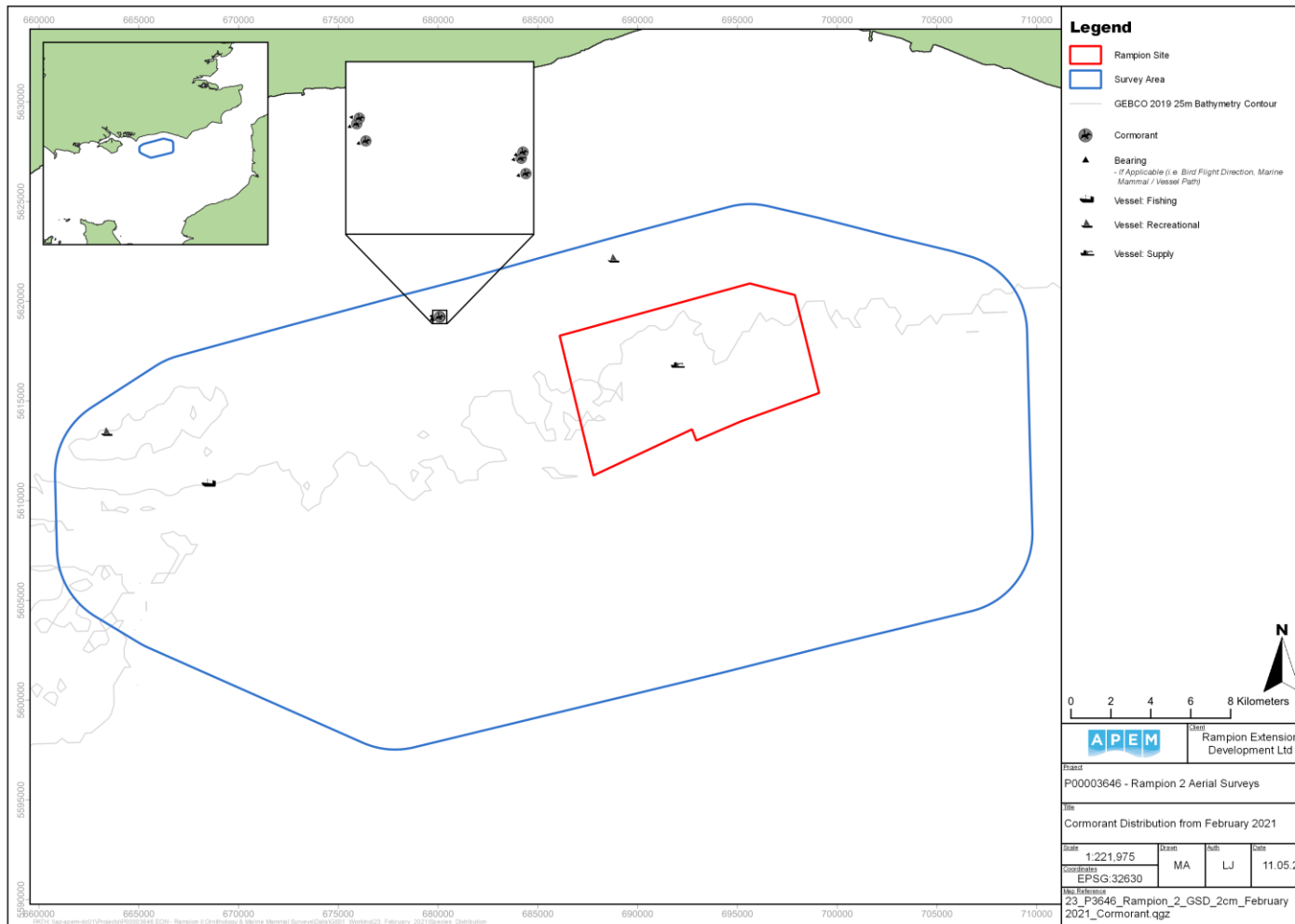


Figure 9 Distribution of cormorants recorded in the Rampion 2 Survey Area in February 2021

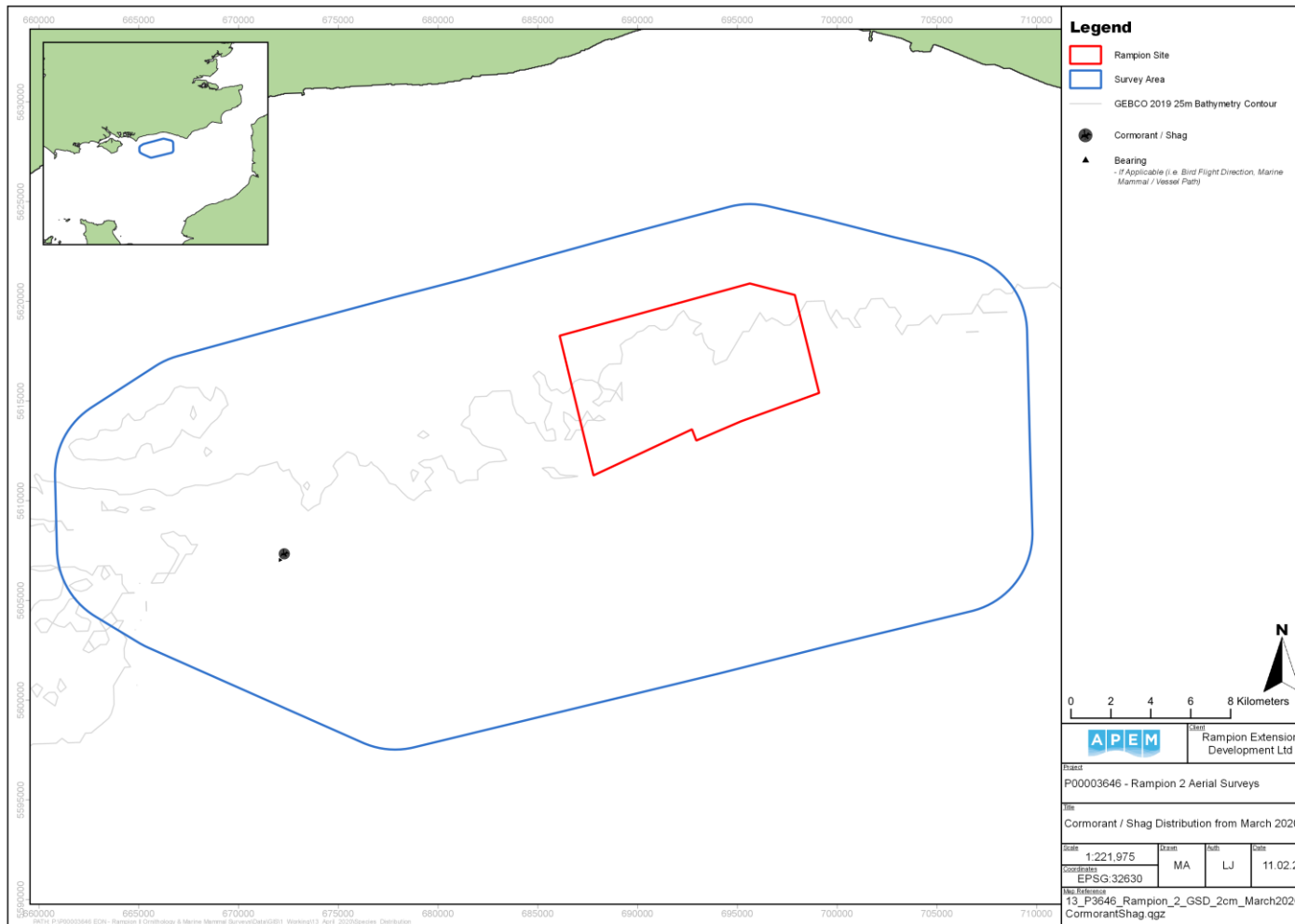


Figure 10 Location of a cormorant and / or shag recorded in the Rampion 2 Survey Area in April 2020

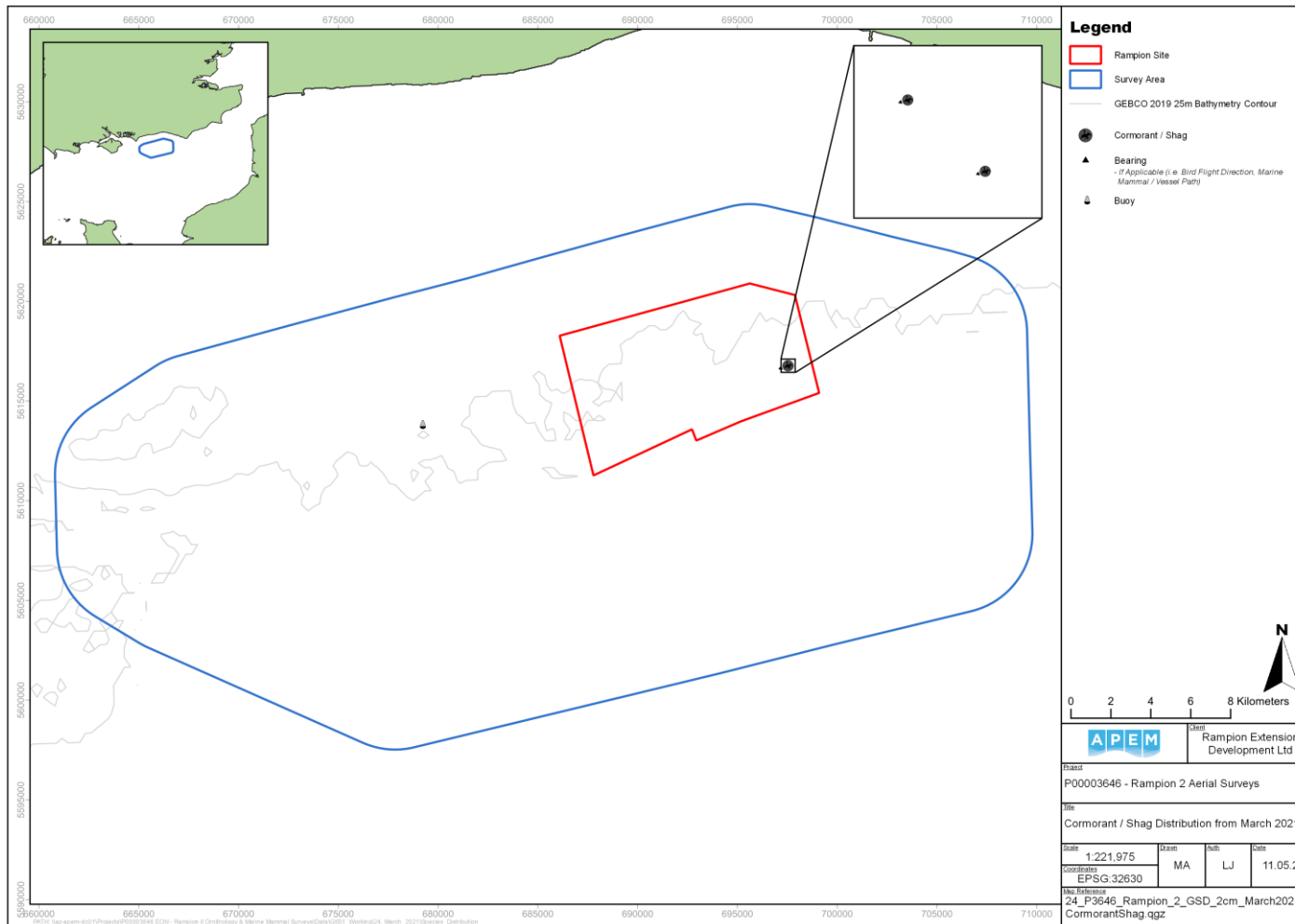


Figure 11 Distribution of cormorants and / or shags recorded in the Rampion 2 Survey Area in March 2021

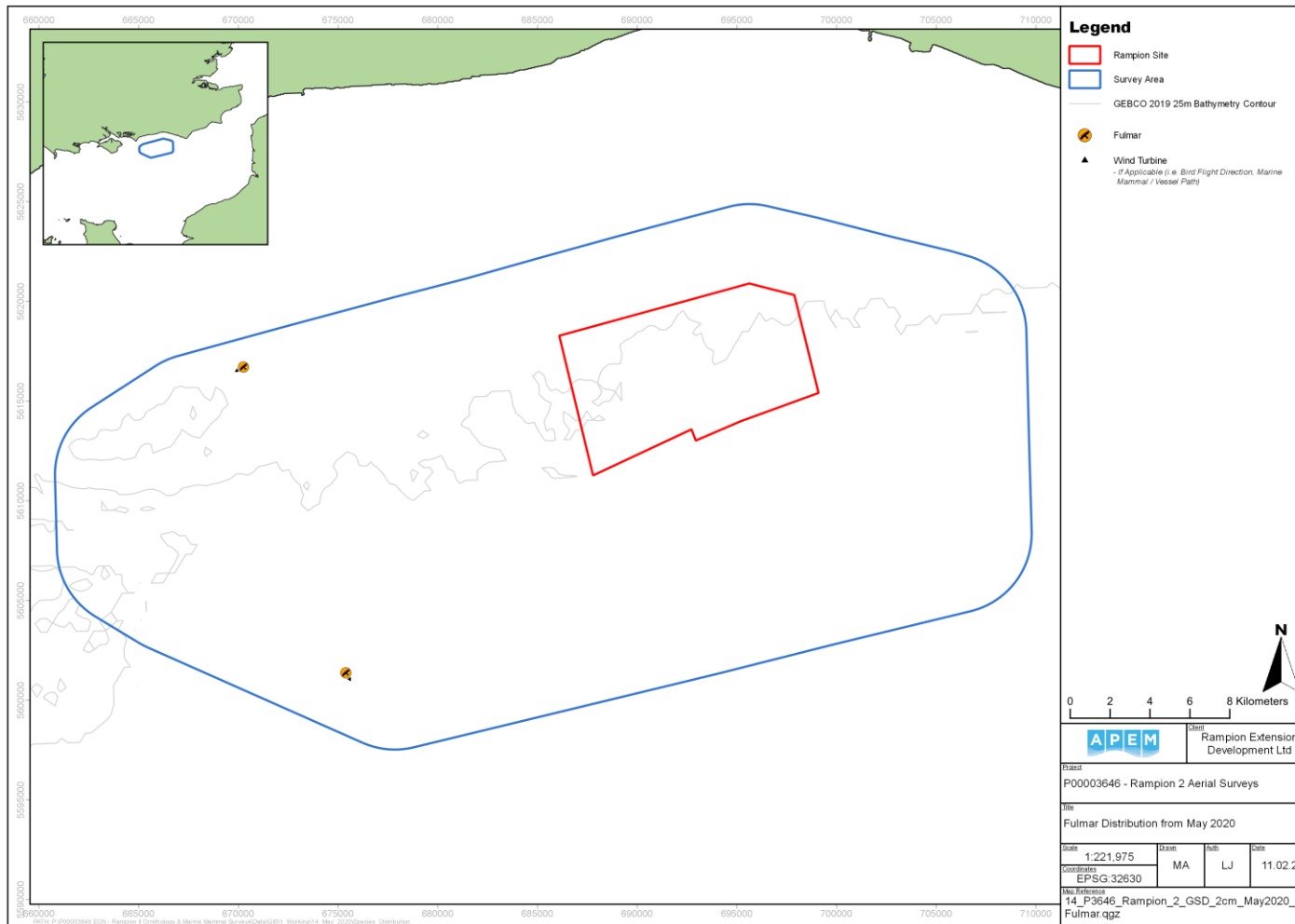


Figure 12 Distribution of fulmars recorded in the Rampion 2 Survey Area in May 2020

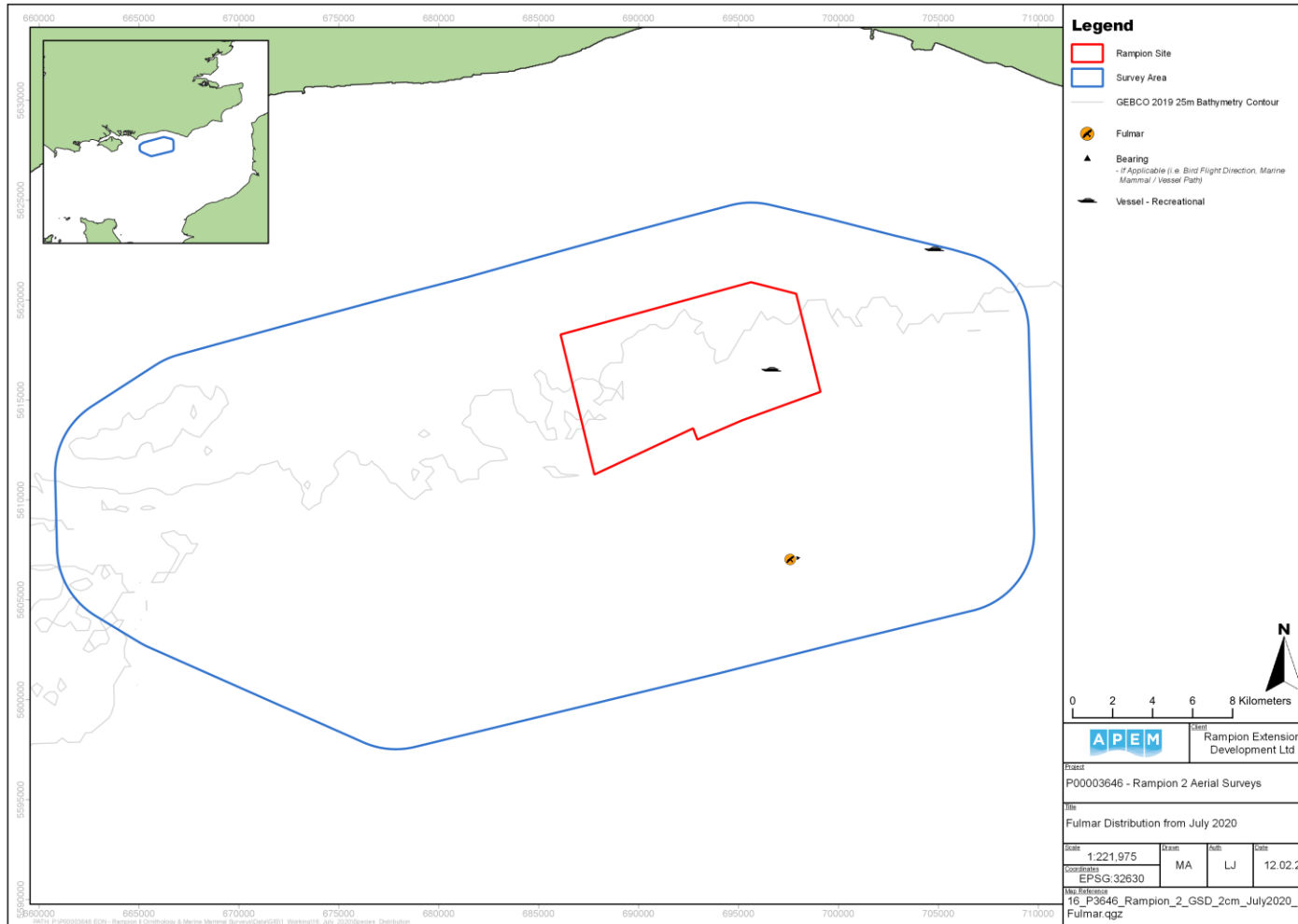


Figure 13 Location of a fulmar recorded in the Rampion 2 Survey Area in July 2020

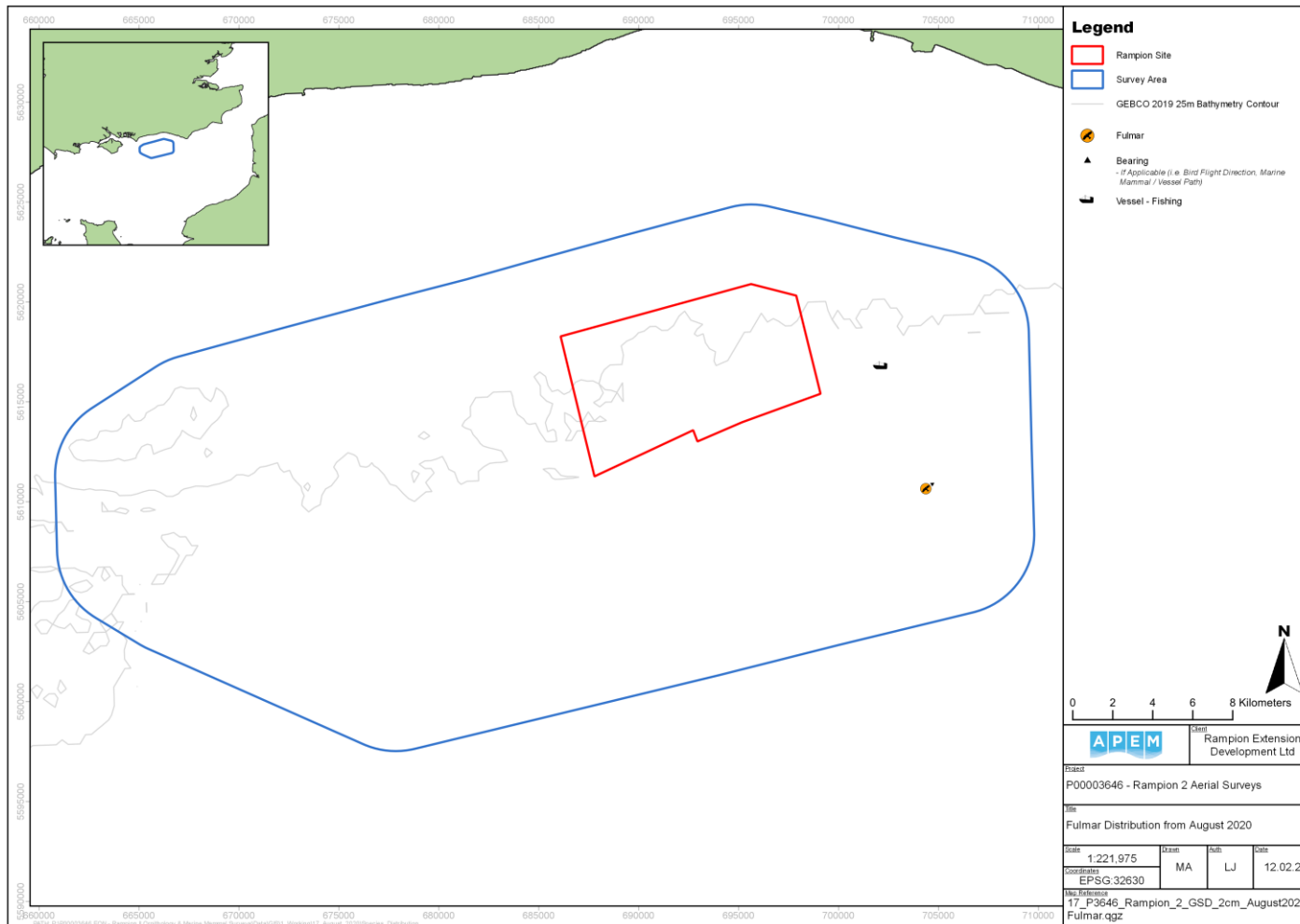


Figure 14 Location of a fulmar recorded in the Rampion 2 Survey Area in August 2020

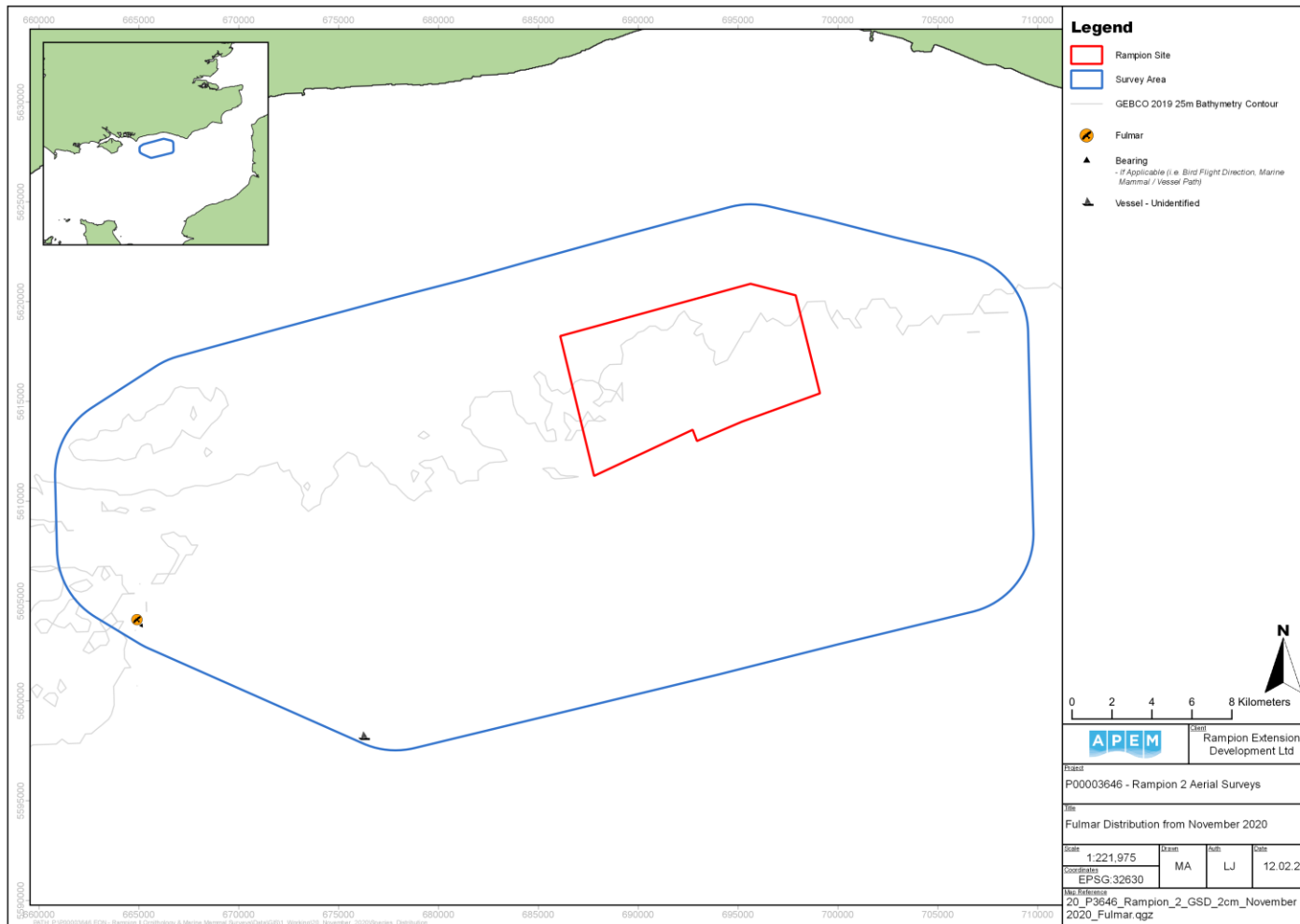


Figure 15 Location of a fulmar recorded in the Rampion 2 Survey Area in November 2020

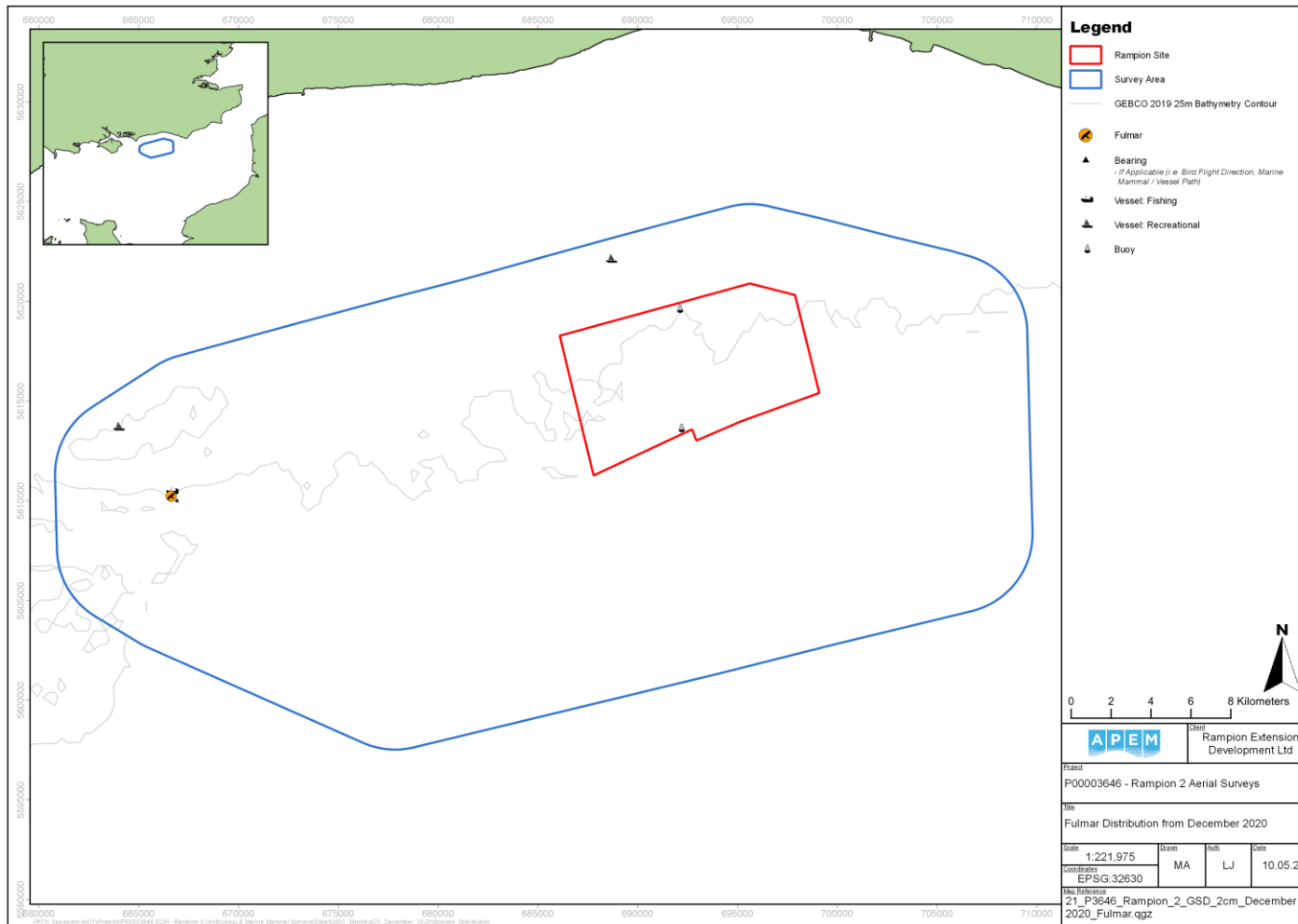


Figure 16 Location of a fulmar recorded in the Rampion 2 Survey Area in December 2020

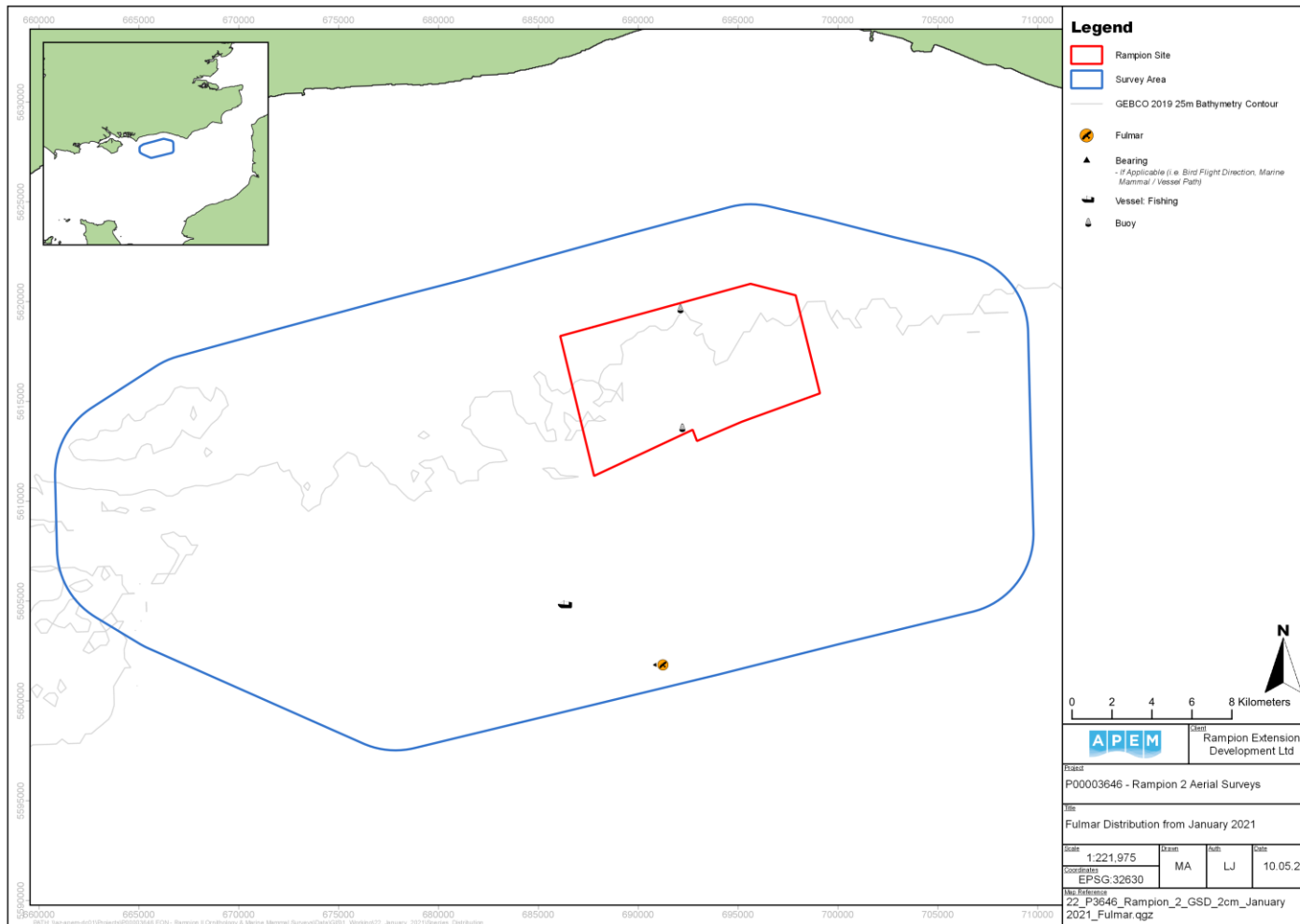


Figure 17 Location of a fulmar recorded in the Rampion 2 Survey Area in January 2021

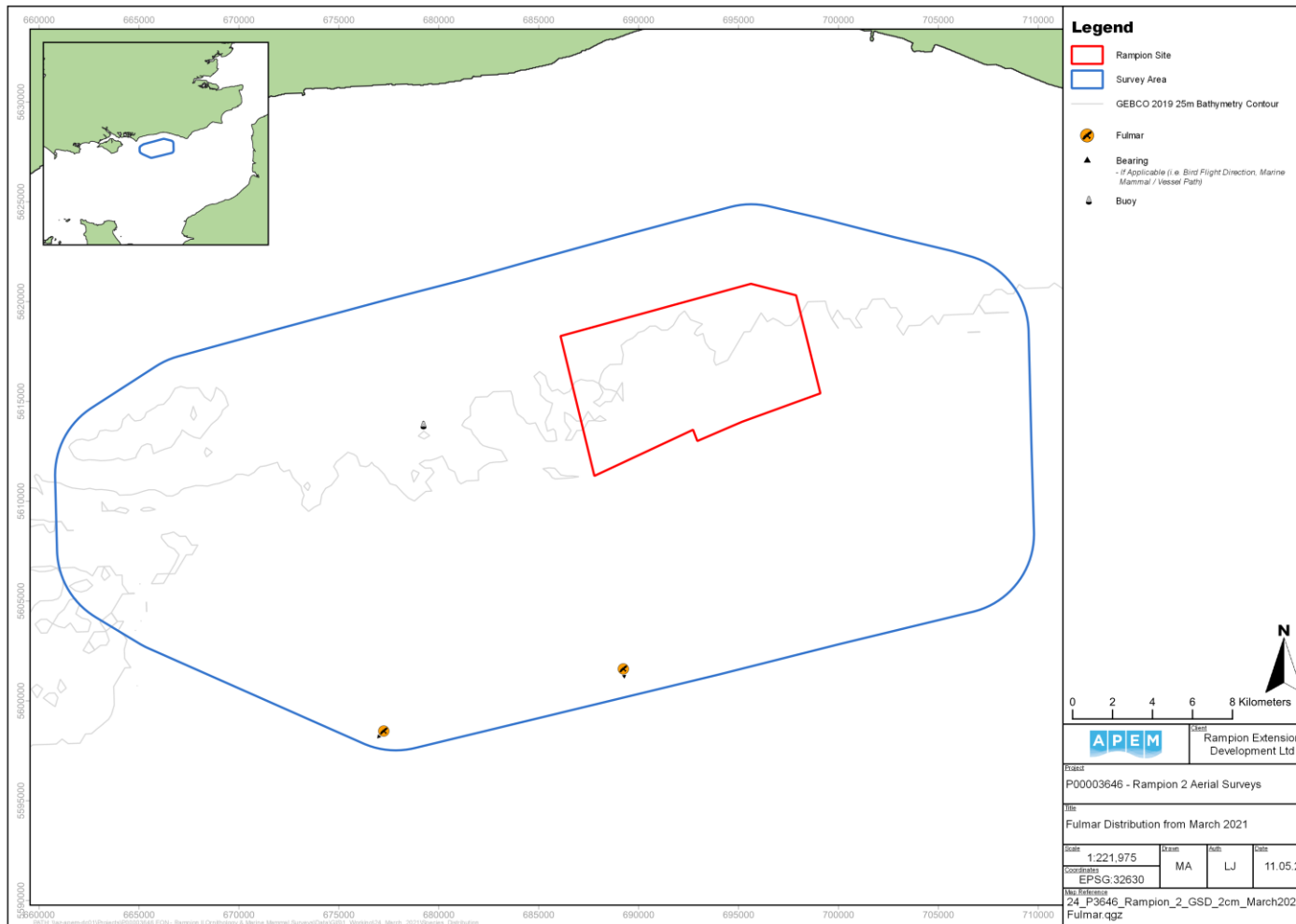


Figure 18 Distribution of fulmars recorded in the Rampion 2 Survey Area in March 2021

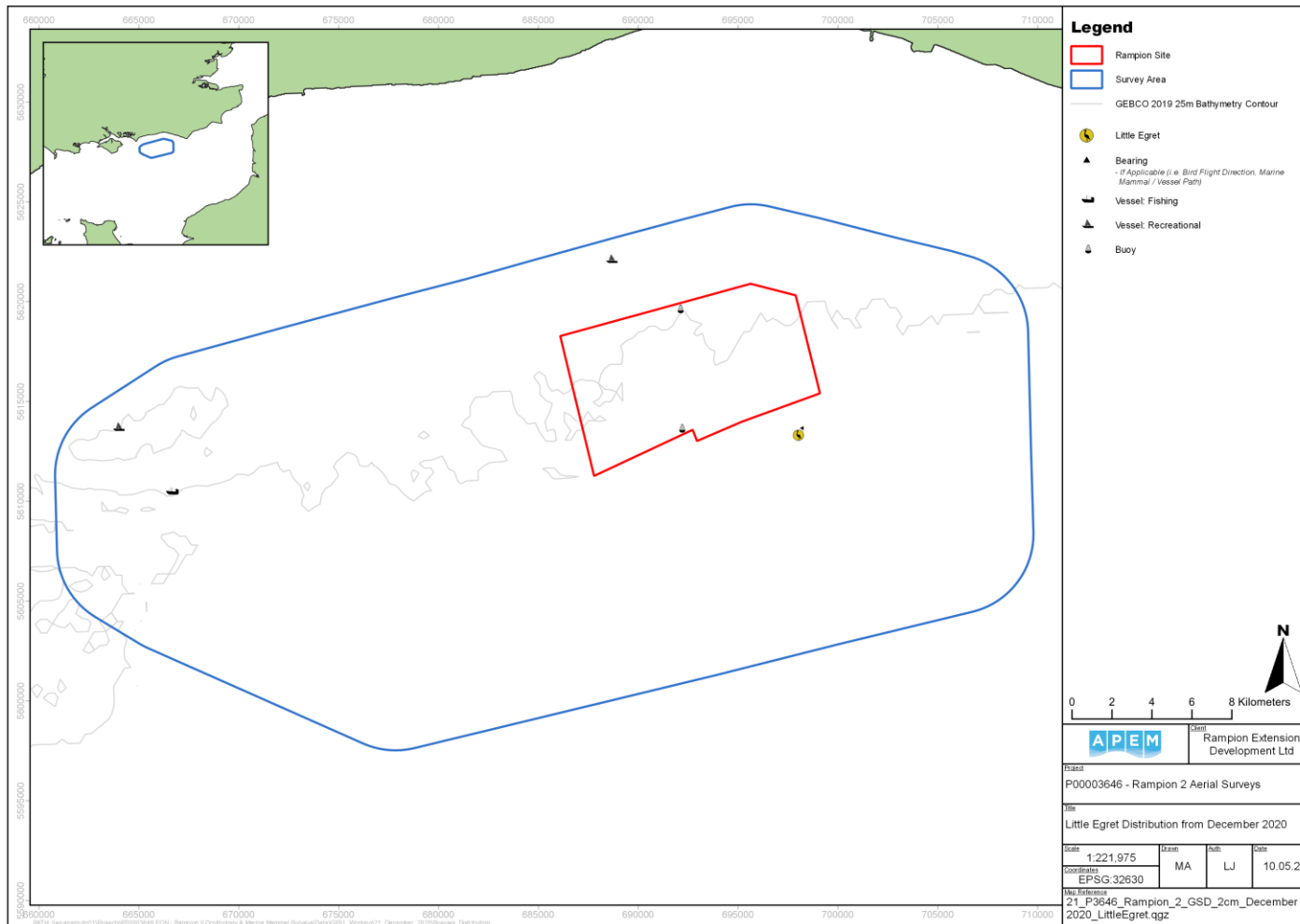


Figure 19 Location of a little egret recorded in the Rampion 2 Survey Area in December 2020

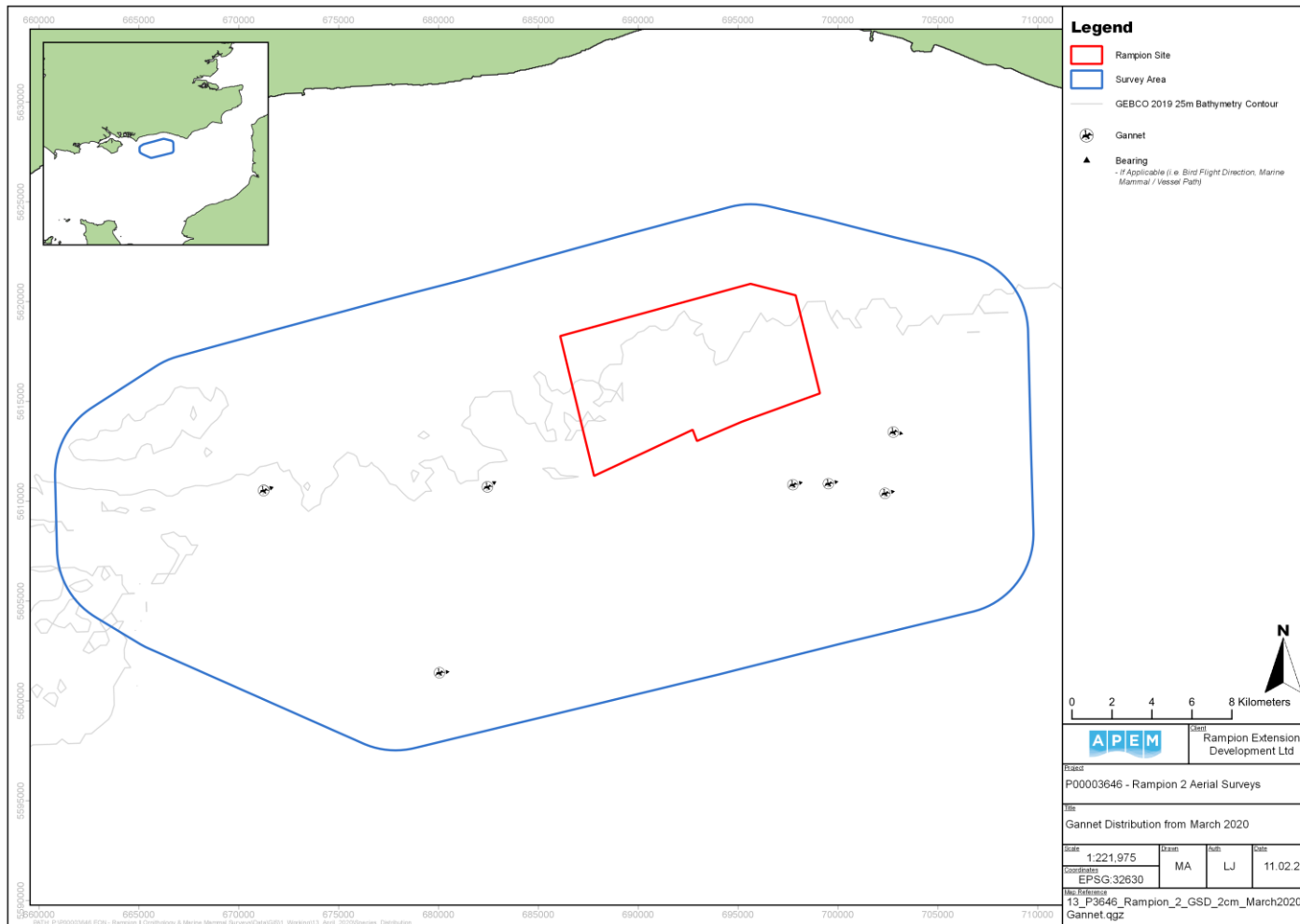


Figure 20 Distribution of gannets recorded in the Rampion 2 Survey Area in April 2020

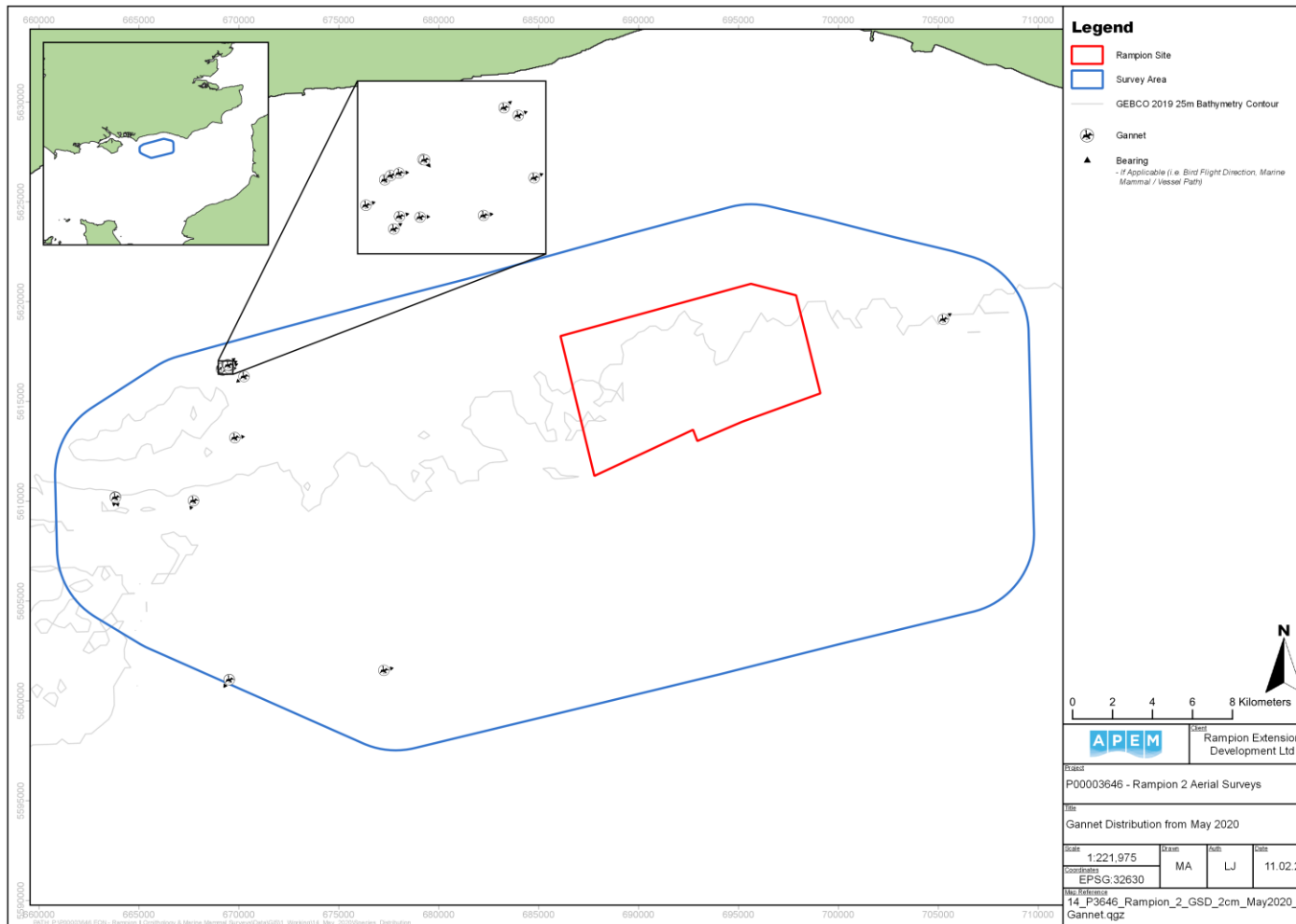


Figure 21 Distribution of gannets recorded in the Rampion 2 Survey Area in May 2020

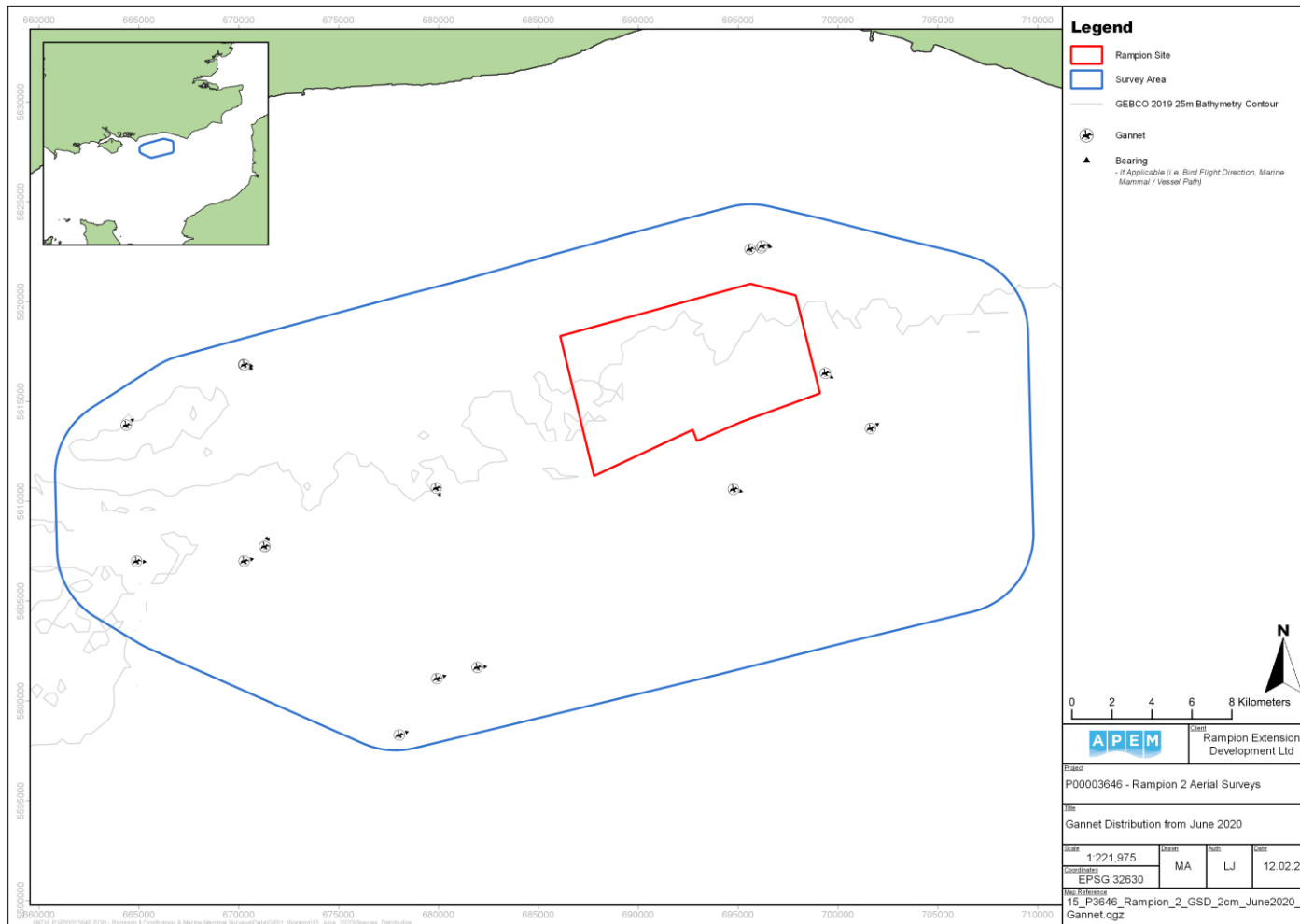


Figure 22 Distribution of gannets recorded in the Rampion 2 Survey Area in June 2020

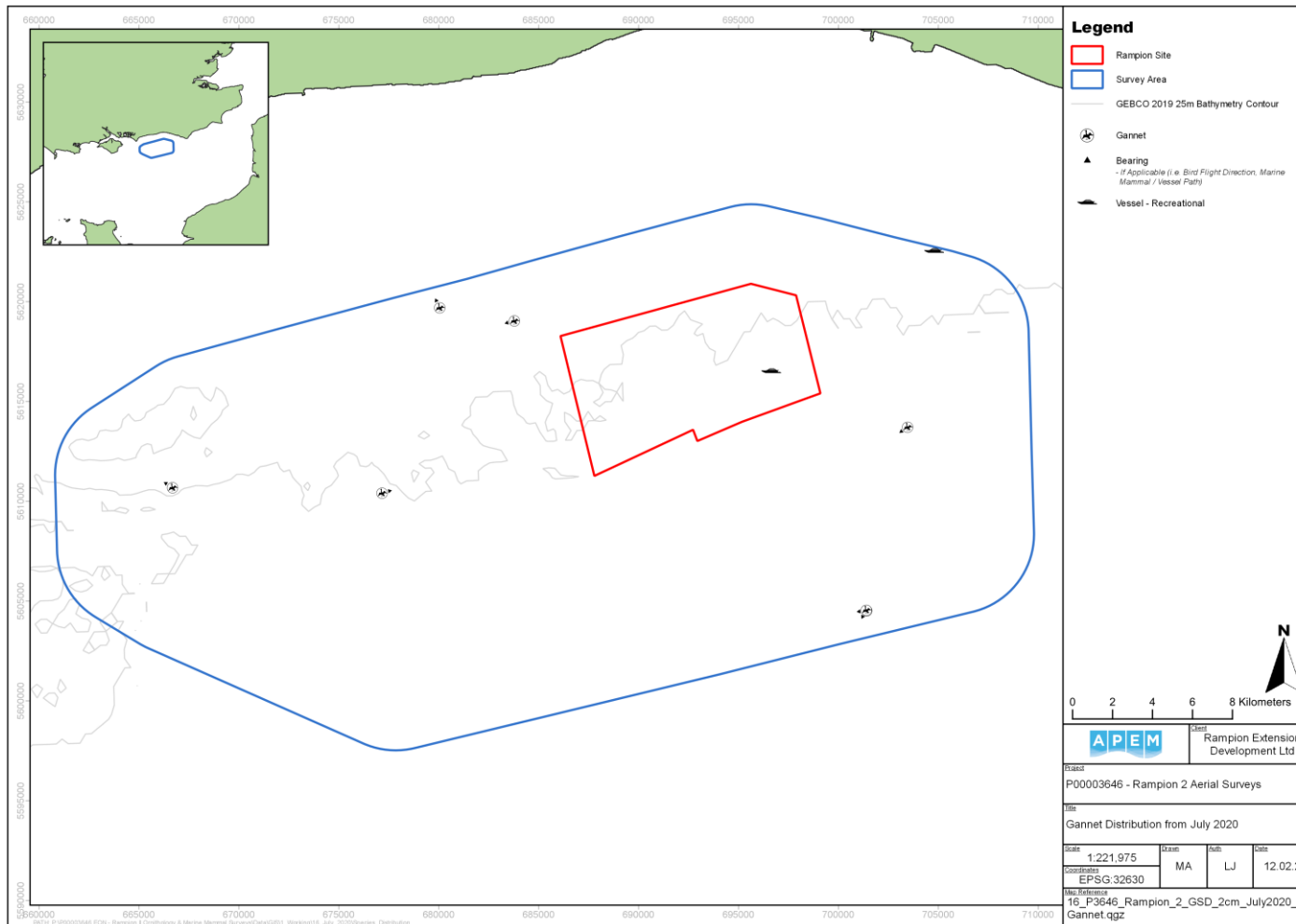


Figure 23 Distribution of gannets recorded in the Rampion 2 Survey Area in July 2020

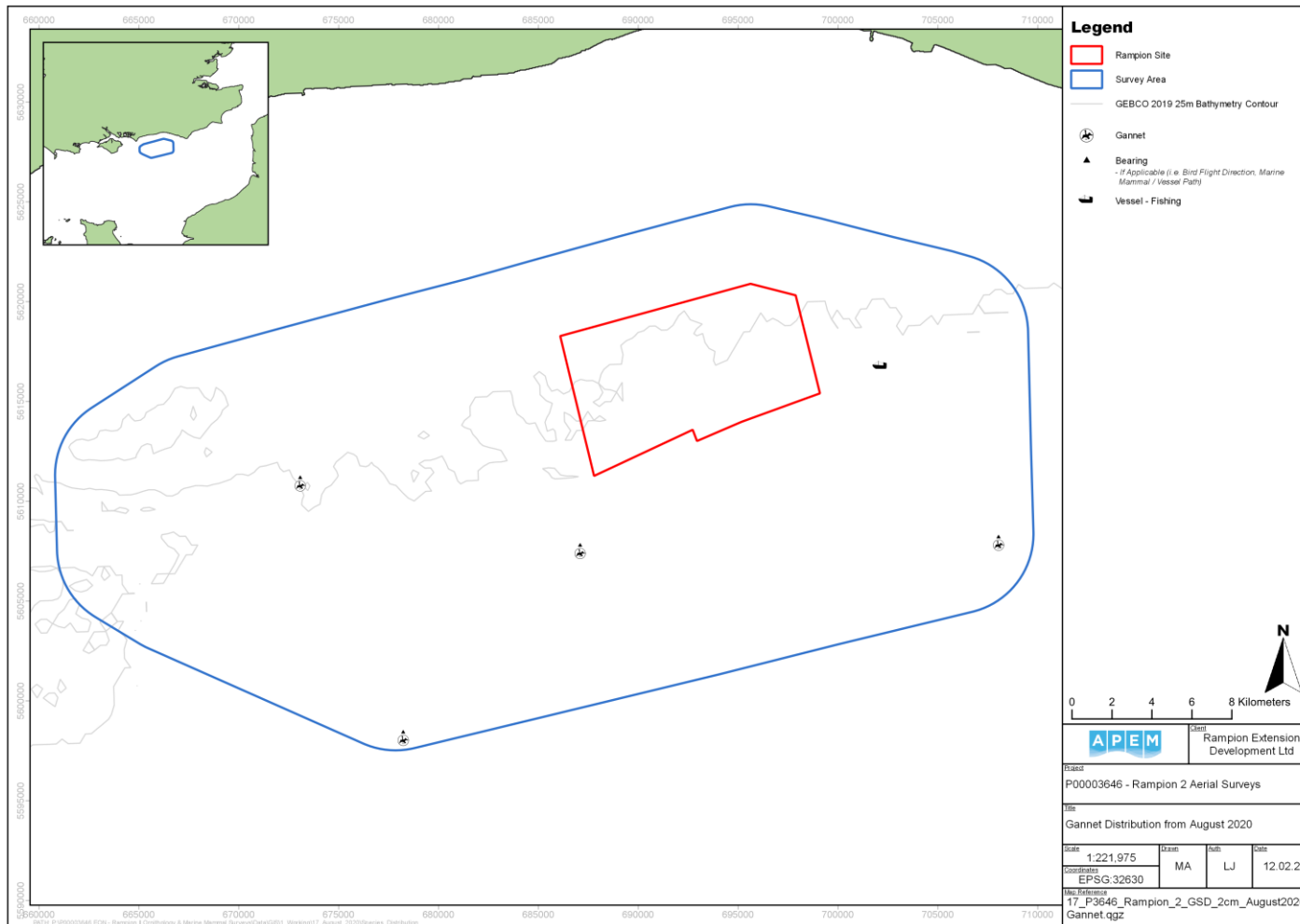


Figure 24 Distribution of gannets recorded in the Rampion 2 Survey Area in August 2020

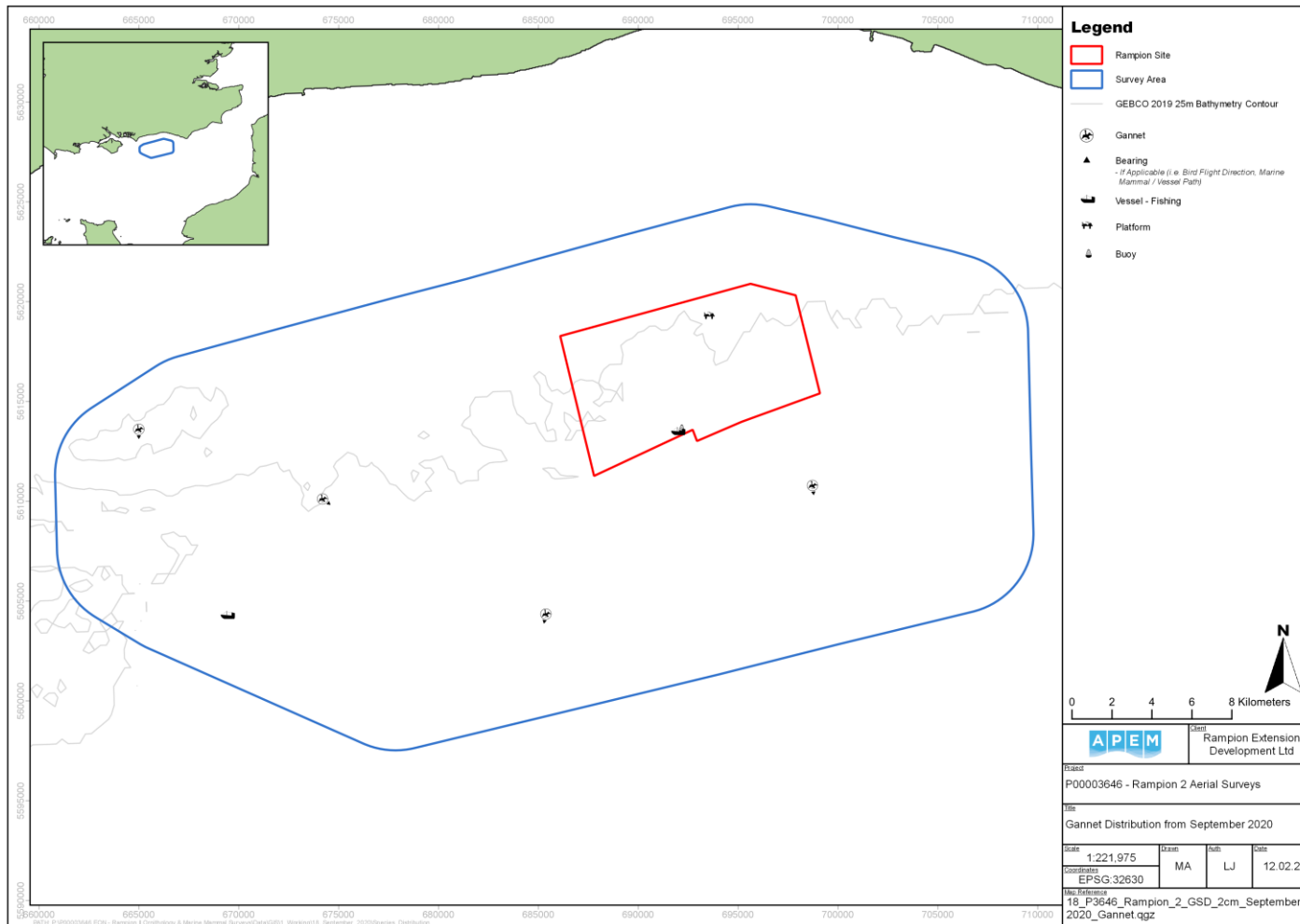


Figure 25 Distribution of gannets recorded in the Rampion 2 Survey Area in September 2020

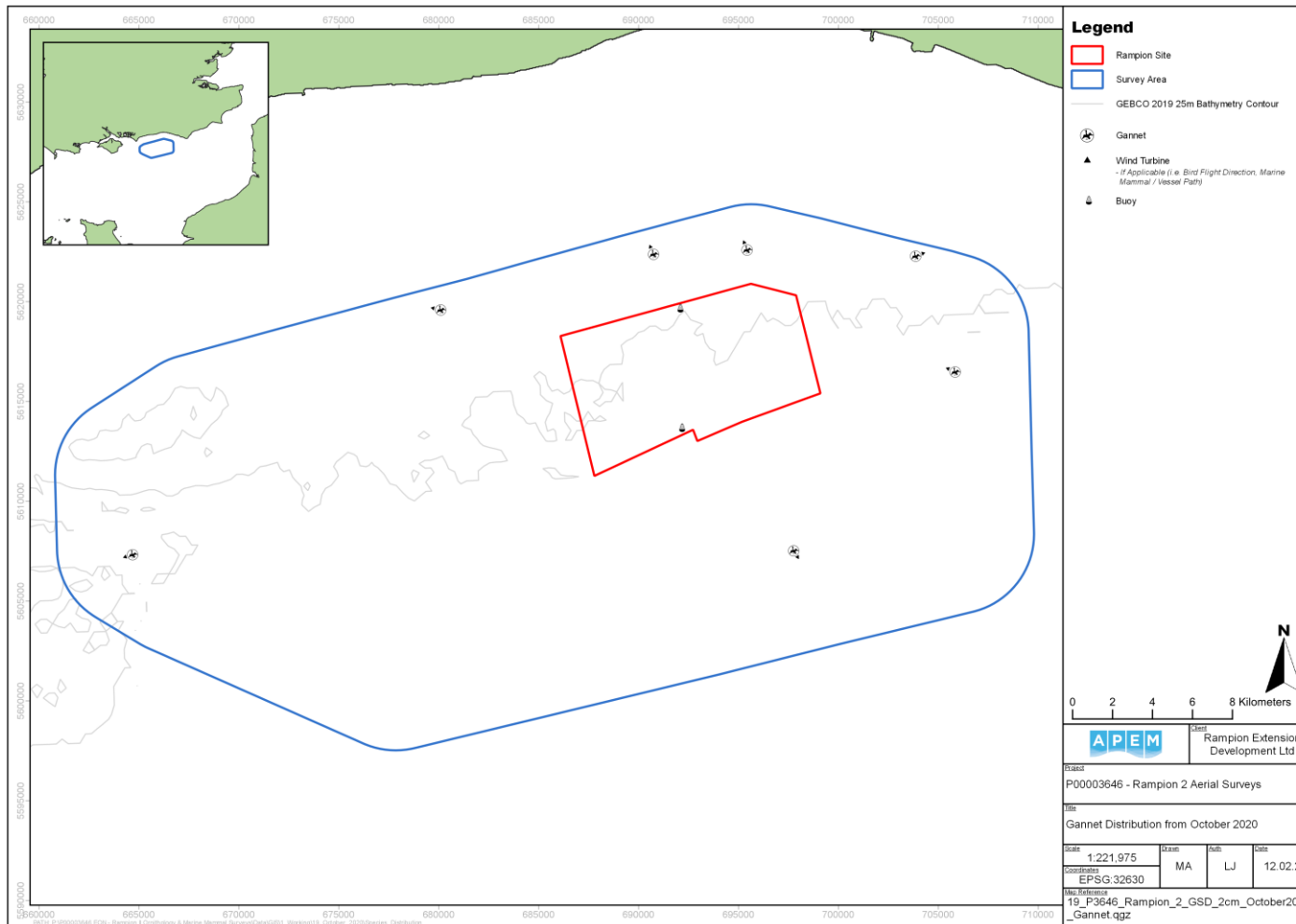


Figure 26 Distribution of gannets recorded in the Rampion 2 Survey Area in October 2020

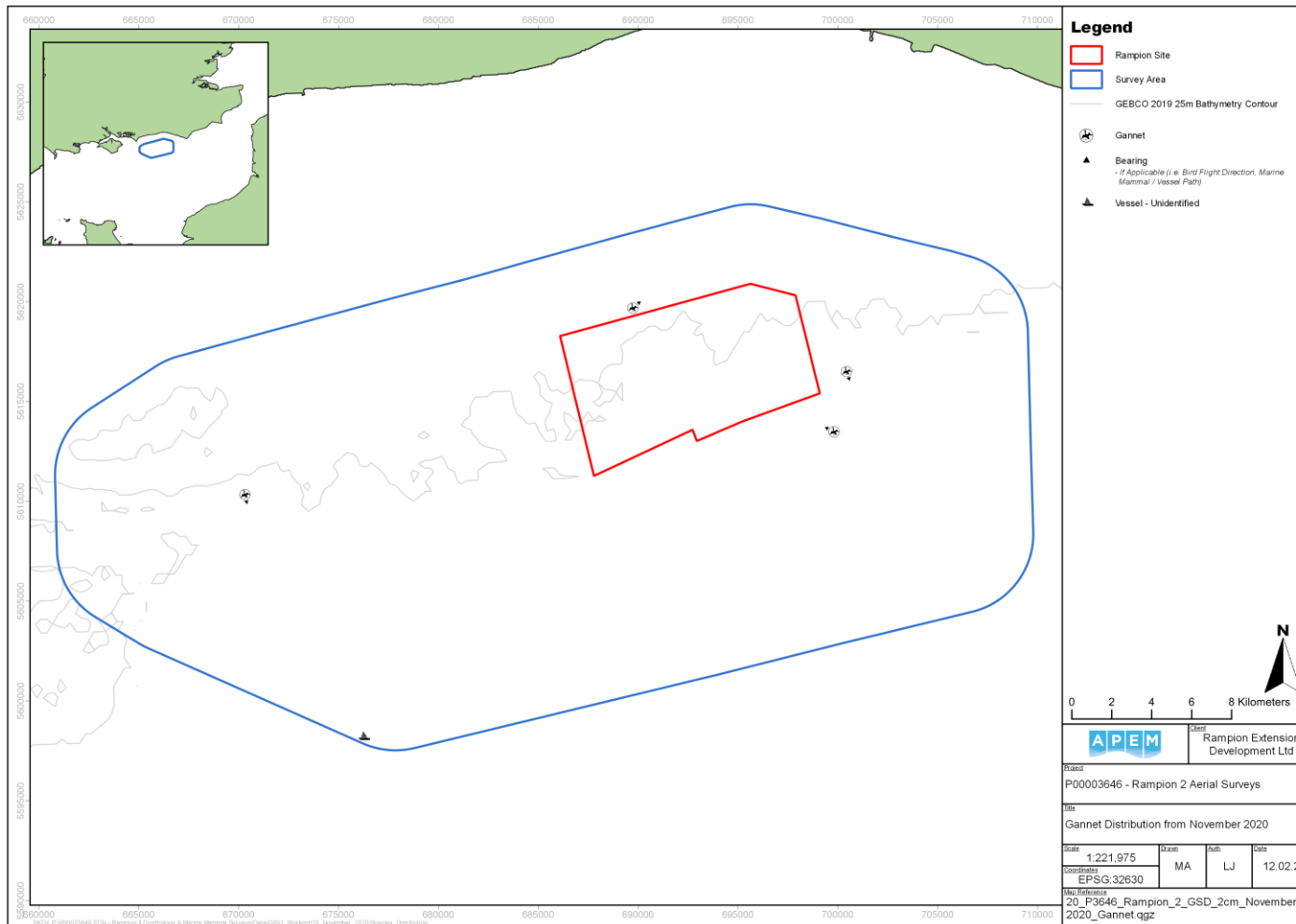


Figure 27 Distribution of gannets recorded in the Rampion 2 Survey Area in November 2020

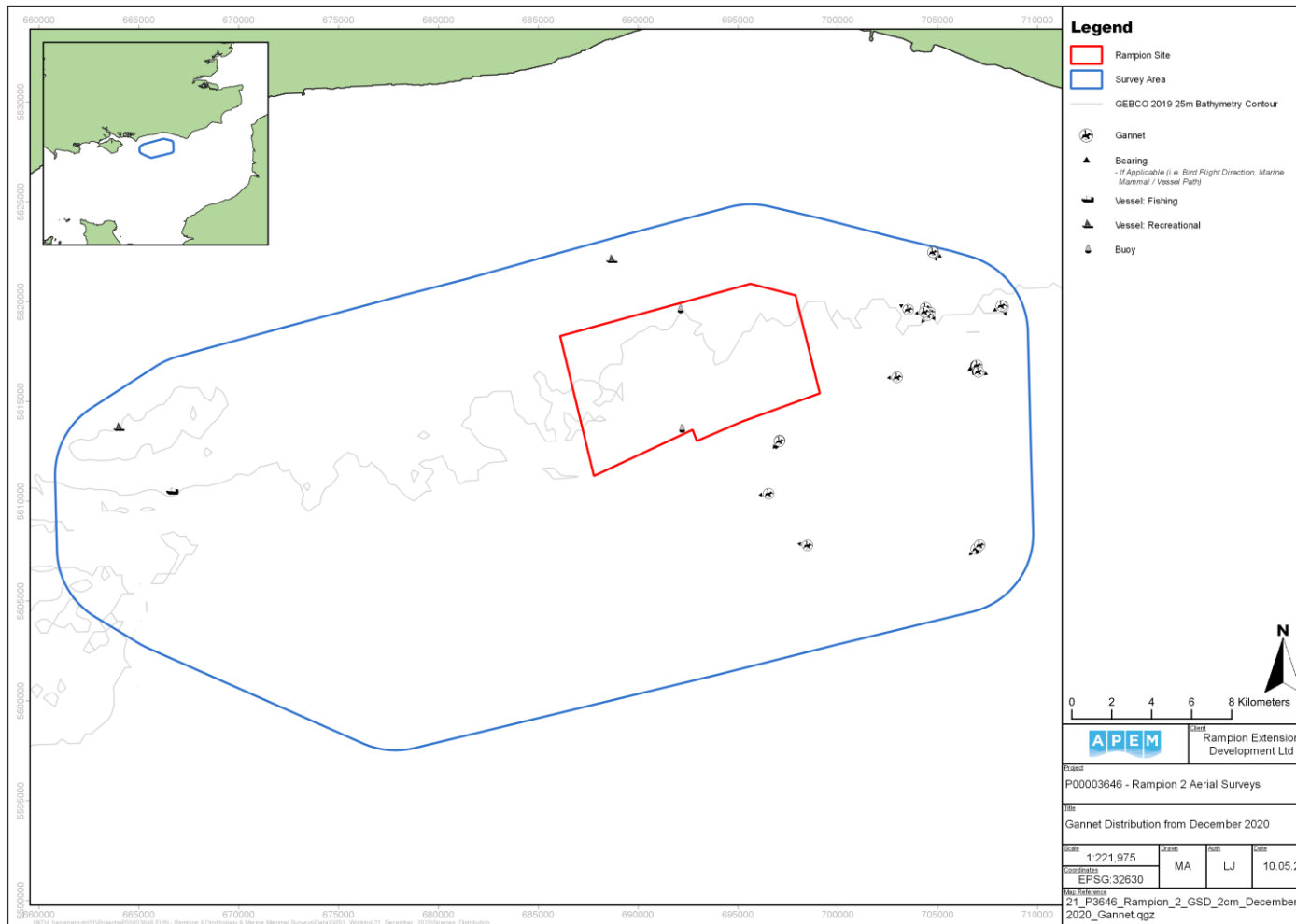


Figure 28 Distribution of gannets recorded in the Rampion 2 Survey Area in December 2020

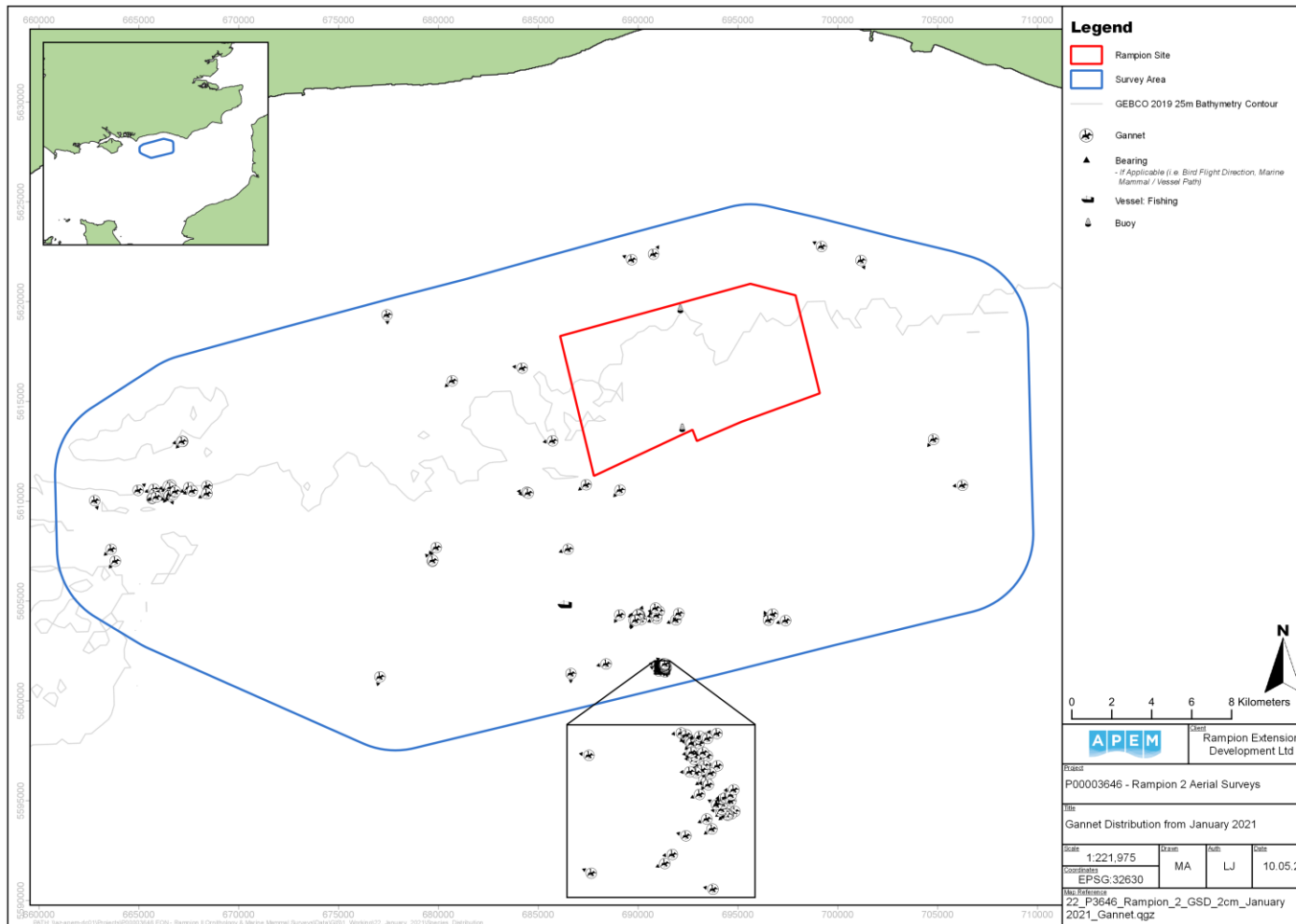


Figure 29 Distribution of gannets recorded in the Rampion 2 Survey Area in January 2021

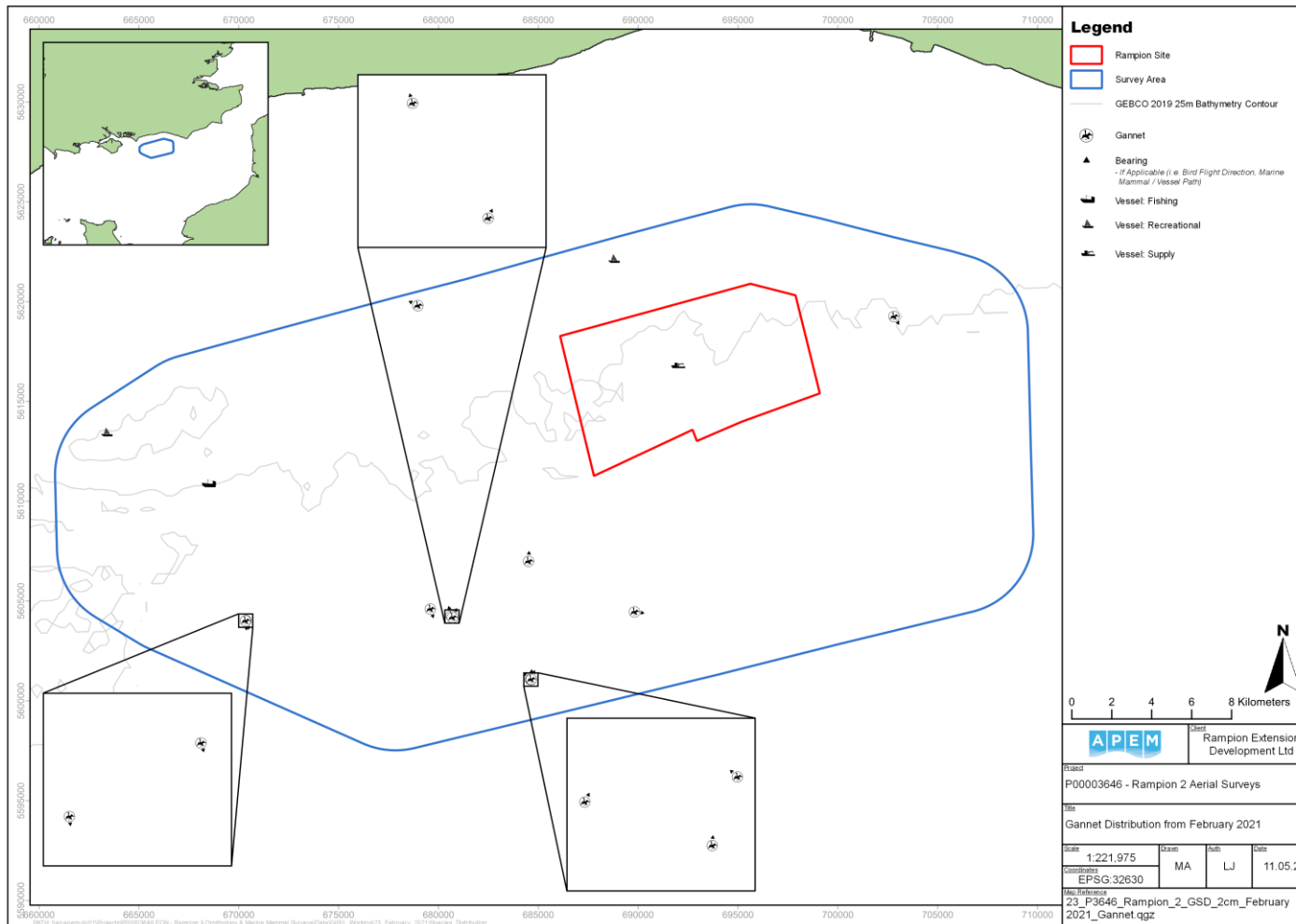


Figure 30 Distribution of gannets recorded in the Rampion 2 Survey Area in February 2021

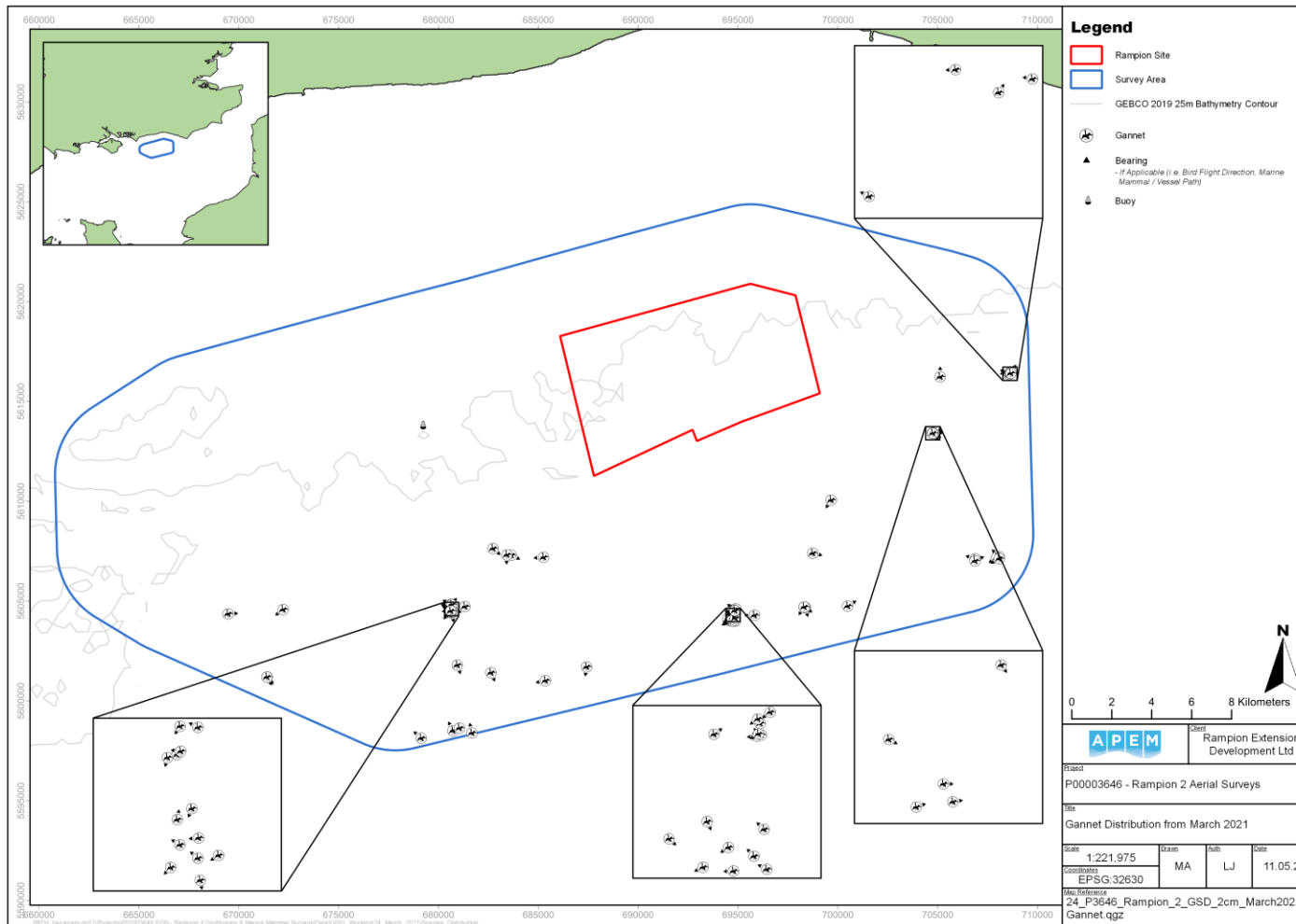


Figure 31 Distribution of gannets recorded in the Rampion 2 Survey Area in March 2021

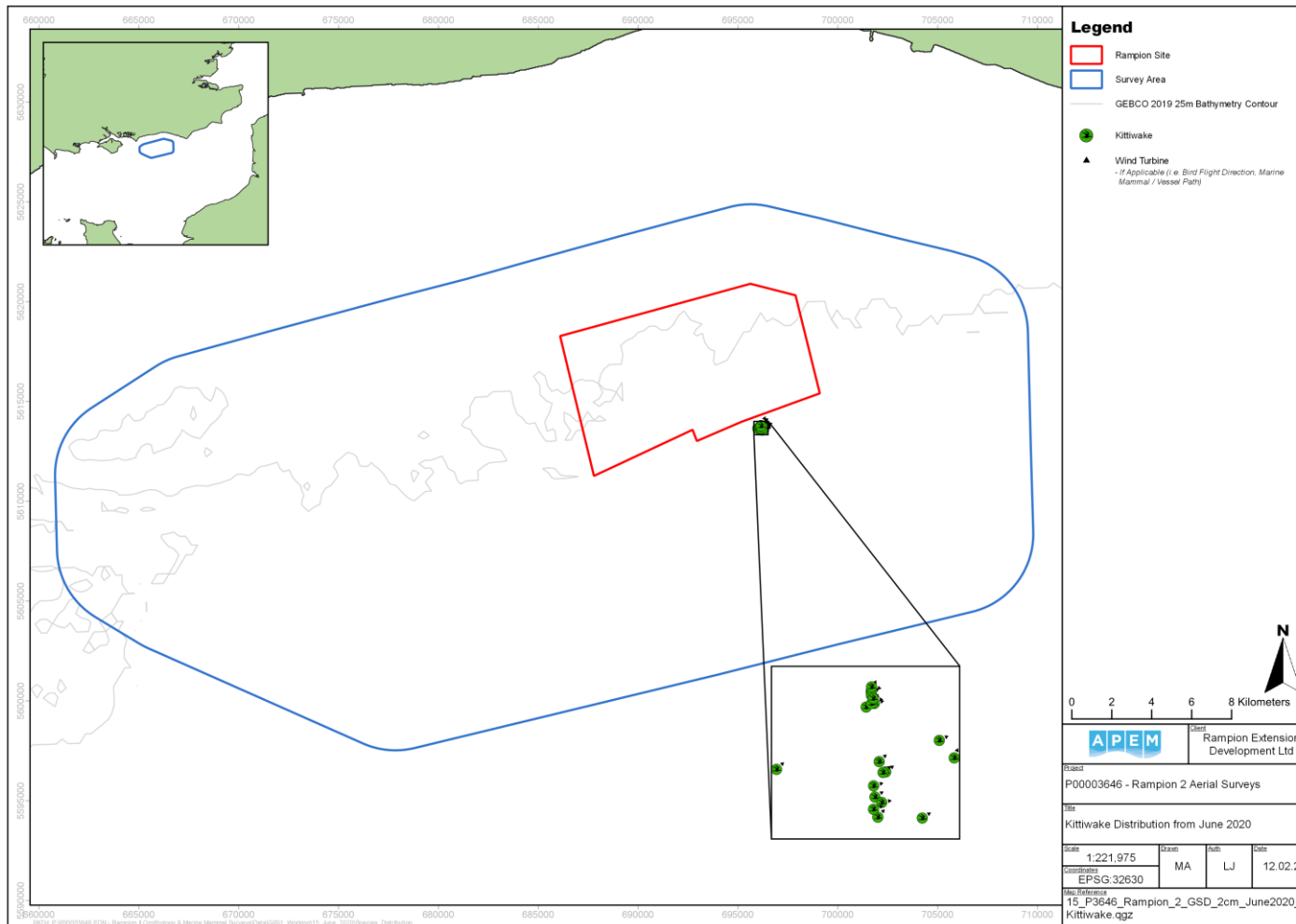


Figure 32 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in June 2020

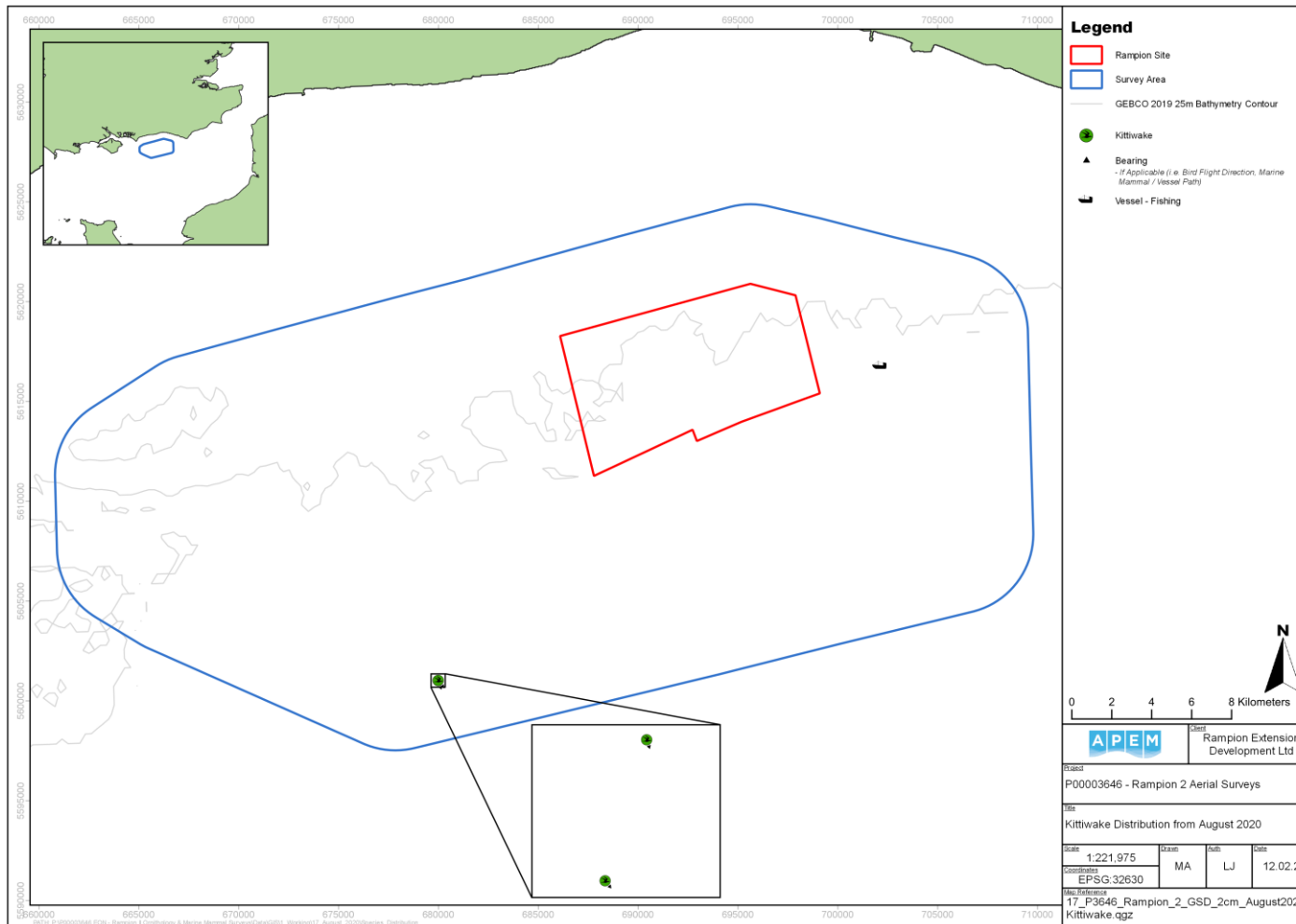


Figure 33 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in August 2020

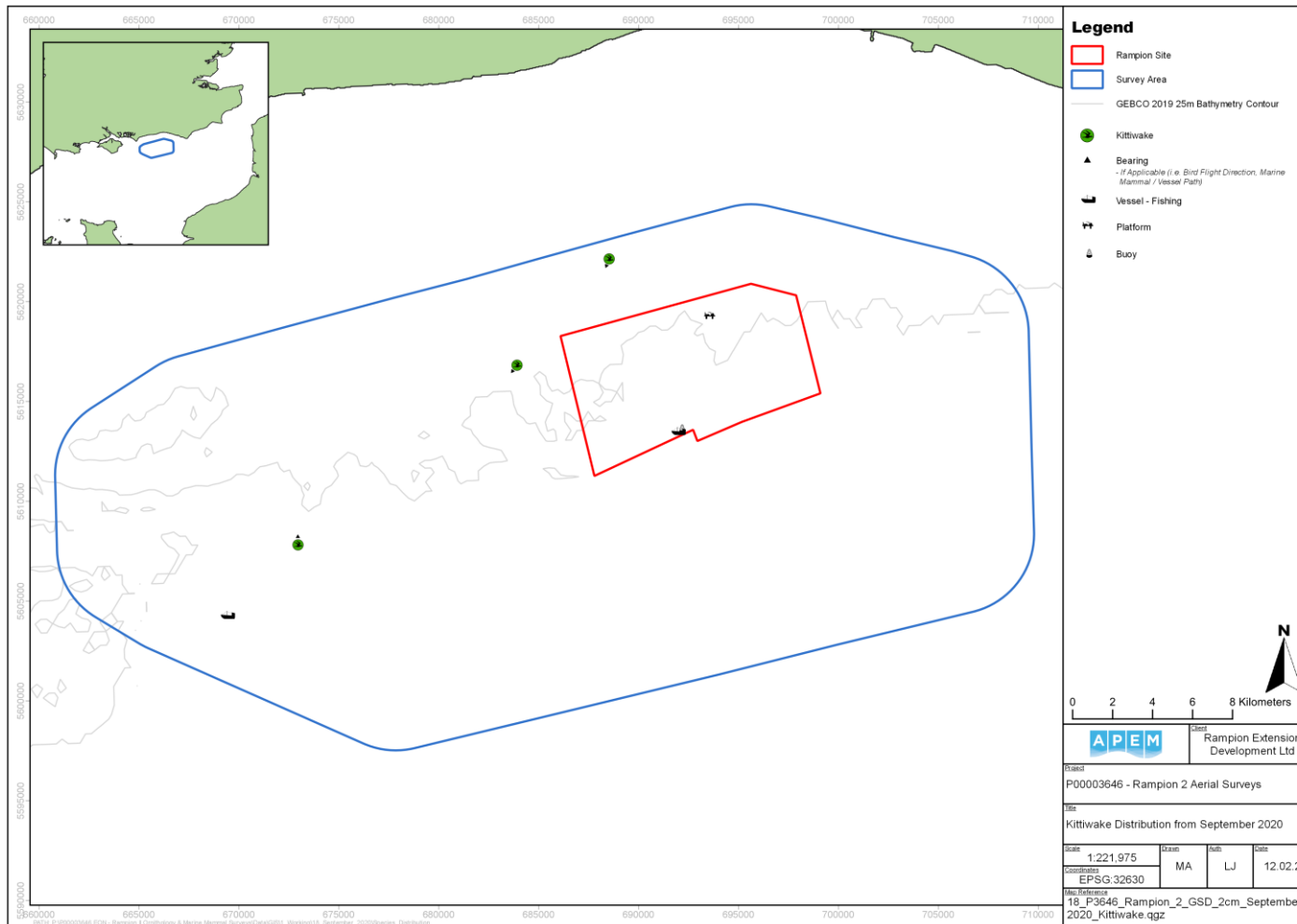


Figure 34 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in September 2020

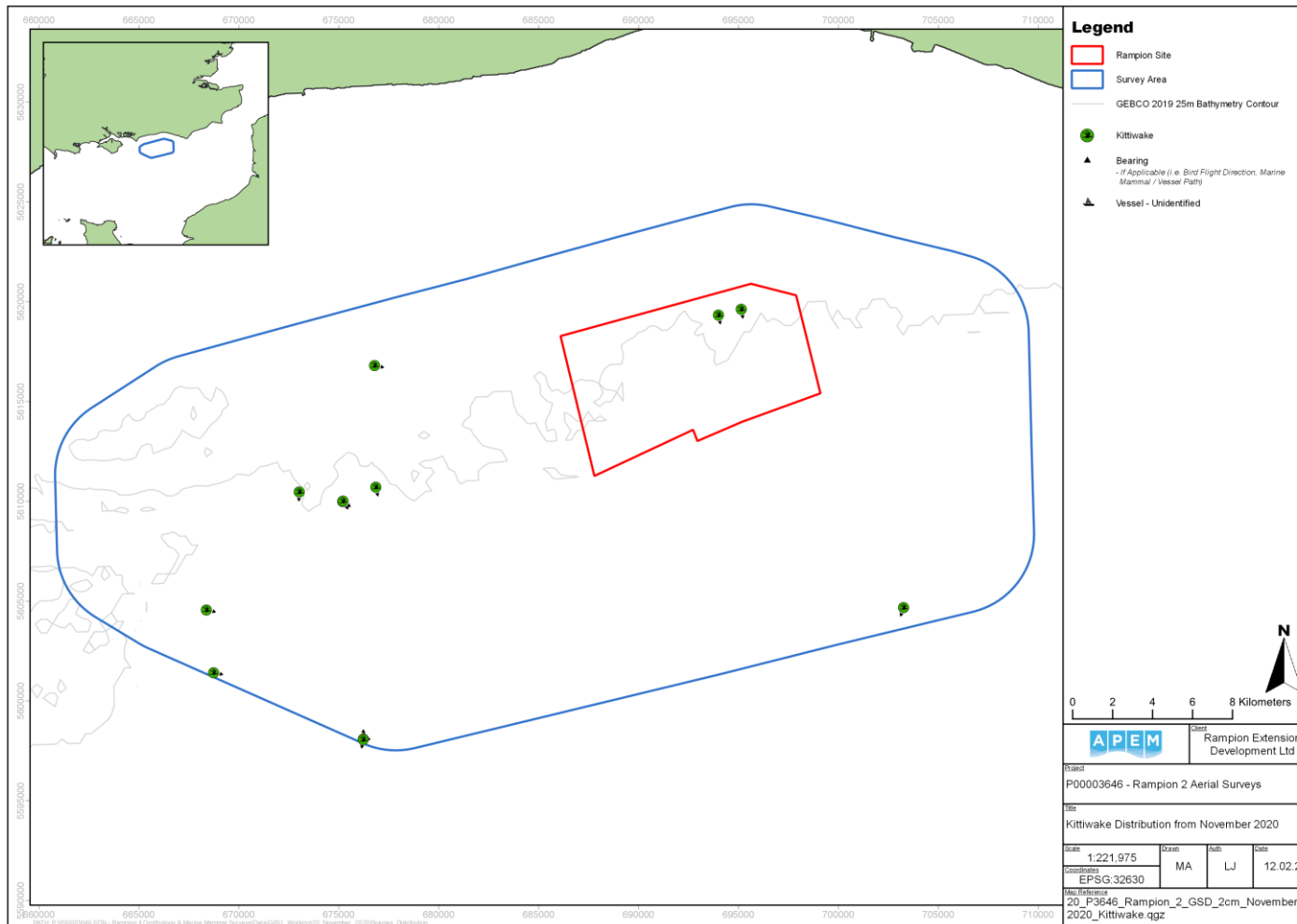


Figure 35 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in November 2020

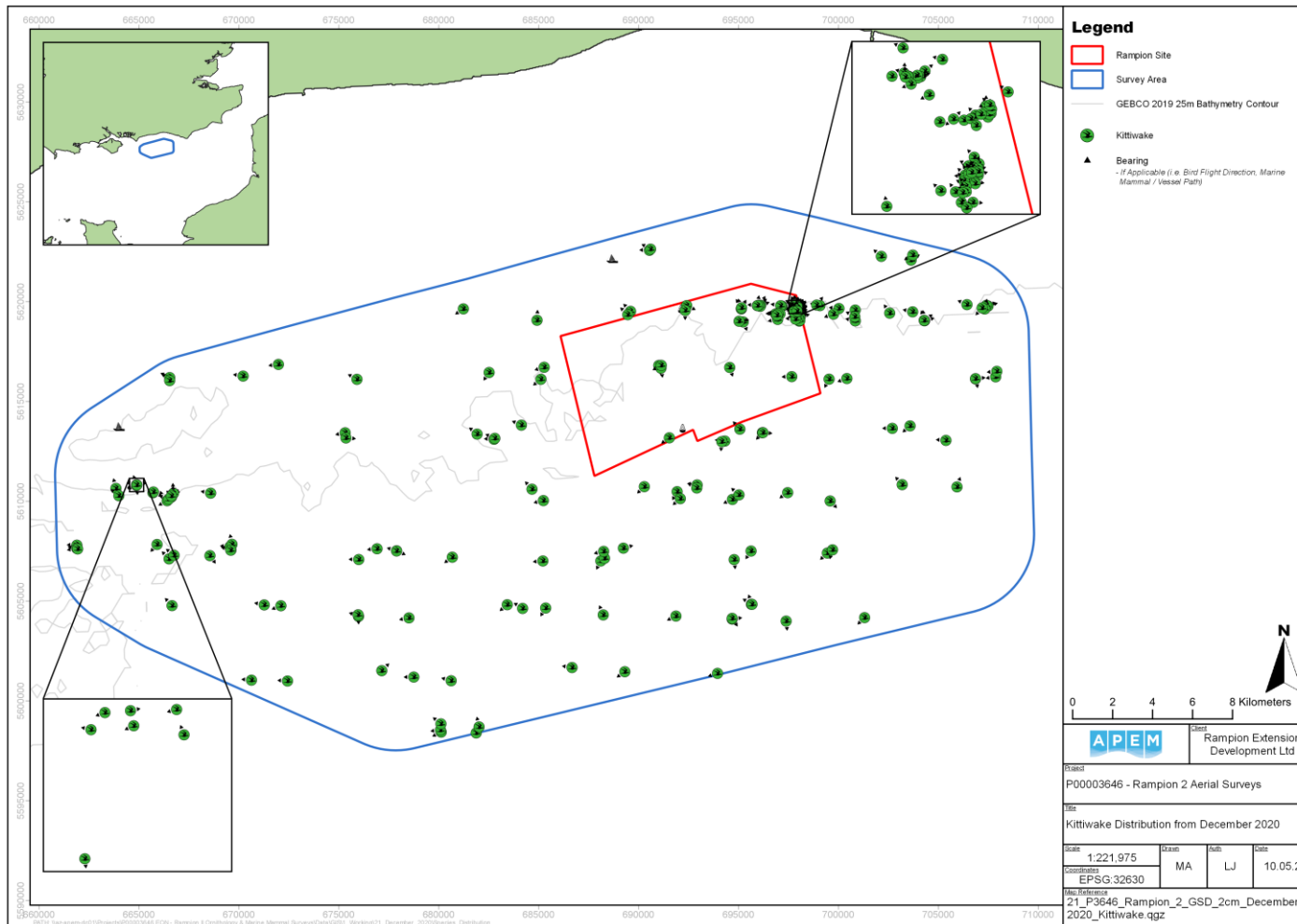


Figure 36 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in December 2020

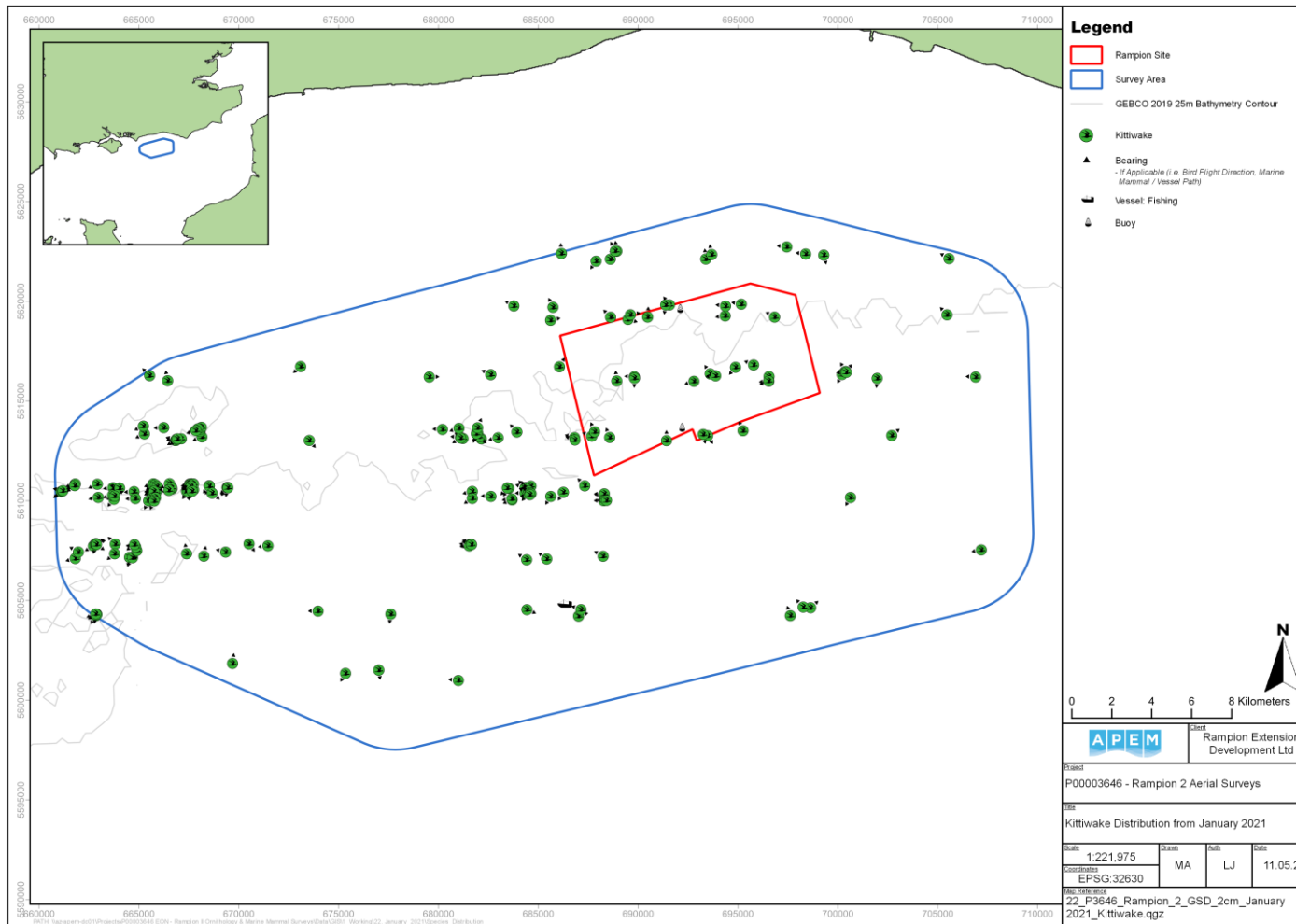


Figure 37 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in January 2021

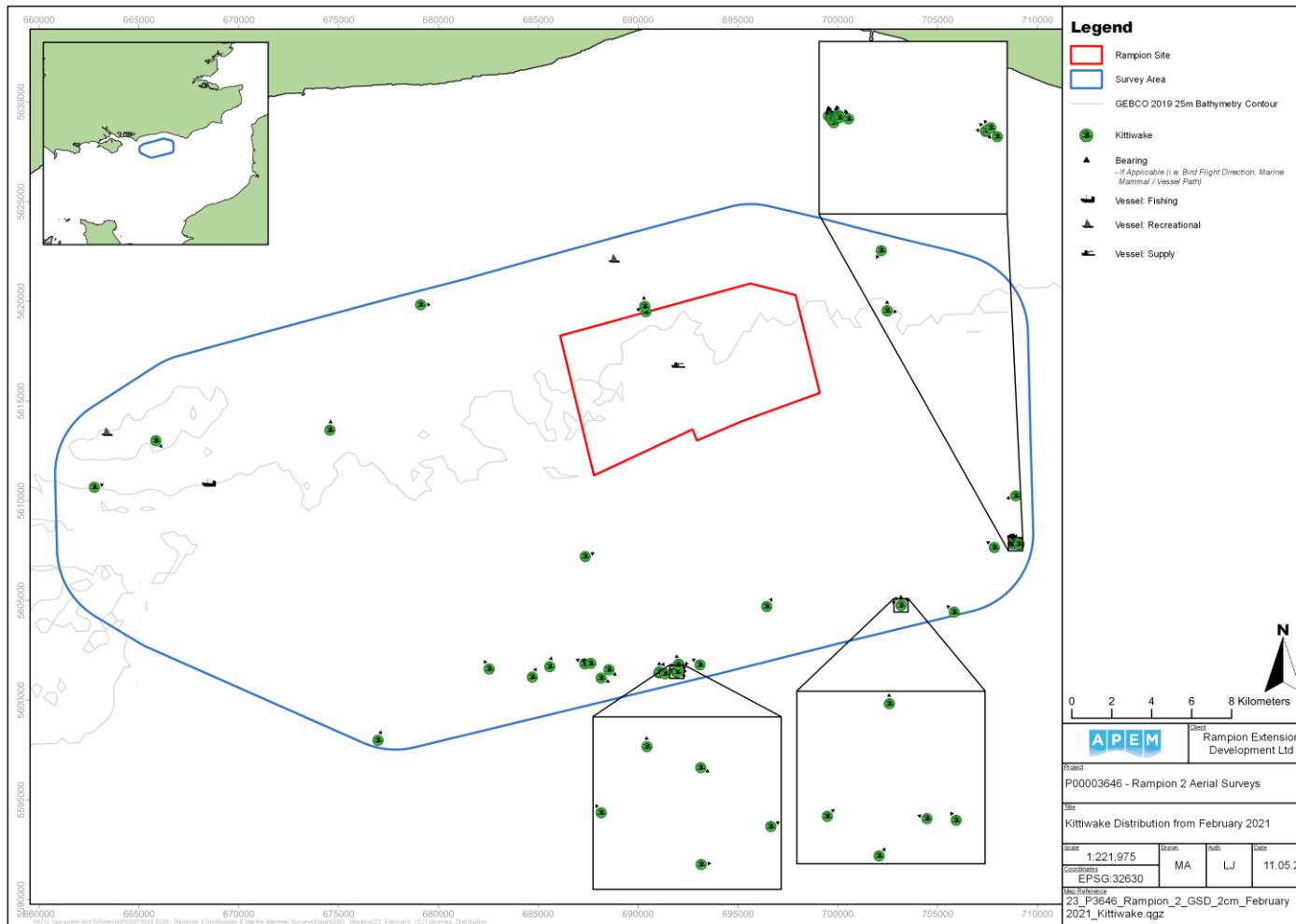


Figure 38 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in February 2021

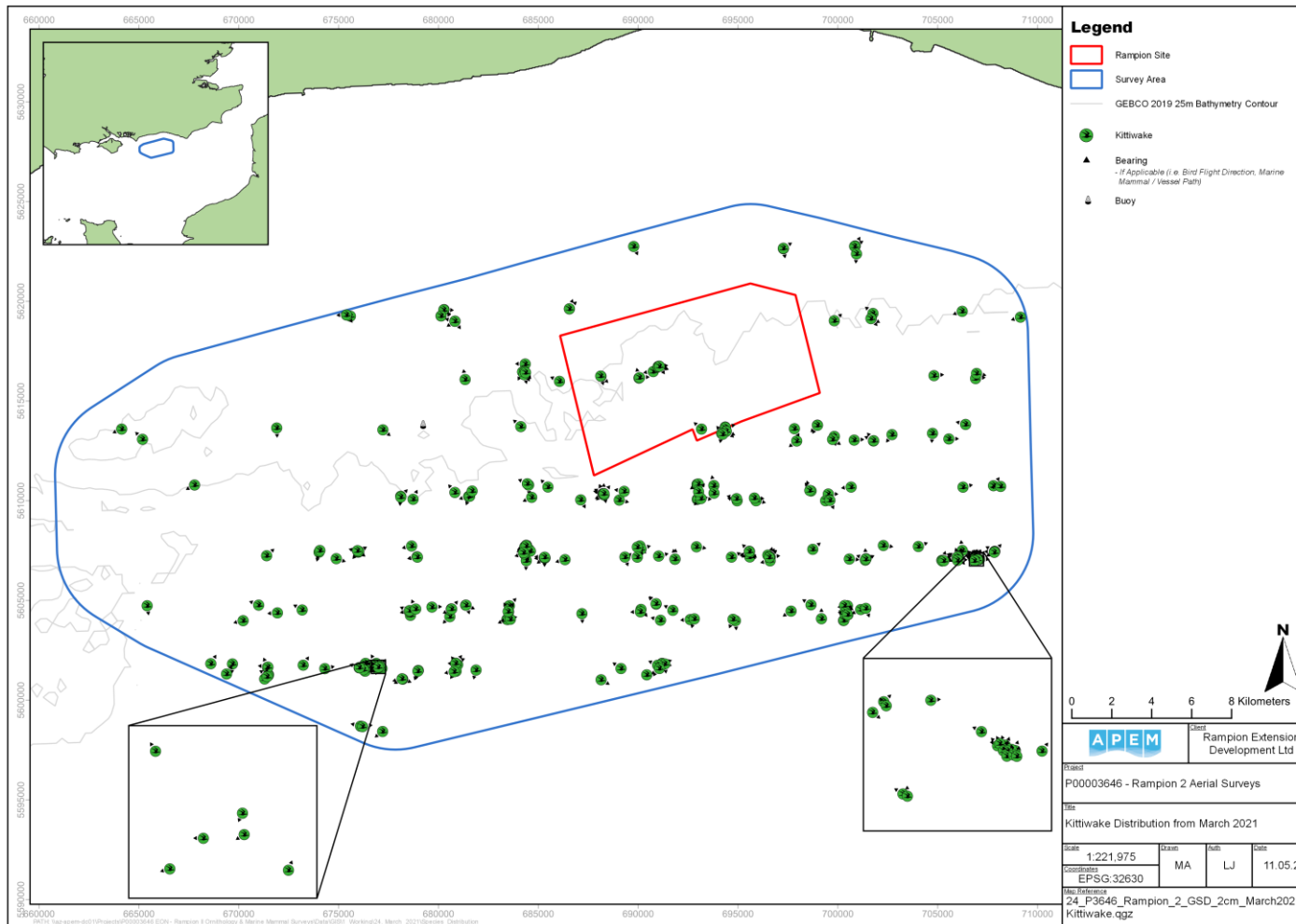


Figure 39 Distribution of kittiwakes recorded in the Rampion 2 Survey Area in March 2021

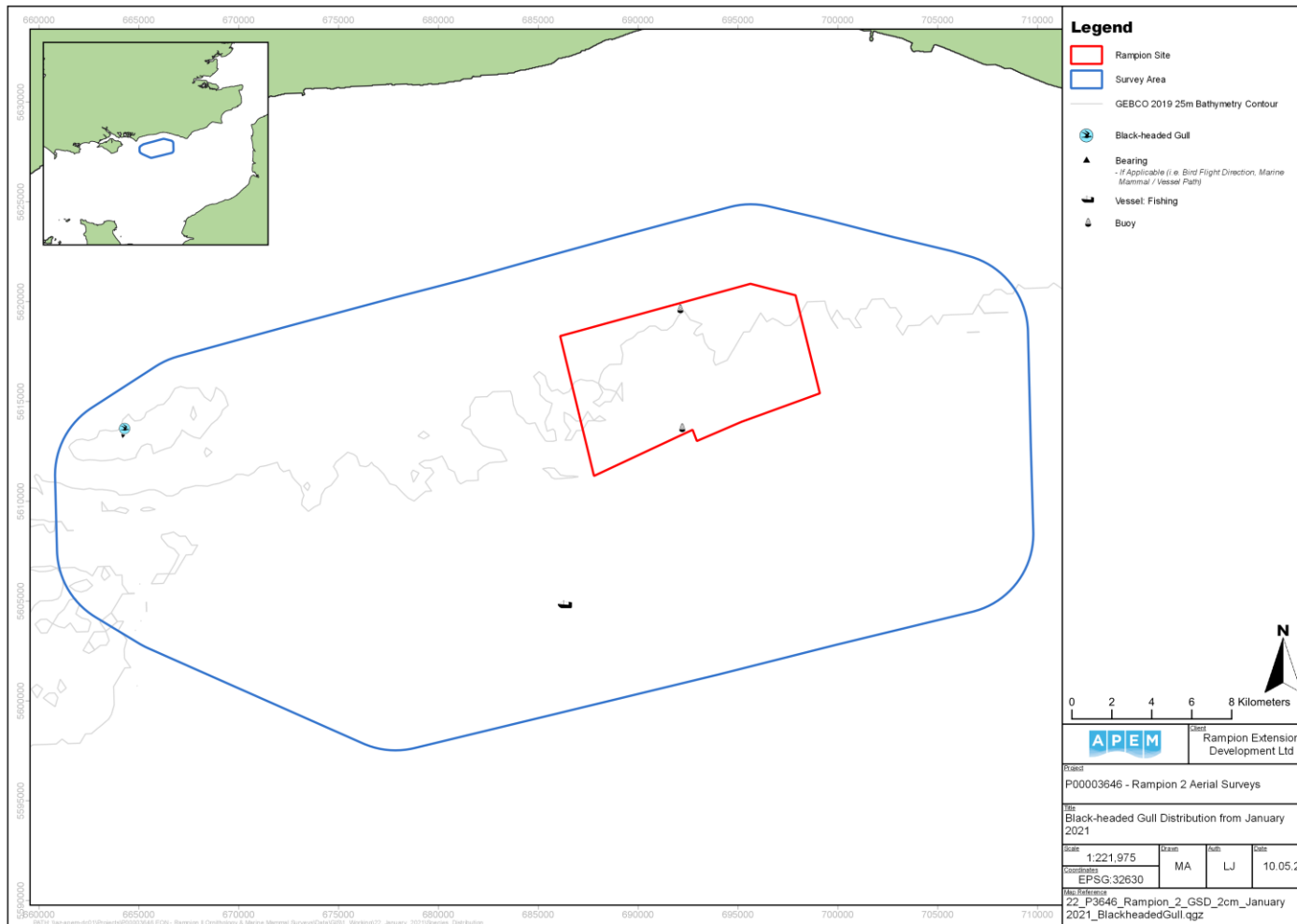


Figure 40 Location of a black-headed gull recorded in the Rampion 2 Survey Area in January 2021

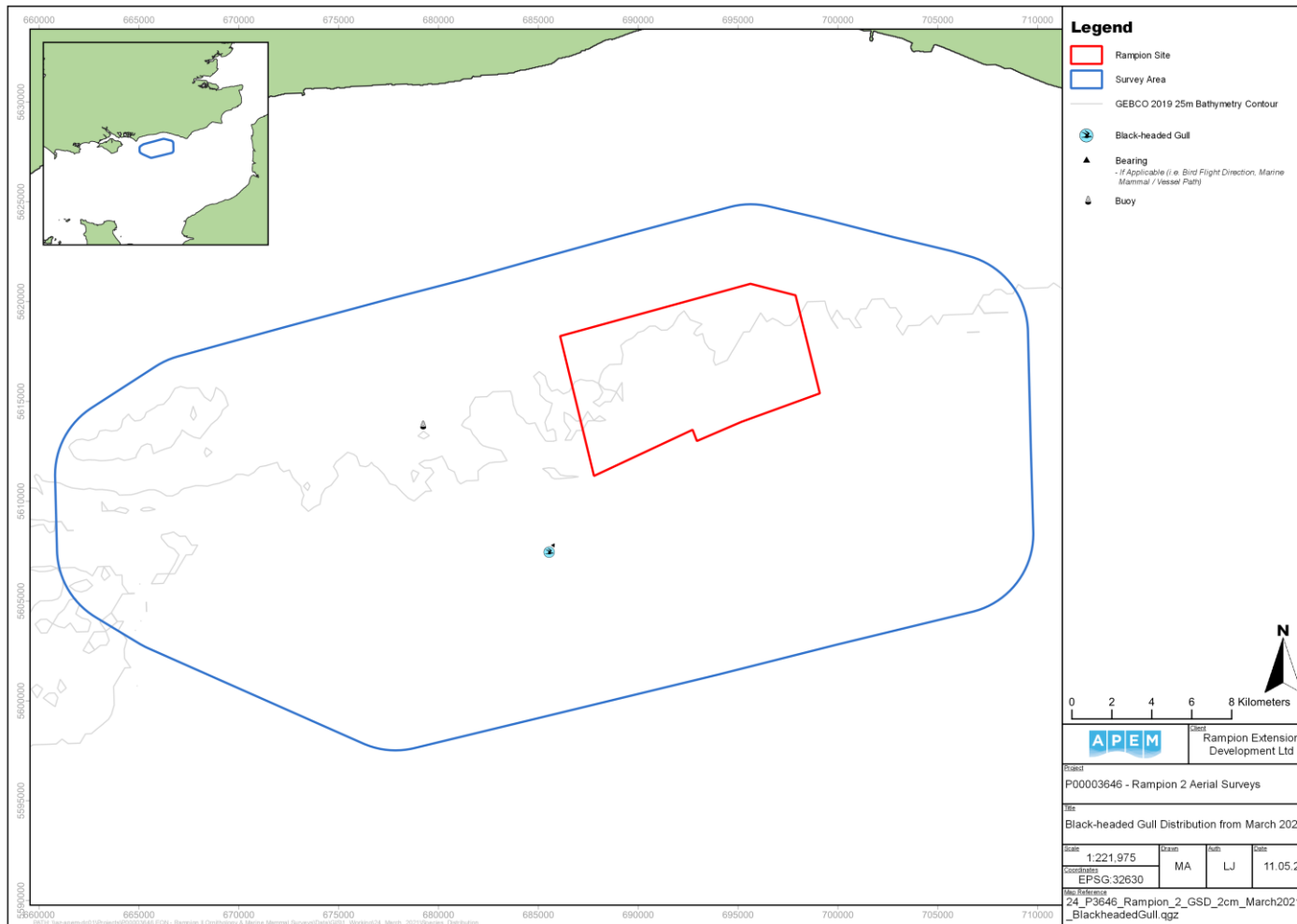


Figure 41 Location of a black-headed gull recorded in the Rampion 2 Survey Area in March 2021

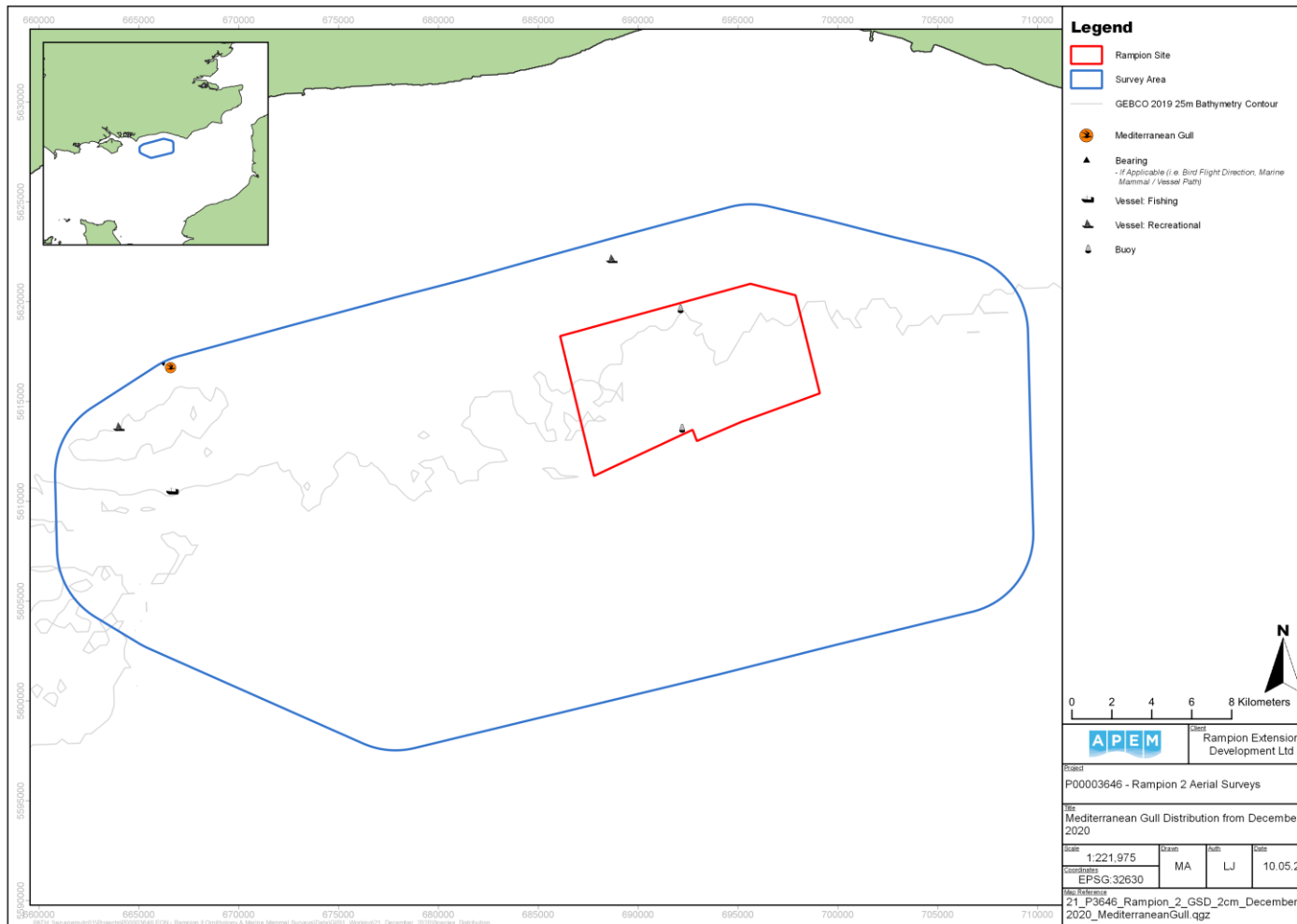


Figure 42 Location of a Mediterranean gull recorded in the Rampion 2 Survey Area in December 2020

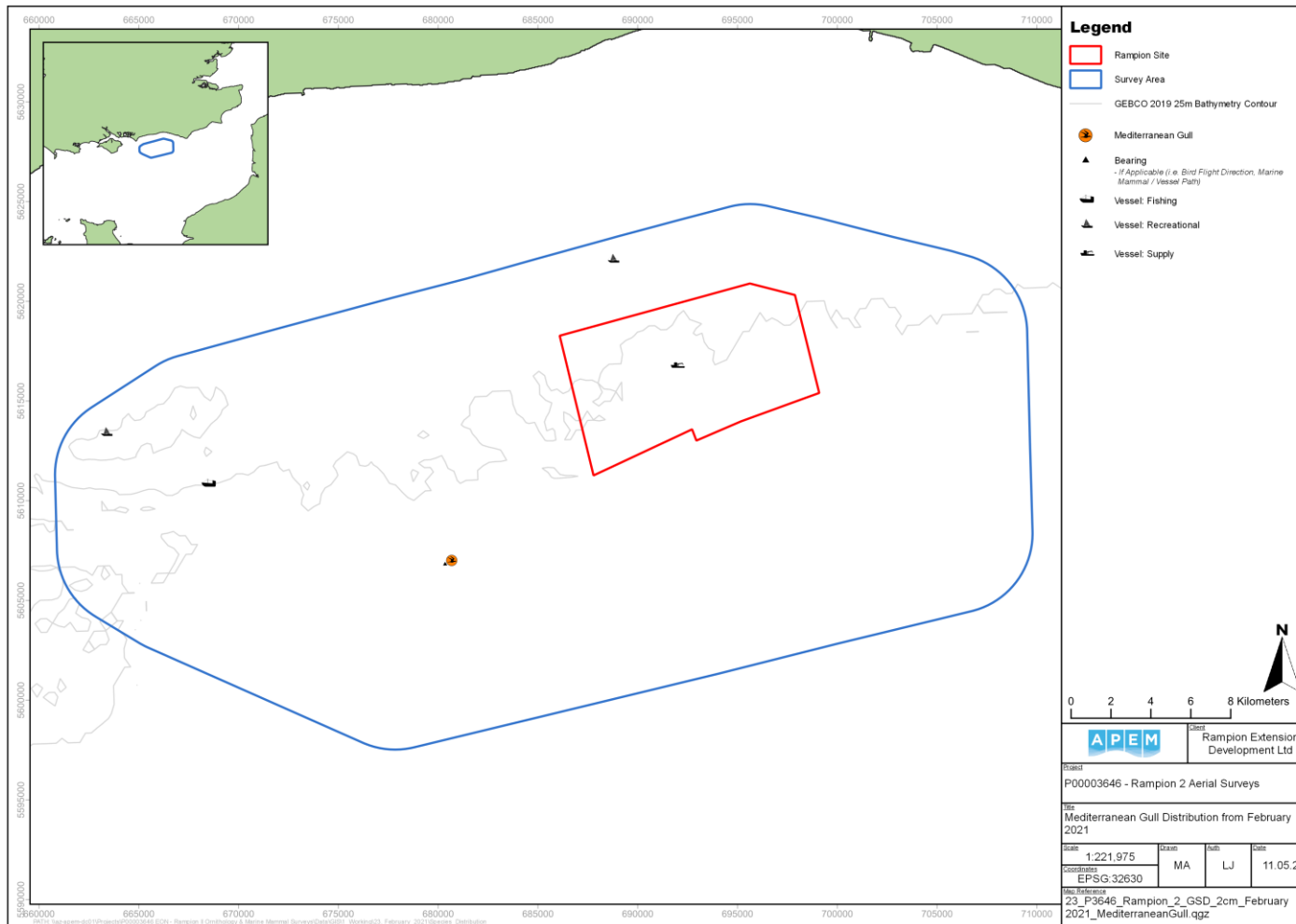


Figure 43 Location of a Mediterranean gull recorded in the Rampion 2 Survey Area in December 2019

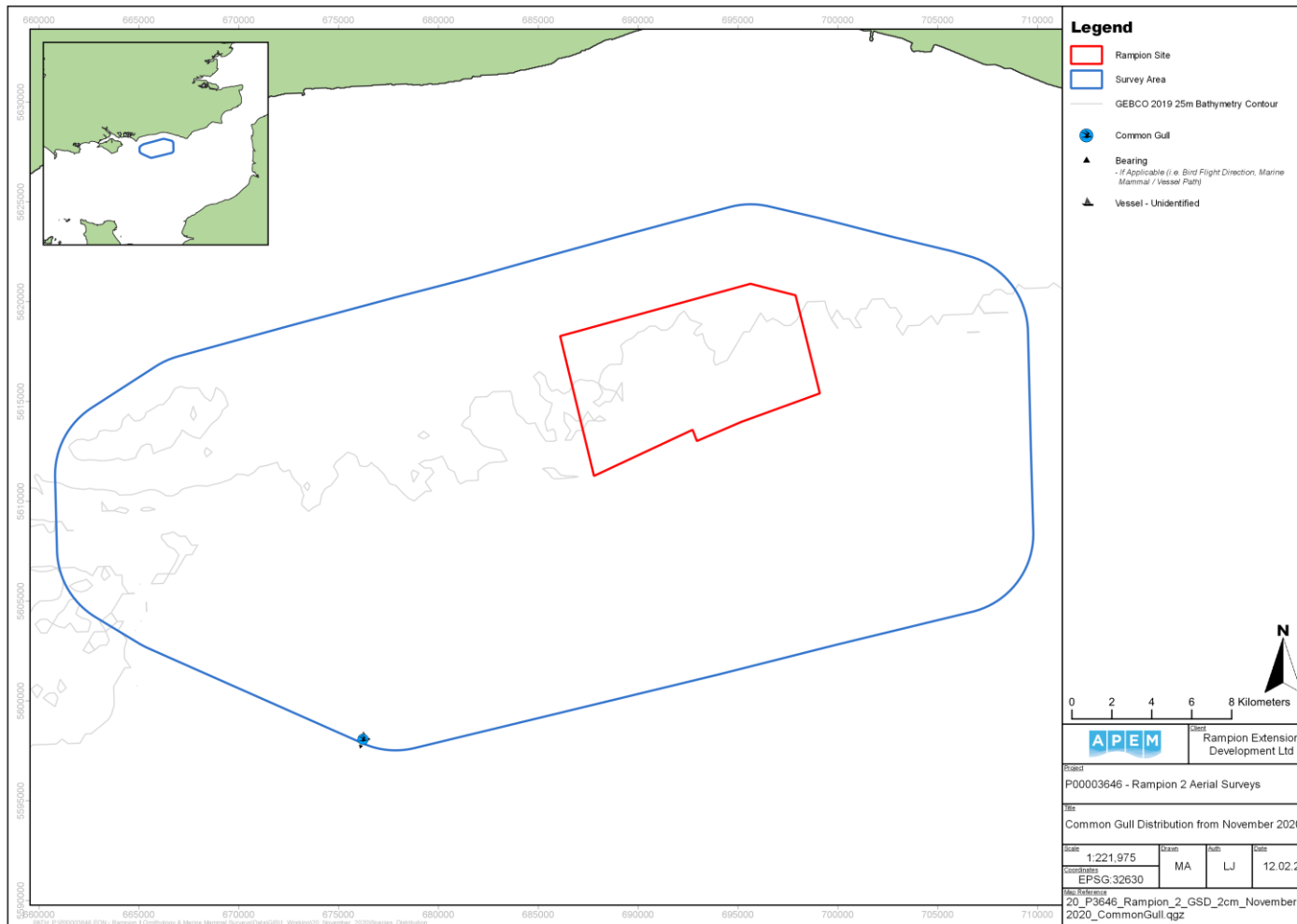


Figure 44 Location of a common gull recorded in the Rampion 2 Survey Area in November 2021

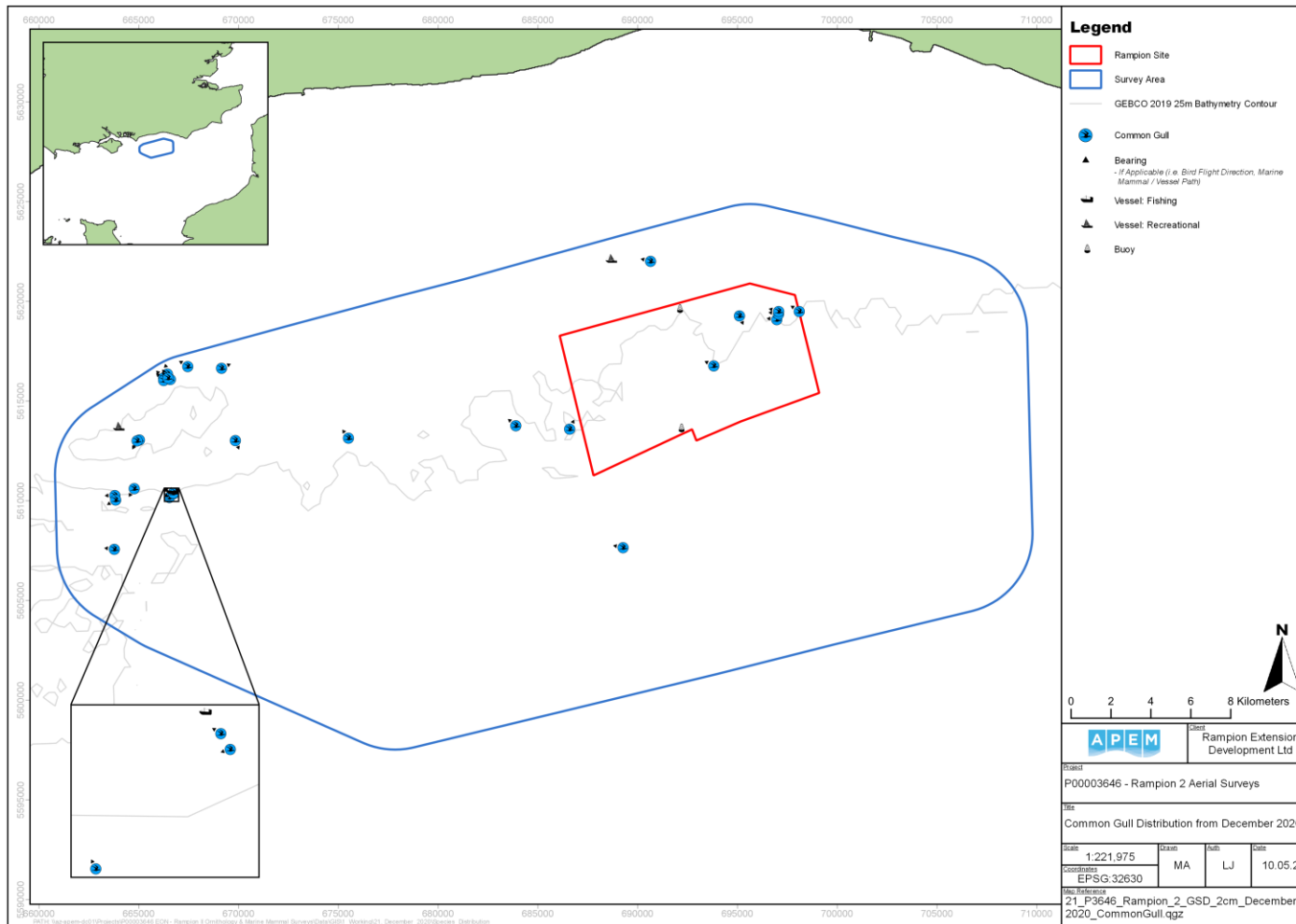


Figure 45 Distribution of common gulls recorded in the Rampion 2 Survey Area in December 2020

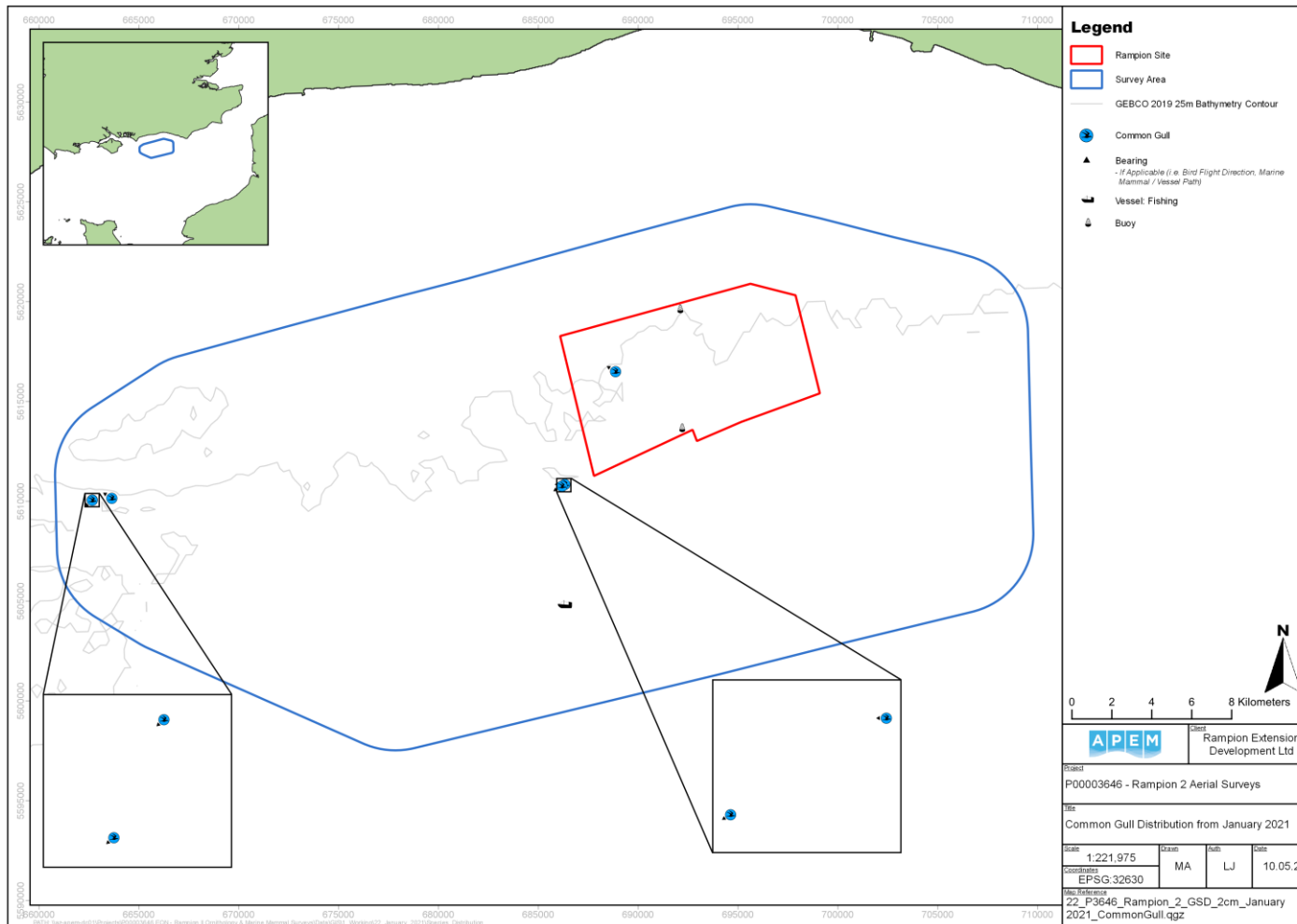


Figure 46 Distribution of common gulls recorded in the Rampion 2 Survey Area in January 2021

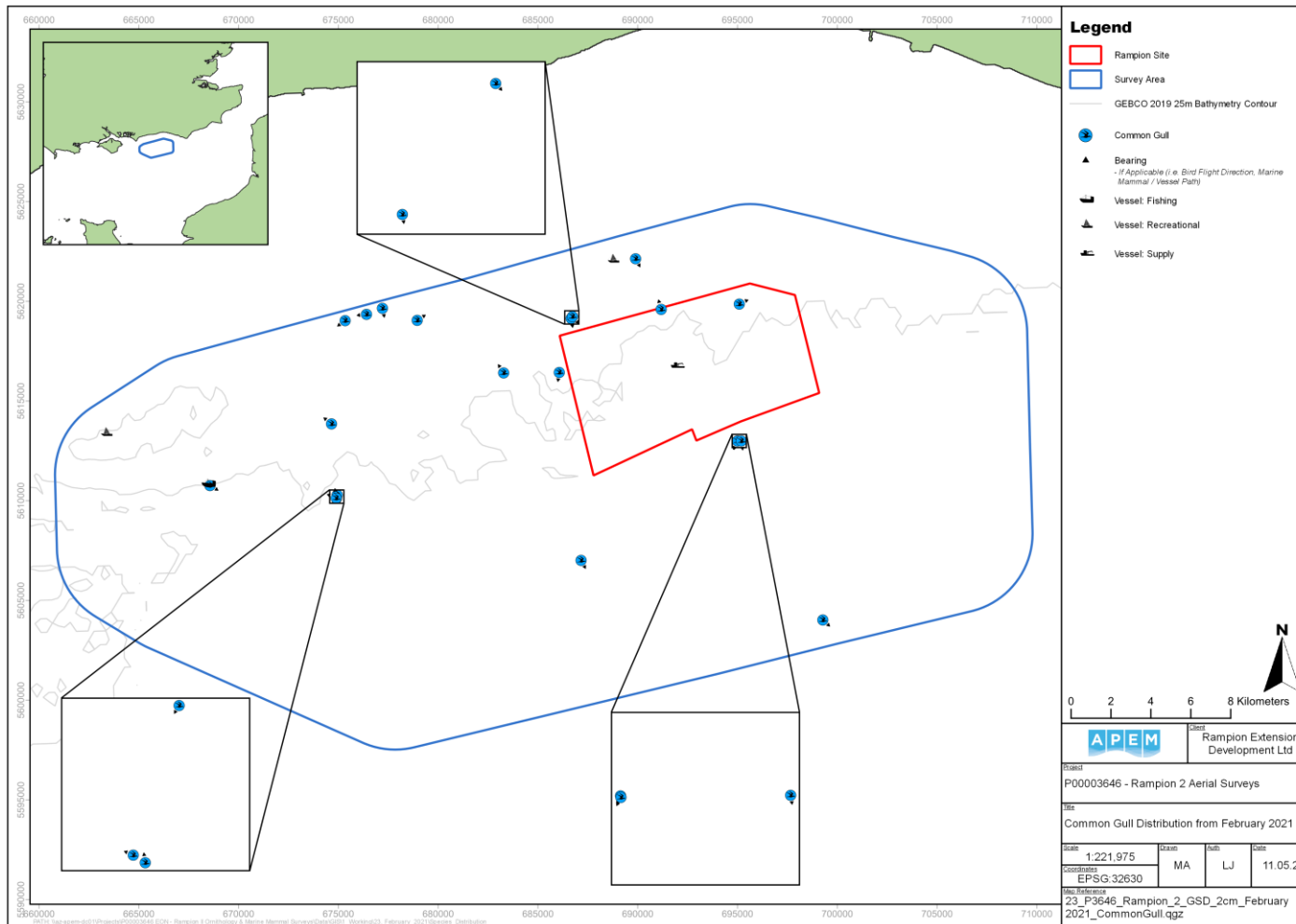


Figure 47 Distribution of common gull recorded in the Rampion 2 Survey Area in February 2021

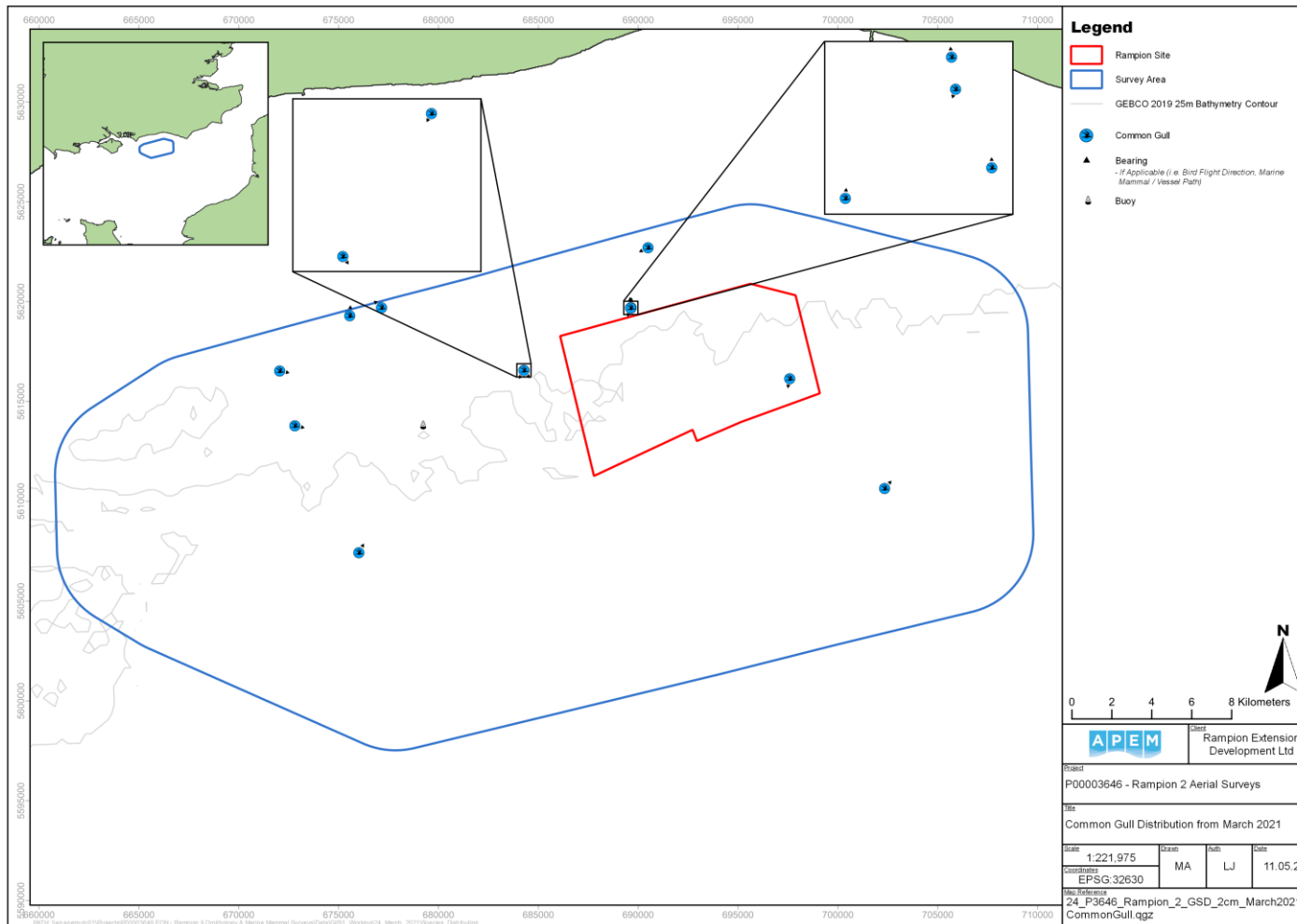


Figure 48 Distribution of common gulls recorded in the Rampion 2 Survey Area in March 2021

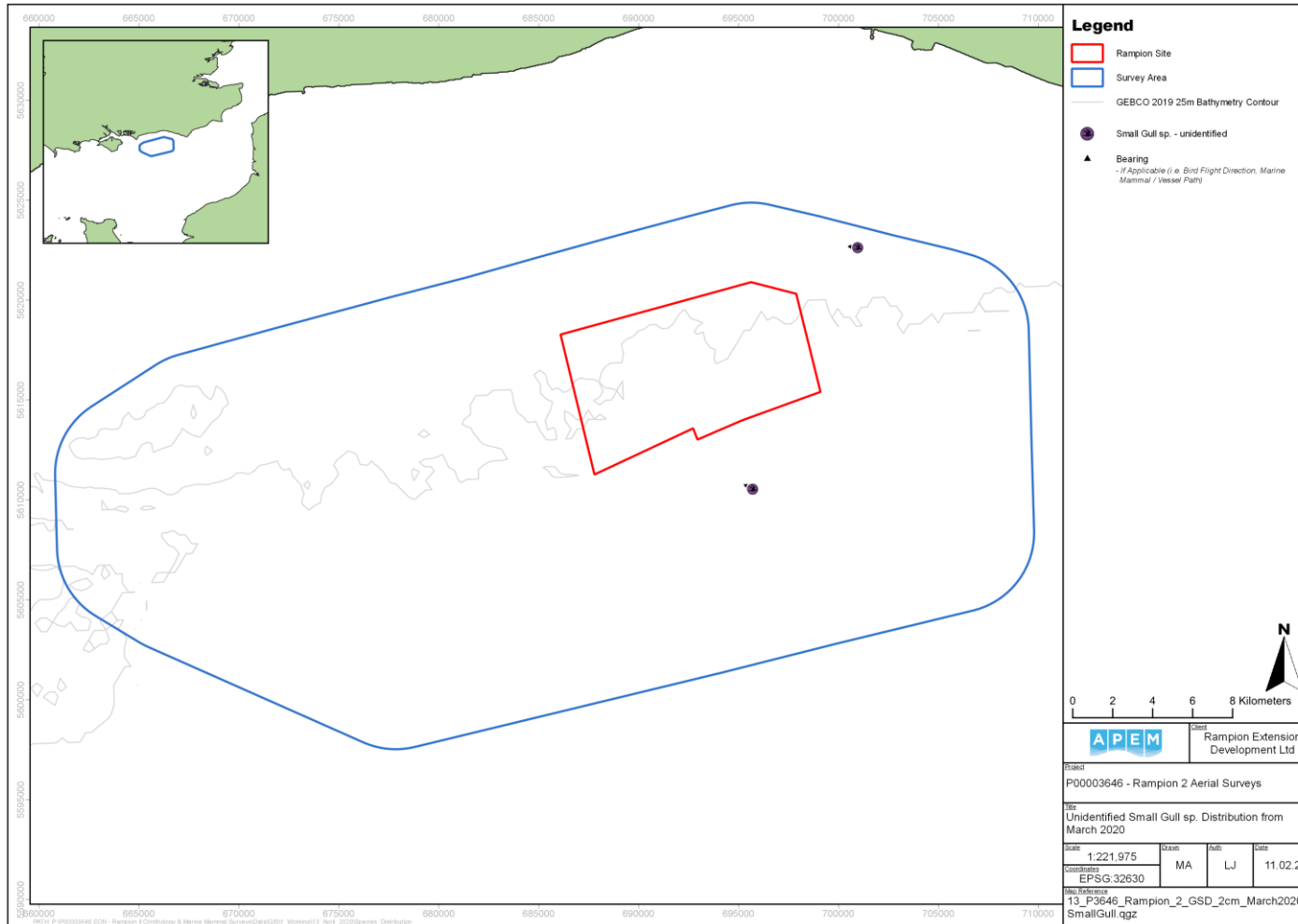


Figure 49 Distribution of unidentified small gulls recorded in the Rampion 2 Survey Area in April 2020

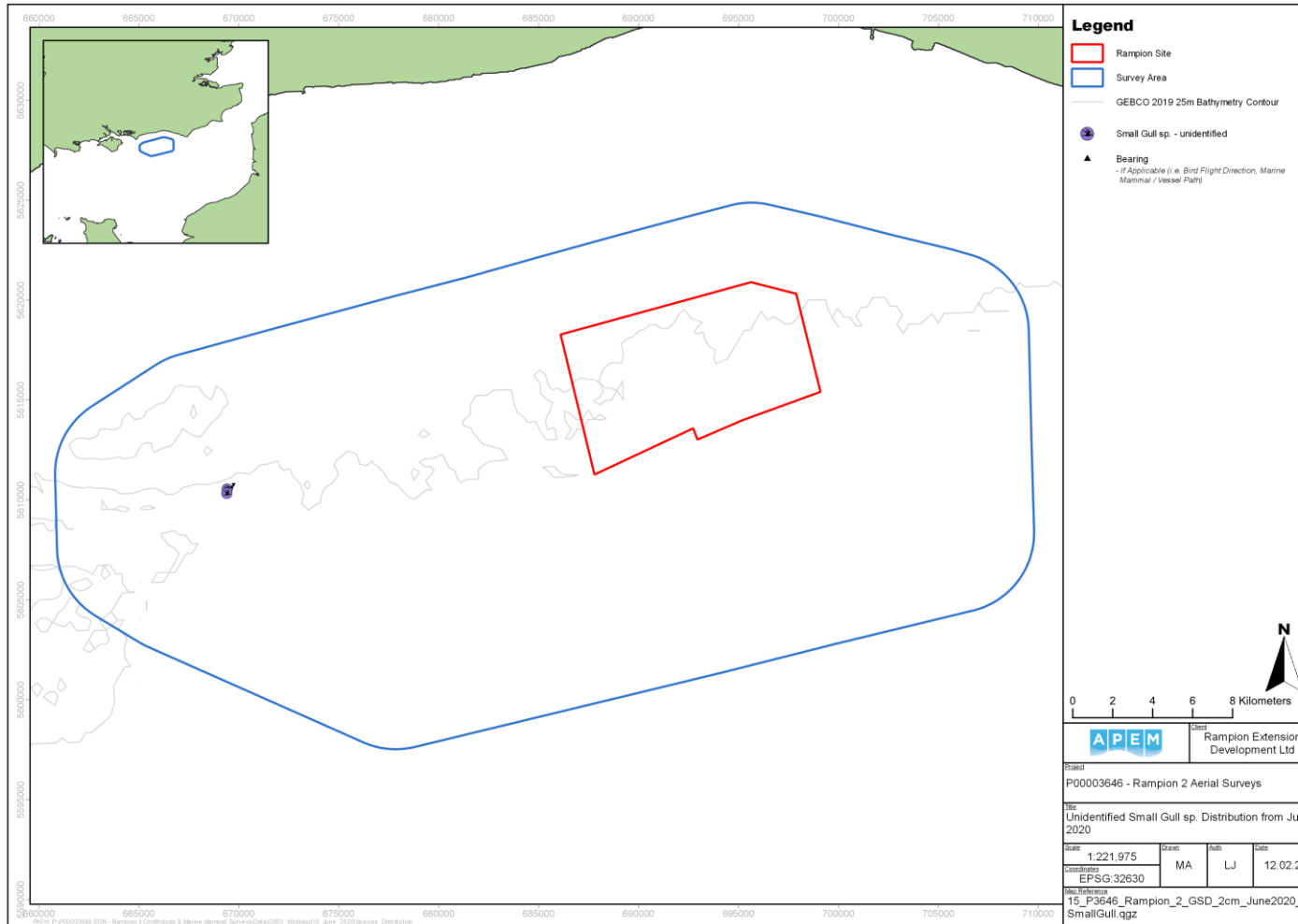


Figure 50 Distribution of unidentified small gulls recorded in the Rampion 2 Survey Area in June 2020

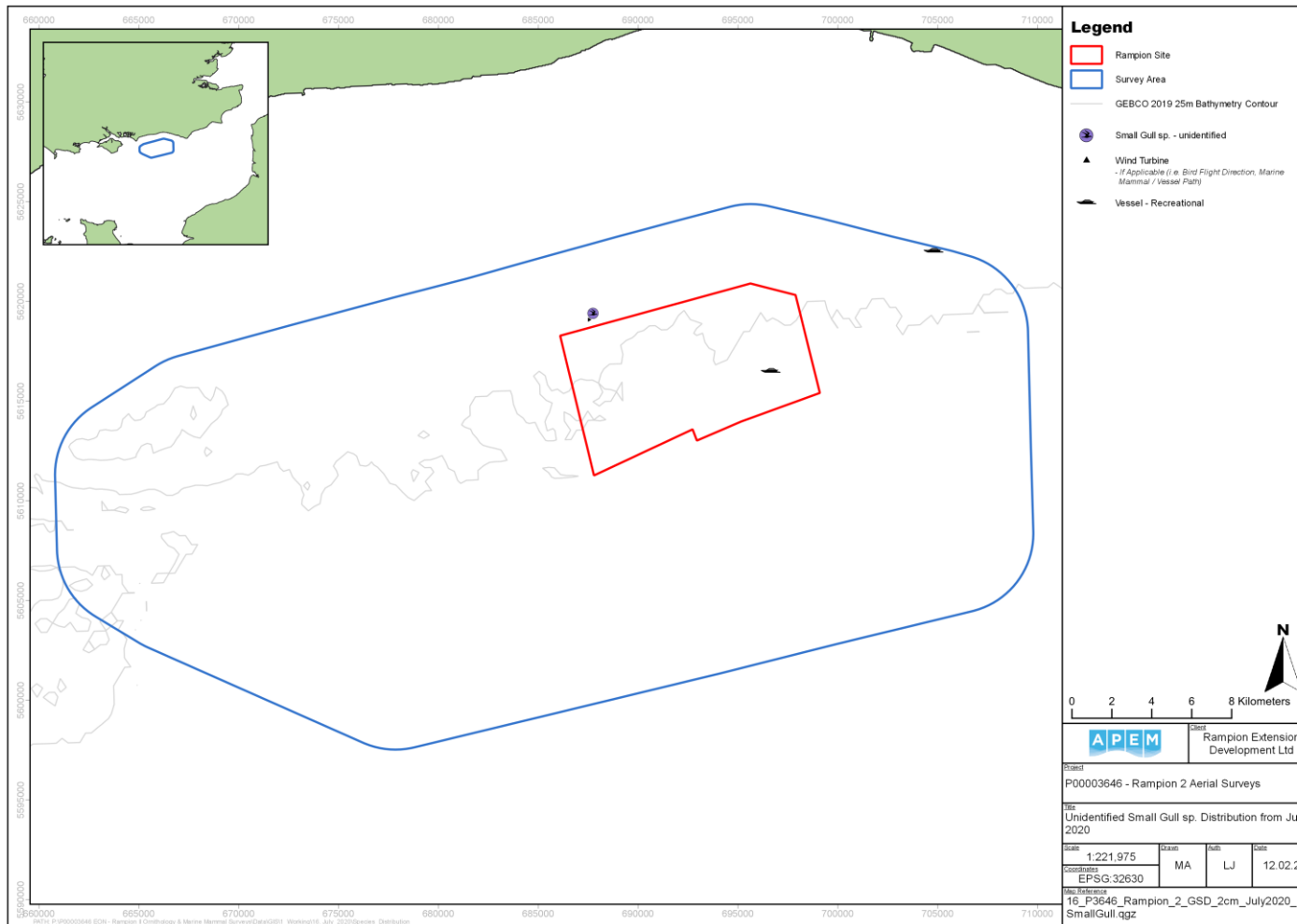


Figure 51 Location of an unidentified small gulls recorded in the Rampion 2 Survey Area in July 2020

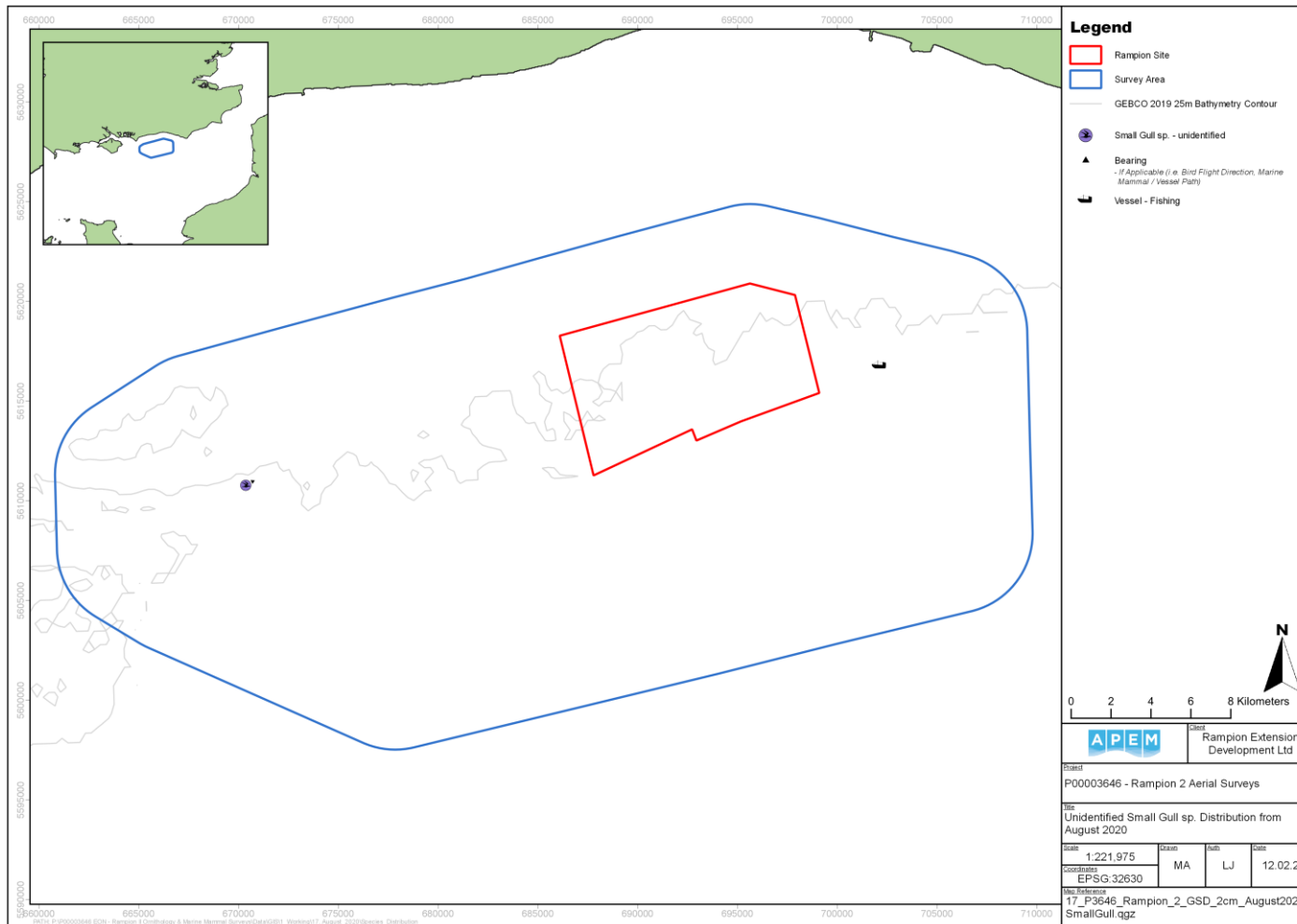


Figure 52 Location of an unidentified small gulls recorded in the Rampion 2 Survey Area in August 2020

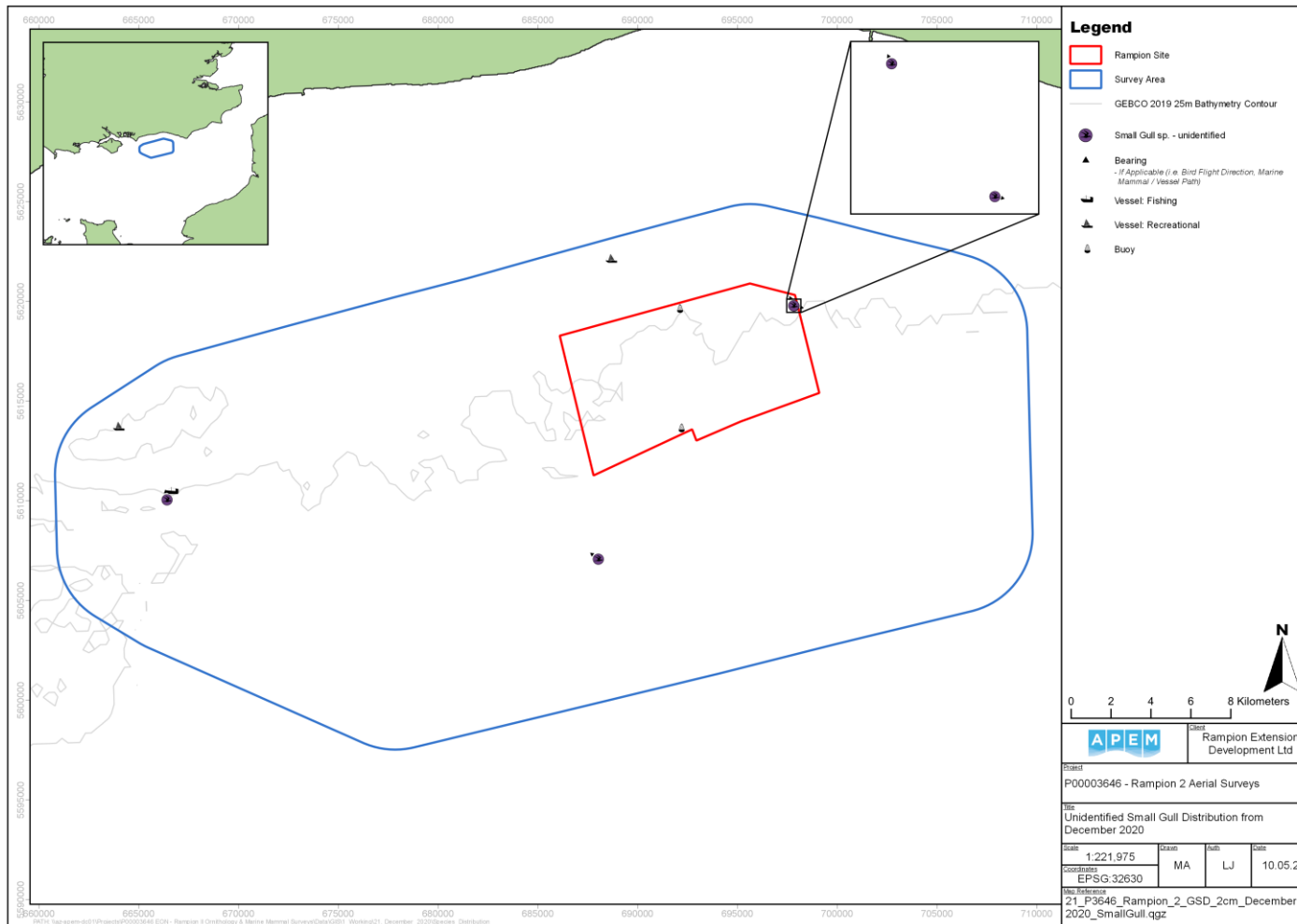


Figure 53 Distribution of unidentified small gulls recorded in the Rampion 2 Survey Area in December 2020

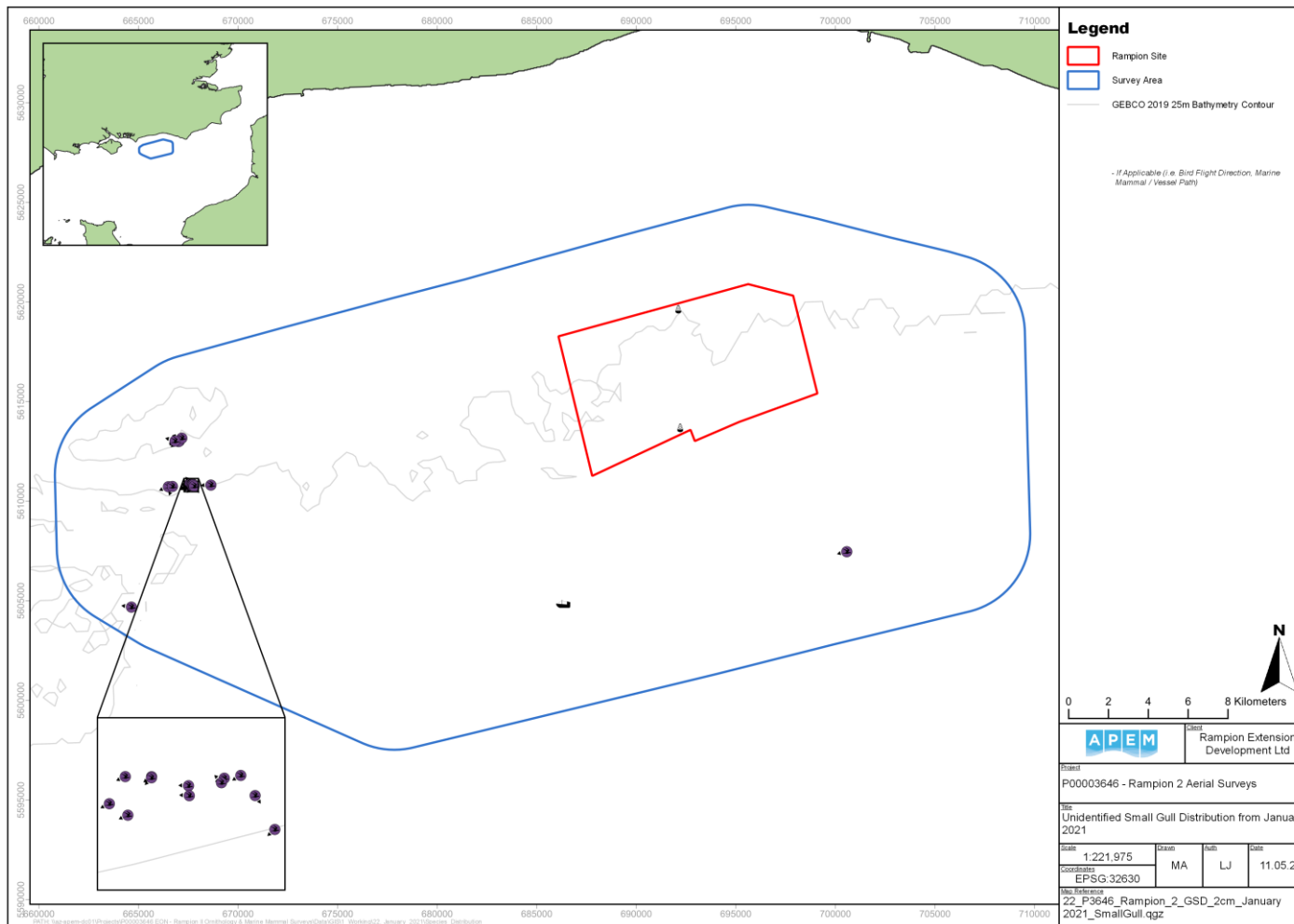


Figure 54 Distribution of unidentified small gulls recorded in the Rampion 2 Survey Area in January 2021

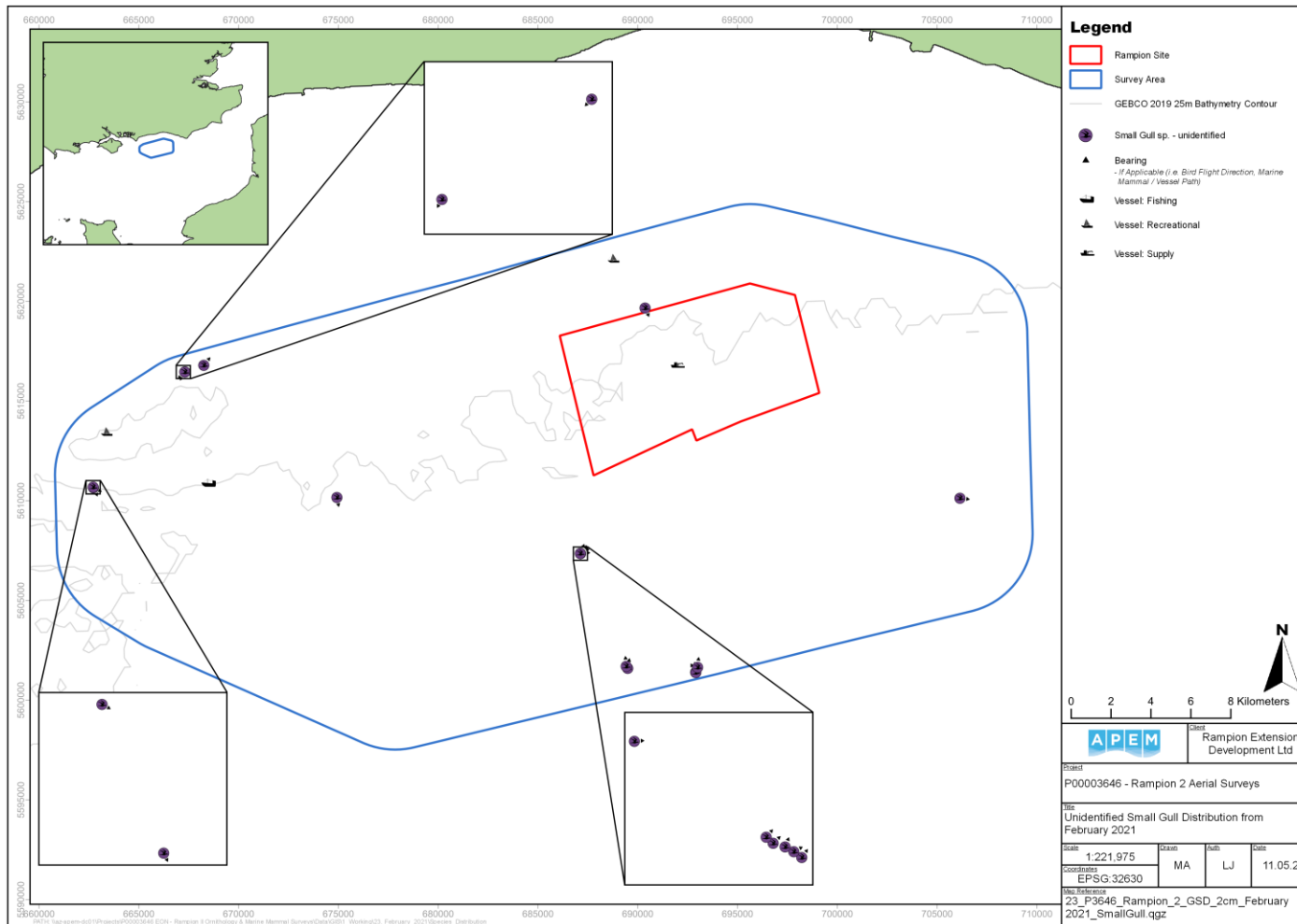


Figure 55 Distribution of unidentified small gulls recorded in the Rampion 2 Survey Area in February 2021

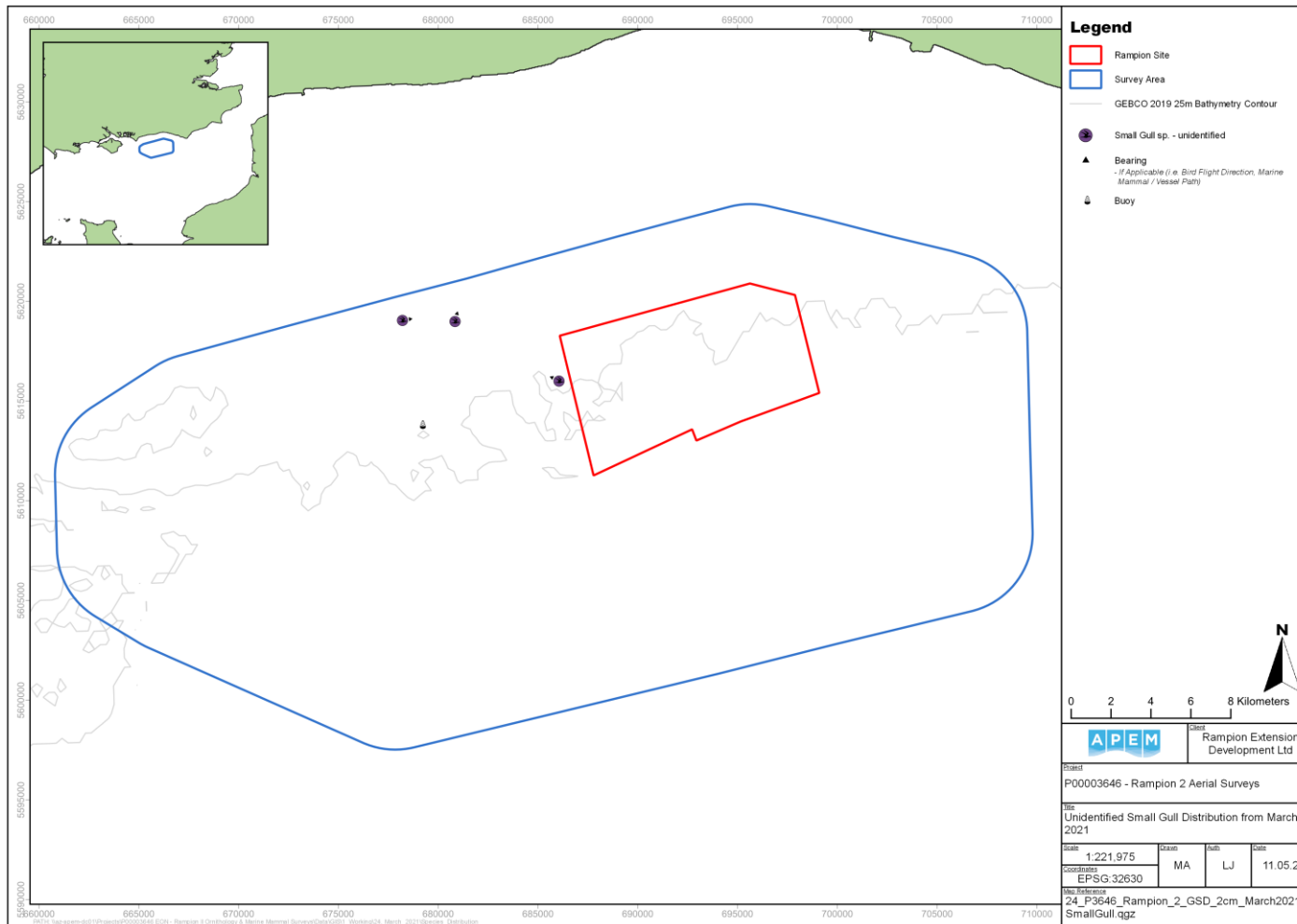


Figure 56 Distribution of unidentified small gulls recorded in the Rampion 2 Survey Area in March 2021

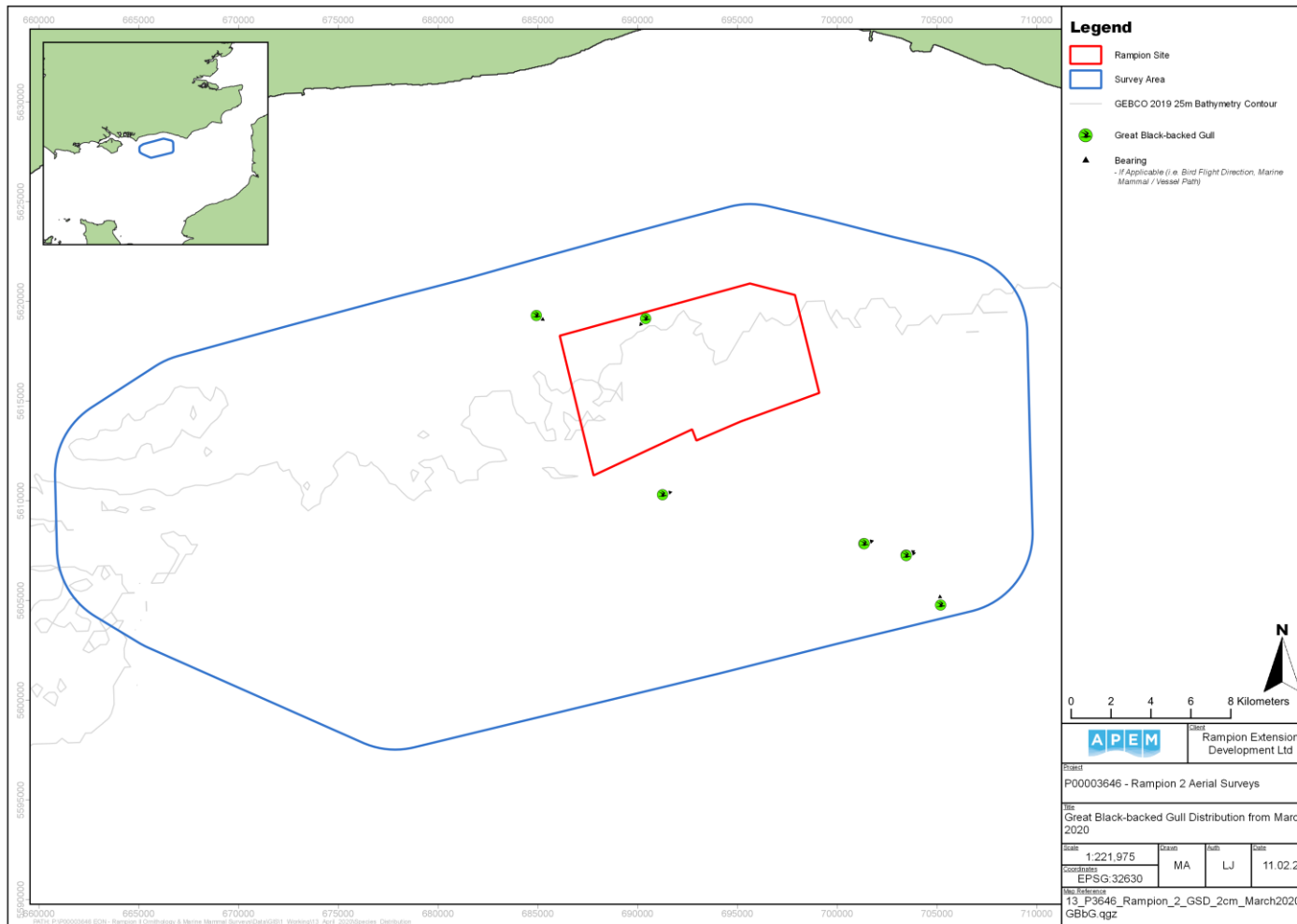


Figure 57 Distribution of great black backed gulls recorded in the Rampion 2 Survey Area in April 2020

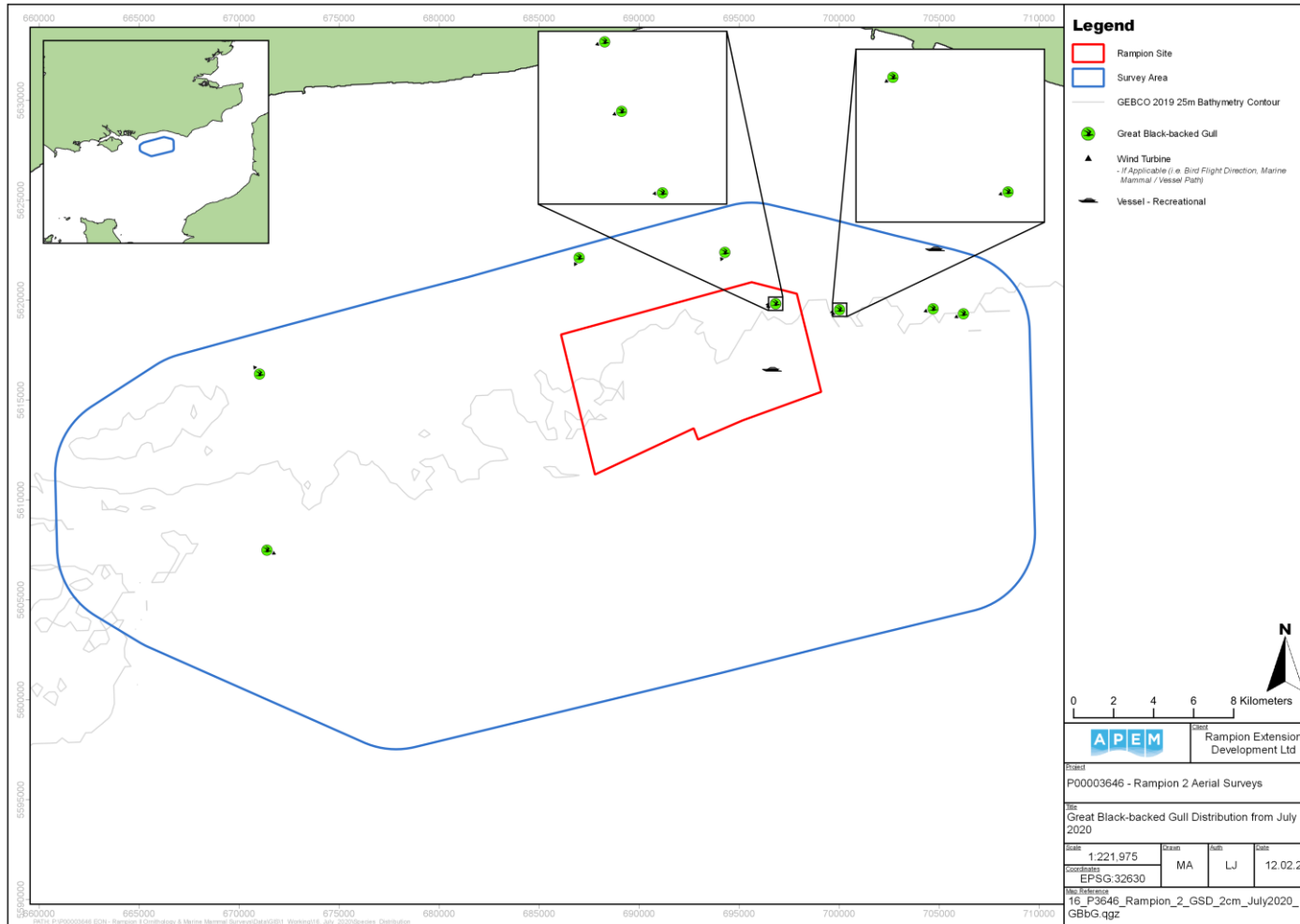


Figure 58 Distribution of great black backed gulls recorded in the Rampion 2 Survey Area in July 2020

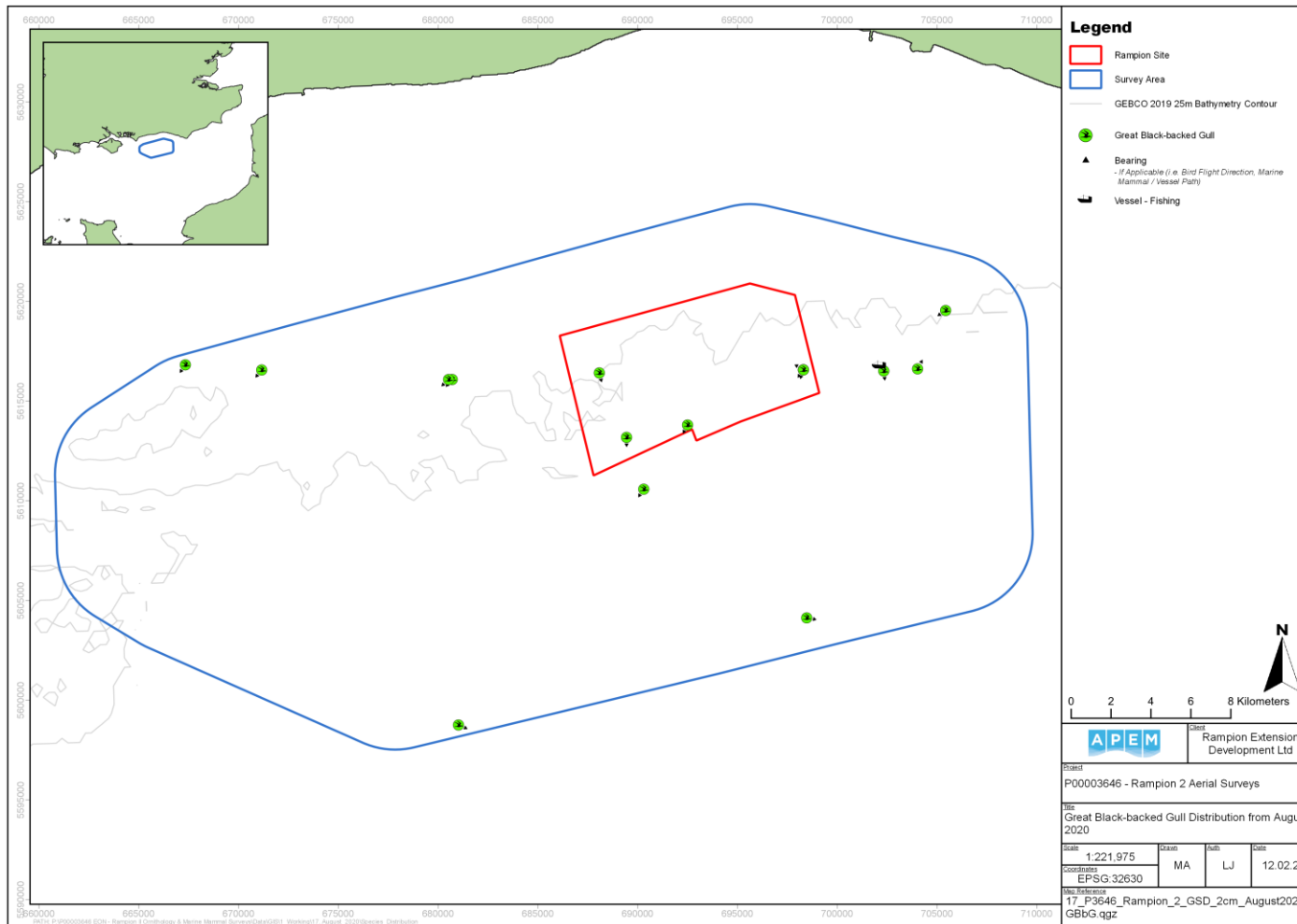


Figure 59 Distribution of great black backed gulls recorded in the Rampion 2 Survey Area in August 2020

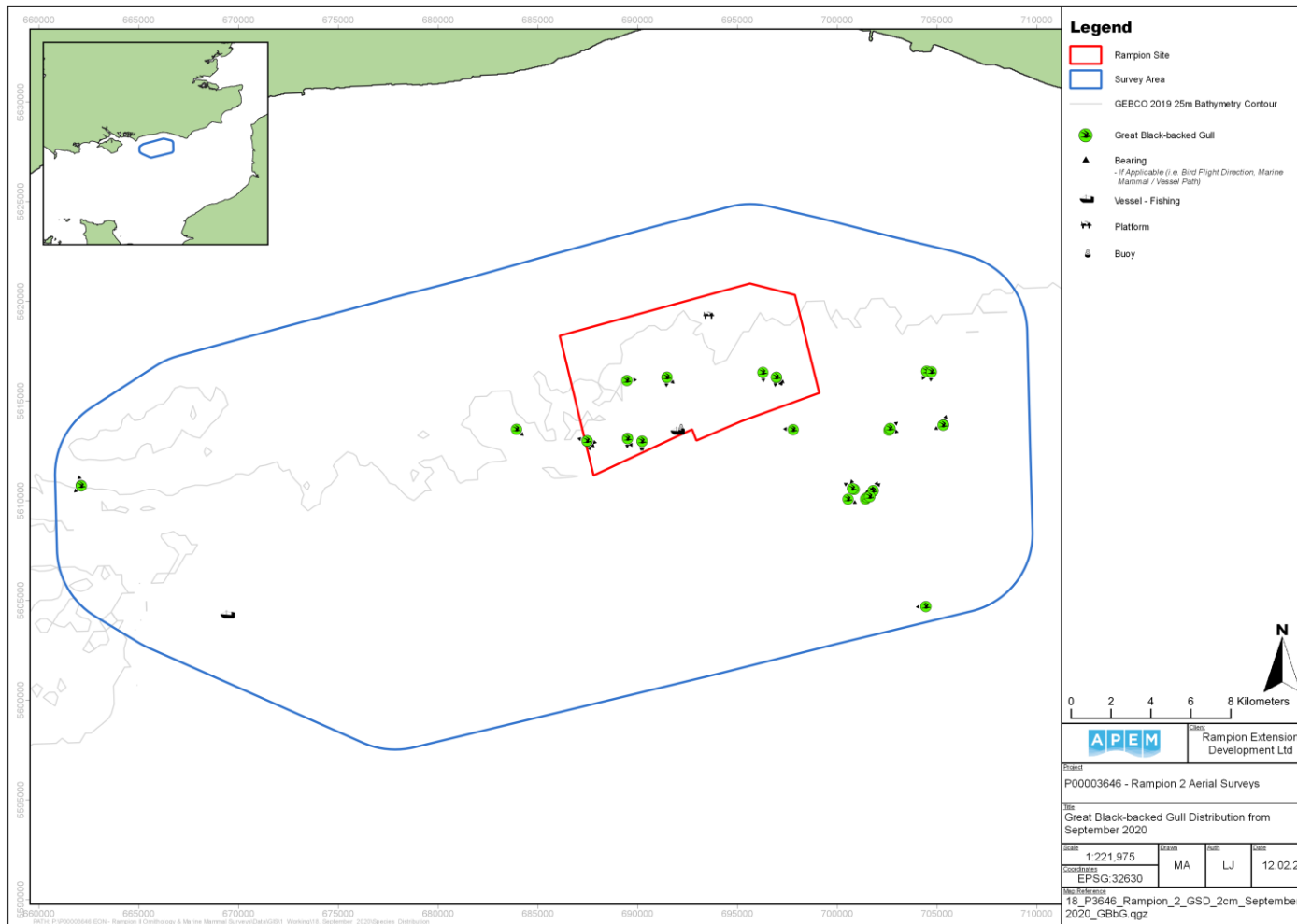


Figure 60 Distribution of great black backed gulls recorded in the Rampion 2 Survey Area in September 2020

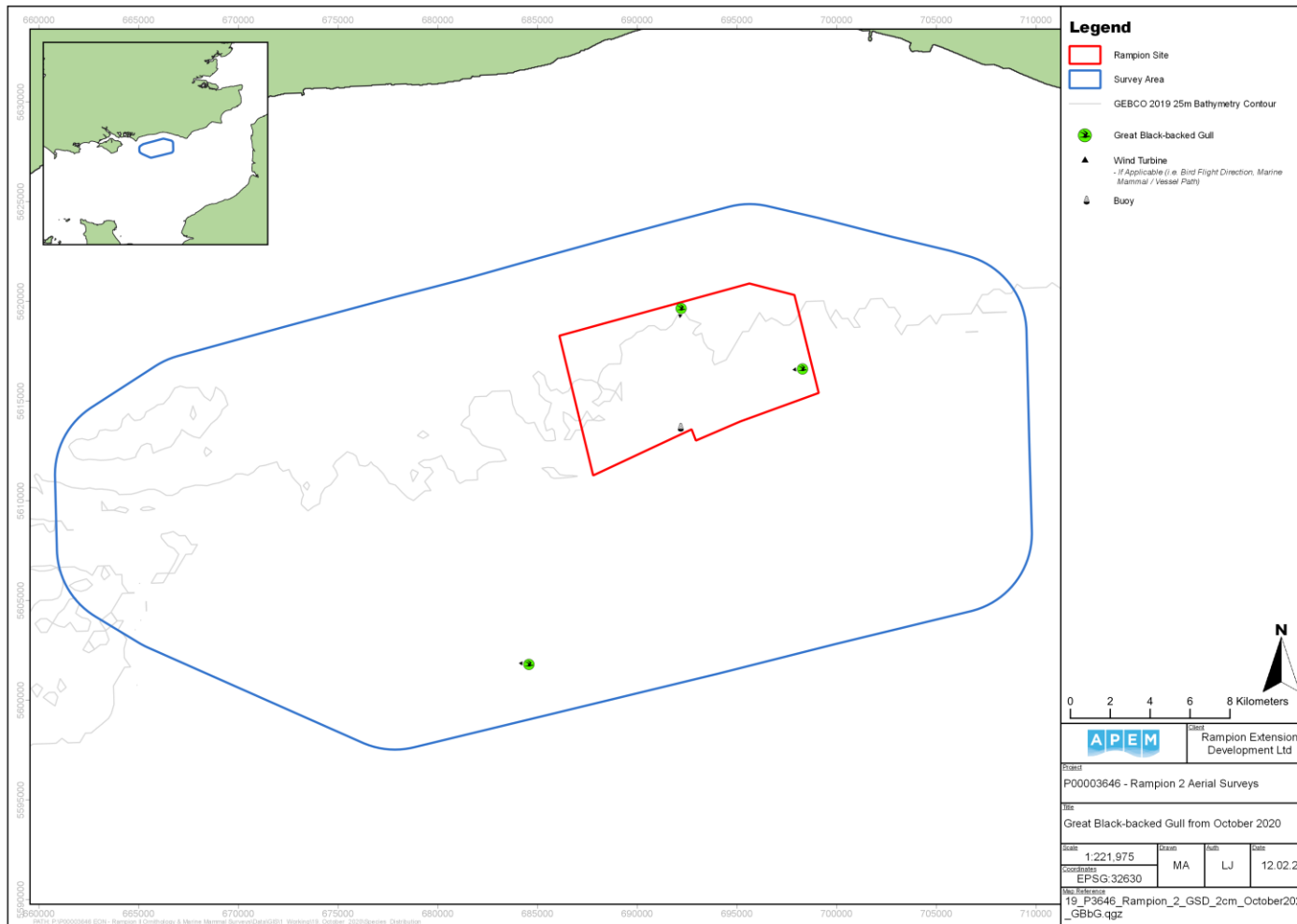


Figure 61 Distribution of great black backed gulls recorded in the Rampion 2 Survey Area in October 2020

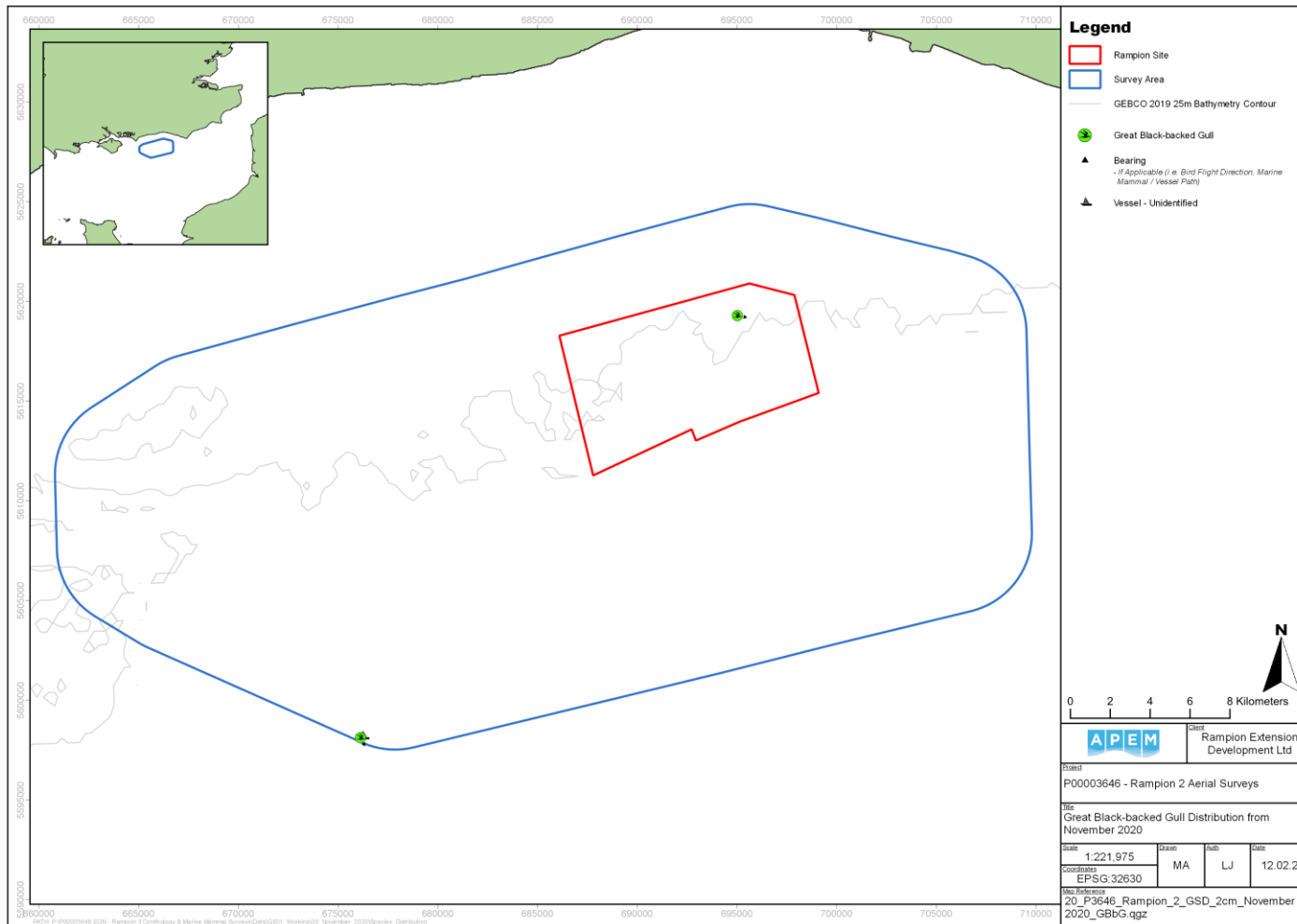


Figure 62 Distribution of great black-backed gulls recorded in the Rampion 2 Survey Area in November 2020

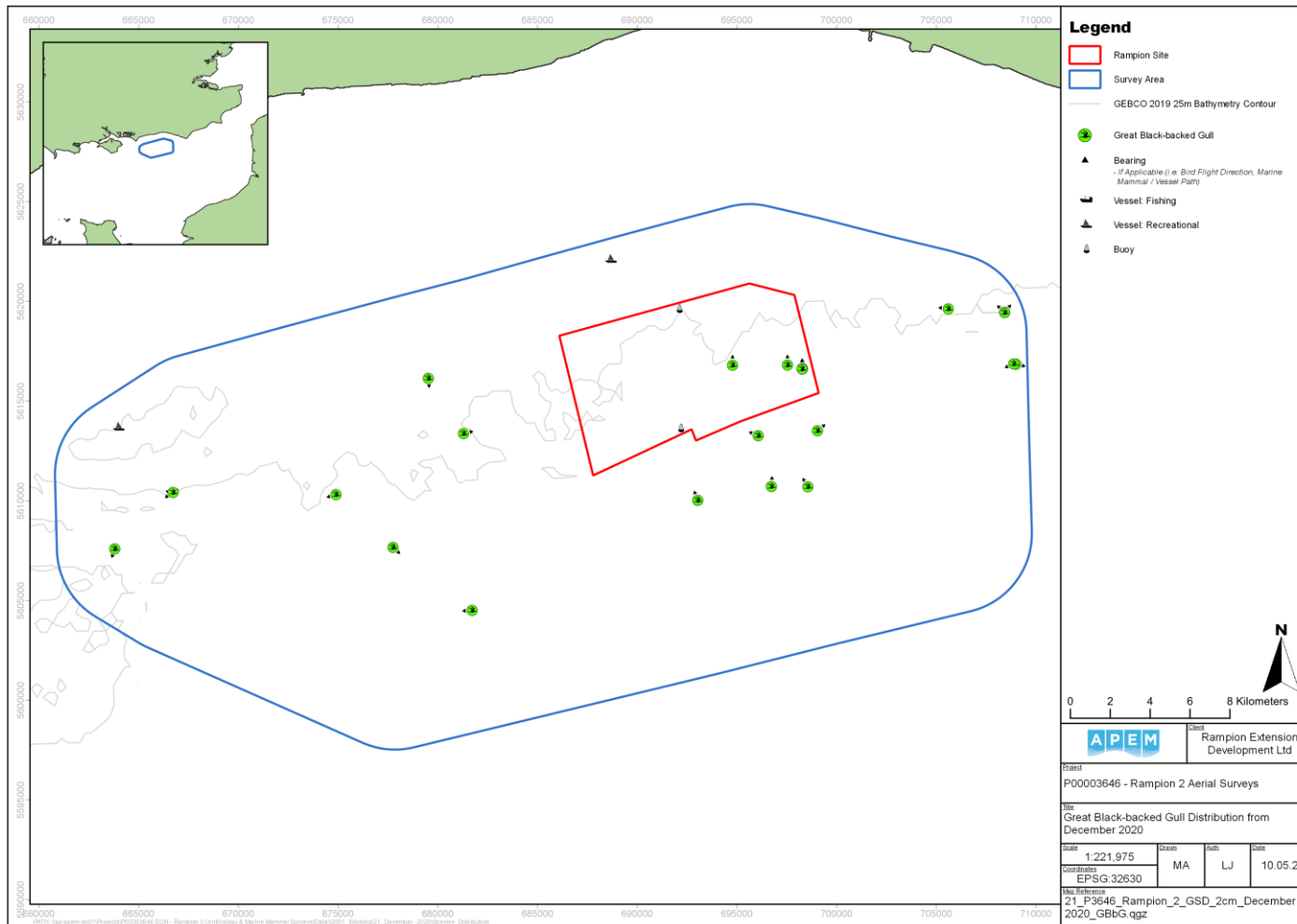


Figure 63 Distribution of great black-backed gulls recorded in the Rampion 2 Survey Area in December 2020

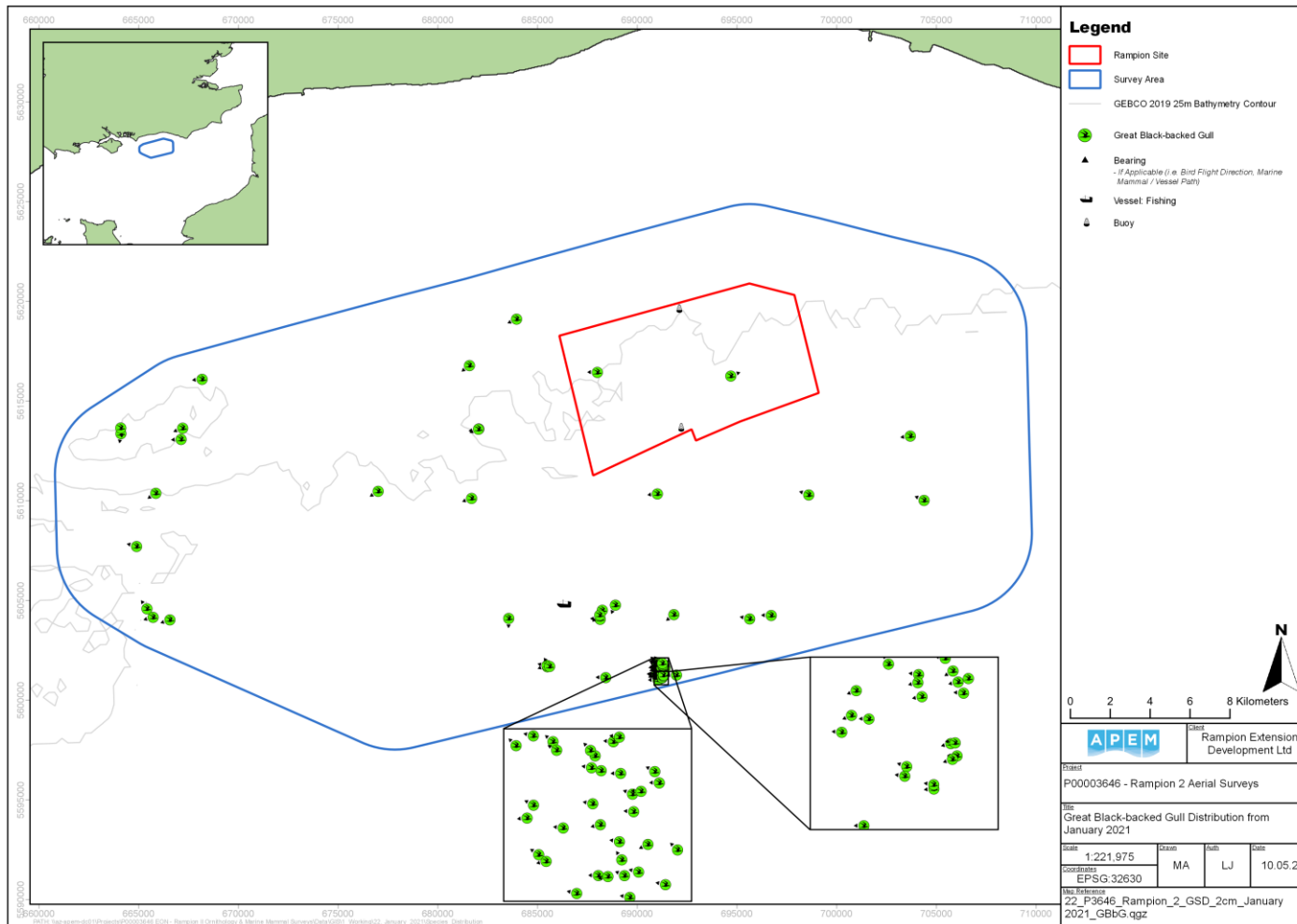


Figure 64 Distribution of great black-backed gulls recorded in the Rampion 2 Survey Area in January 2021

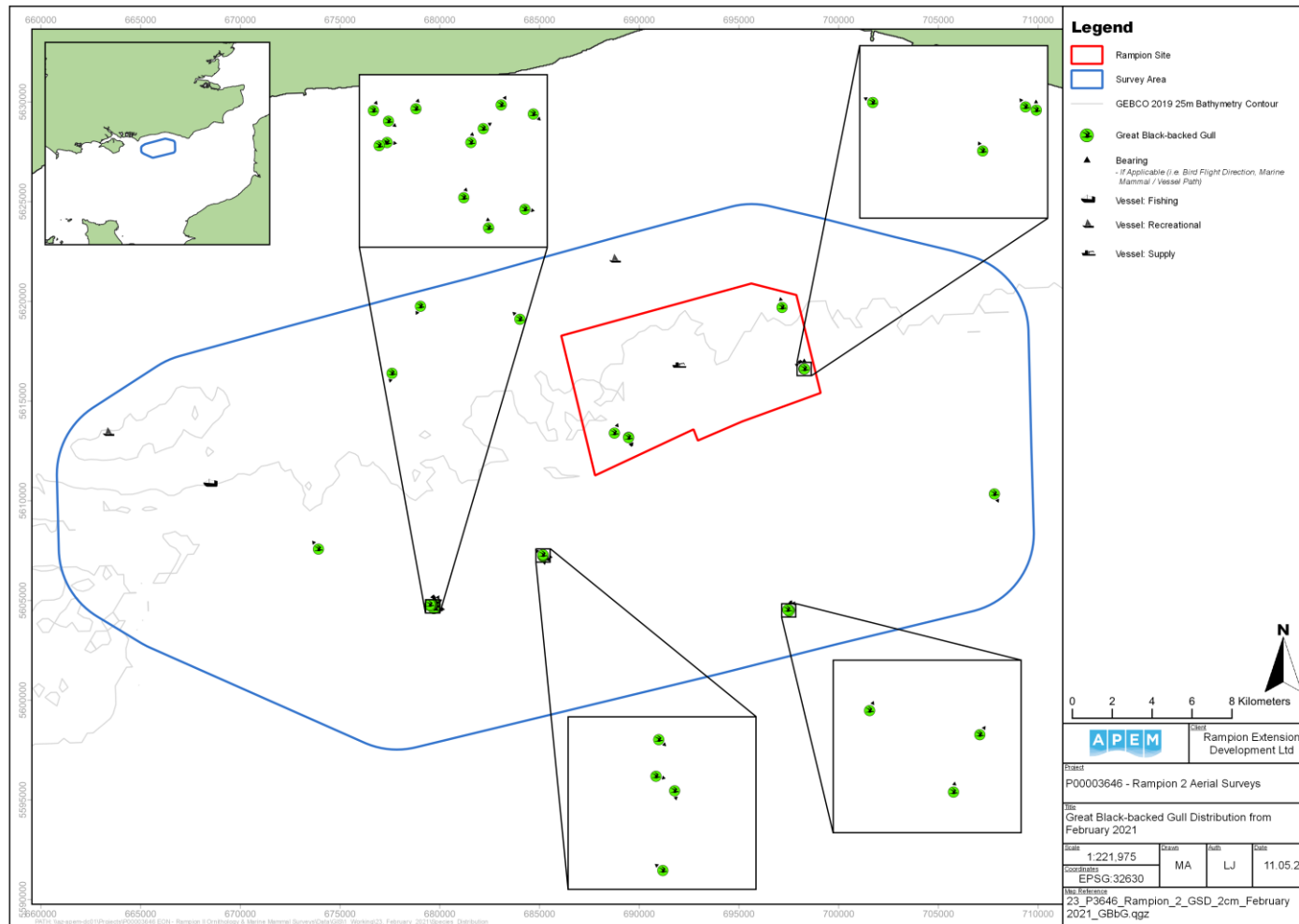


Figure 65 Distribution of great black-backed gulls recorded in the Rampion 2 Survey Area in February 2021

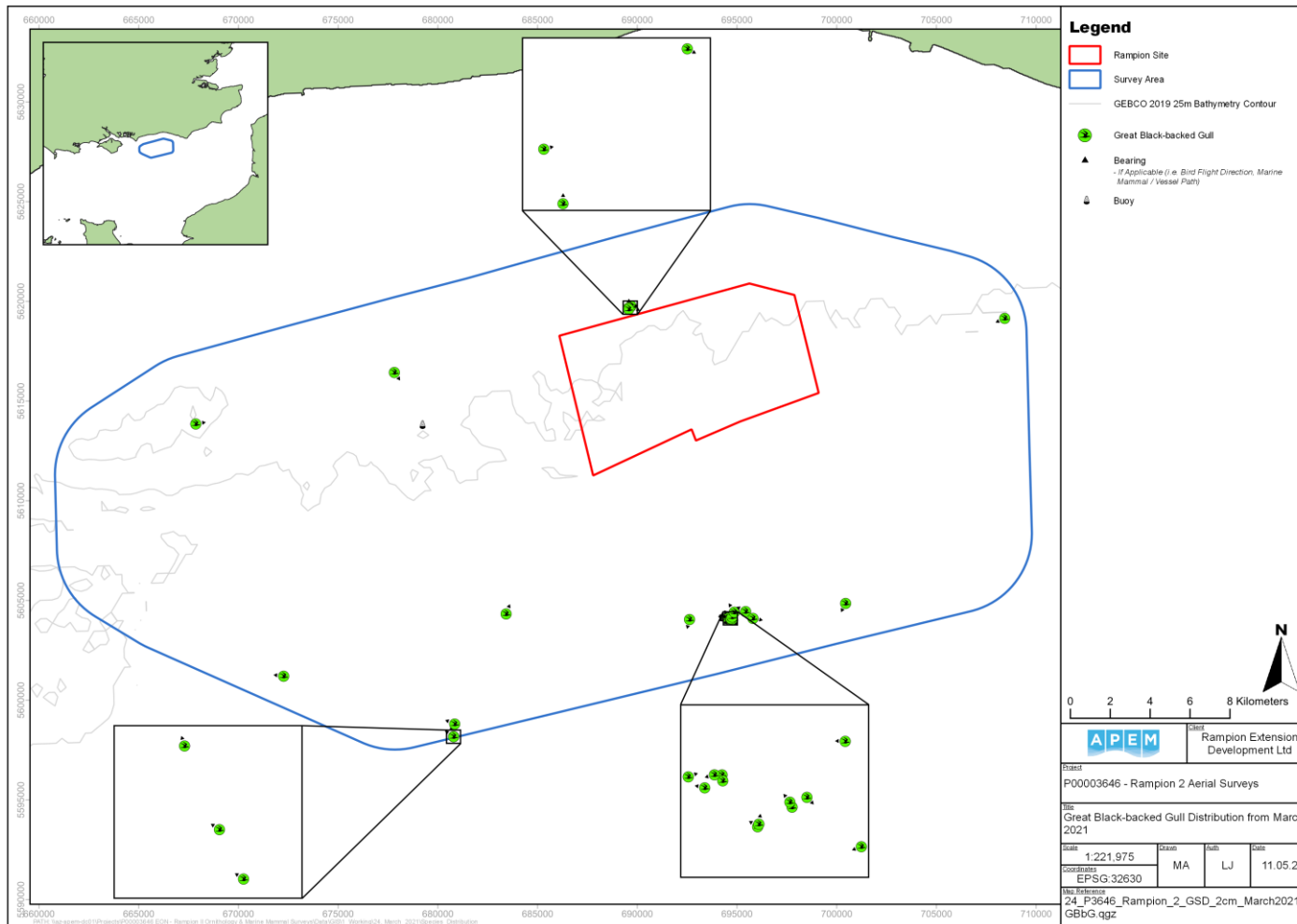


Figure 66 Distribution of great black-backed gulls recorded in the Rampion 2 Survey Area in March 2021

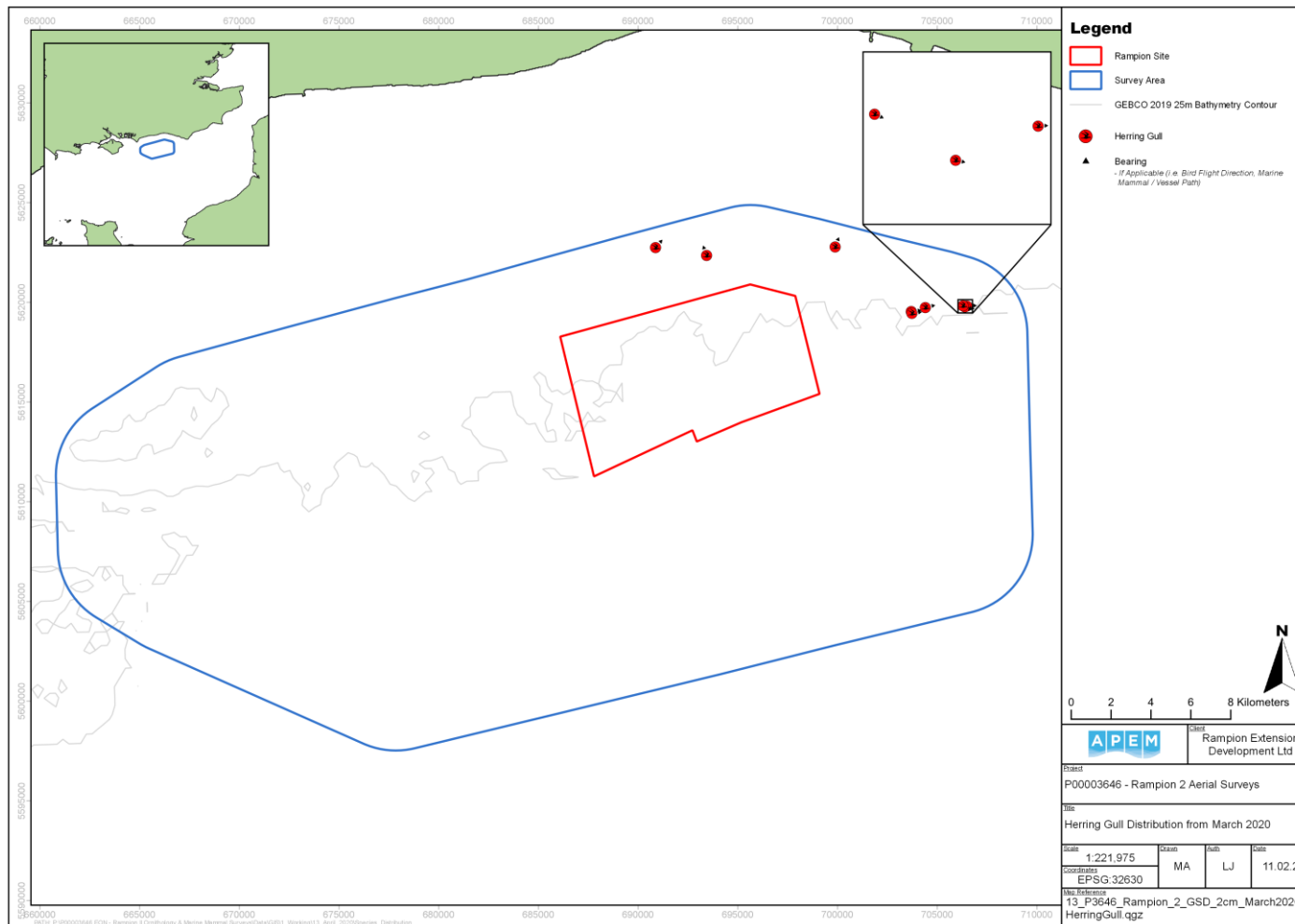


Figure 67 Distribution of herring gulls recorded in the Rampion 2 Survey Area in April 2020

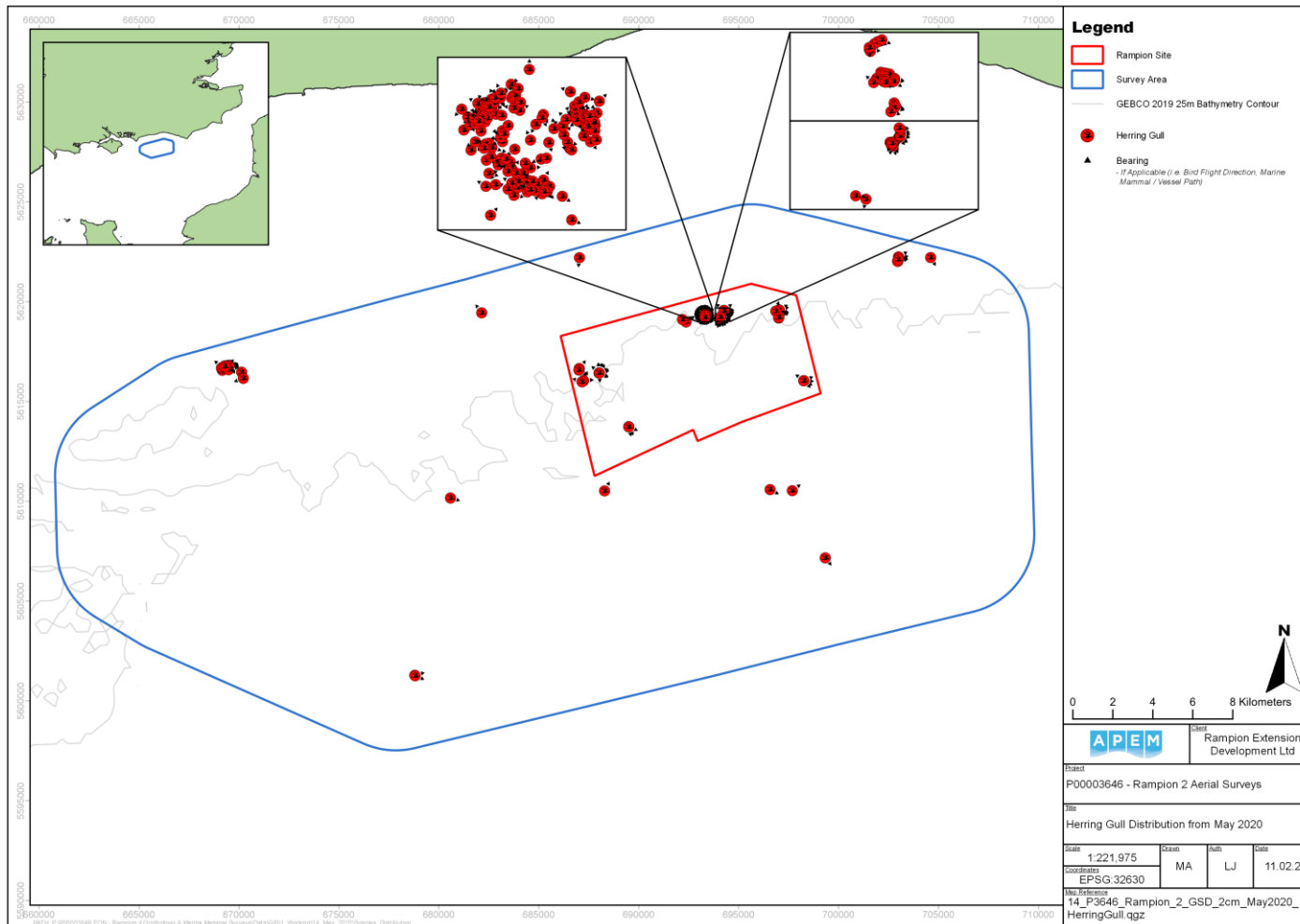


Figure 68 Distribution of herring gulls recorded in the Rampion 2 Survey Area in May 2020

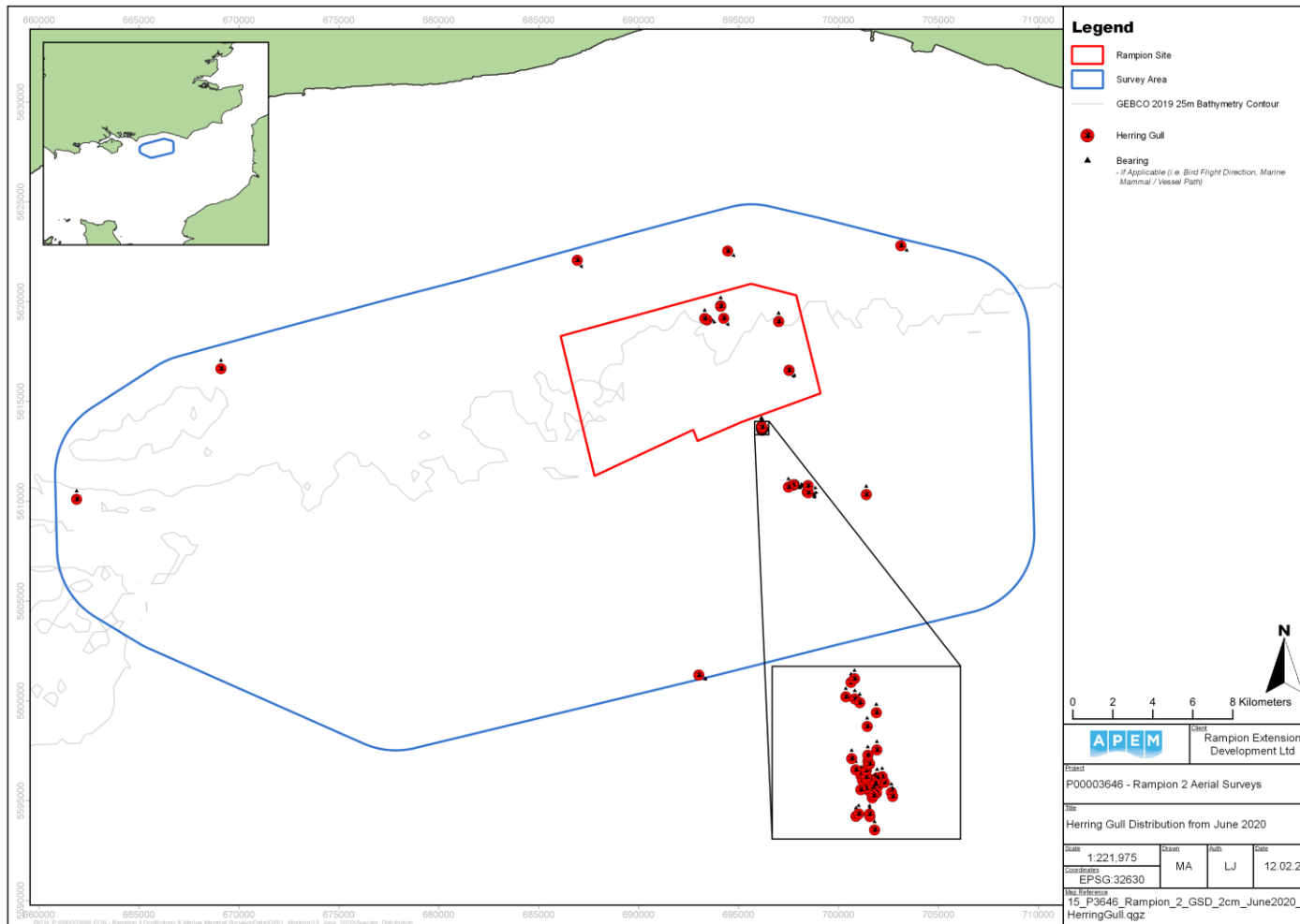


Figure 69 Distribution of herring gull recorded in the Rampion 2 Survey Area in June 2020

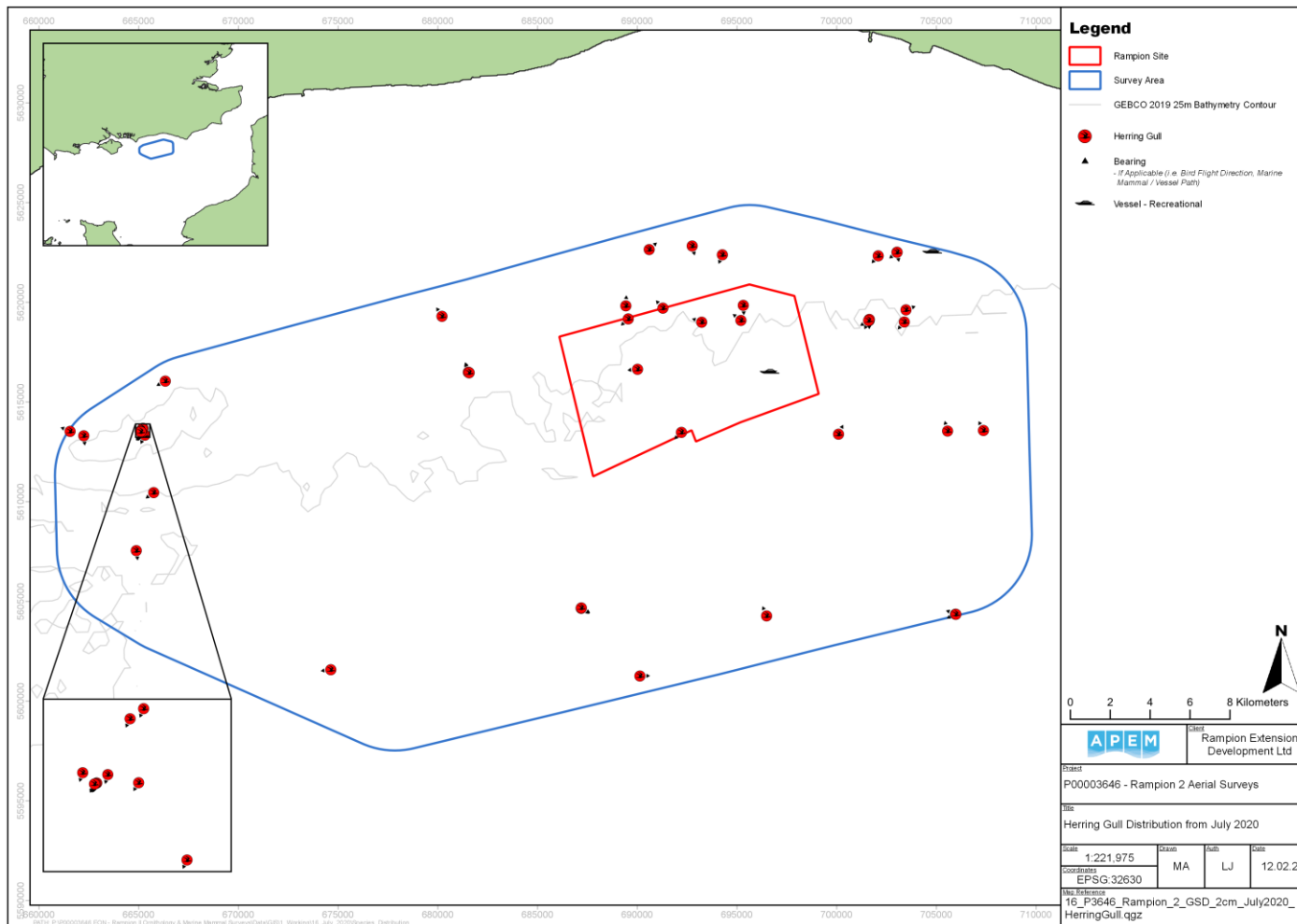


Figure 70 Distribution of herring gulls recorded in the Rampion 2 Survey Area in July 2020

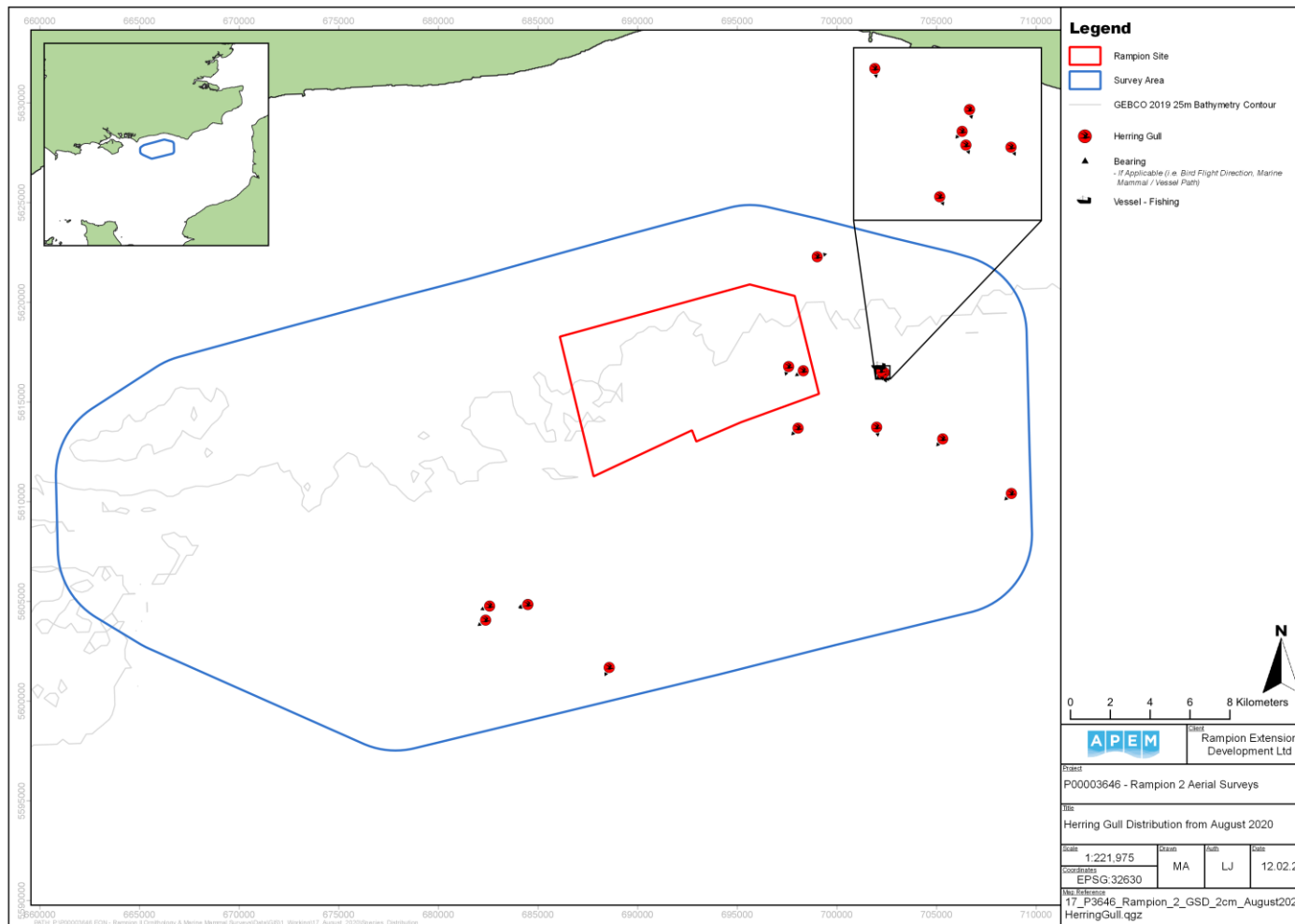


Figure 71 Distribution of herring gulls recorded in the Rampion 2 Survey Area in August 2020

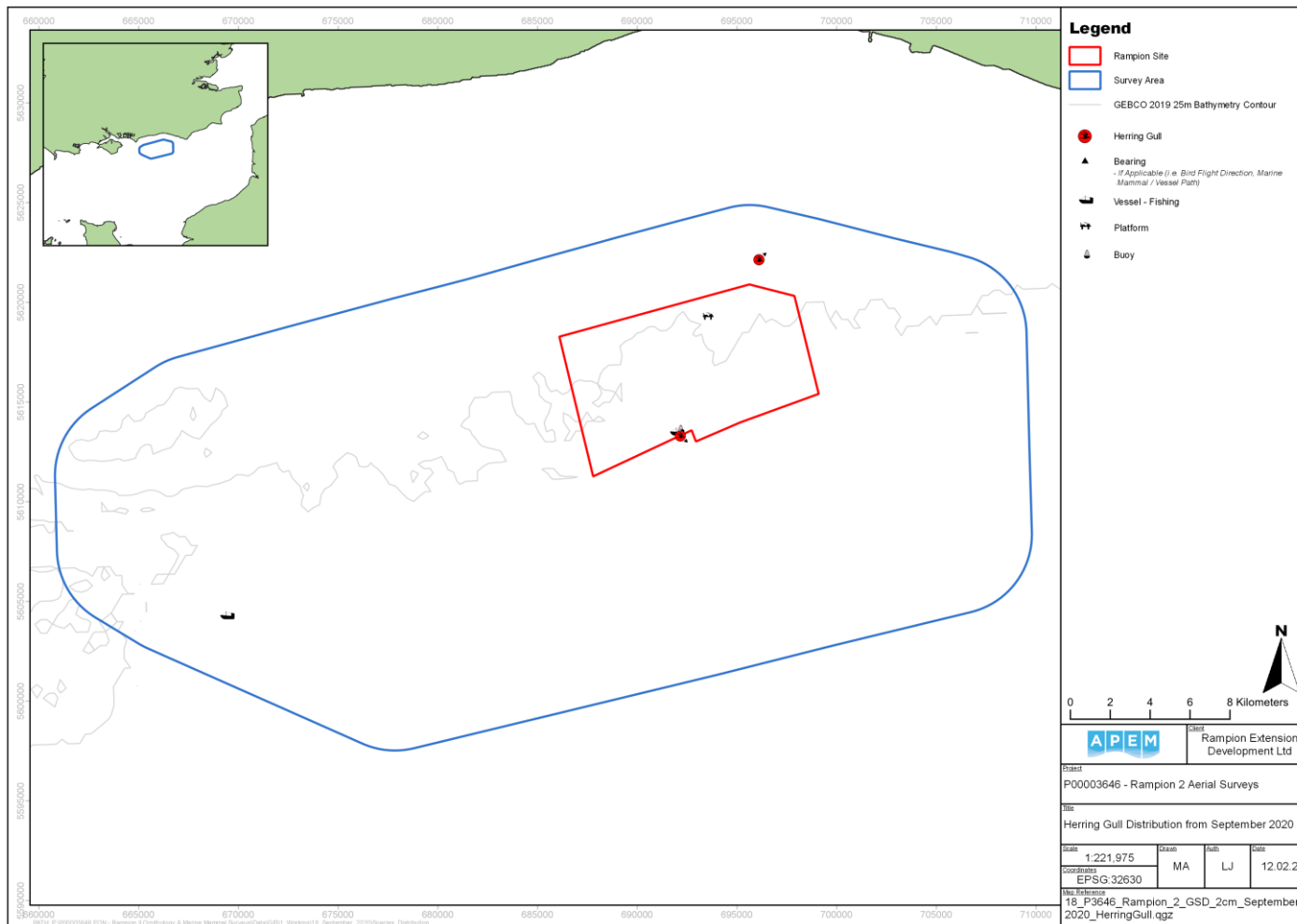


Figure 72 Distribution of herring gulls recorded in the Rampion 2 Survey Area in September 2020

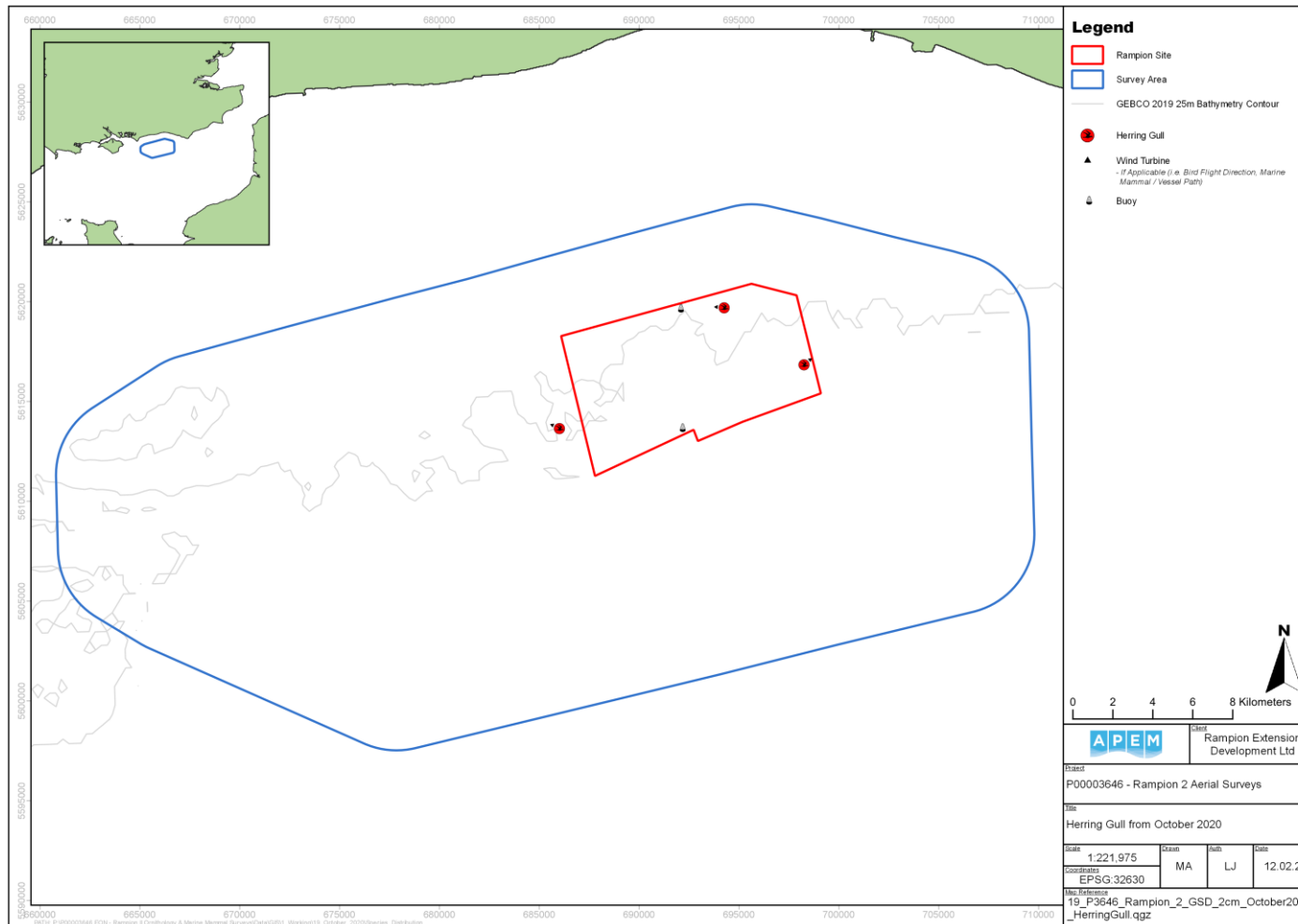


Figure 73 Distribution of herring gulls recorded in the Rampion 2 Survey Area in October 2020

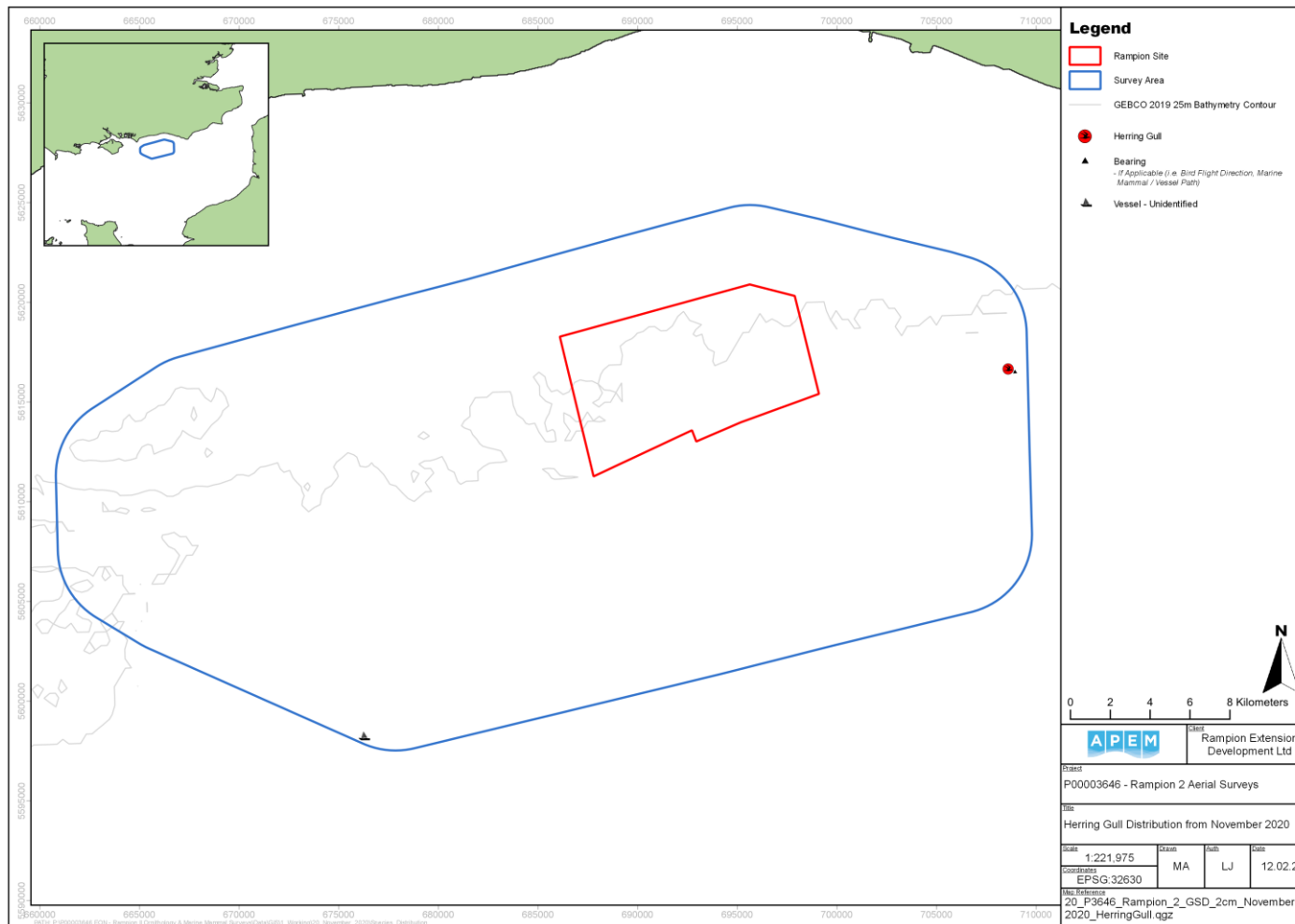


Figure 74 Location of a herring gull recorded in the Rampion 2 Survey Area in November 2020

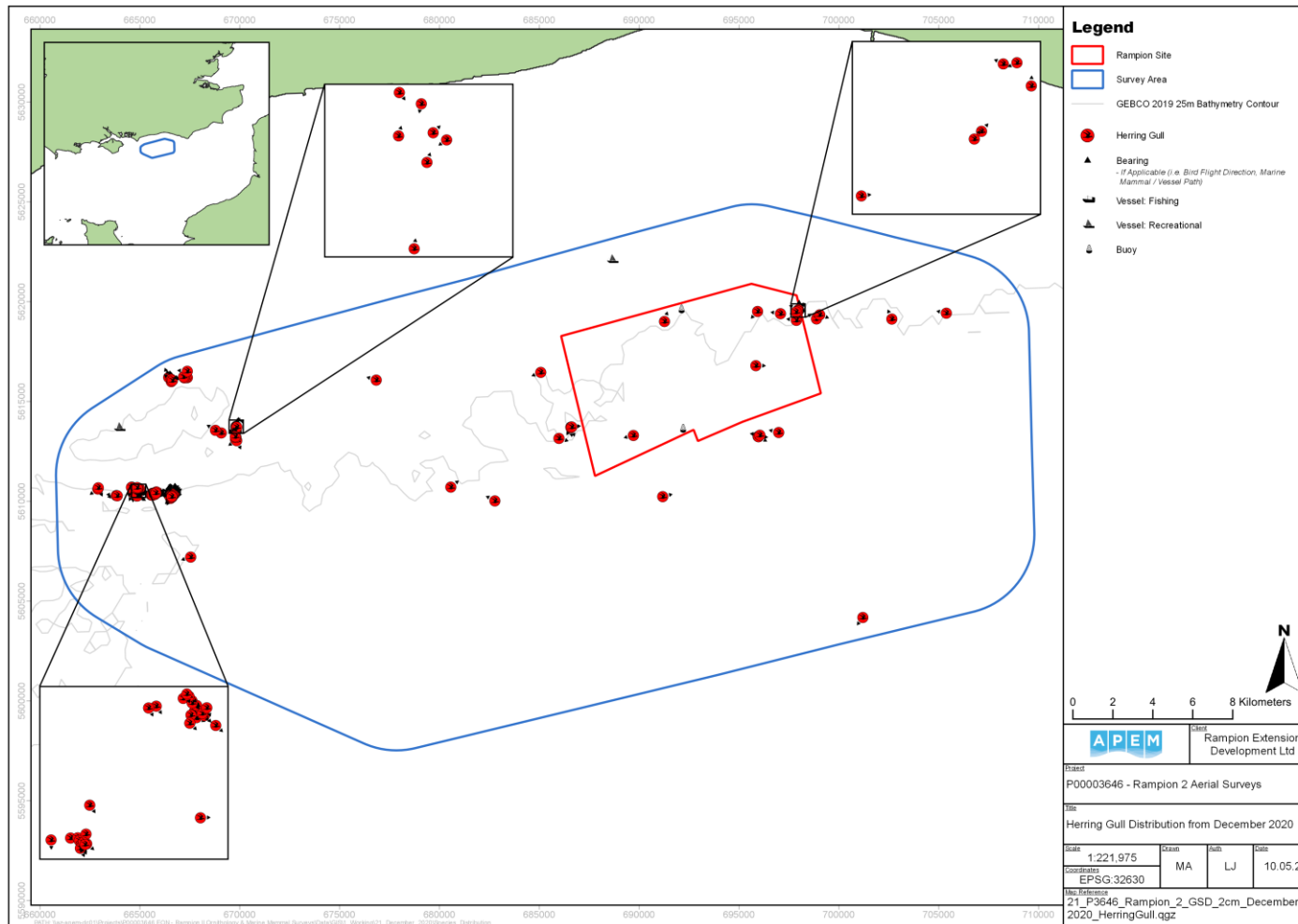


Figure 75 Distribution of herring gulls recorded in the Rampion 2 Survey Area in December 2020

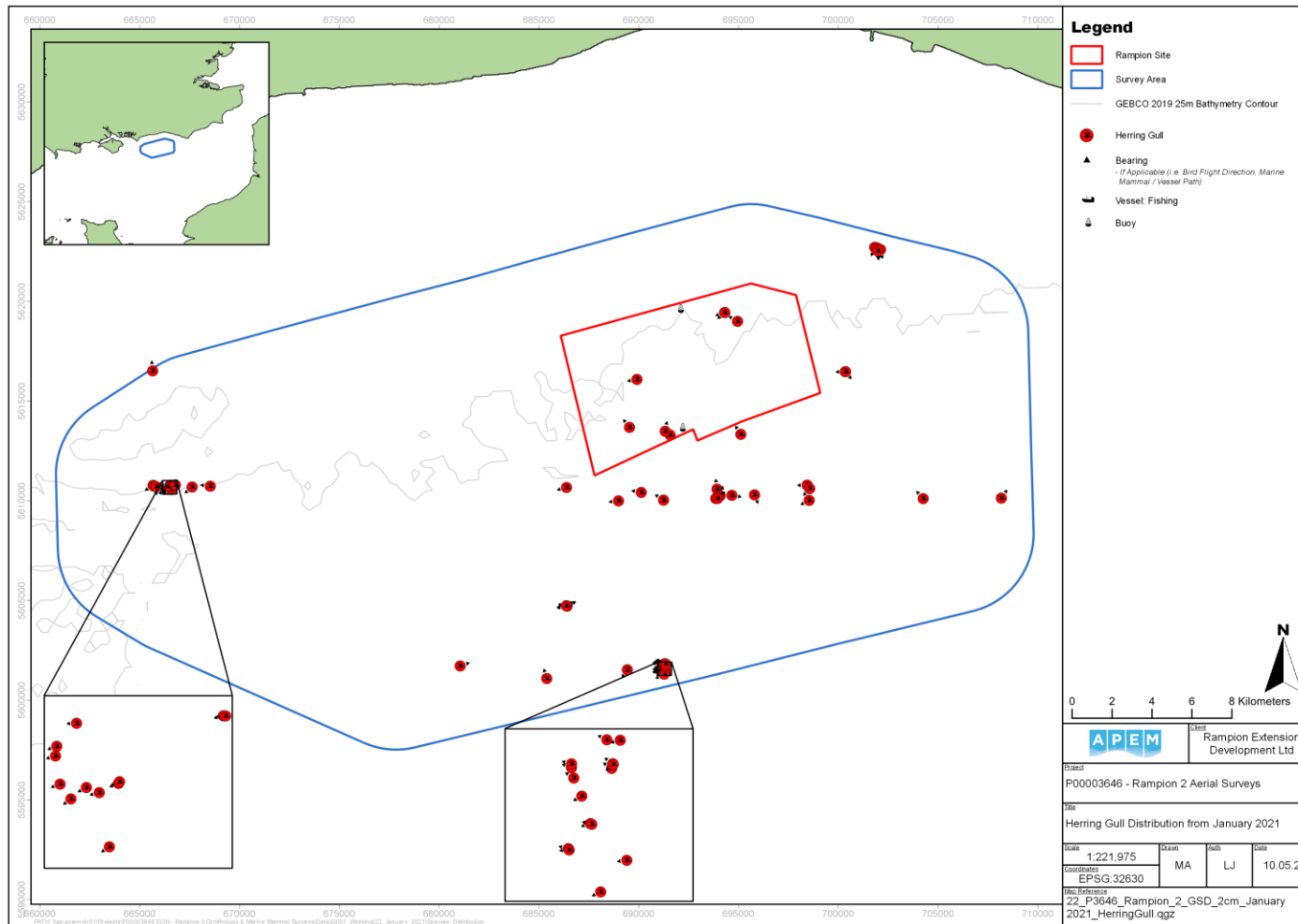


Figure 76 Distribution of herring gulls recorded in the Rampion 2 Survey Area in January 2021

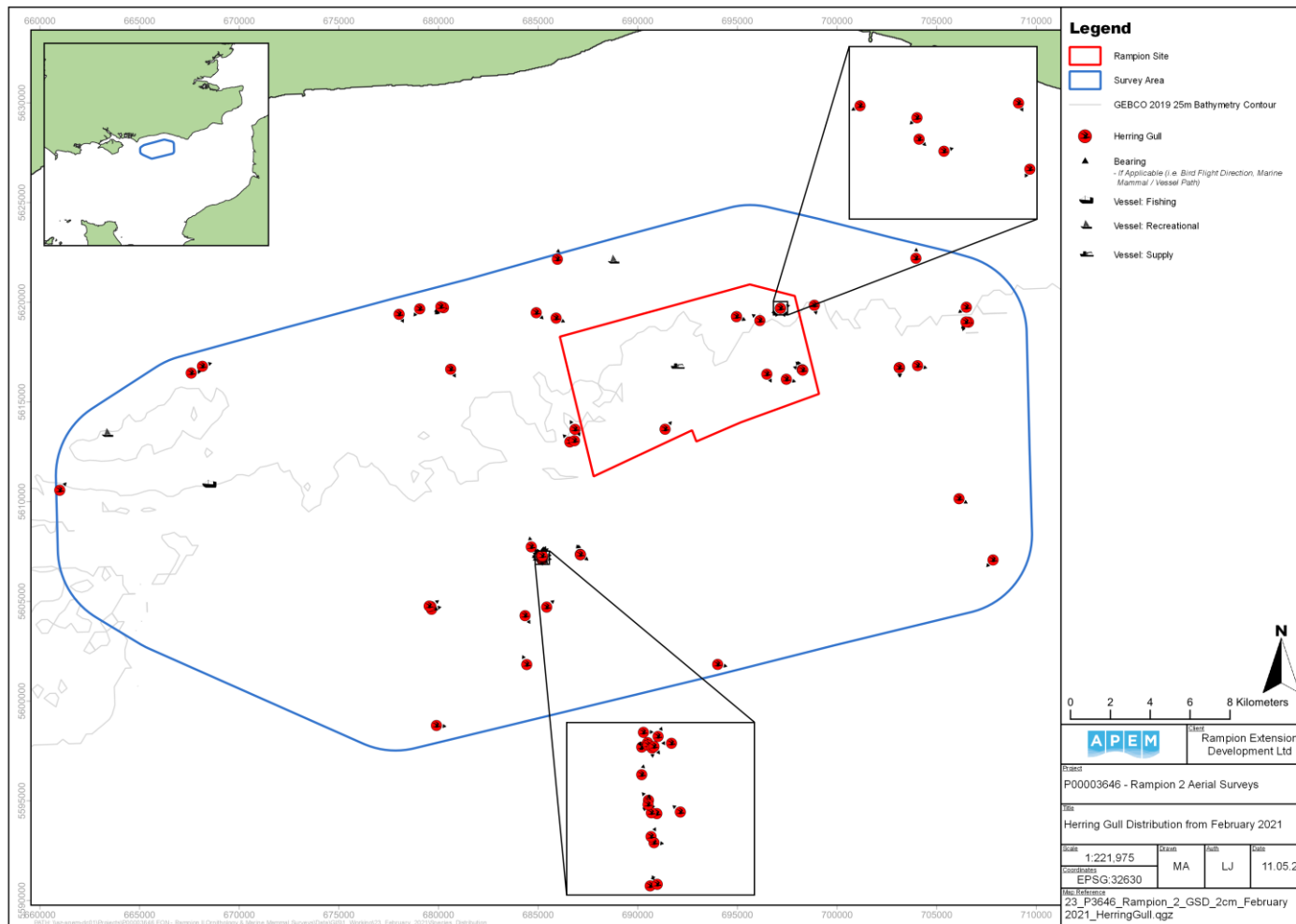


Figure 77 Distribution of herring gulls recorded in the Rampion 2 Survey Area in February 2021

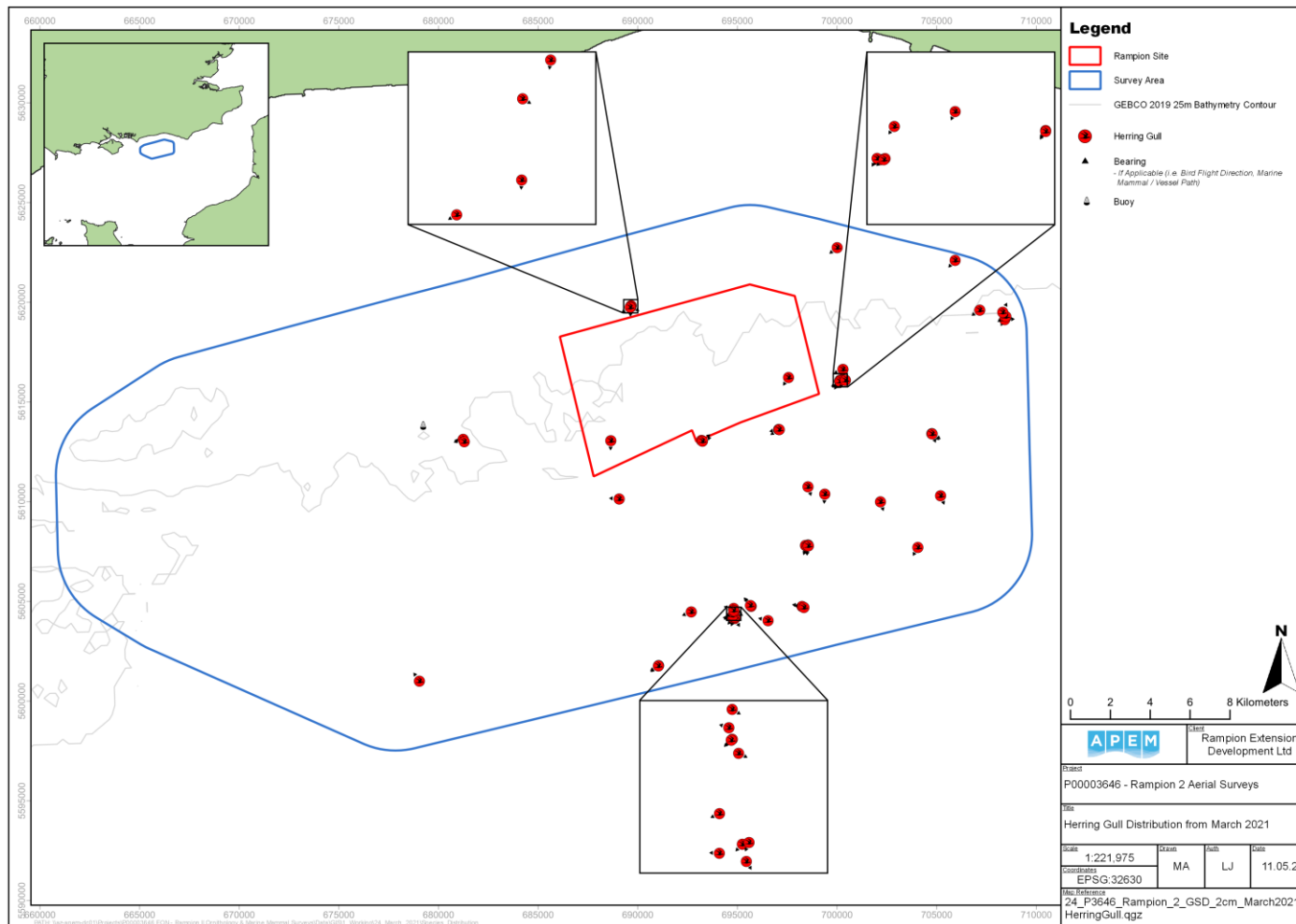


Figure 78 Distribution of herring gulls recorded in the Rampion 2 Survey Area in March 2021

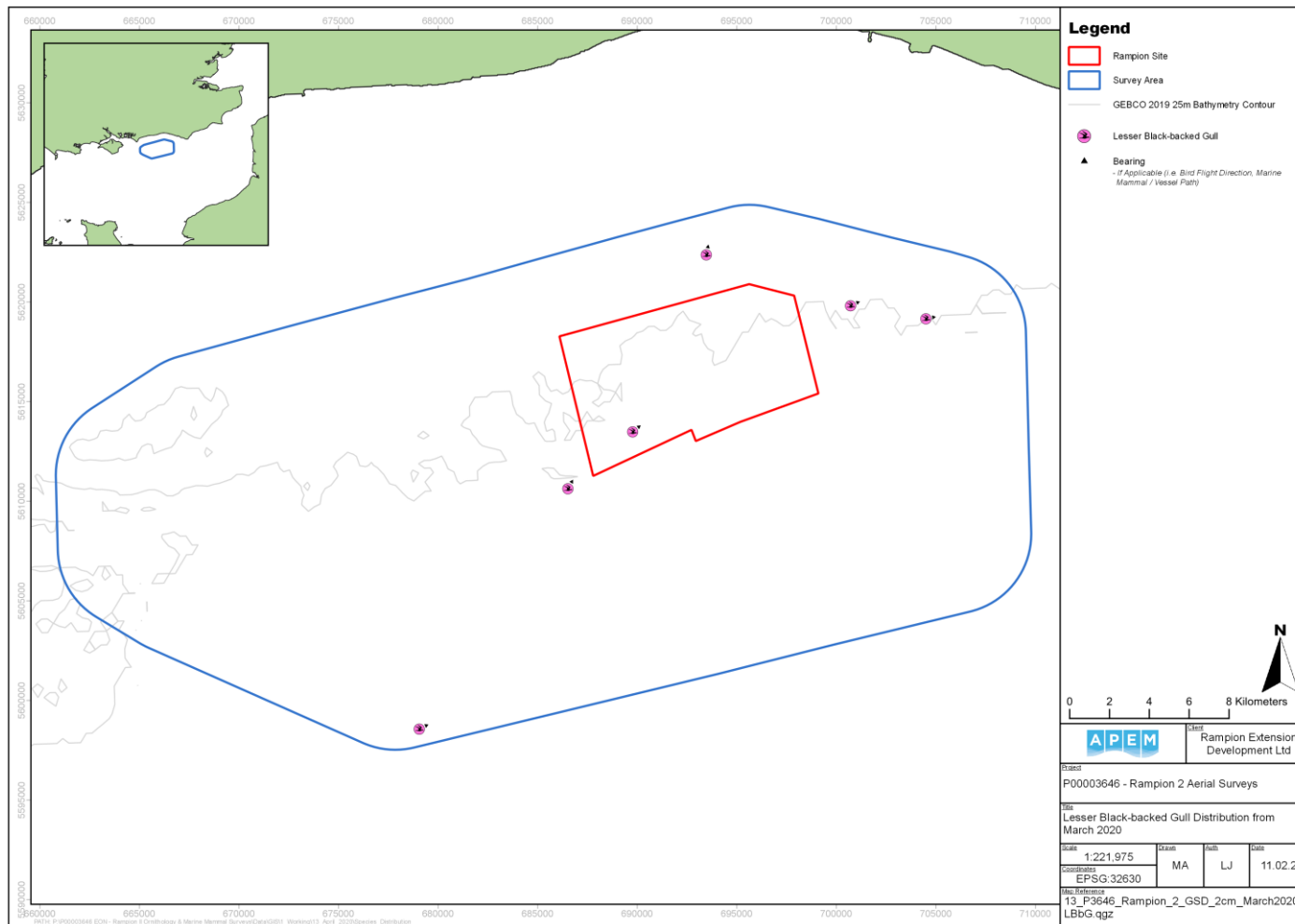


Figure 79 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area in April 2020

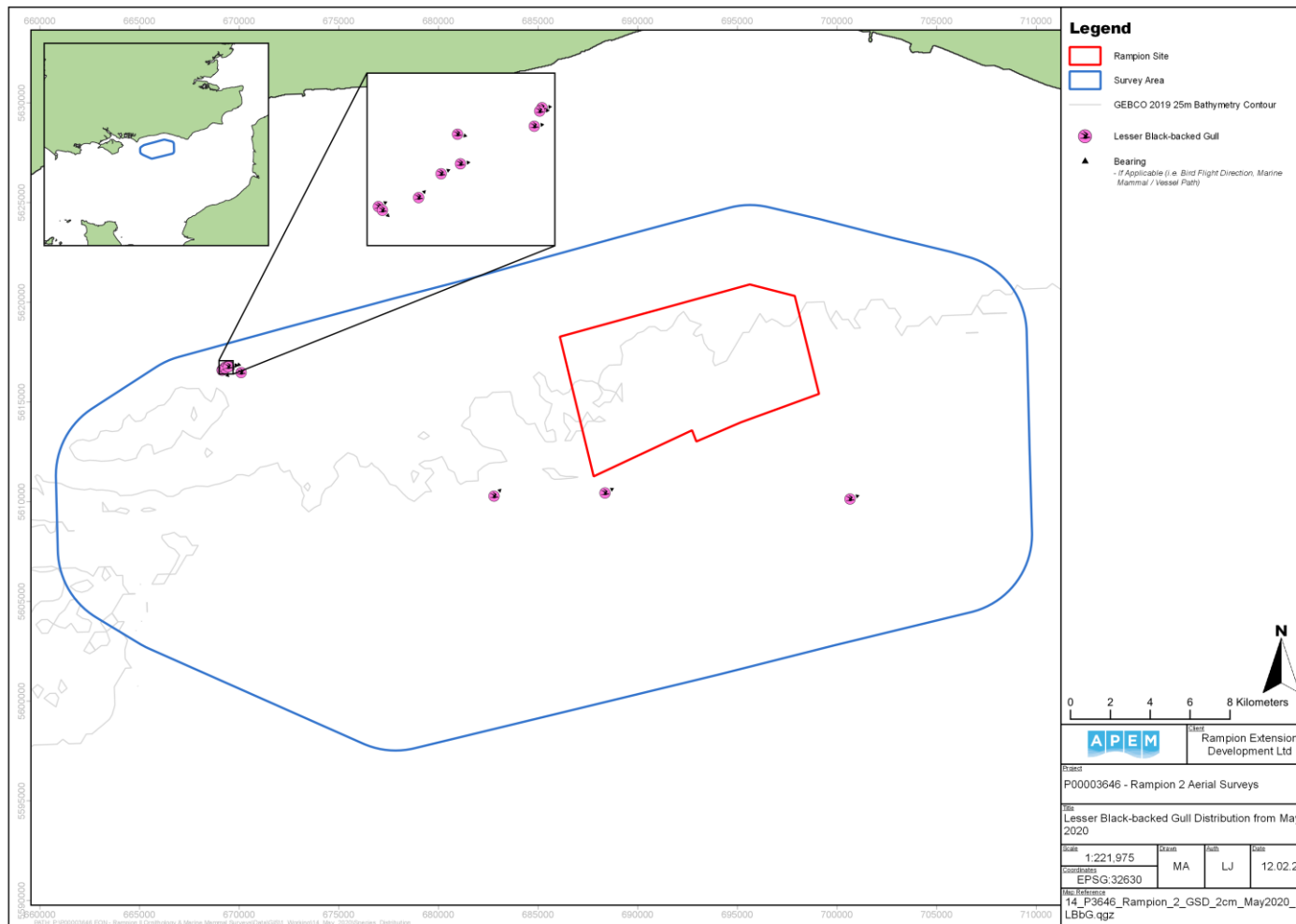


Figure 80 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area in May 2020

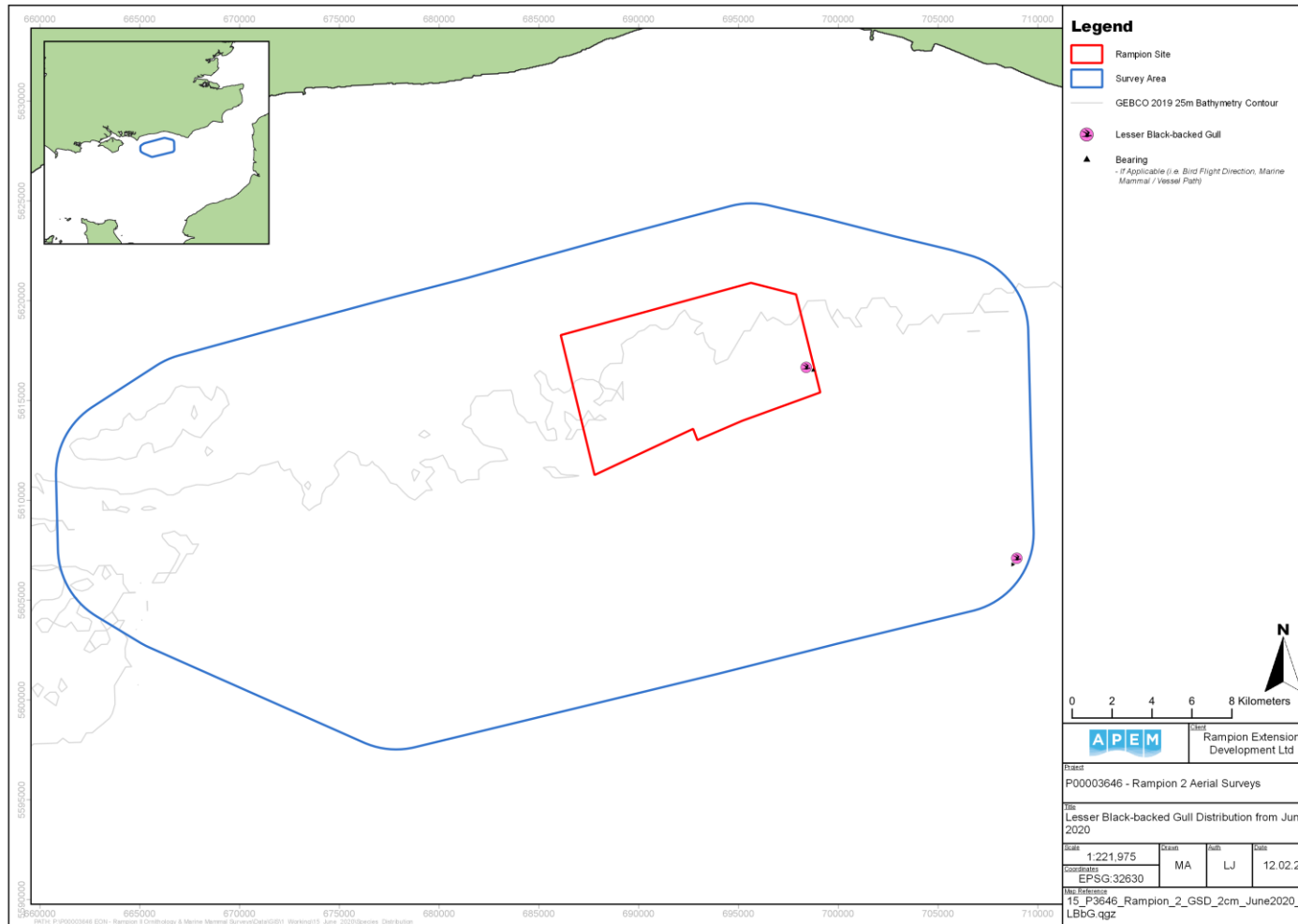


Figure 81 Distribution of lesser black-backed gull recorded in the Rampion 2 Survey Area in June 2020

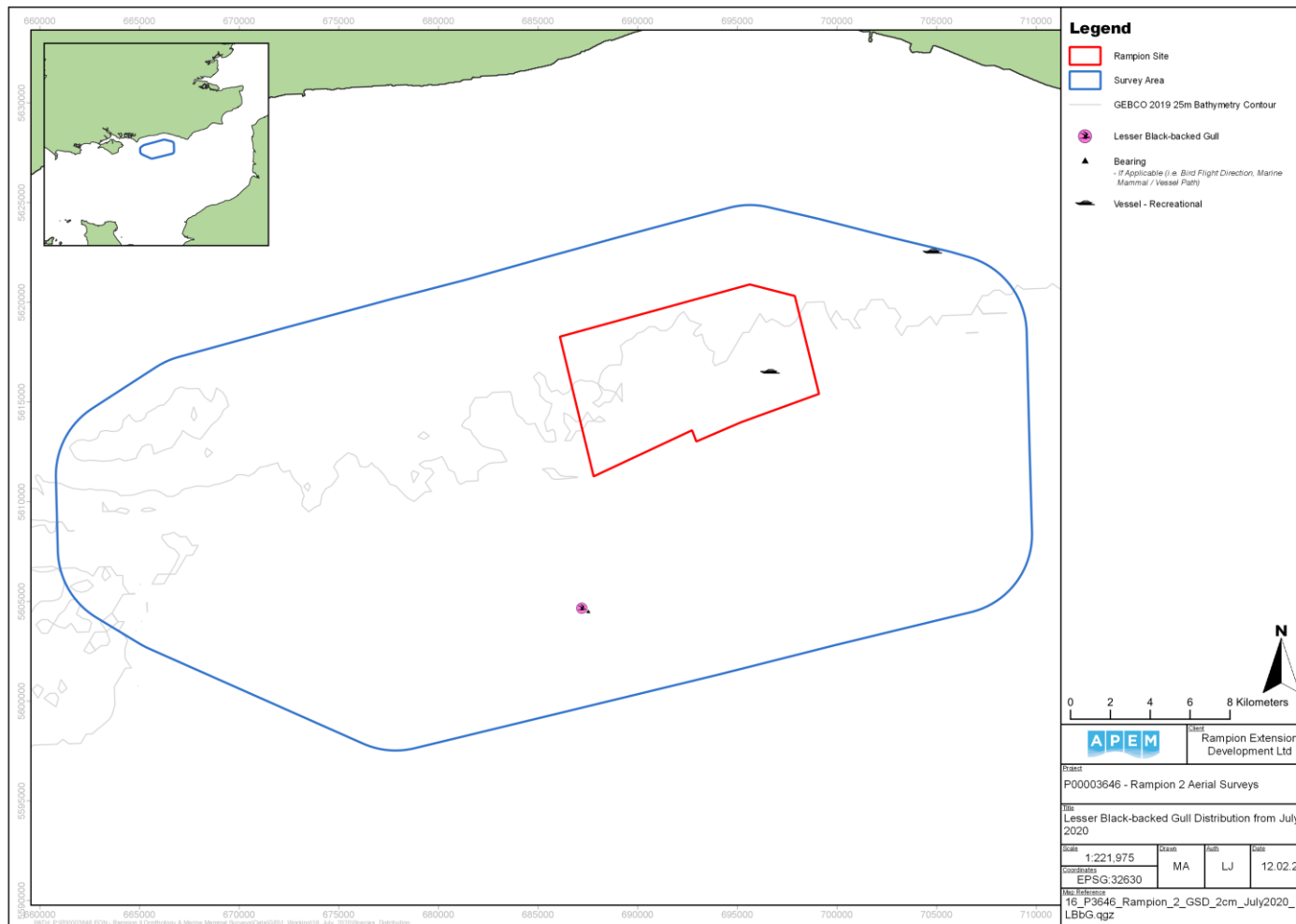


Figure 82 Location of a lesser black-backed gull recorded in the Rampion 2 Survey Area in July 2020

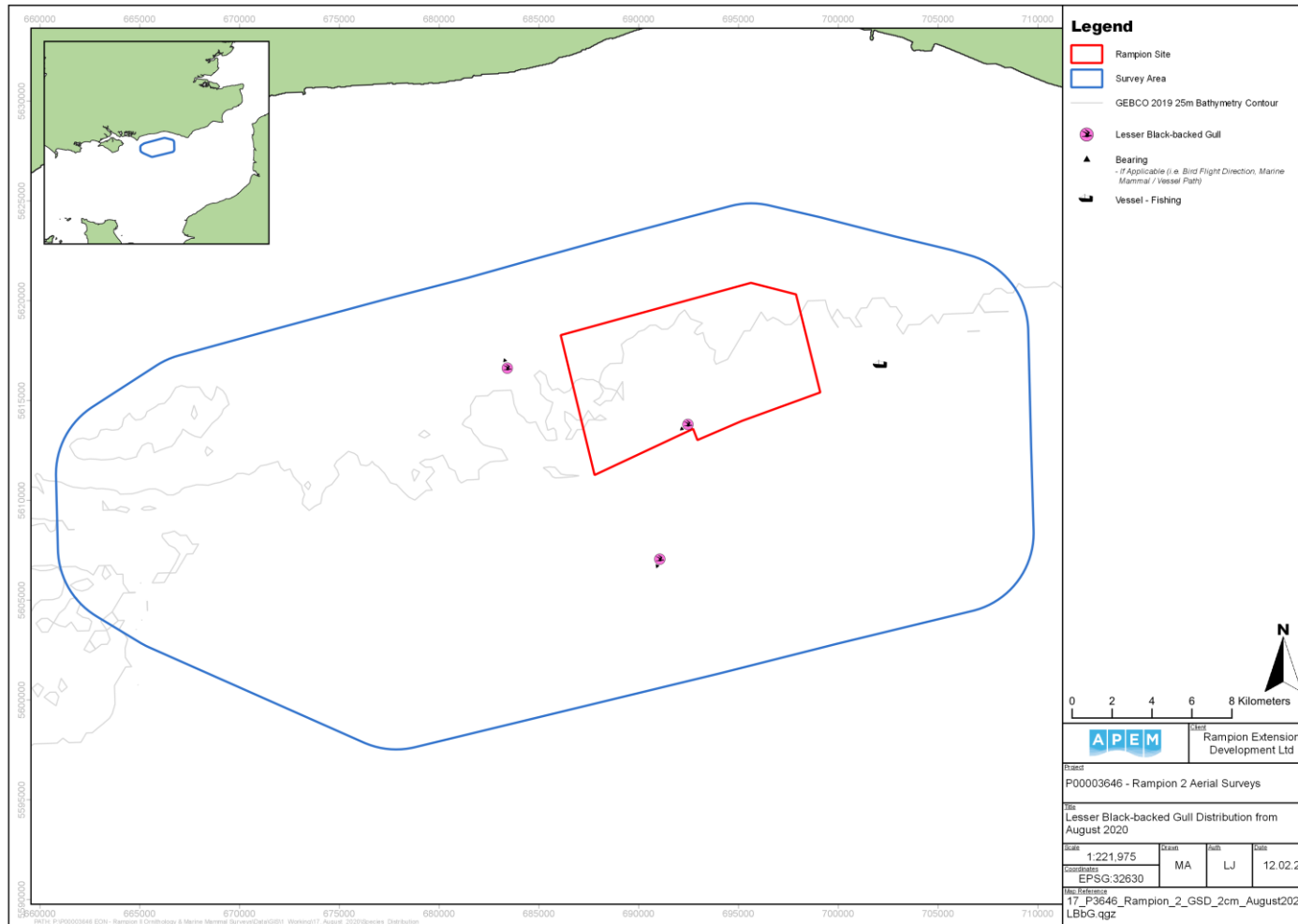


Figure 83 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area in August 2020

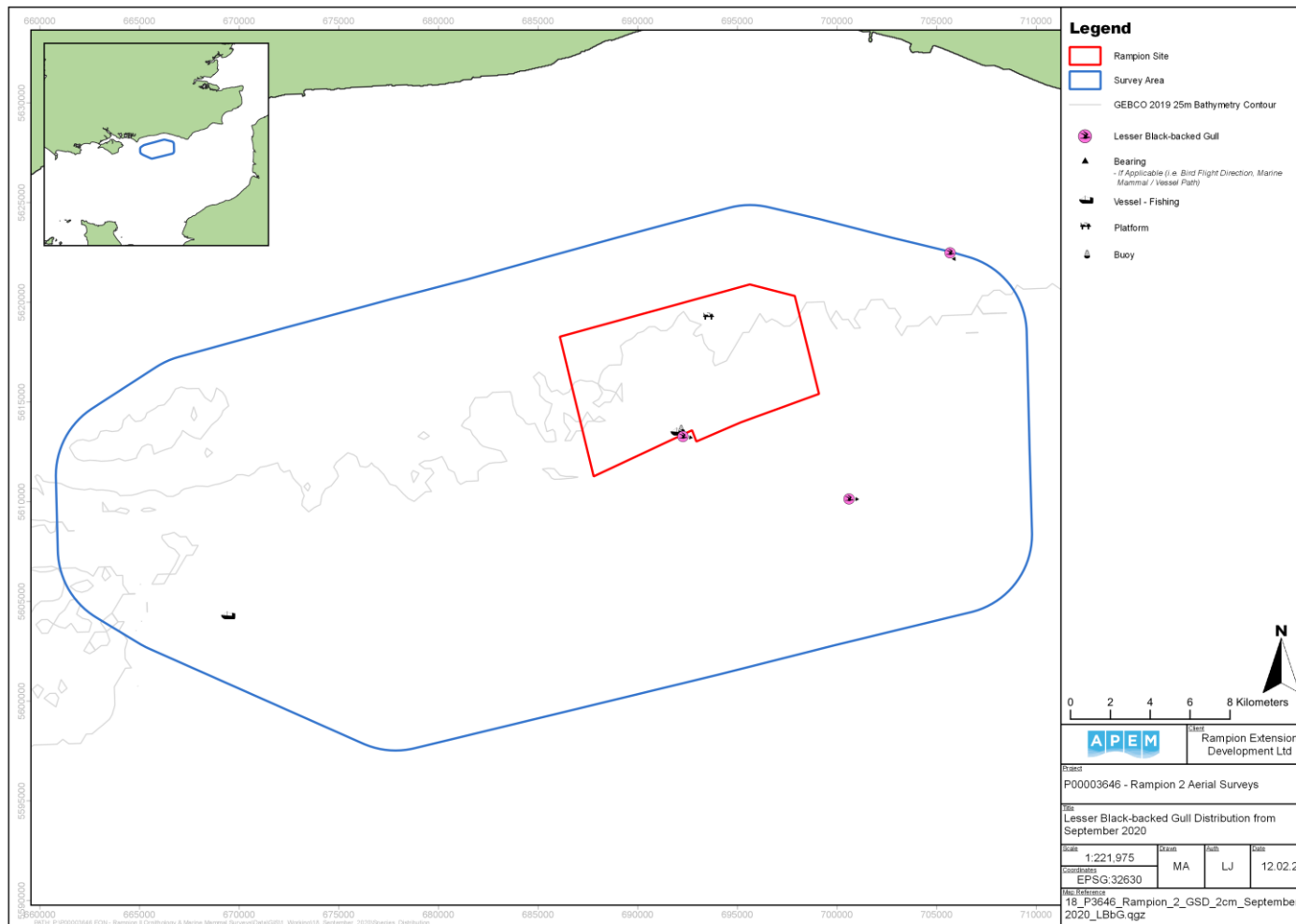


Figure 84 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area in September 2020

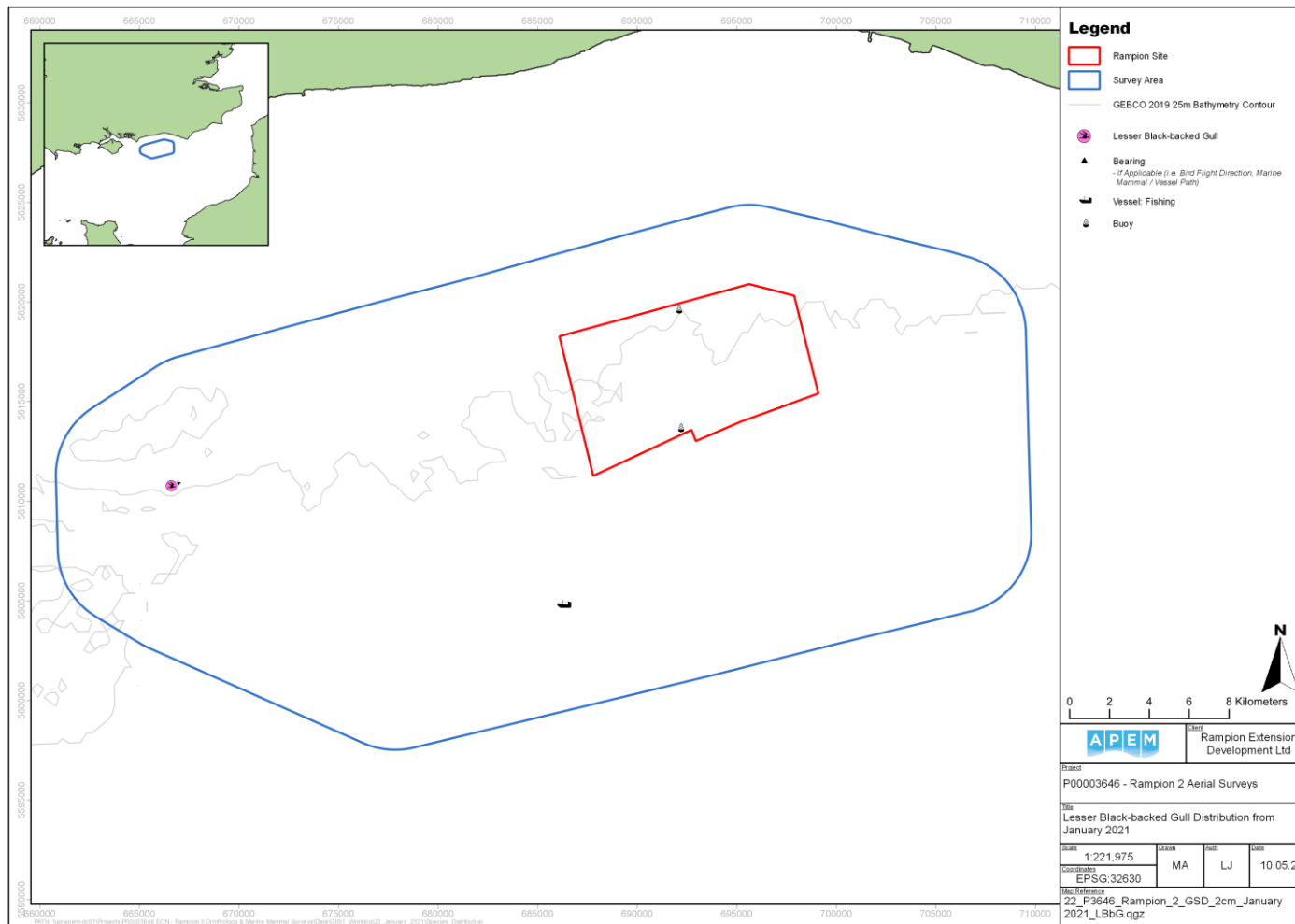


Figure 85 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area in January 2021

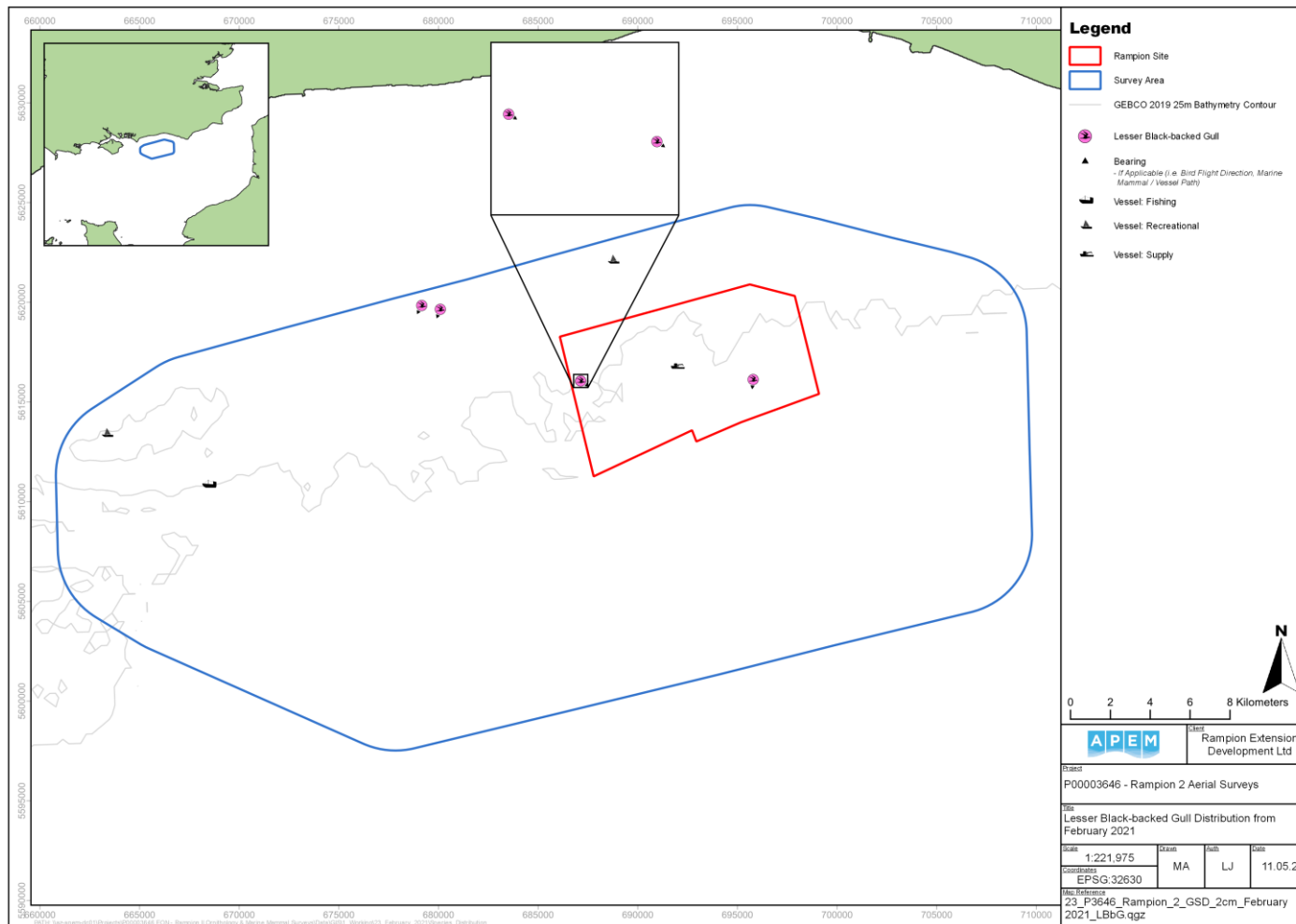


Figure 86 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area in February 2021

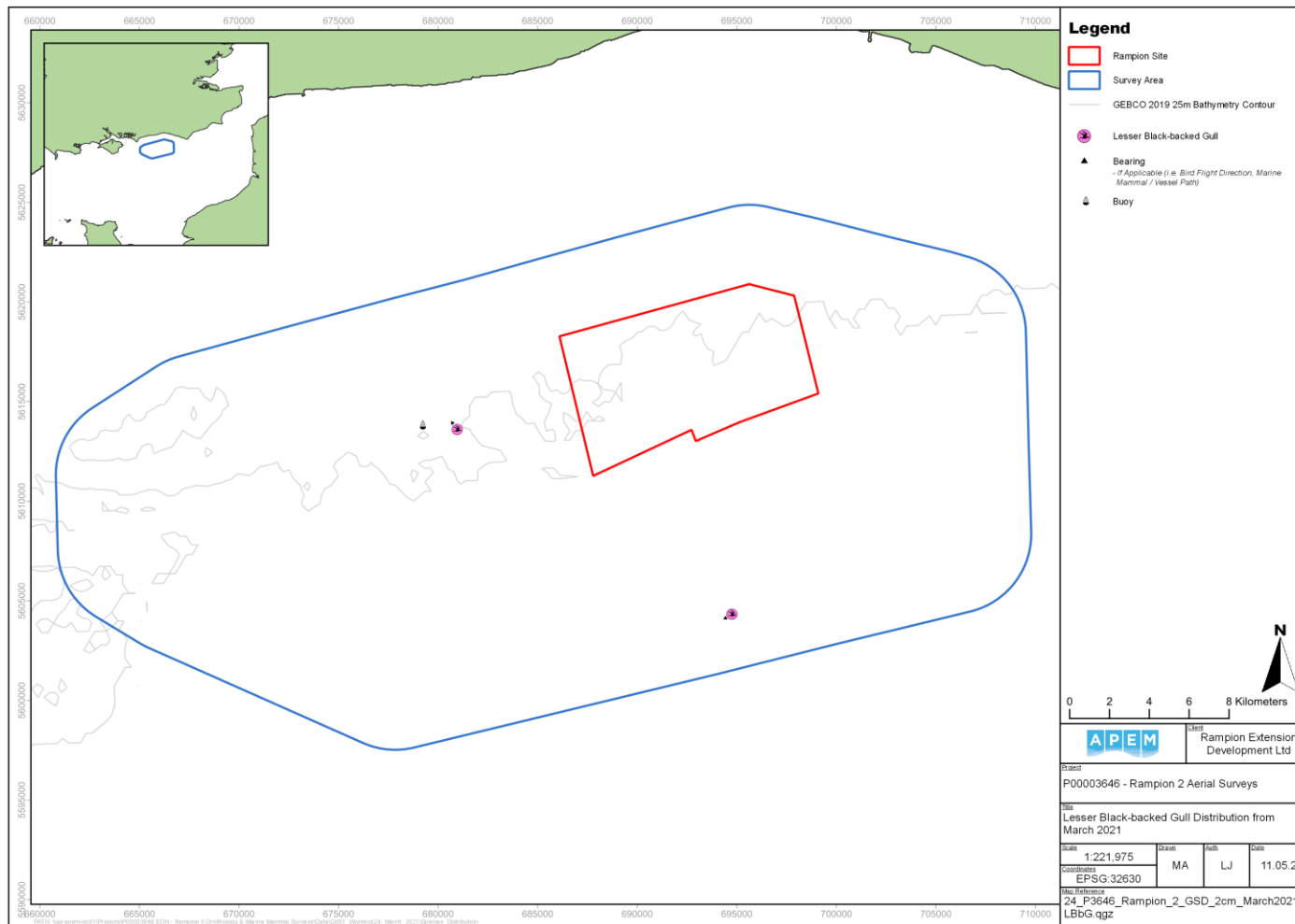


Figure 87 Distribution of lesser black-backed gulls recorded in the Rampion 2 Survey Area in March 2021

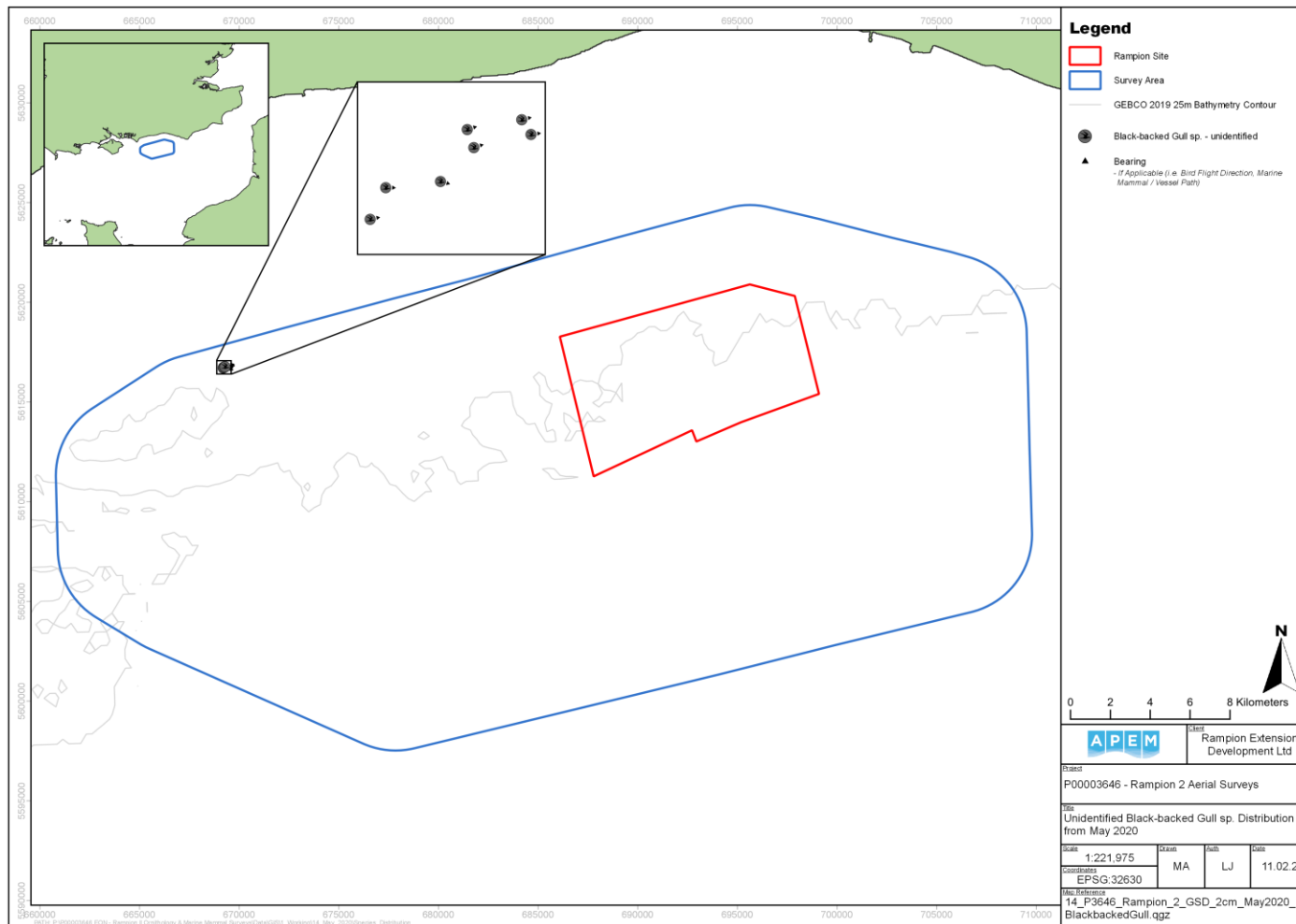


Figure 88 Distribution of unidentified black-backed gulls recorded in the Rampion 2 Survey Area in May 2020

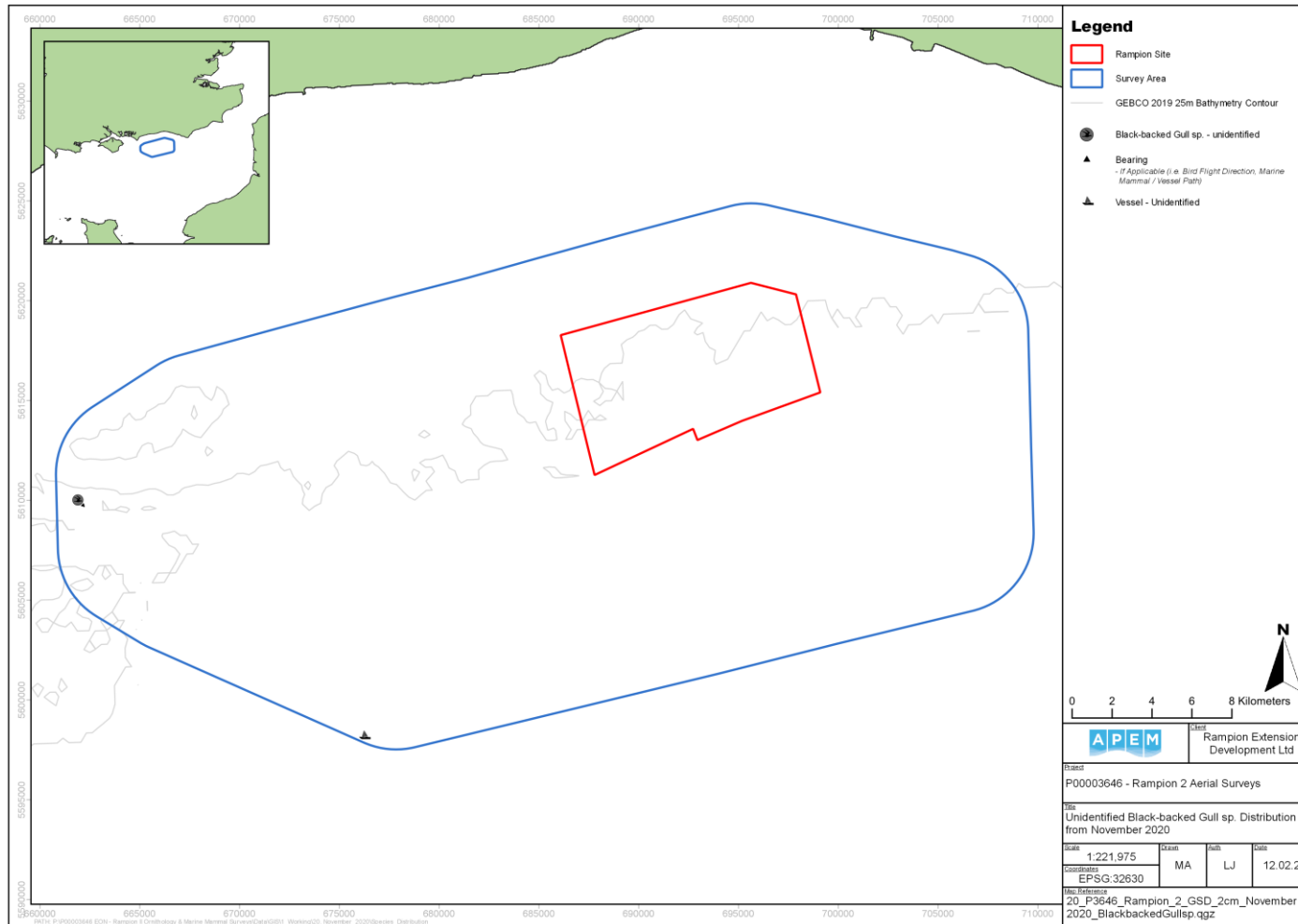


Figure 89 Distribution of unidentified black-backed gulls recorded in the Rampion 2 Survey Area in November 2020

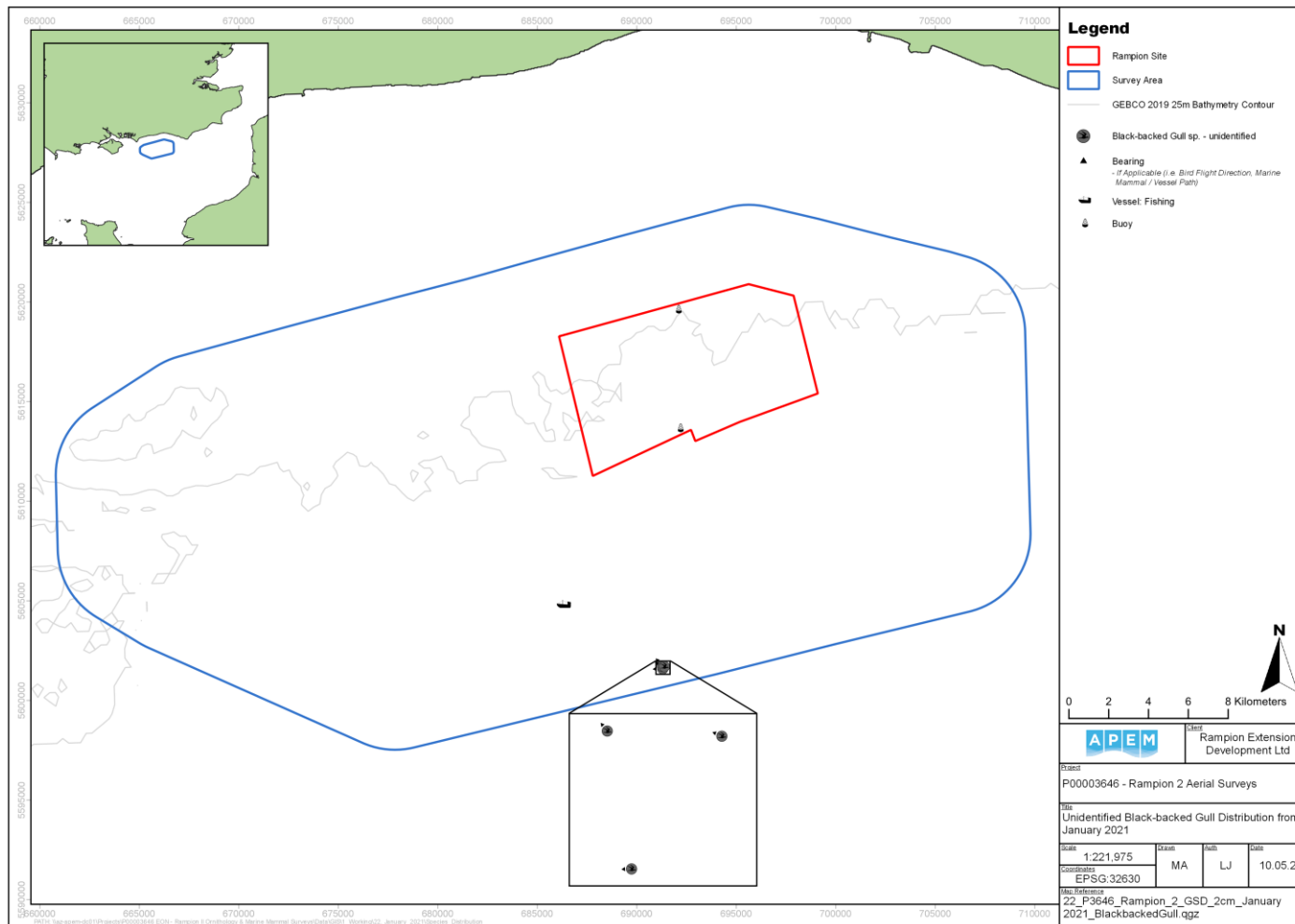


Figure 90 Distribution of unidentified black-backed gulls recorded in the Rampion 2 Survey Area in January 2021

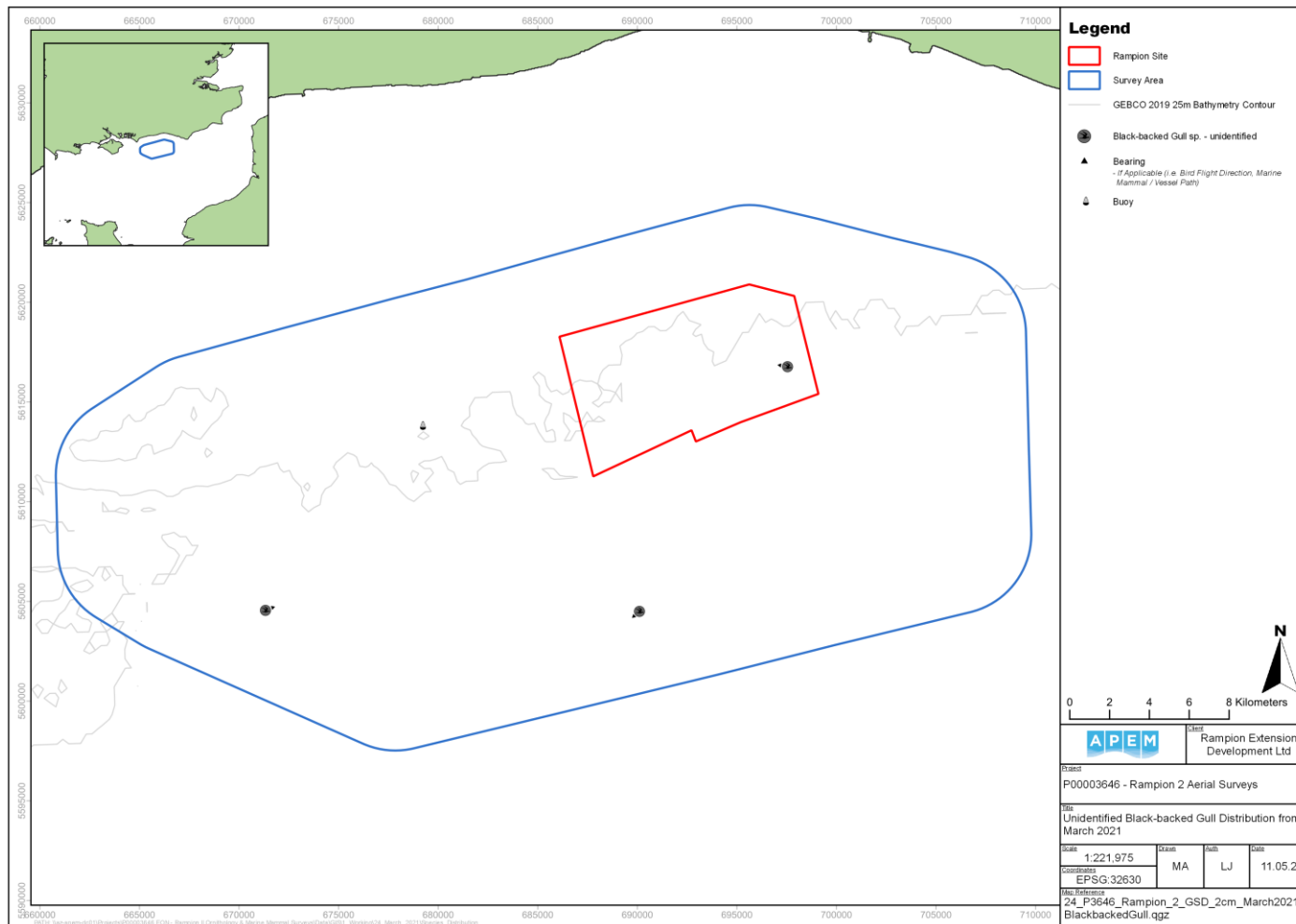


Figure 91 Distribution of unidentified black-backed gulls recorded in the Rampion 2 Survey Area in March 2021

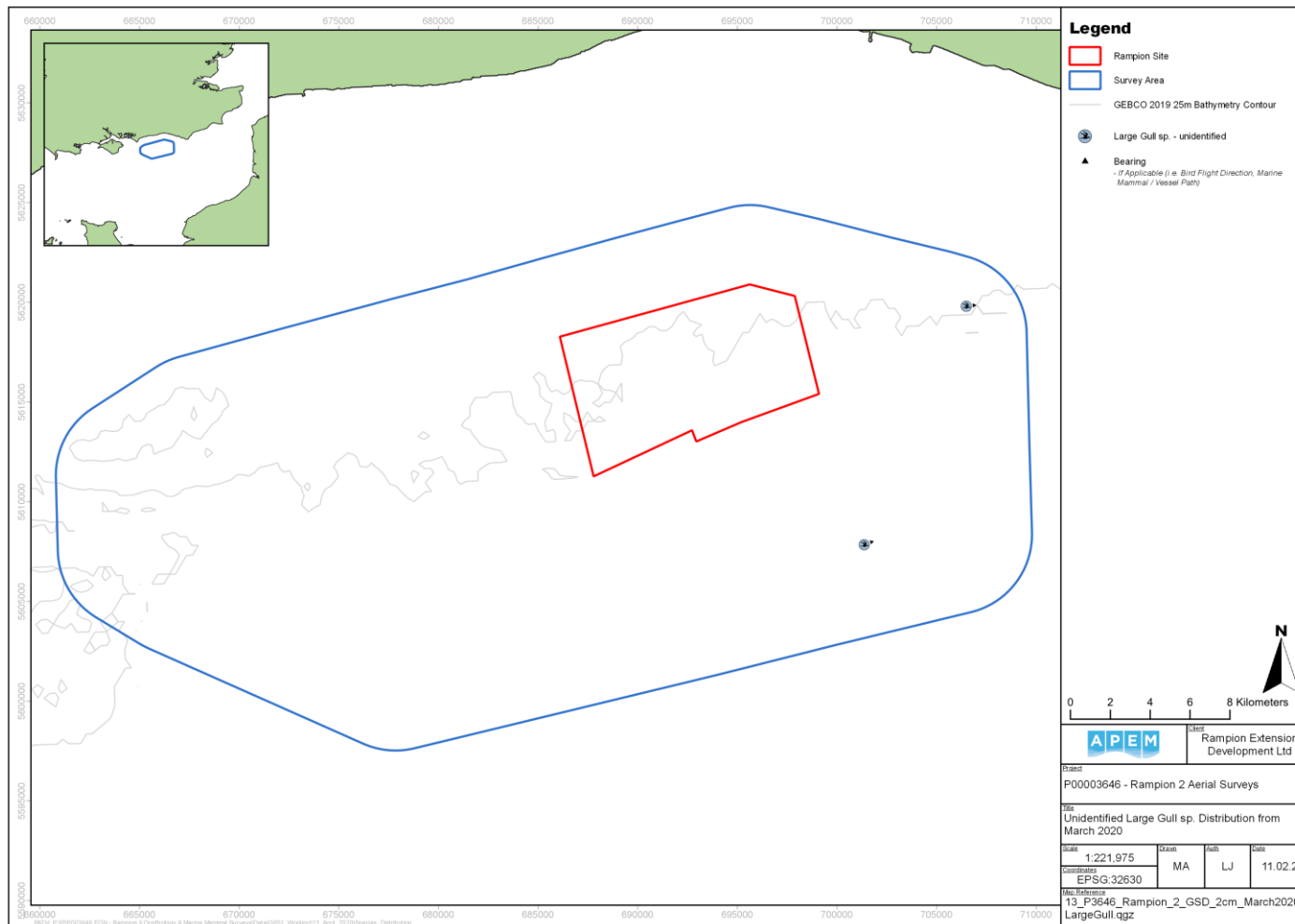


Figure 92 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area in April 2020

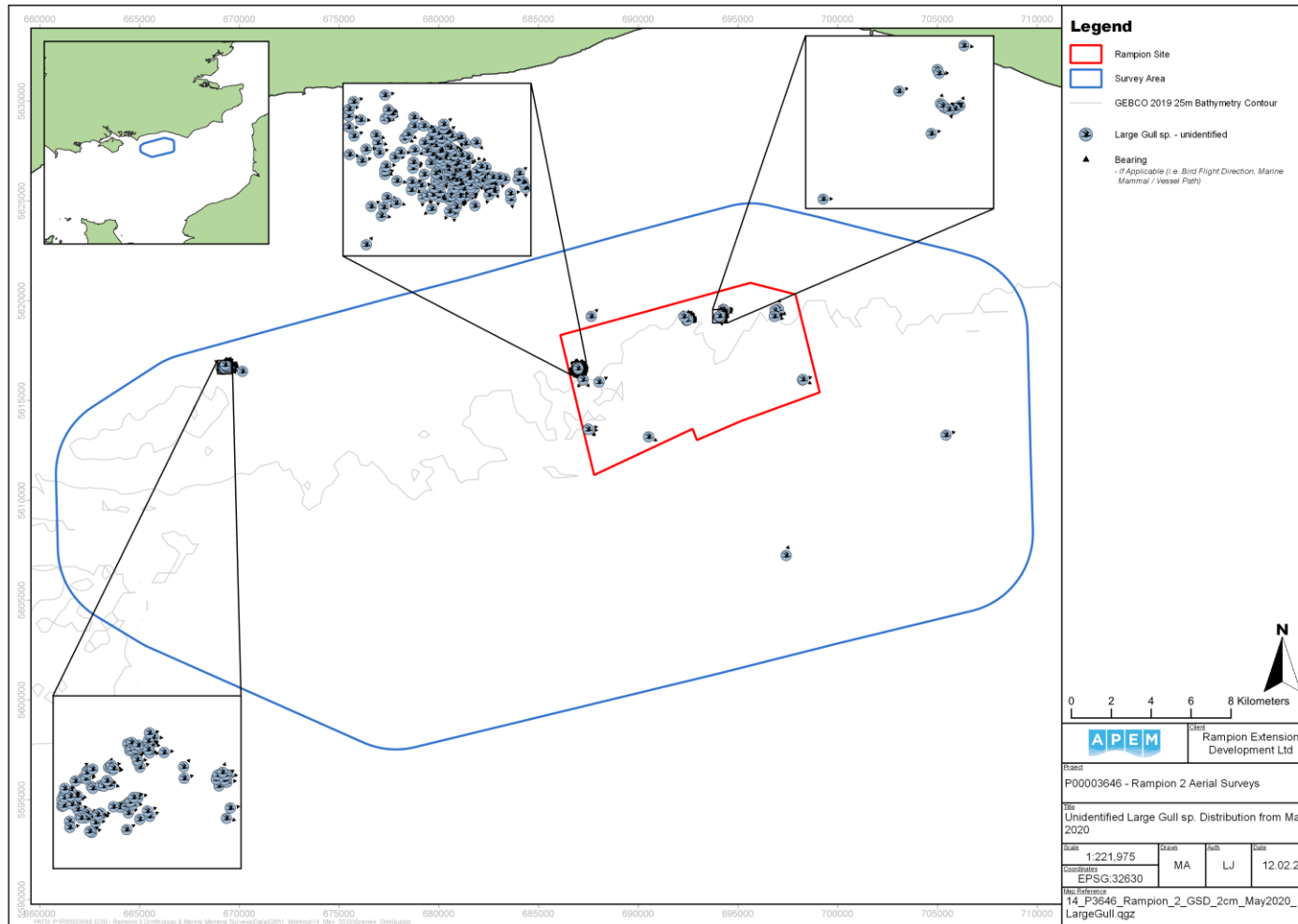


Figure 93 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area in May 2020

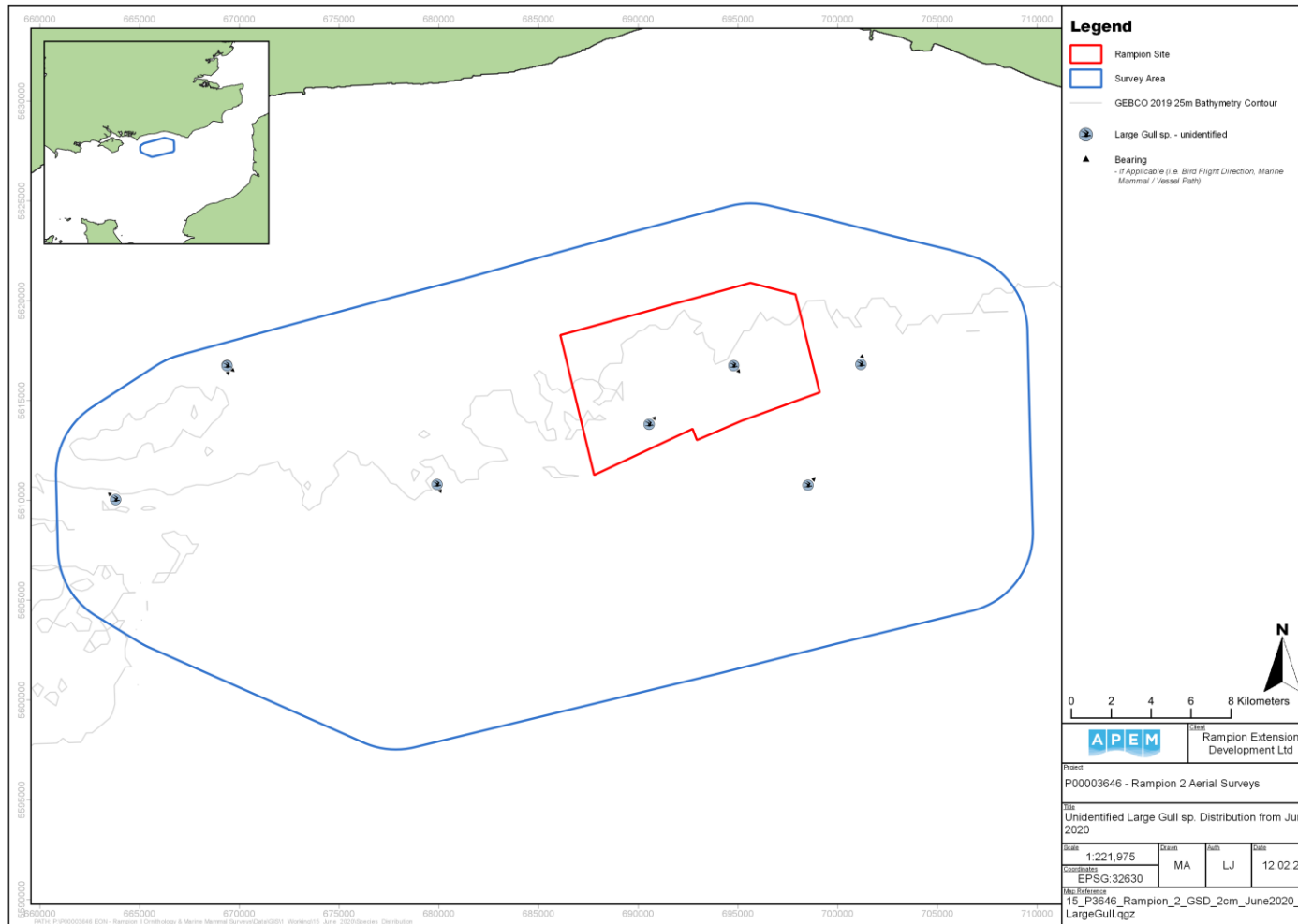


Figure 94 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area in June 2020

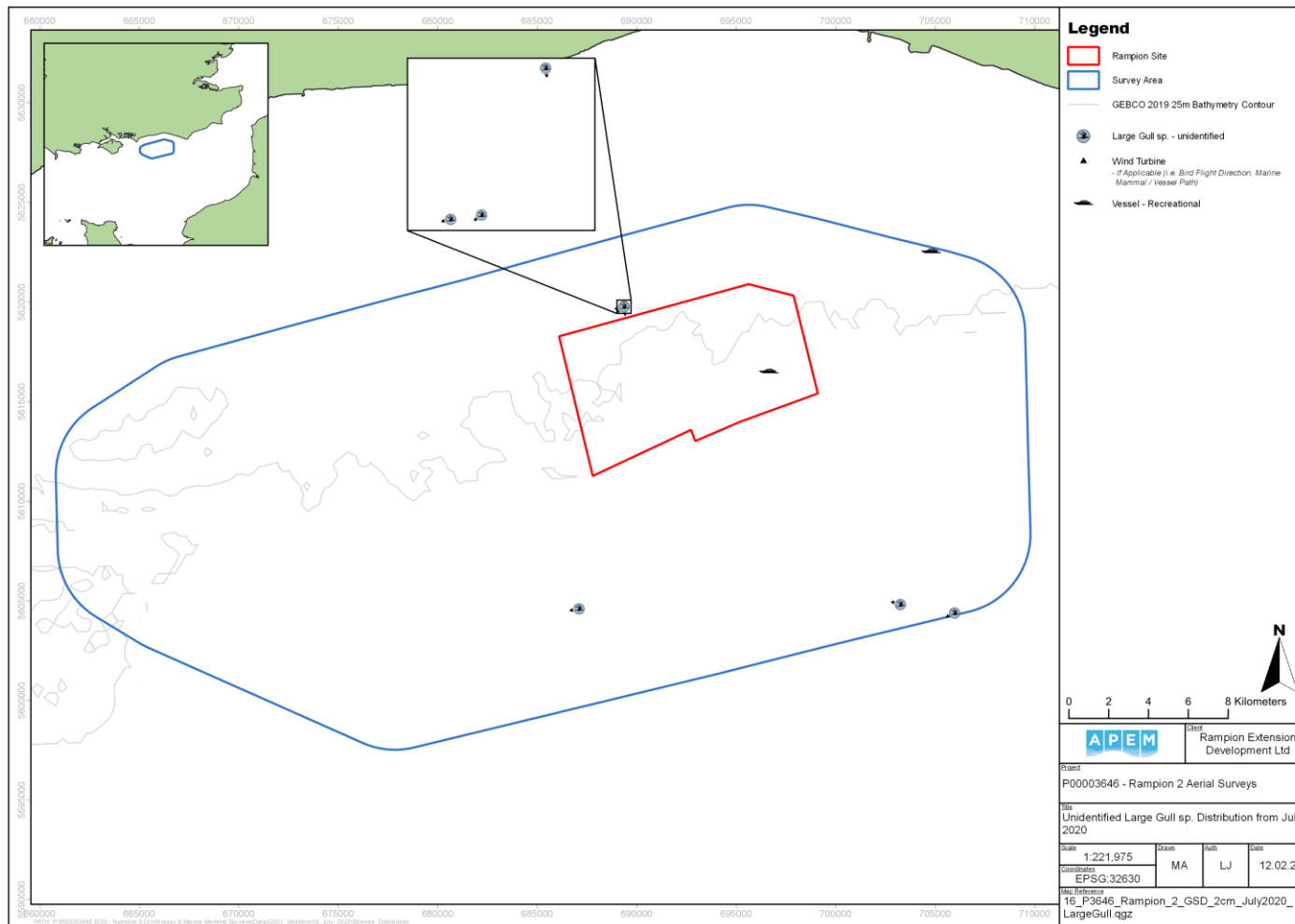


Figure 95 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area in July 2020

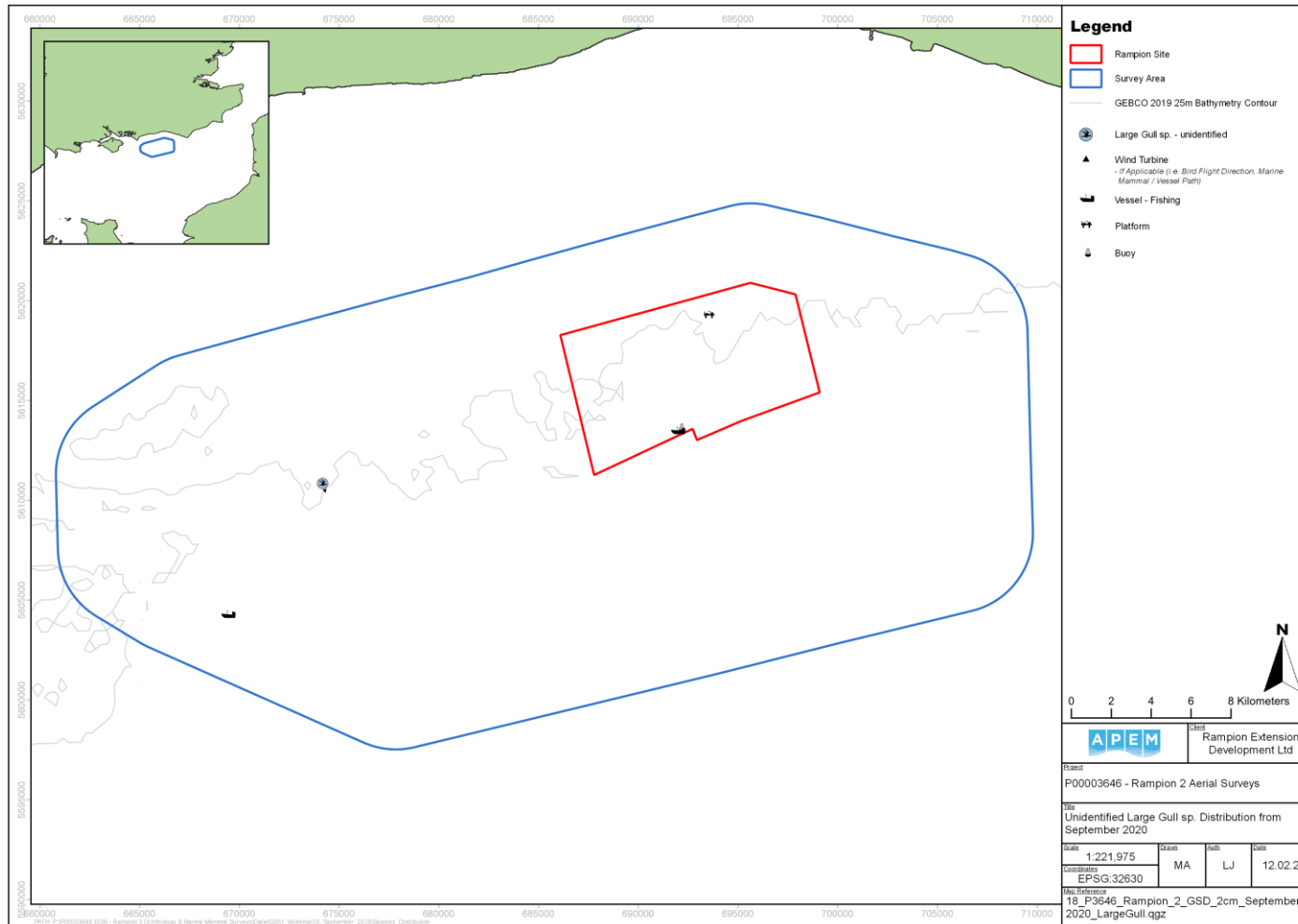


Figure 96 Location of an unidentified large gull recorded in the Rampion 2 Survey Area in September 2020

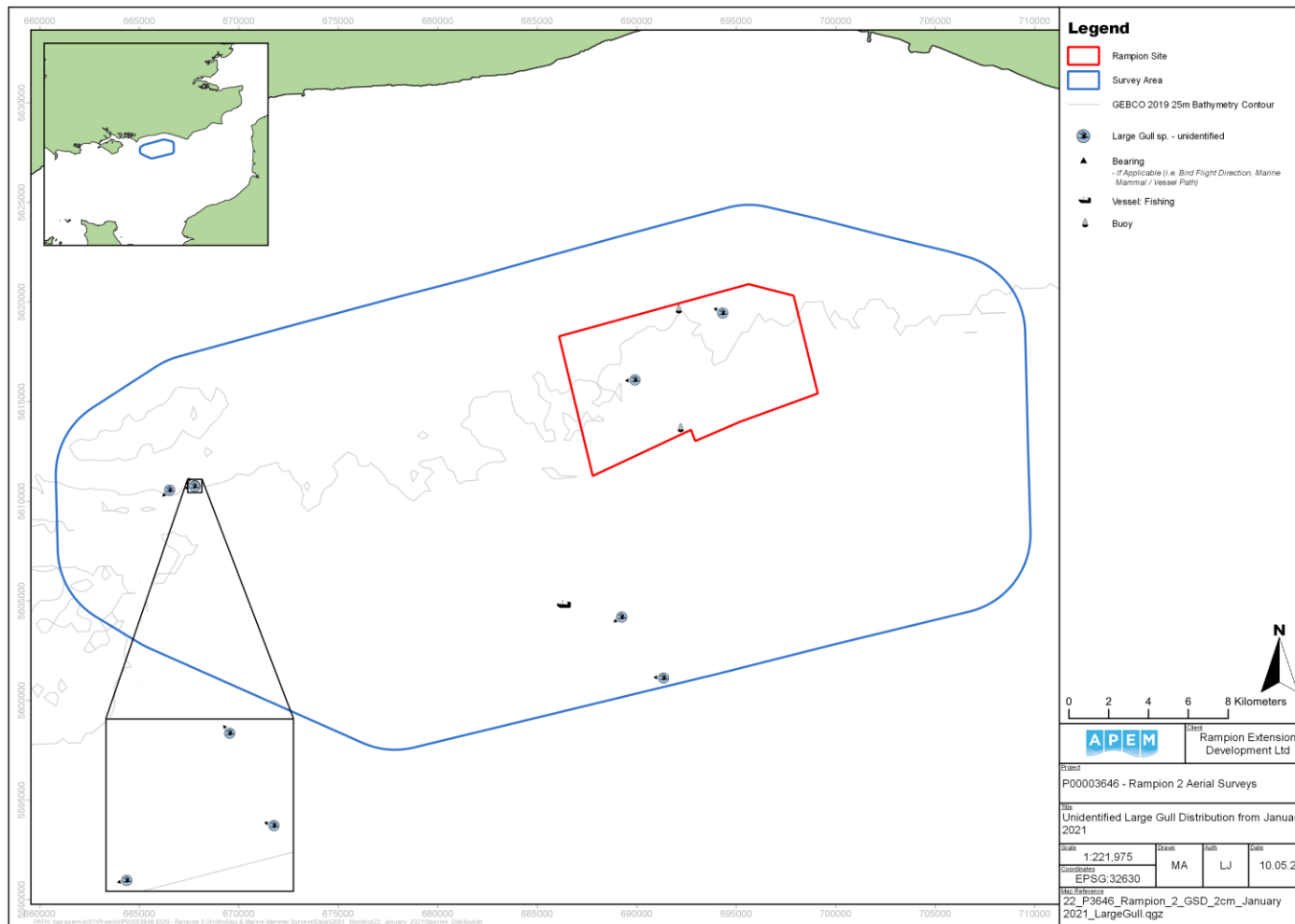


Figure 97 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area in January 2021

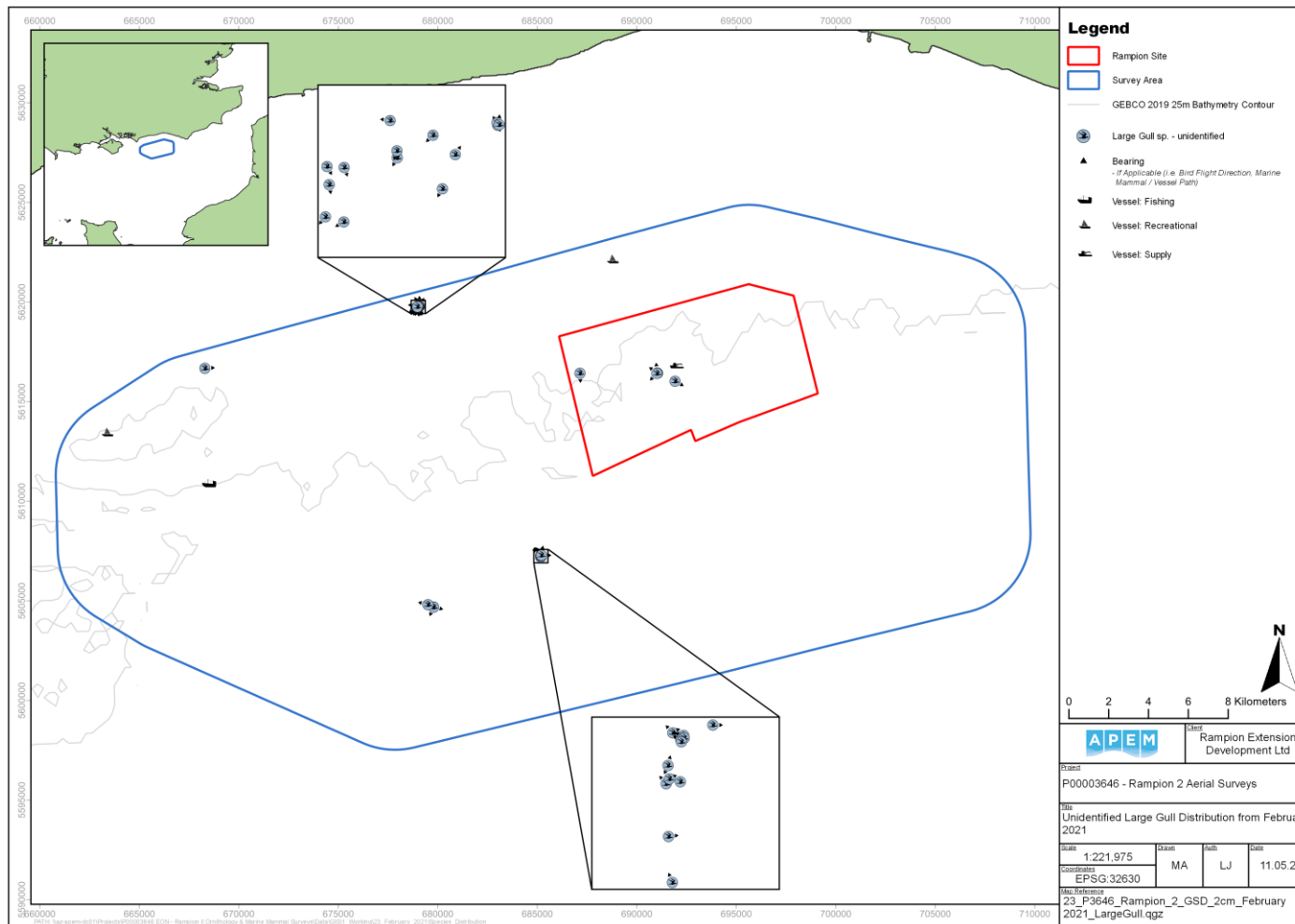


Figure 98 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area in February 2021

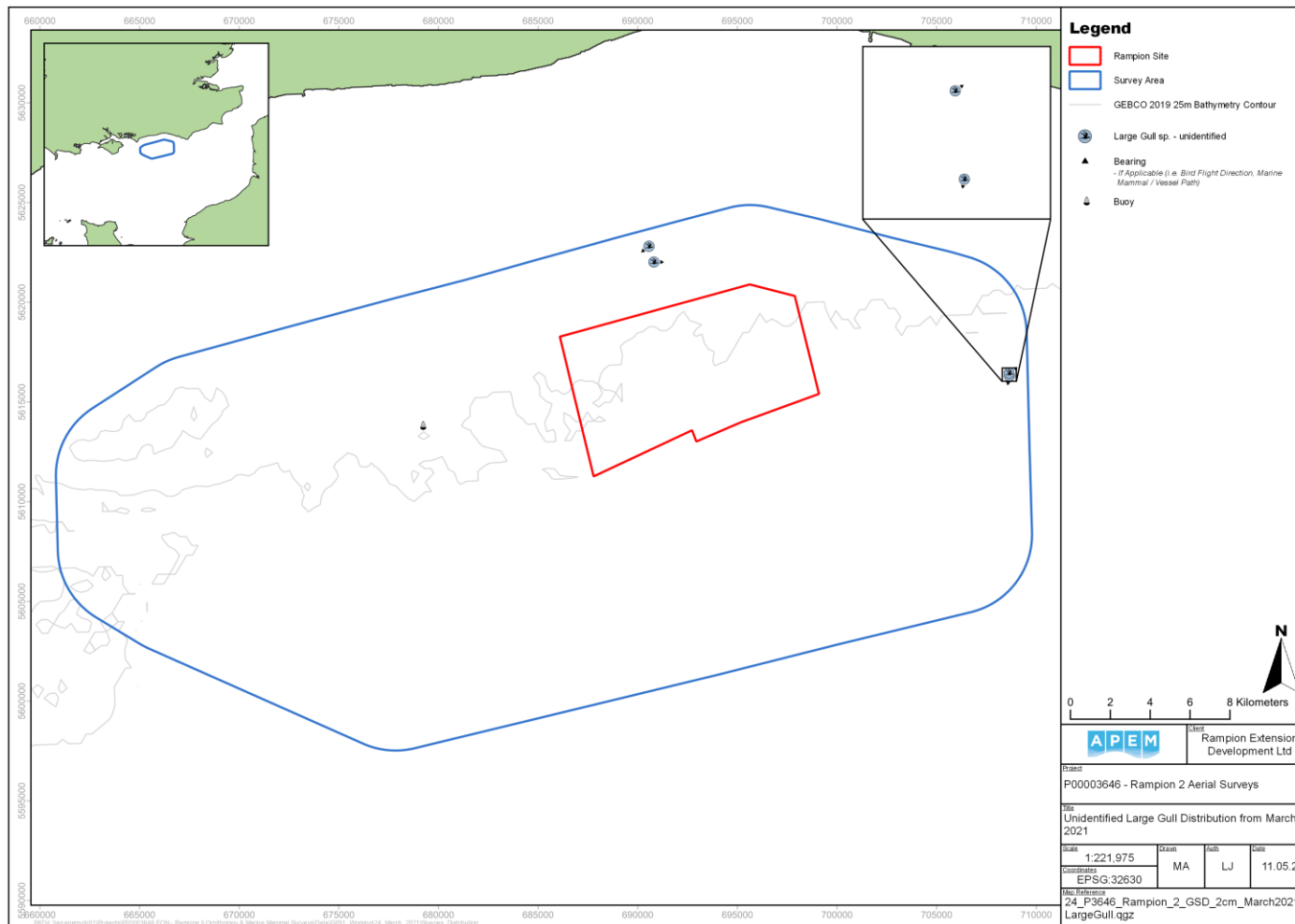


Figure 99 Distribution of unidentified large gulls recorded in the Rampion 2 Survey Area in March 2021

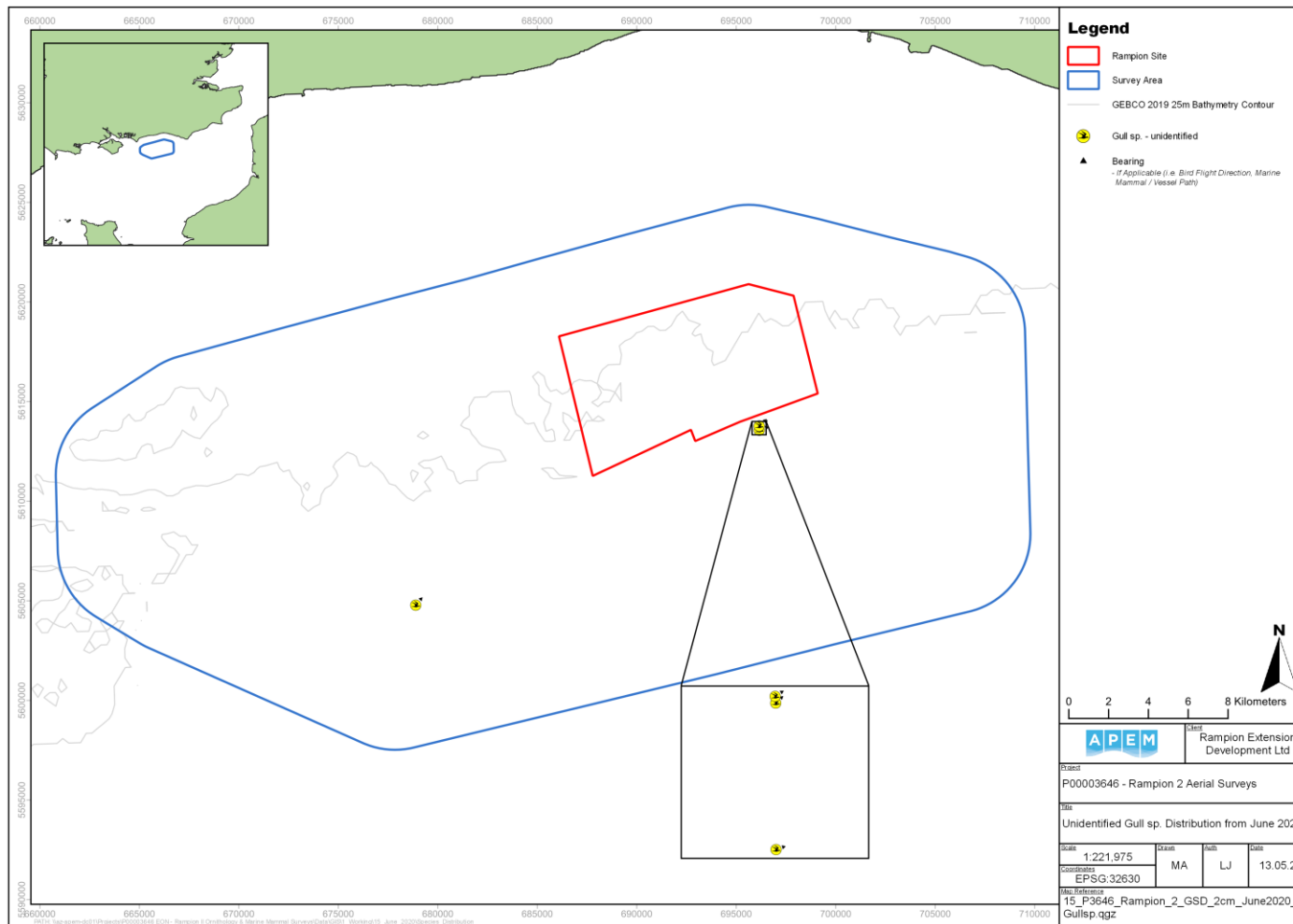


Figure 100 Distribution of unclassified gulls recorded in the Rampion 2 Survey Area in June 2020

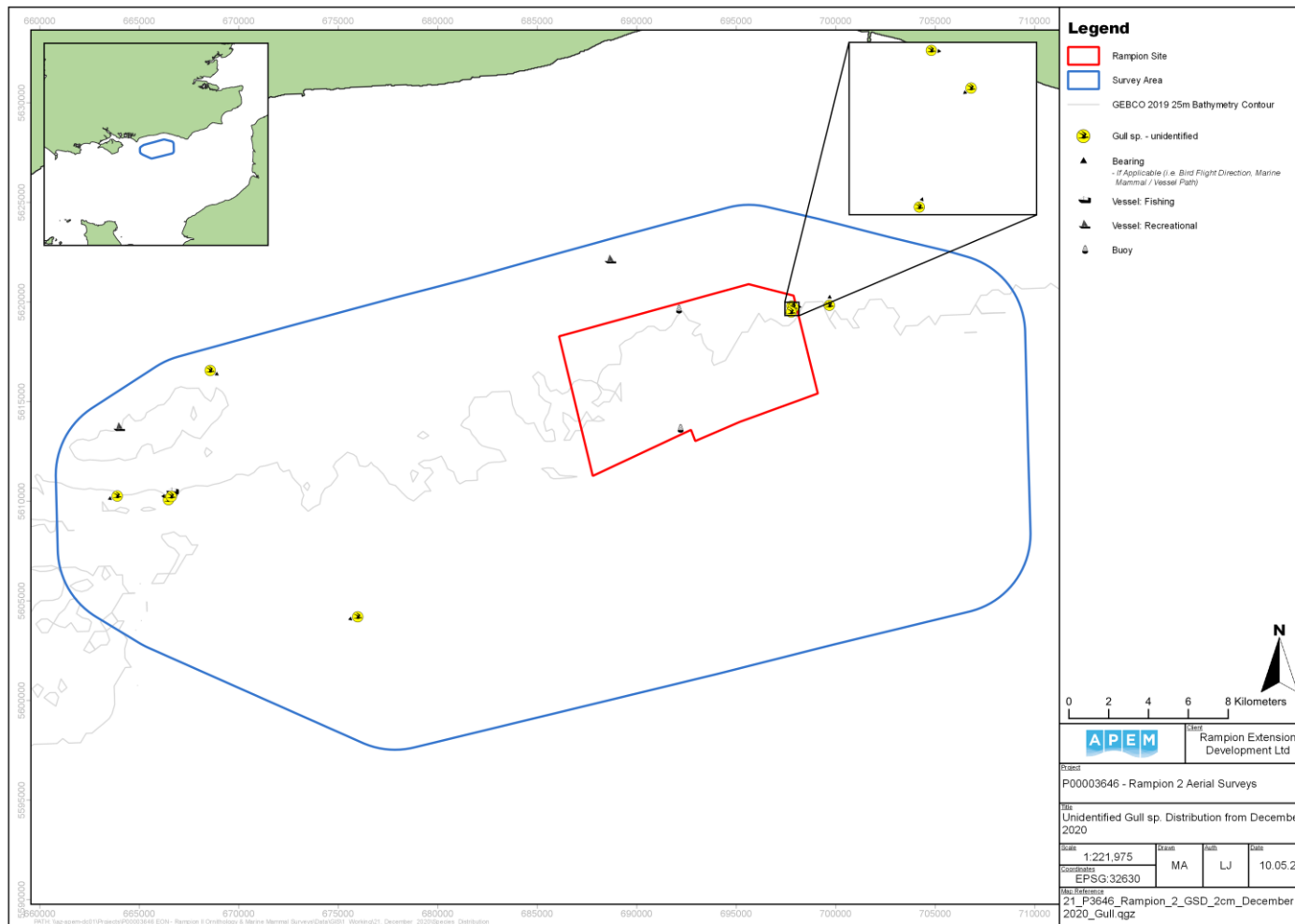


Figure 101 Distribution of unclassified gulls recorded in the Rampion 2 Survey Area in December 2020

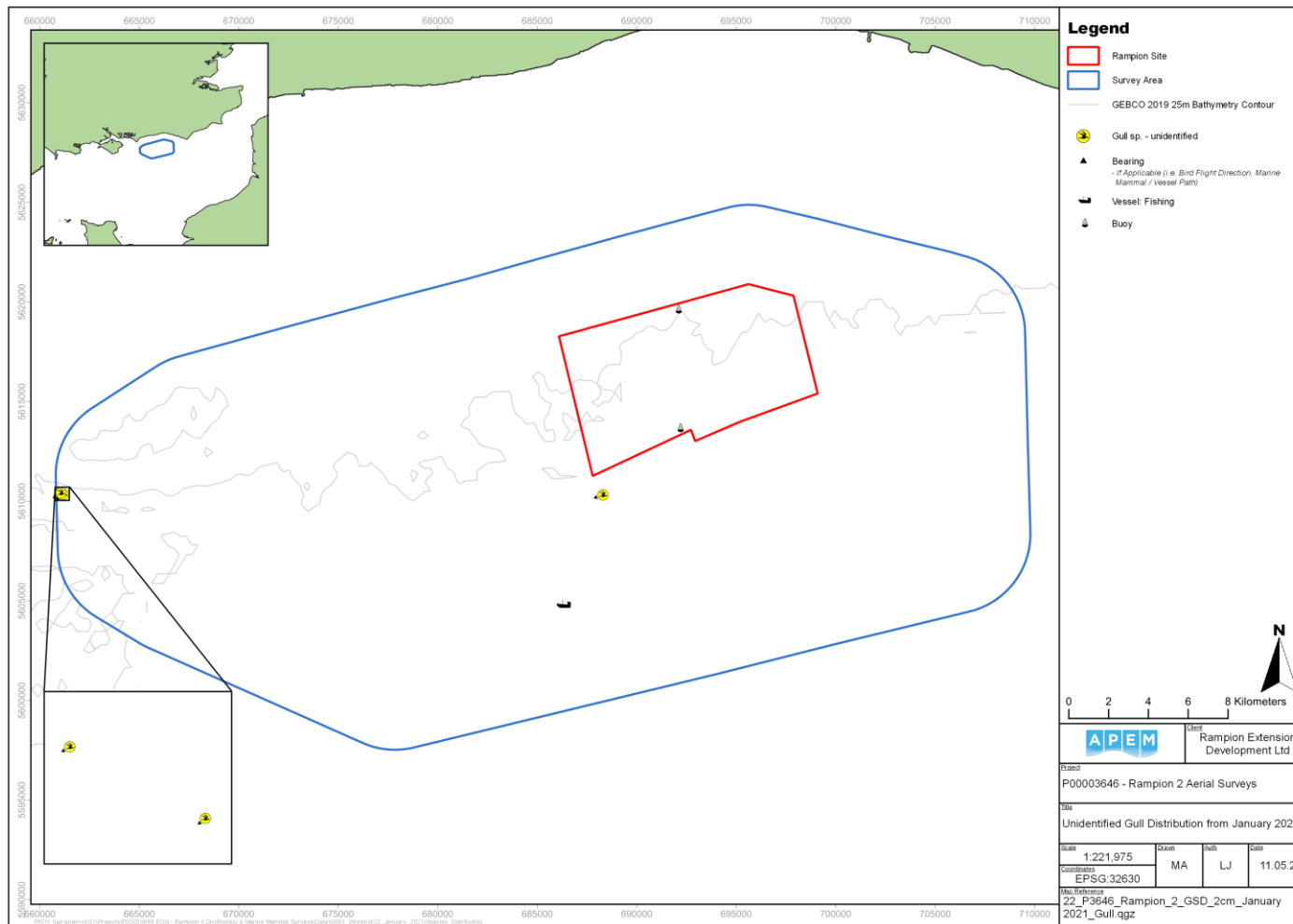


Figure 102 Distribution of unclassified gulls recorded in the Rampion 2 Survey Area in January 2021

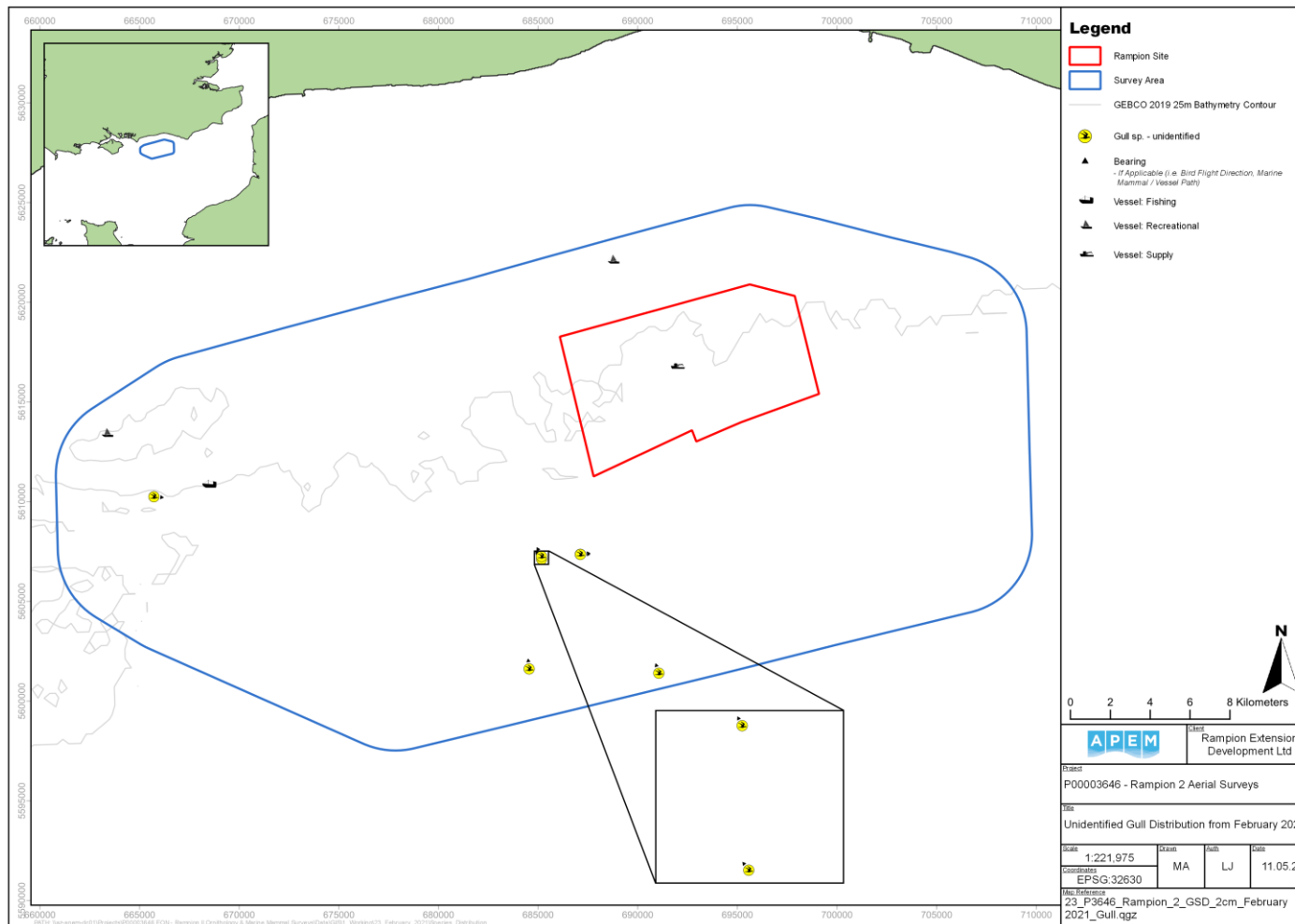


Figure 103 Distribution of unclassified gulls recorded in the Rampion 2 Survey Area in February 2021

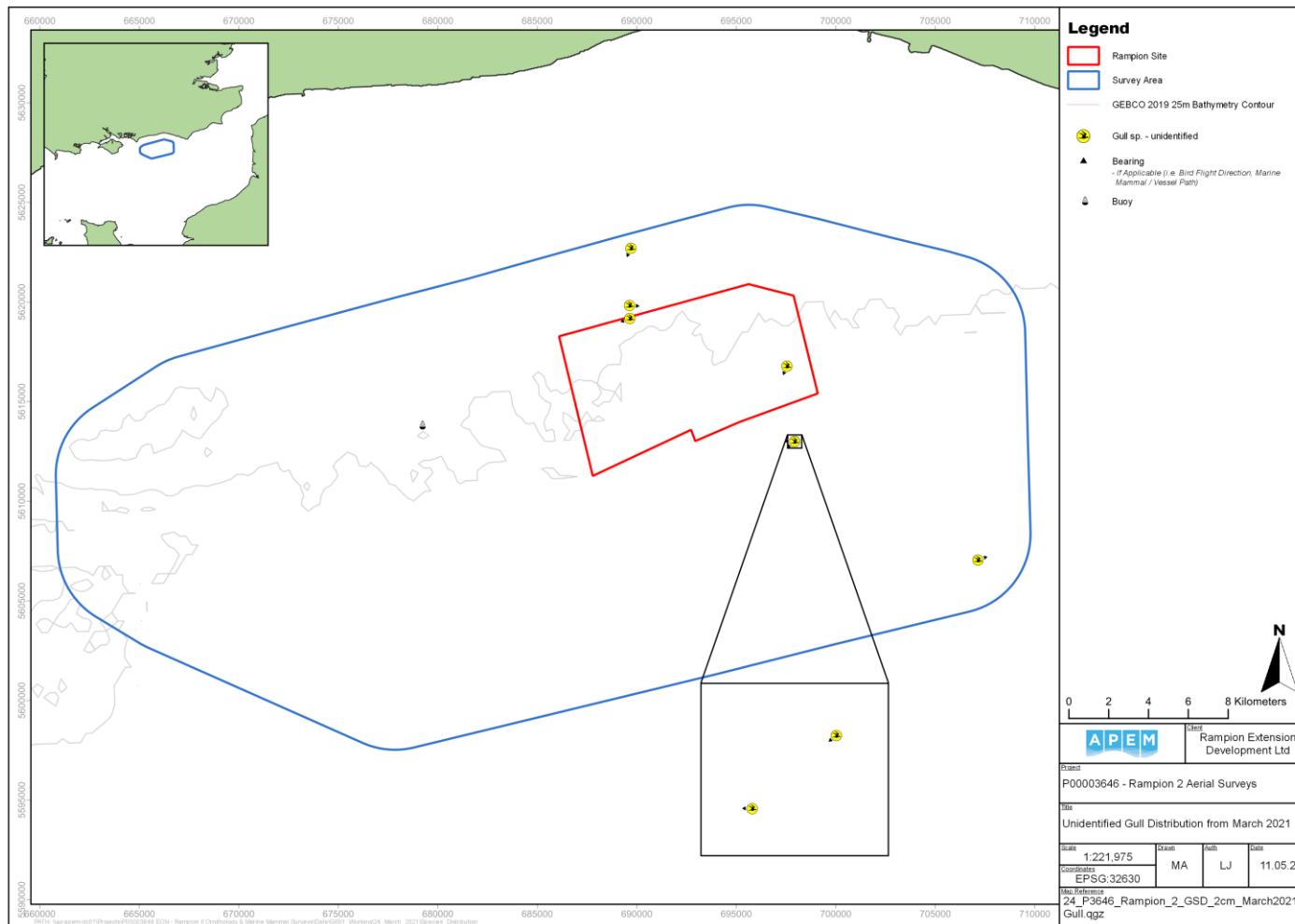


Figure 104 Distribution of unclassified gulls recorded in the Rampion 2 Survey Area in March 2021

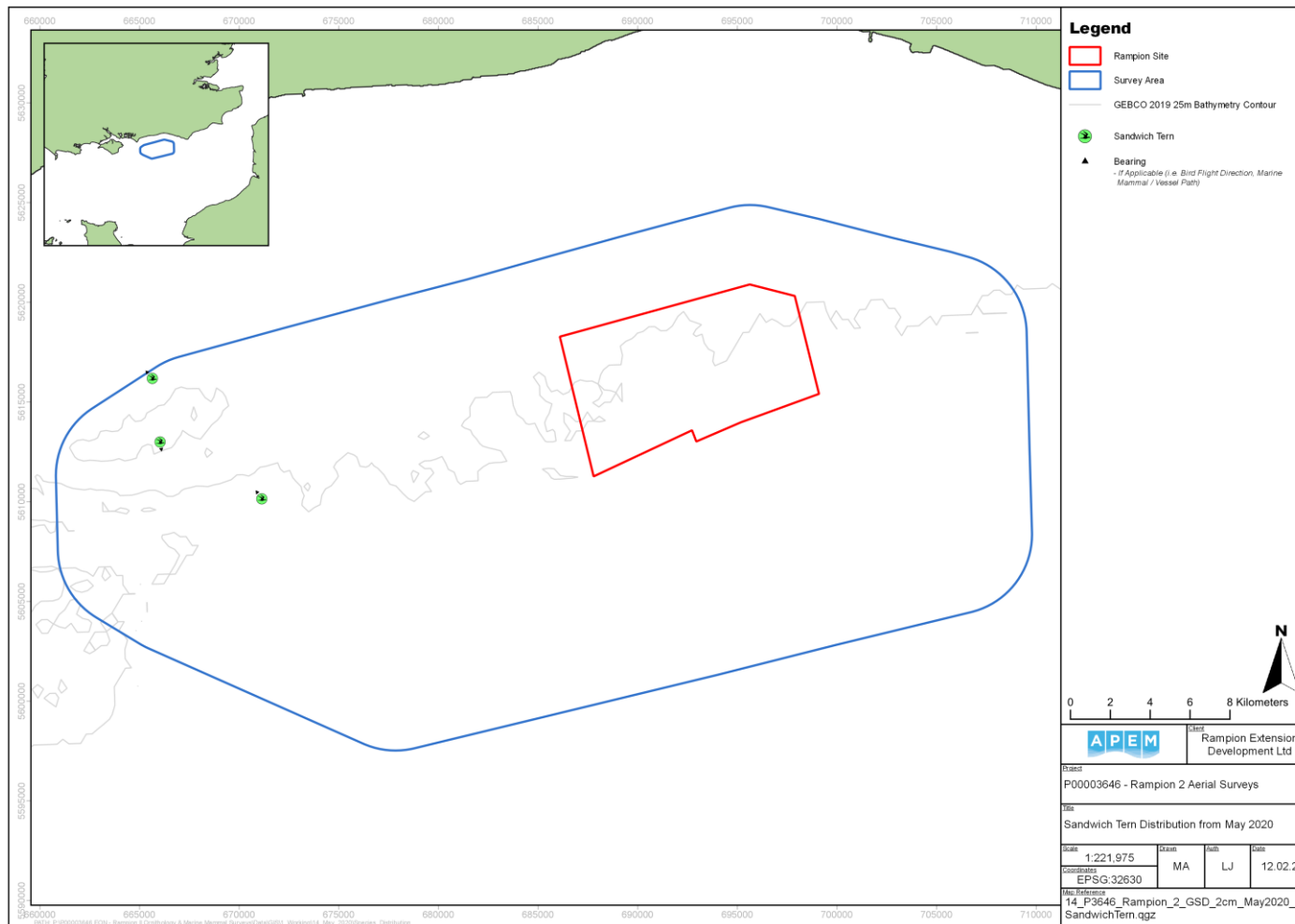


Figure 105 Distribution of Sandwich terns recorded in the Rampion 2 Survey Area in May 2020

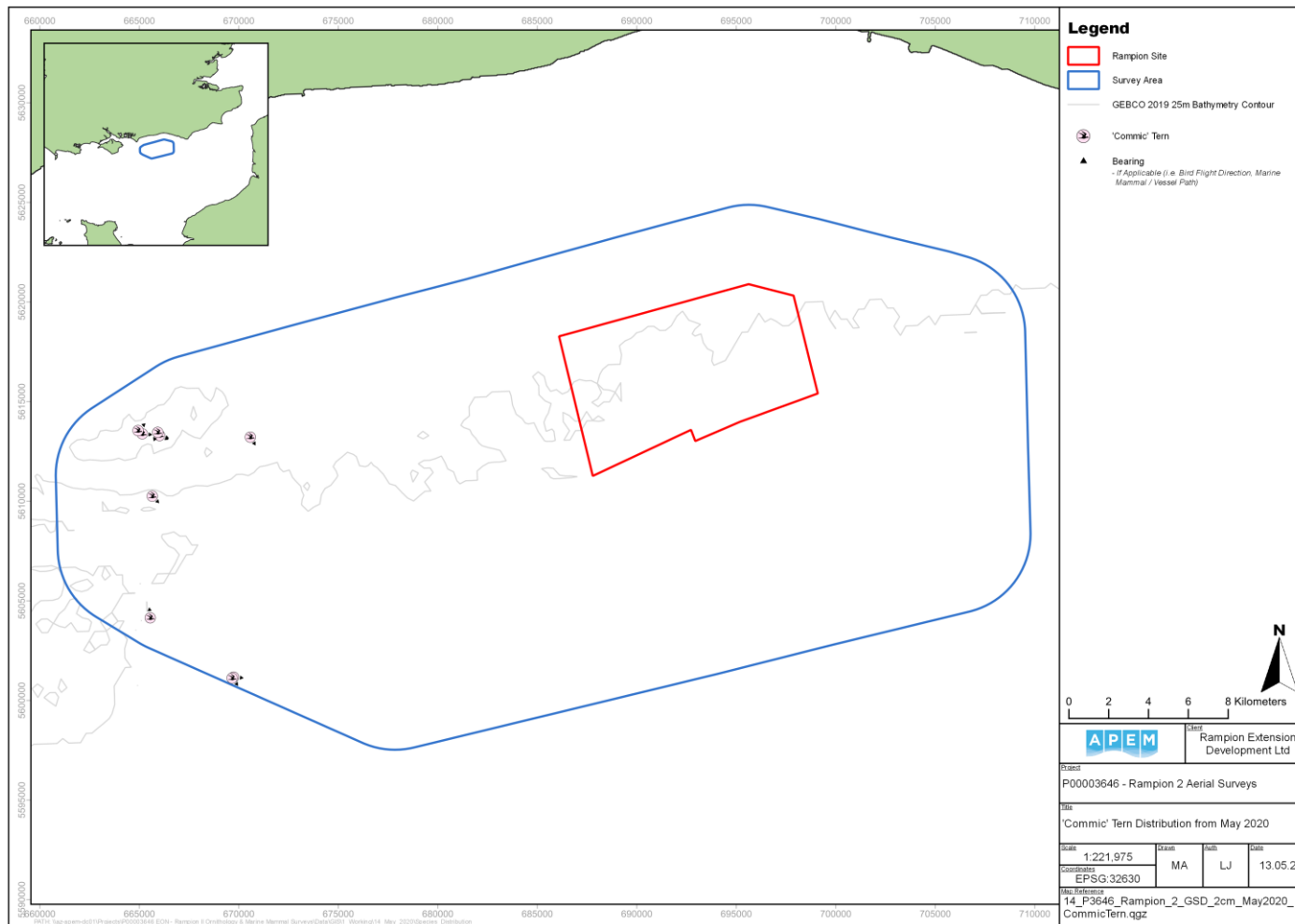


Figure 106 Distribution of 'commic' terns recorded in the Rampion 2 Survey Area in May 2020

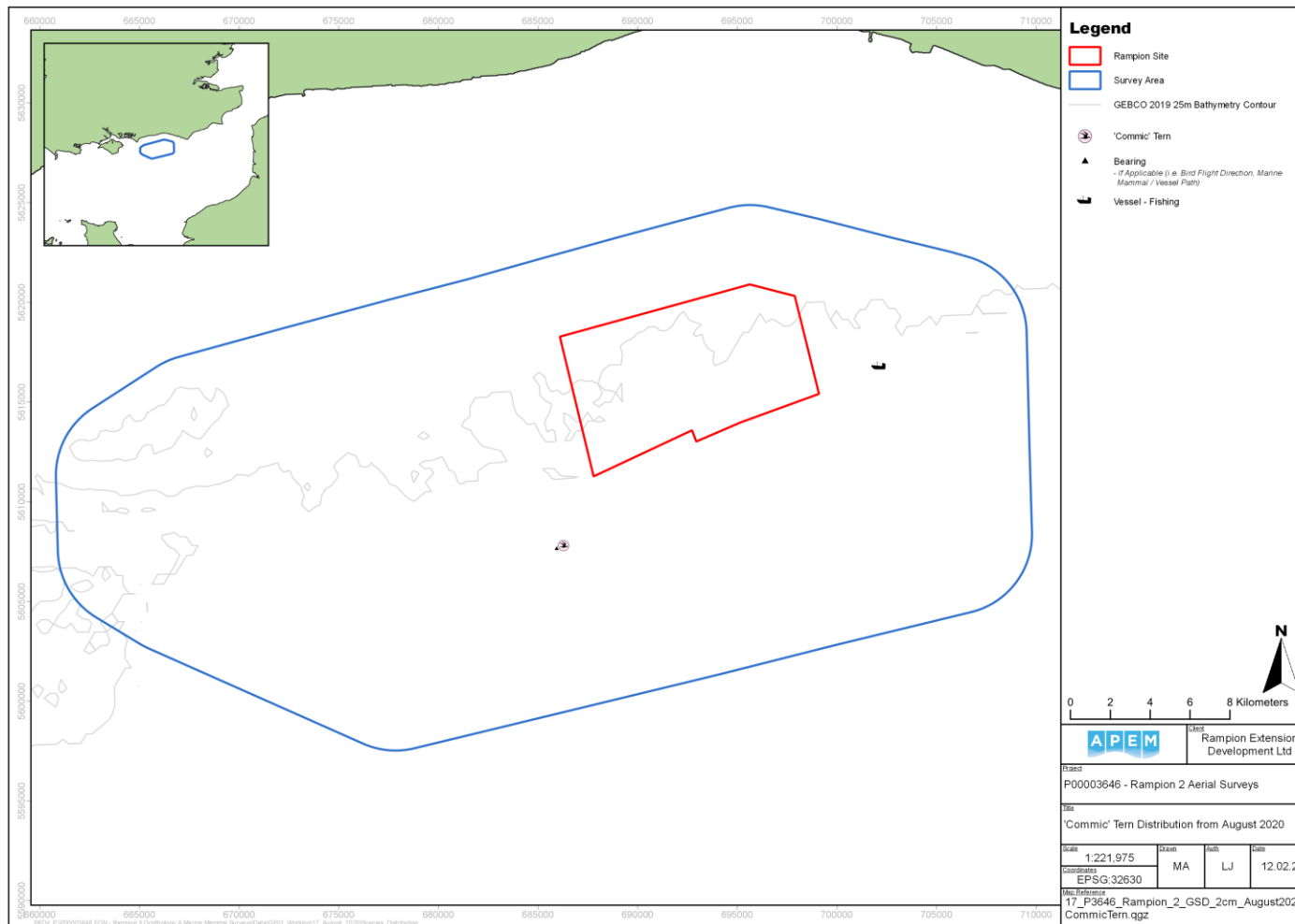


Figure 107 Location of a 'commic' tern recorded in the Rampion 2 Survey Area in August 2020

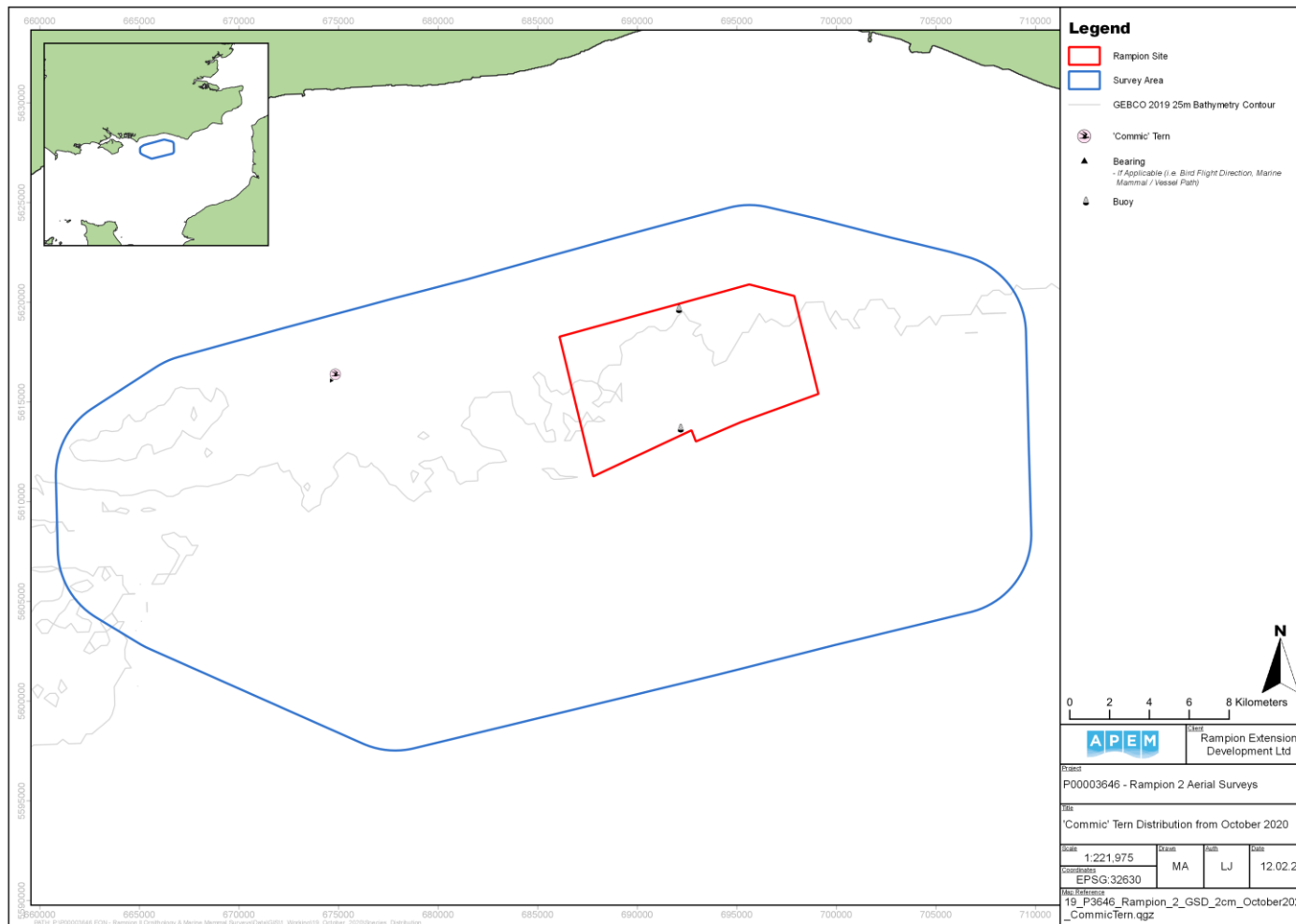


Figure 108 Location of a 'commic' tern recorded in the Rampion 2 Survey Area in October 2020

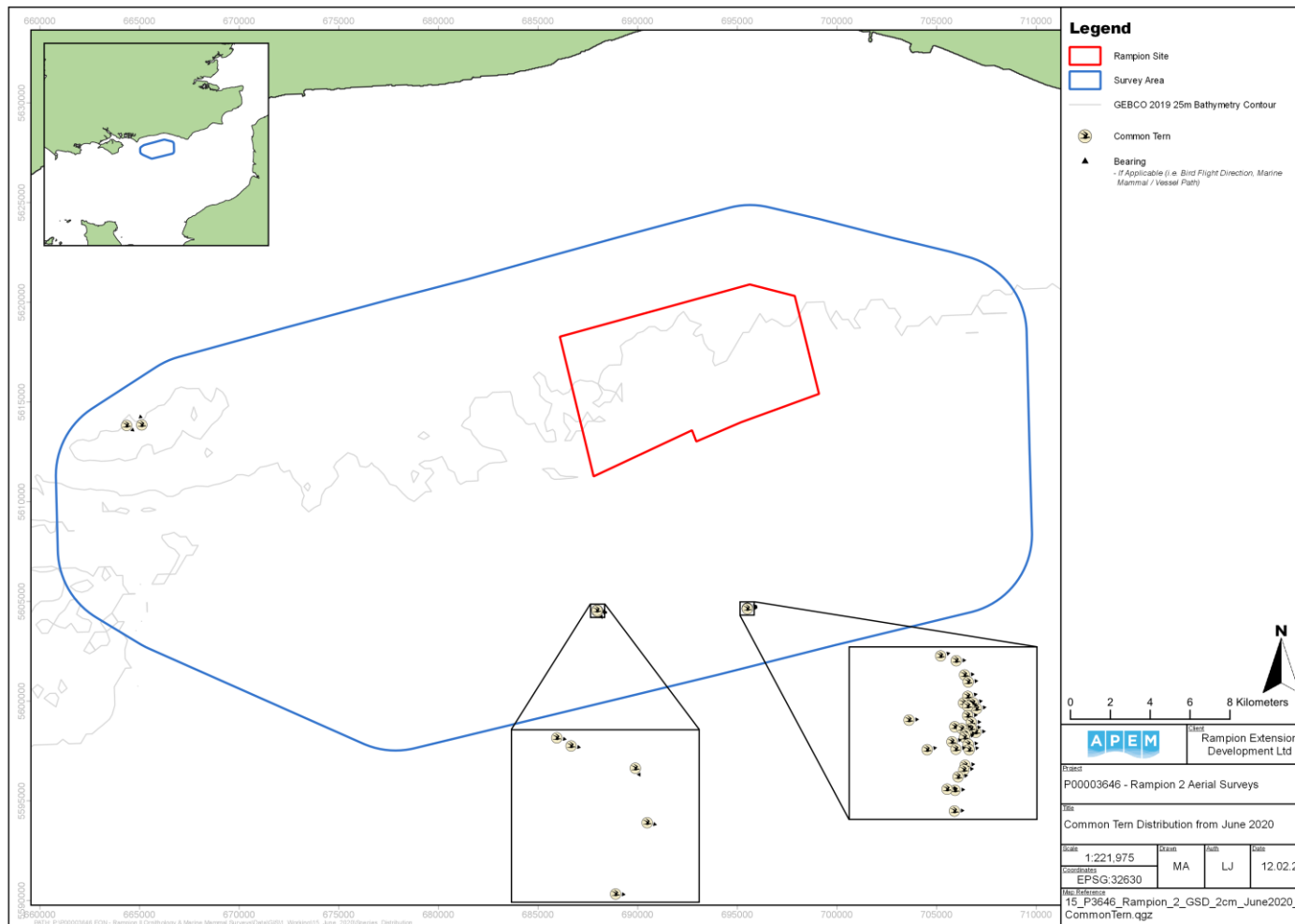


Figure 109 Distribution of common terns recorded in the Rampion 2 Survey Area in June 2020

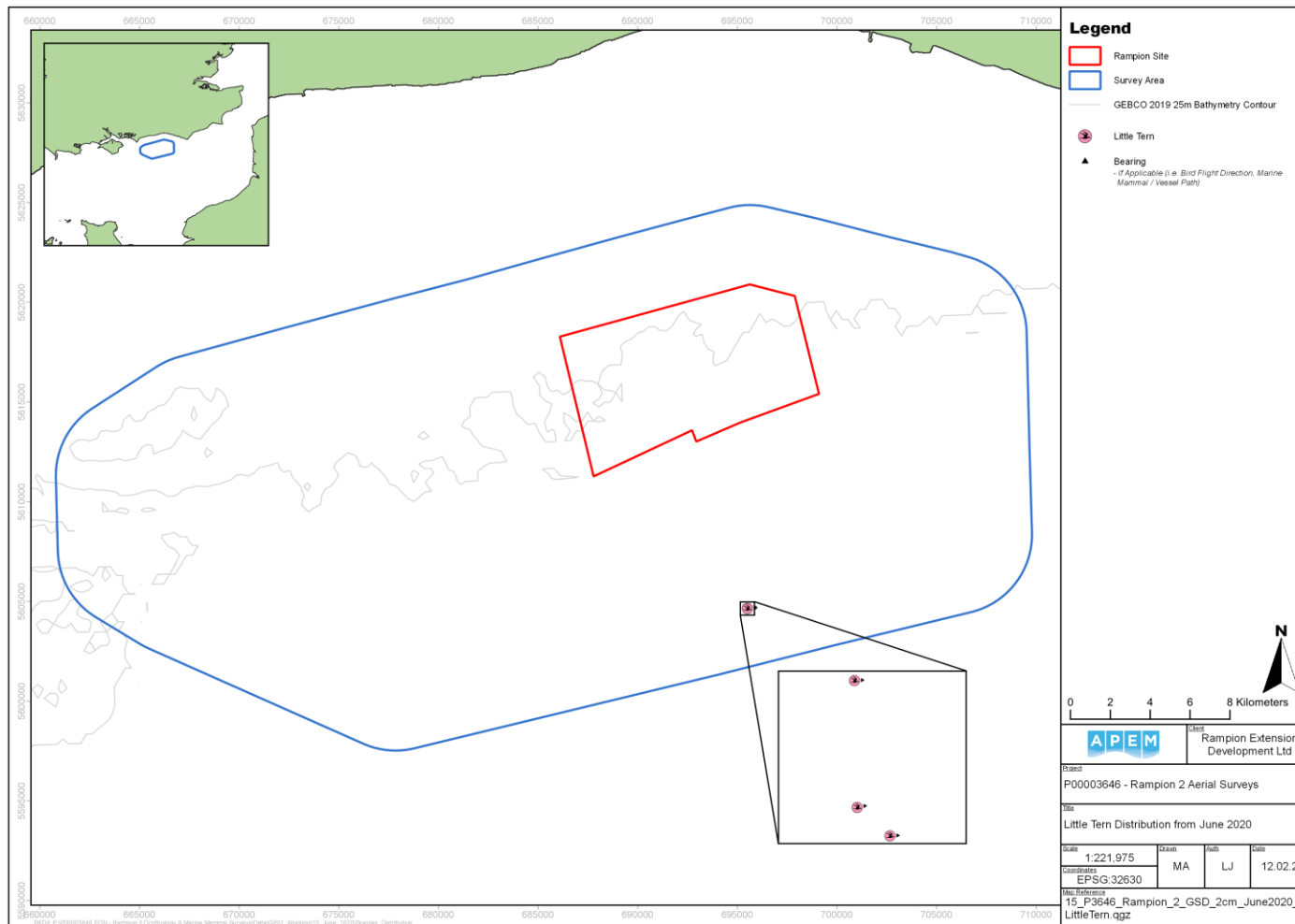


Figure 110 Distribution of little terns recorded in the Rampion 2 Survey Area in June 2020

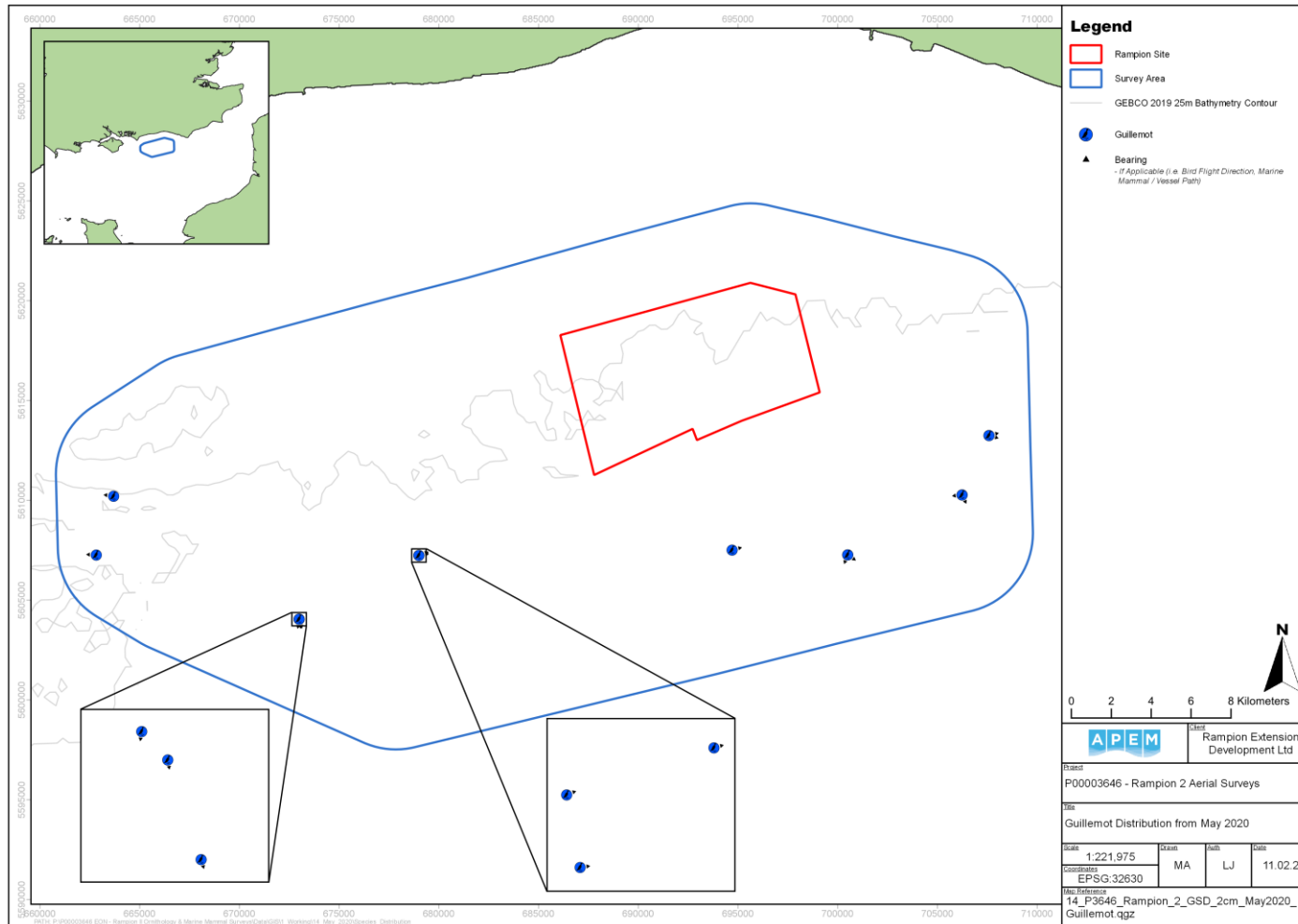


Figure 111 Distribution of guillemots recorded in the Rampion 2 Survey Area in May 2020

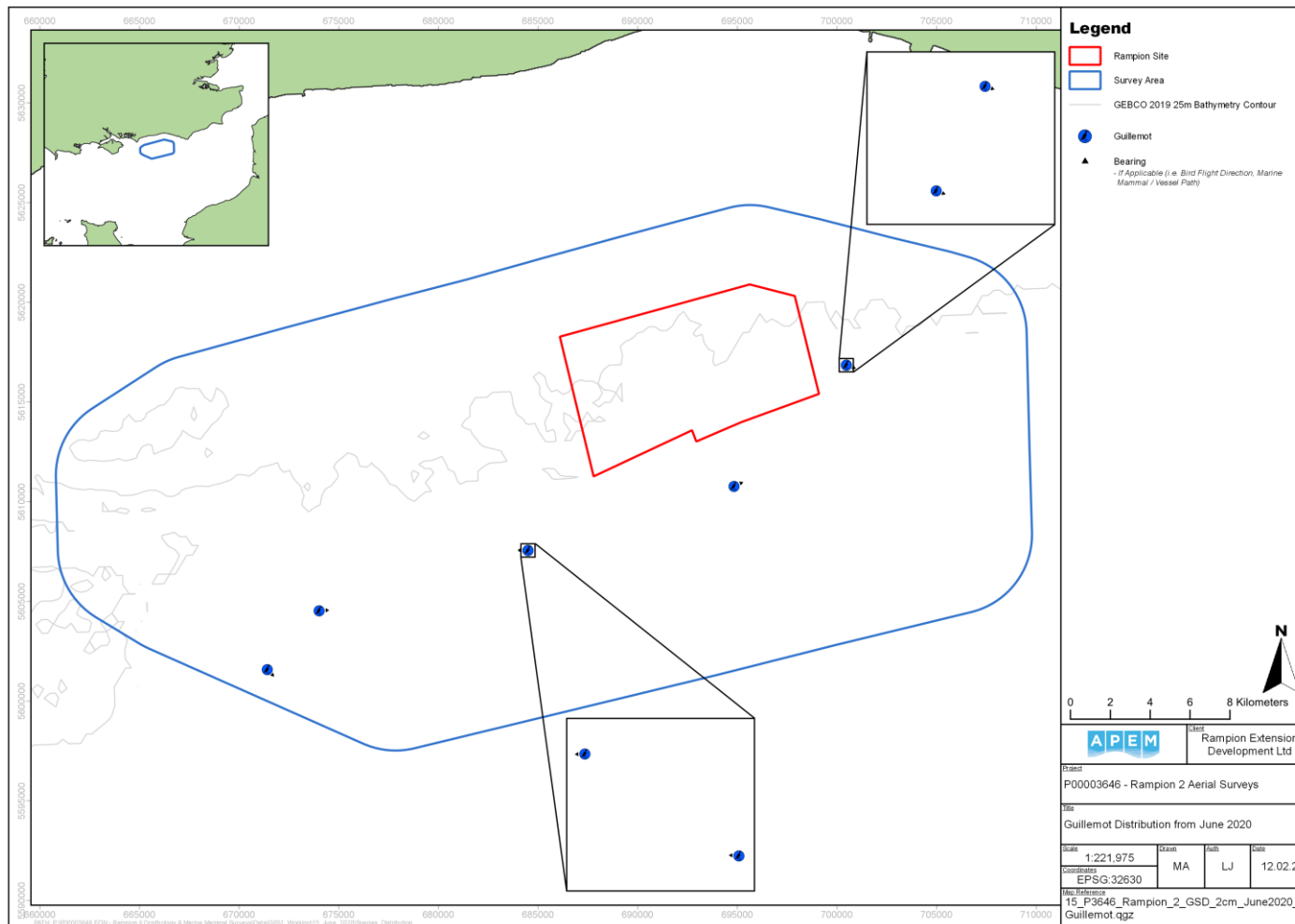


Figure 112 Distribution of guillemots recorded in the Rampion 2 Survey Area in June 2020

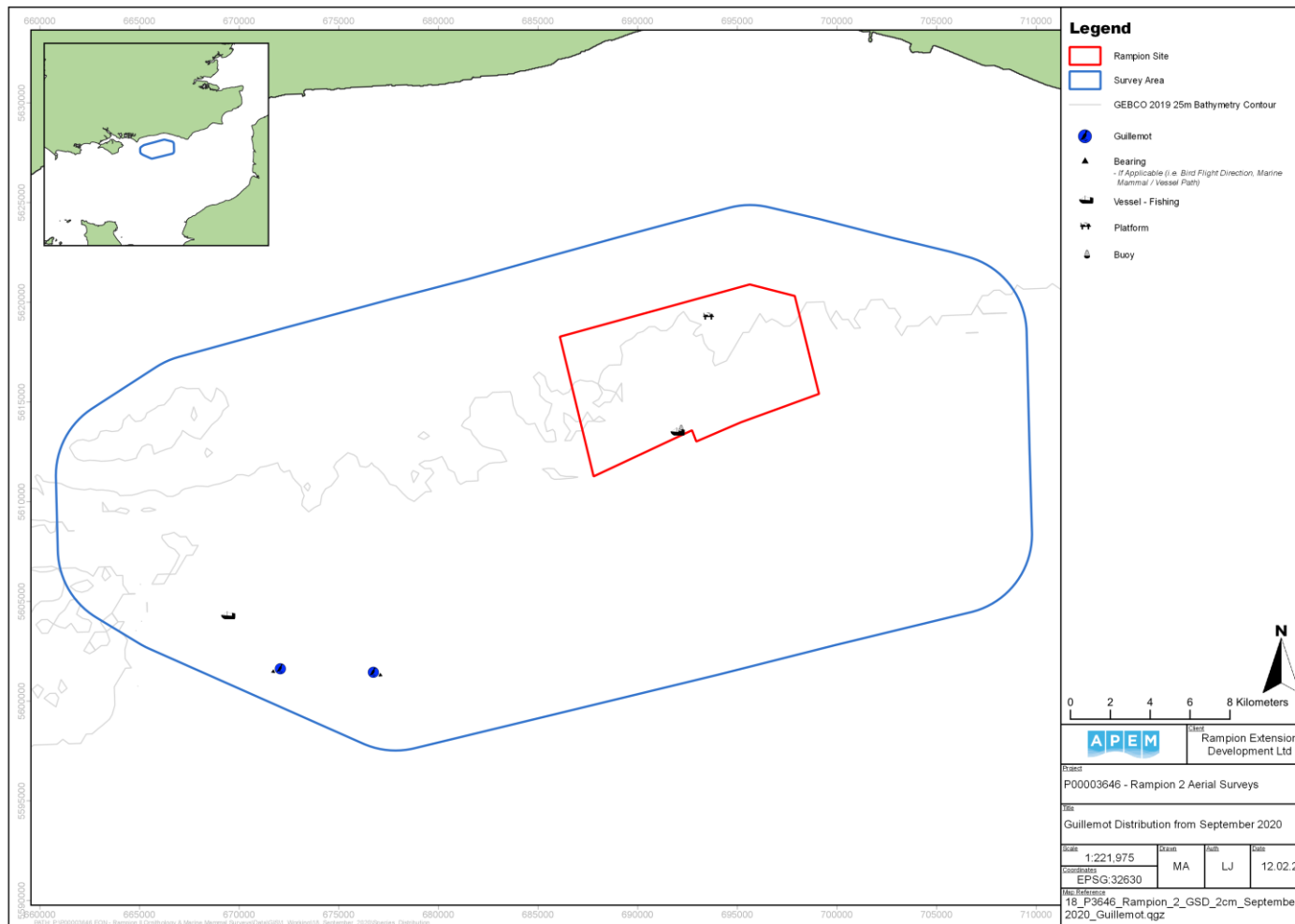


Figure 113 Distribution of guillemots recorded in the Rampion 2 Survey Area in September 2020

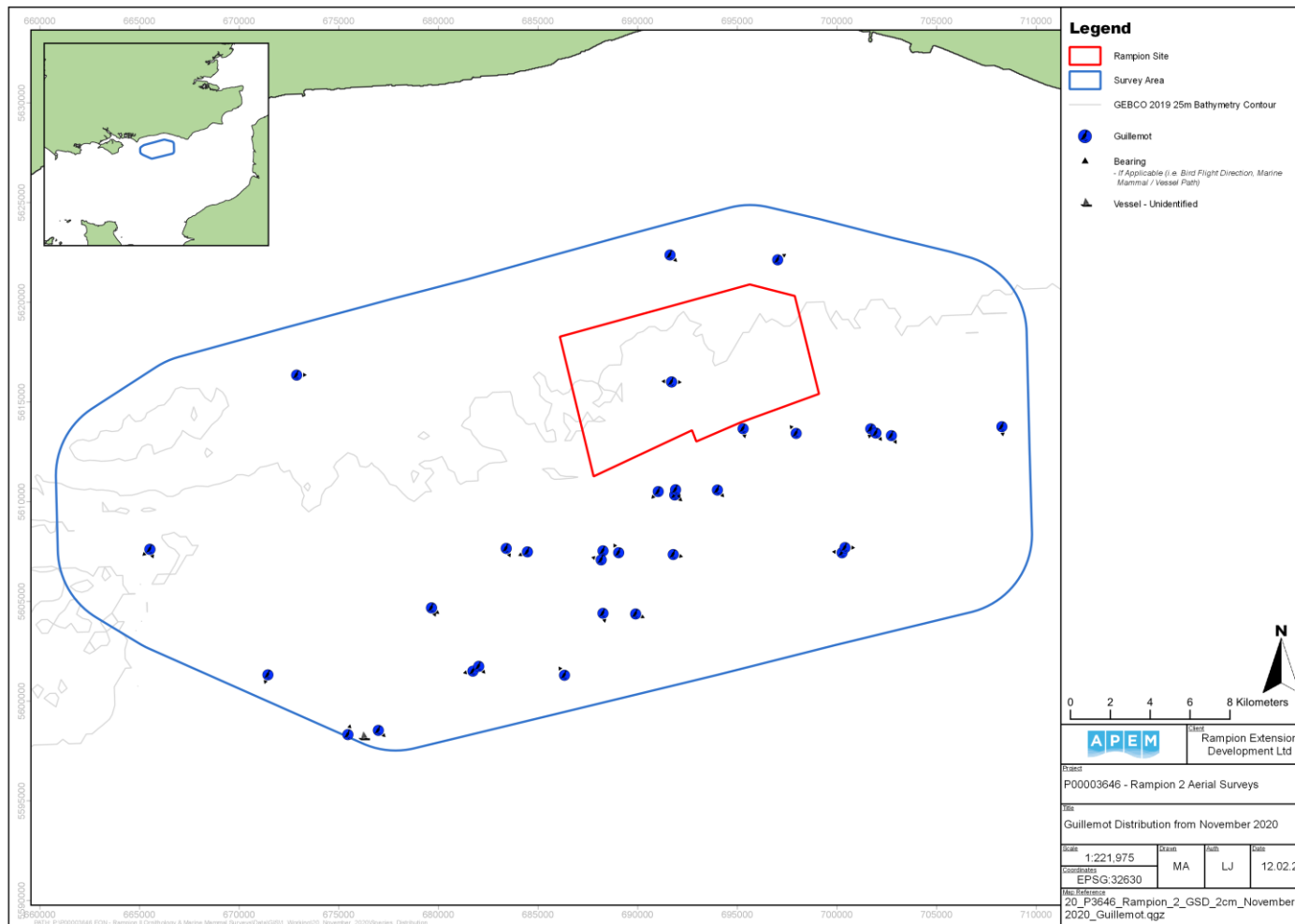


Figure 114 Distribution of guillemots recorded in the Rampion 2 Survey Area in November 2020

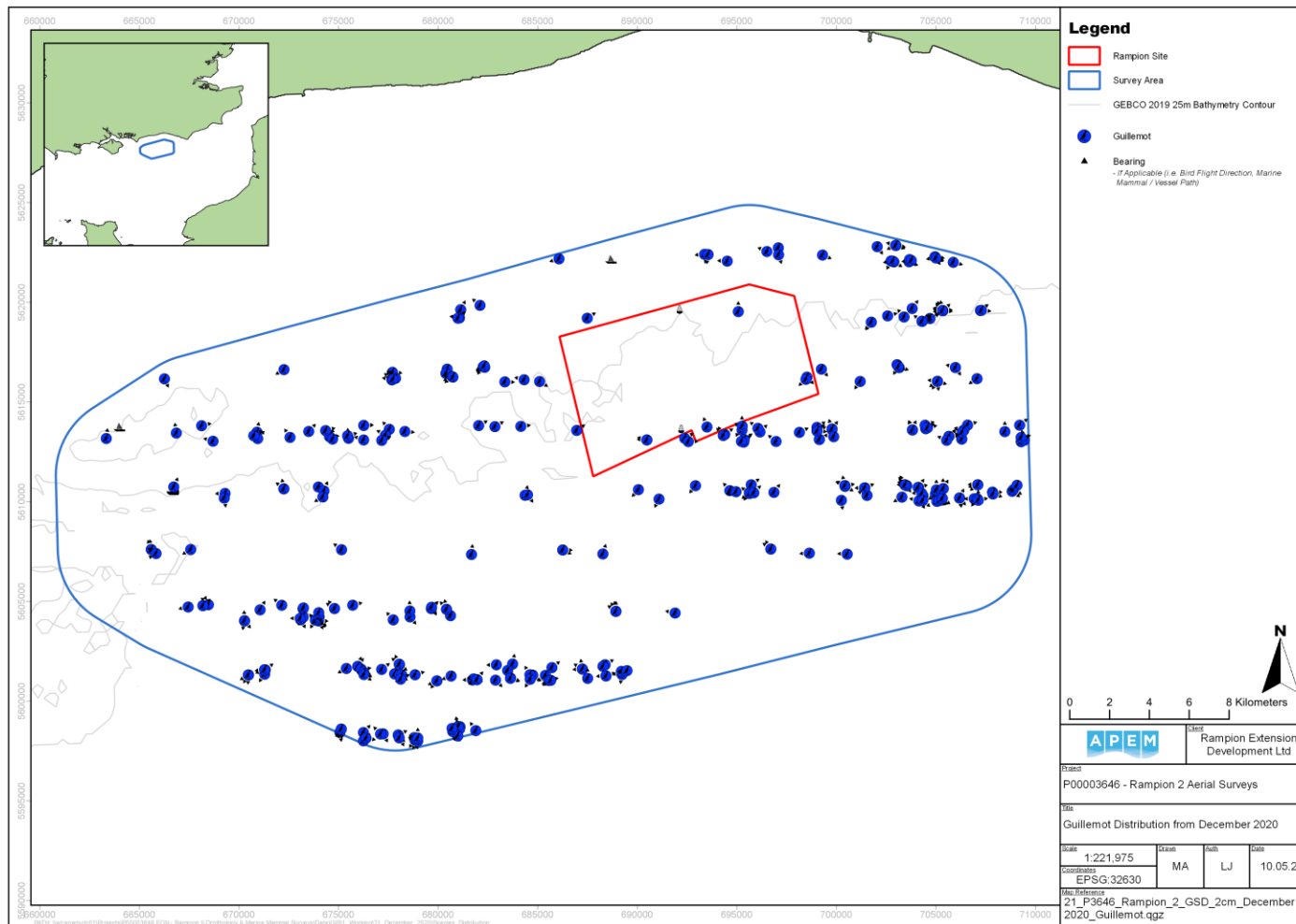


Figure 115 Distribution of guillemots recorded in the Rampion 2 Survey Area in December 2020

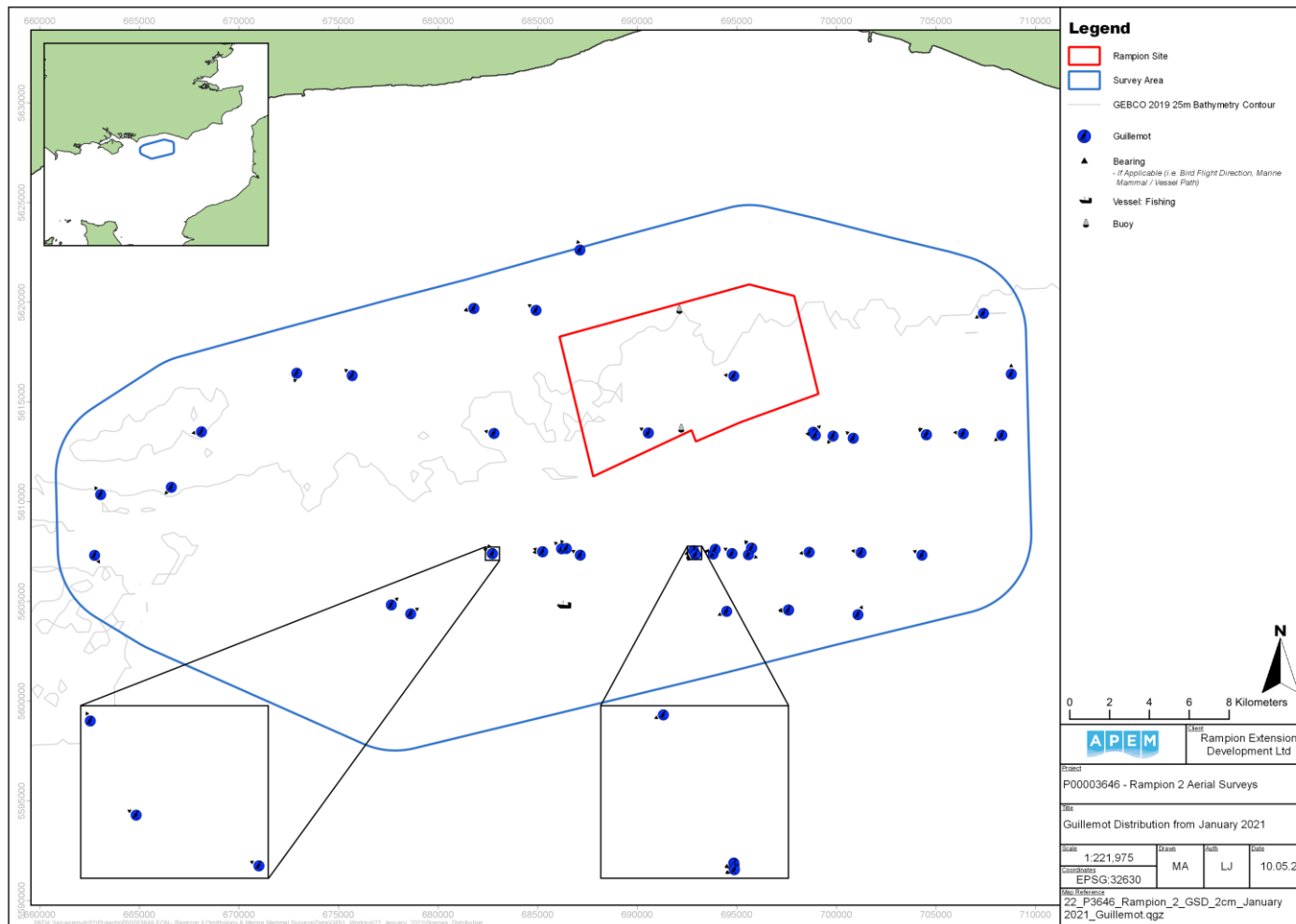


Figure 116 Distribution of guillemots recorded in the Rampion 2 Survey Area in January 2021

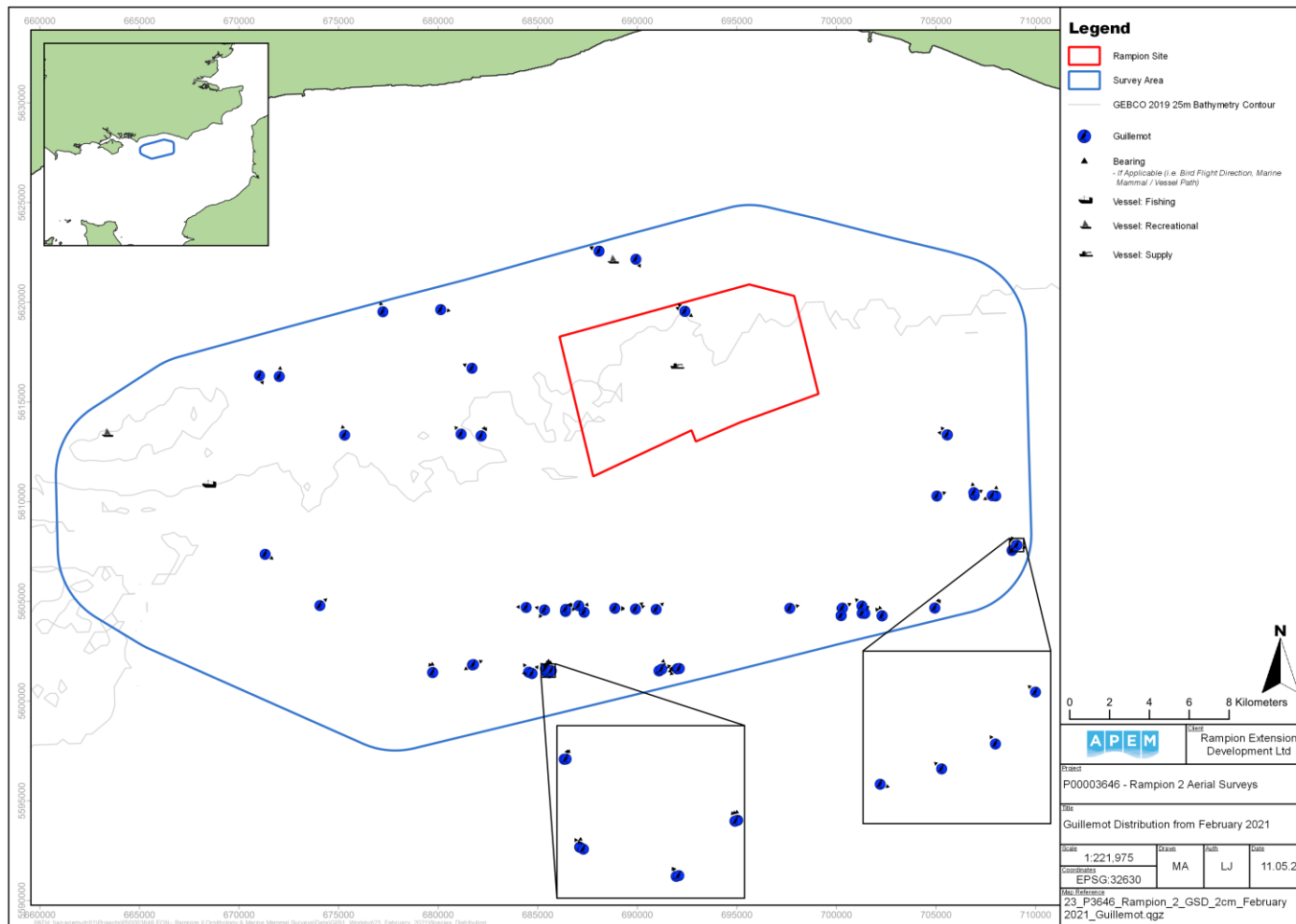


Figure 117 Distribution of guillemots recorded in the Rampion 2 Survey Area in February 2021

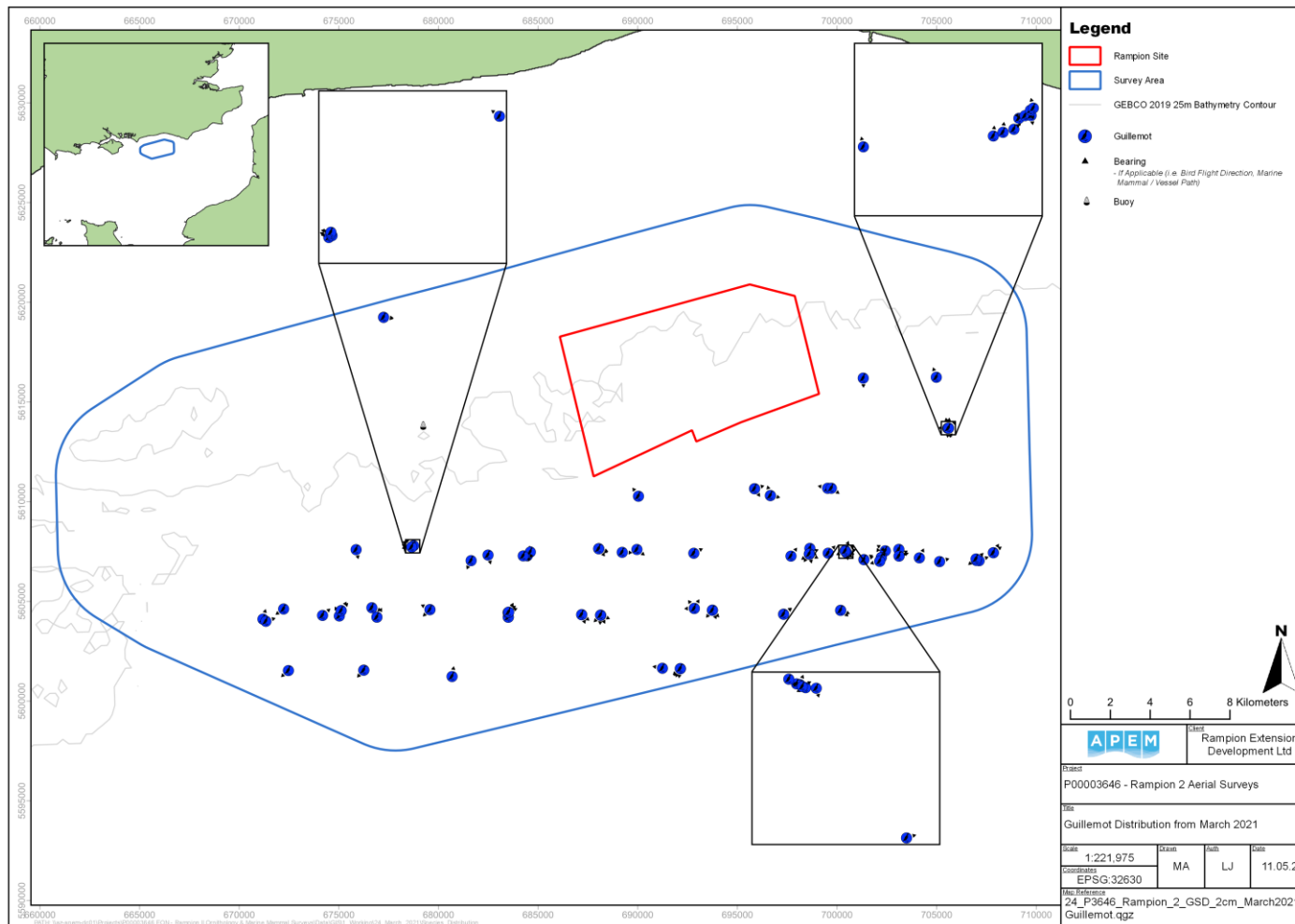


Figure 118 Distribution of guillemots recorded in the Rampion 2 Survey Area in March 2021

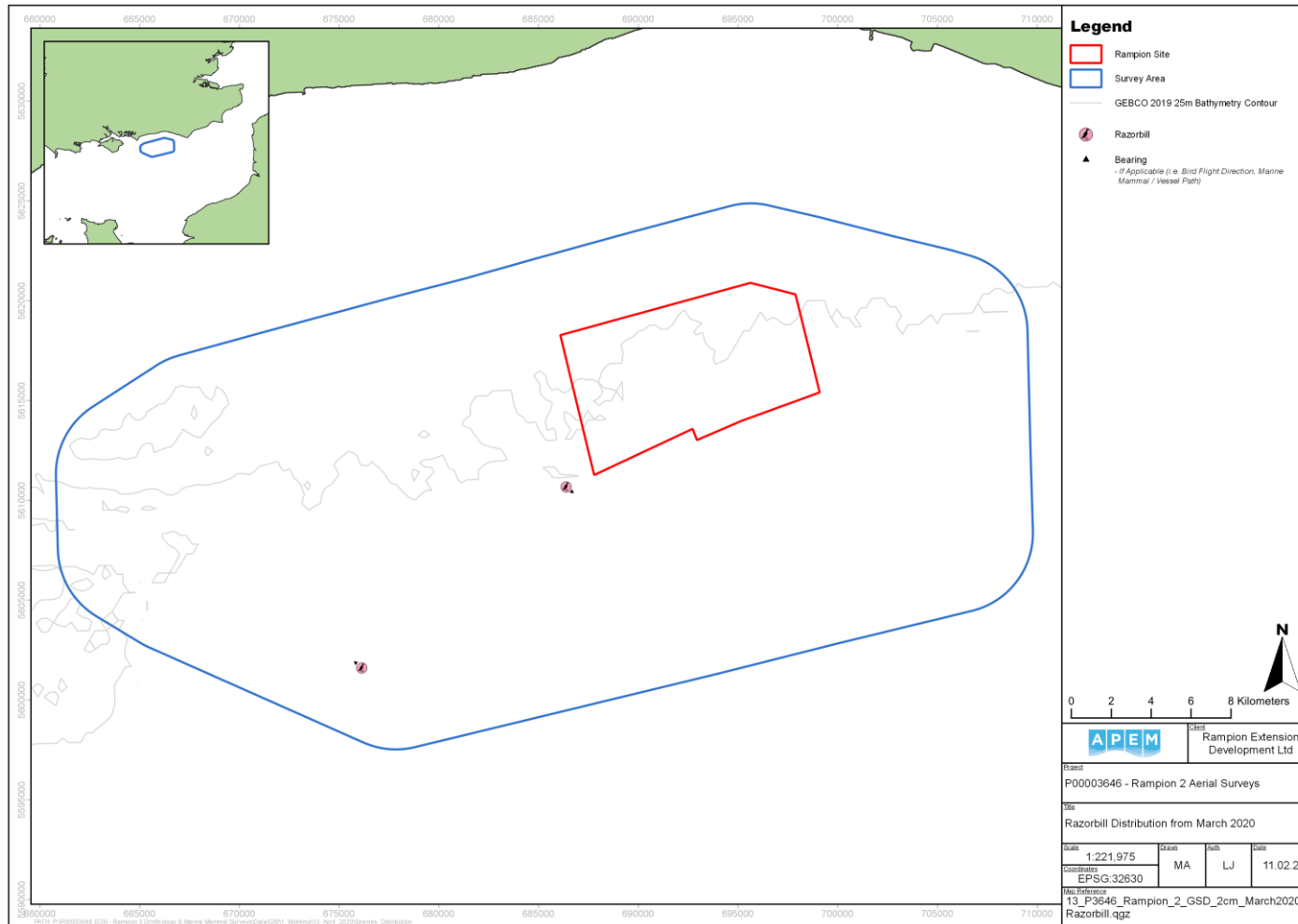


Figure 119 Distribution of razorbills recorded in the Rampion 2 Survey Area in April 2020

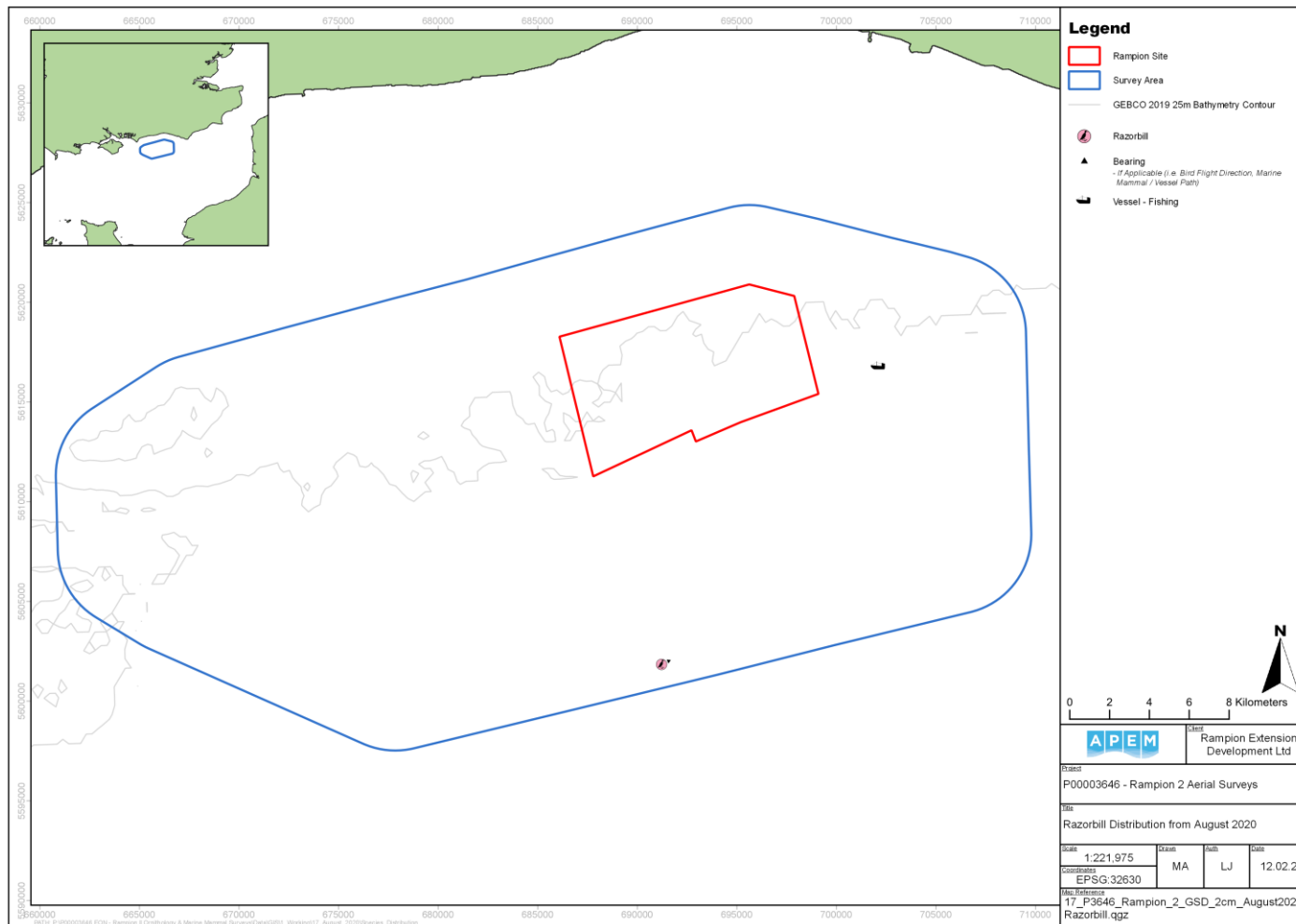


Figure 120 Location of a razorbill recorded in the Rampion 2 Survey Area in August 2020

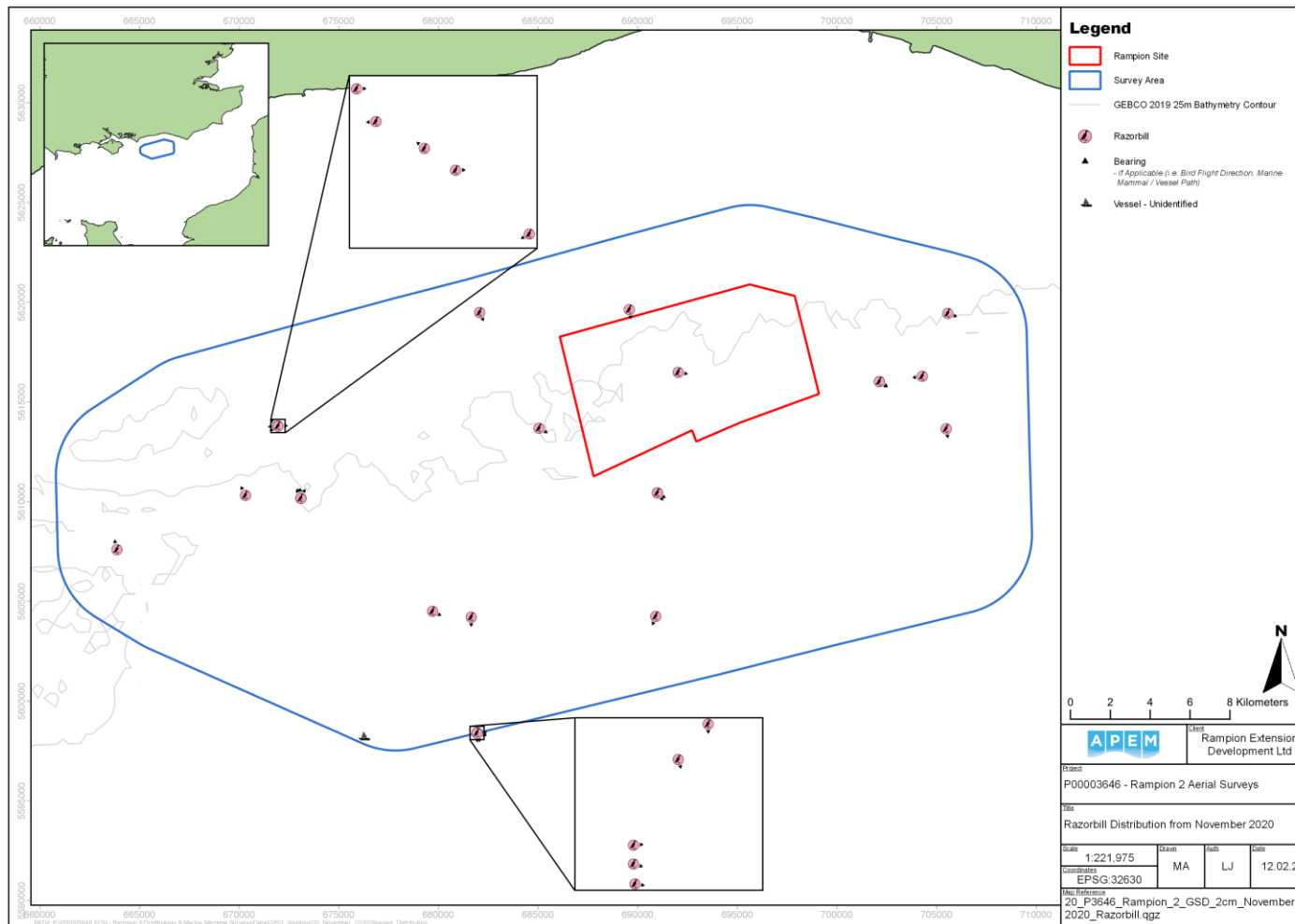


Figure 121 Distribution of razorbills recorded in the Rampion 2 Survey Area in November 2020

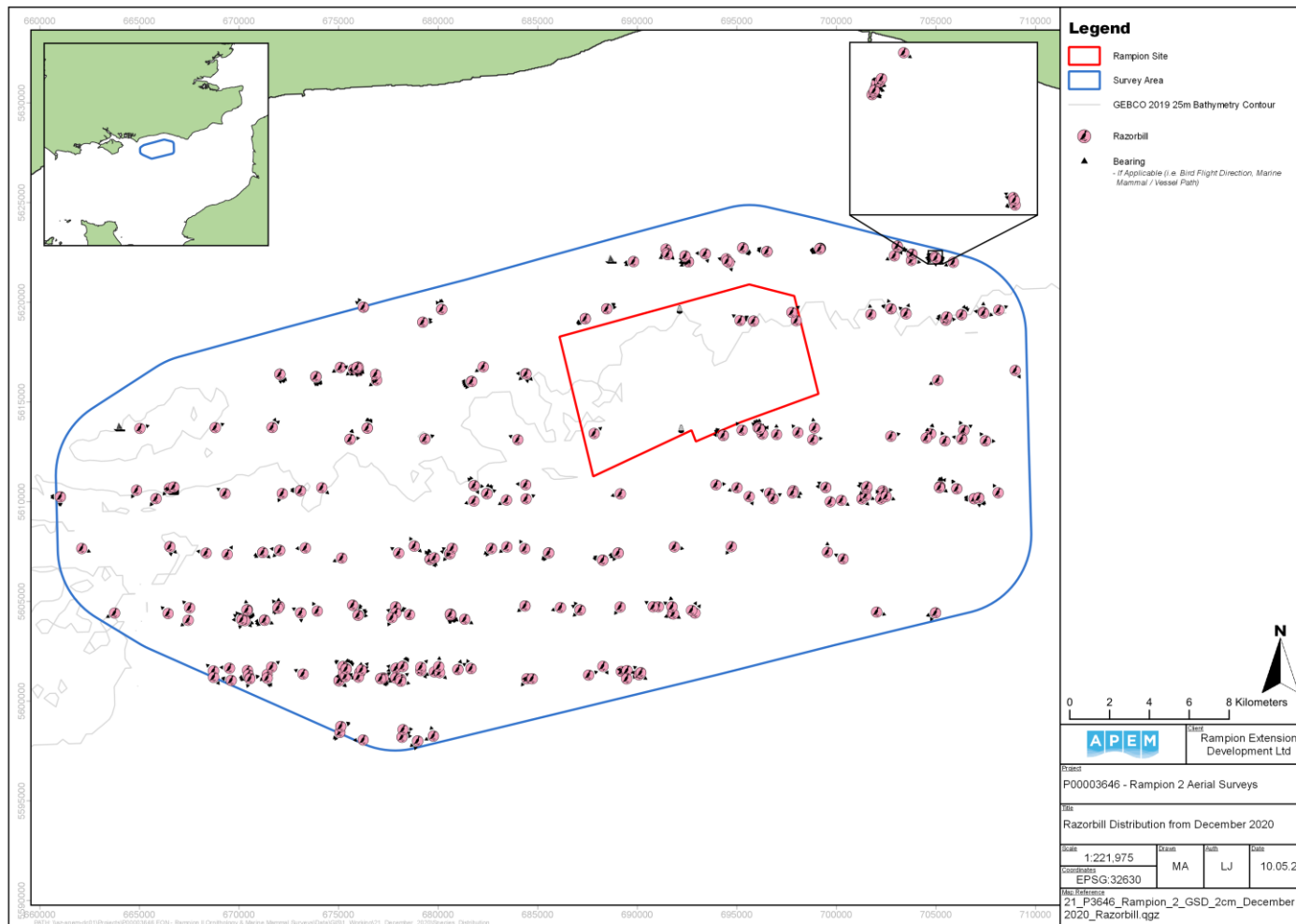


Figure 122 Distribution of razorbills recorded in the Rampion 2 Survey Area in December 2020

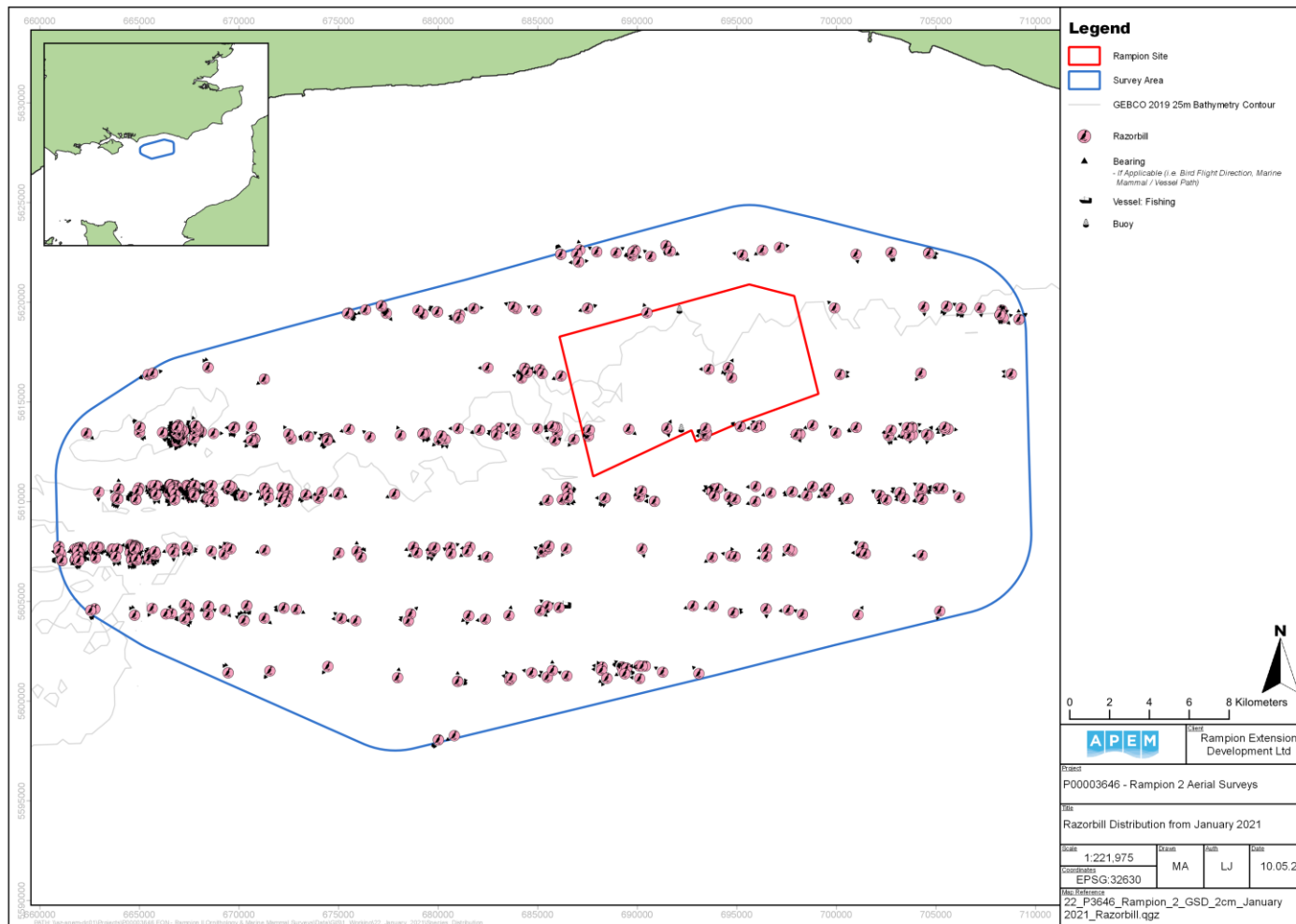


Figure 123 Distribution of razorbills recorded in the Rampion 2 Survey Area in January 2021

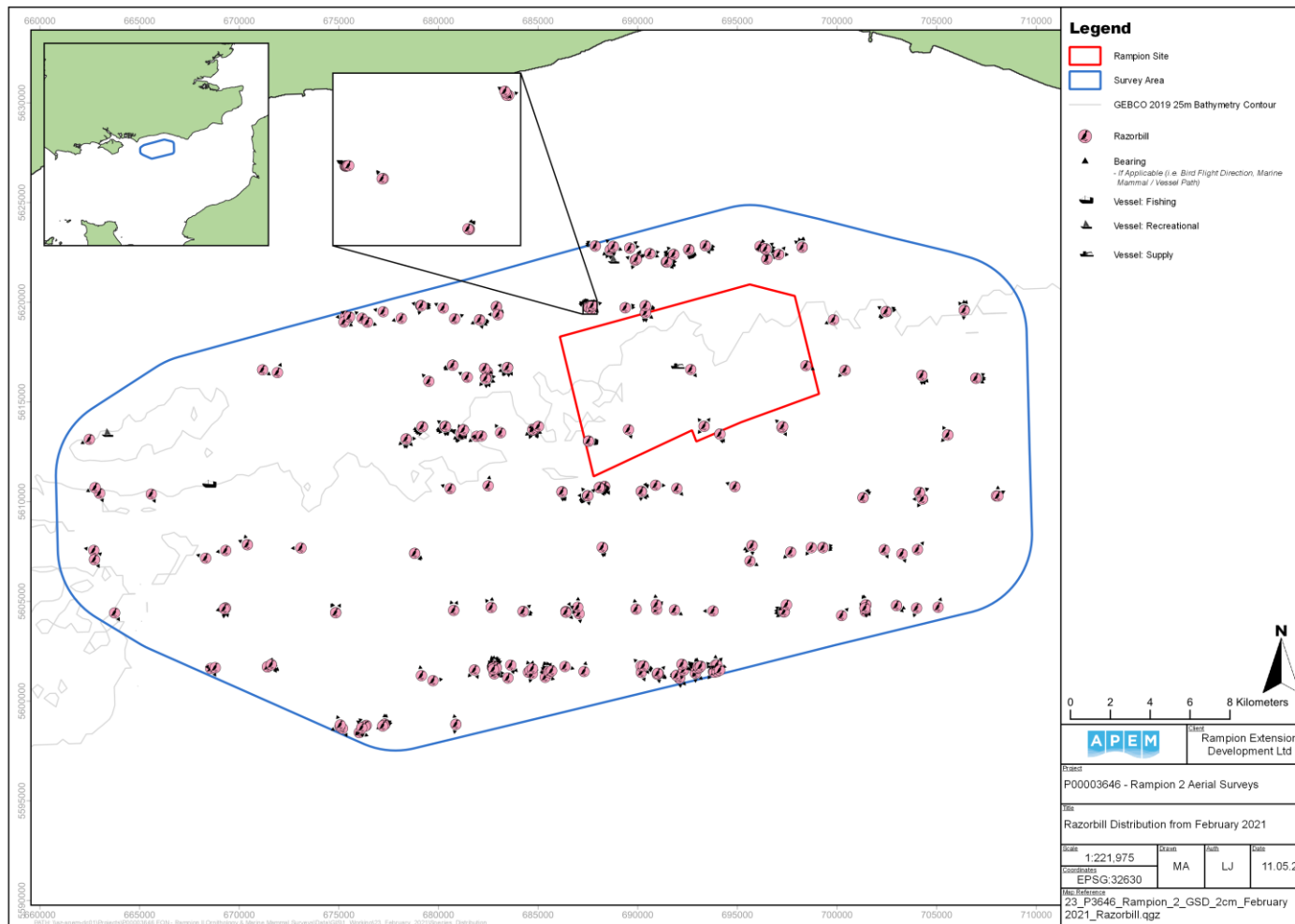


Figure 124 Distribution of razorbills recorded in the Rampion 2 Survey Area in February 2021

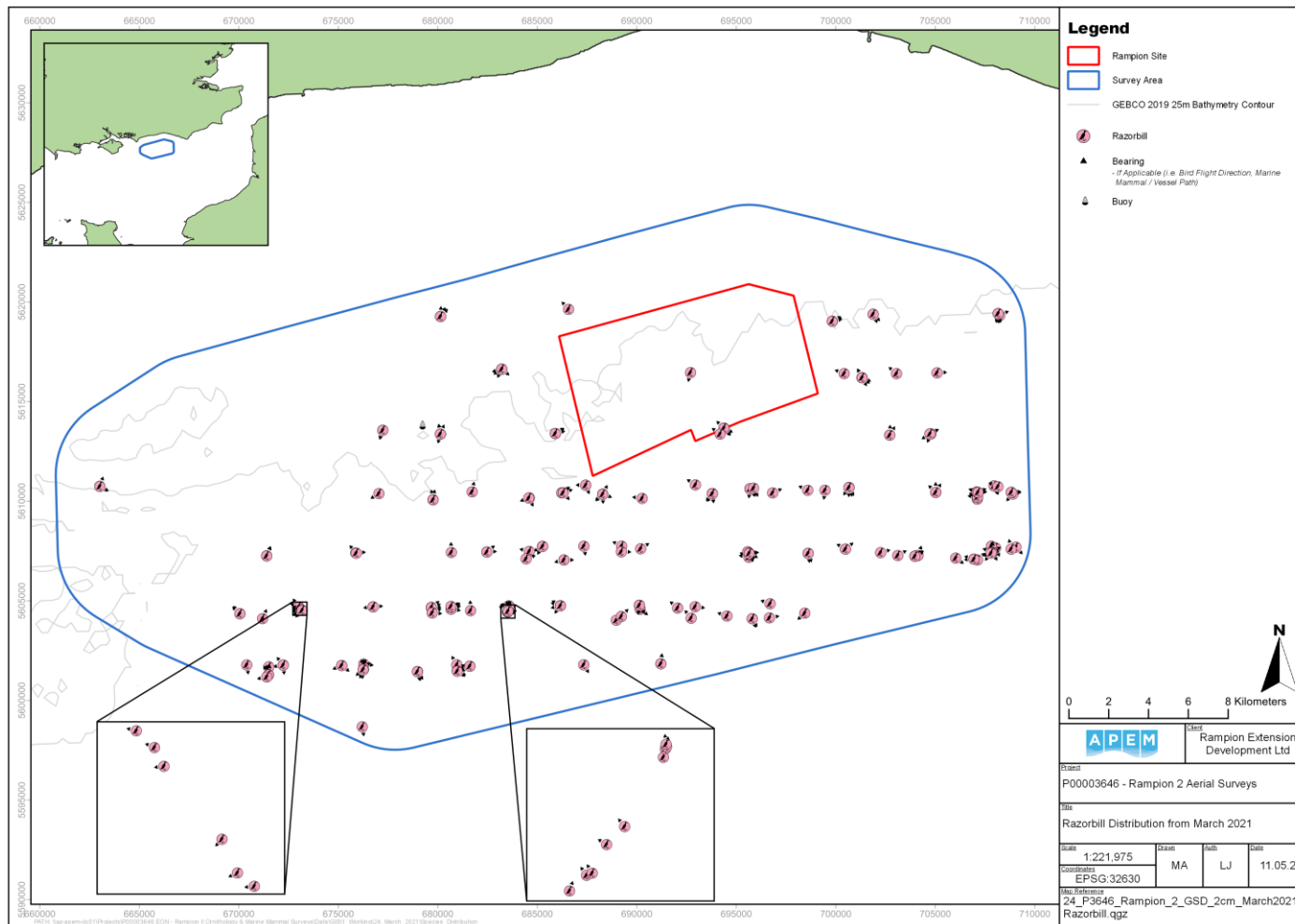


Figure 125 Distribution of razorbills recorded in the Rampion 2 Survey Area in March 2021

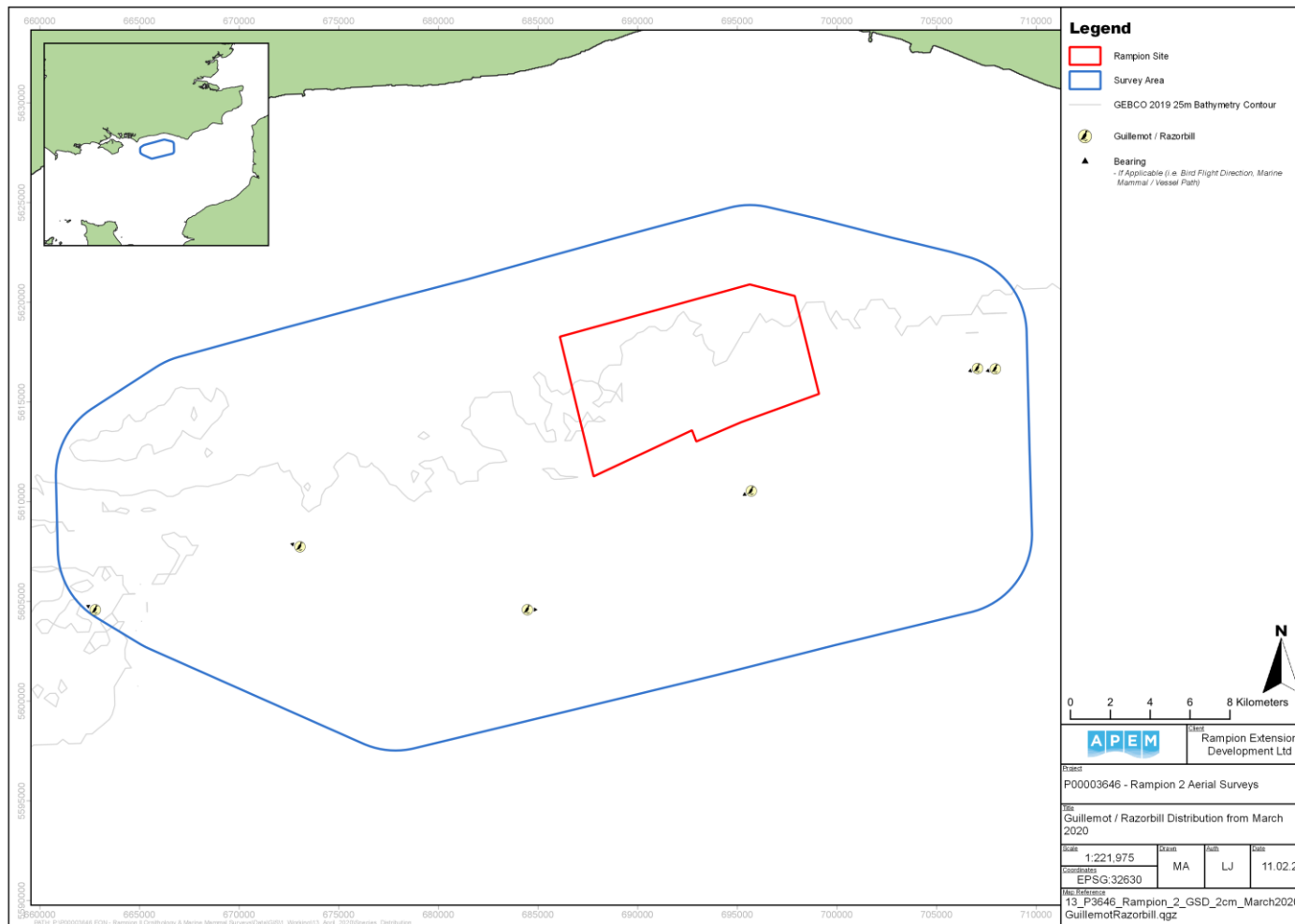


Figure 126 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in April 2020

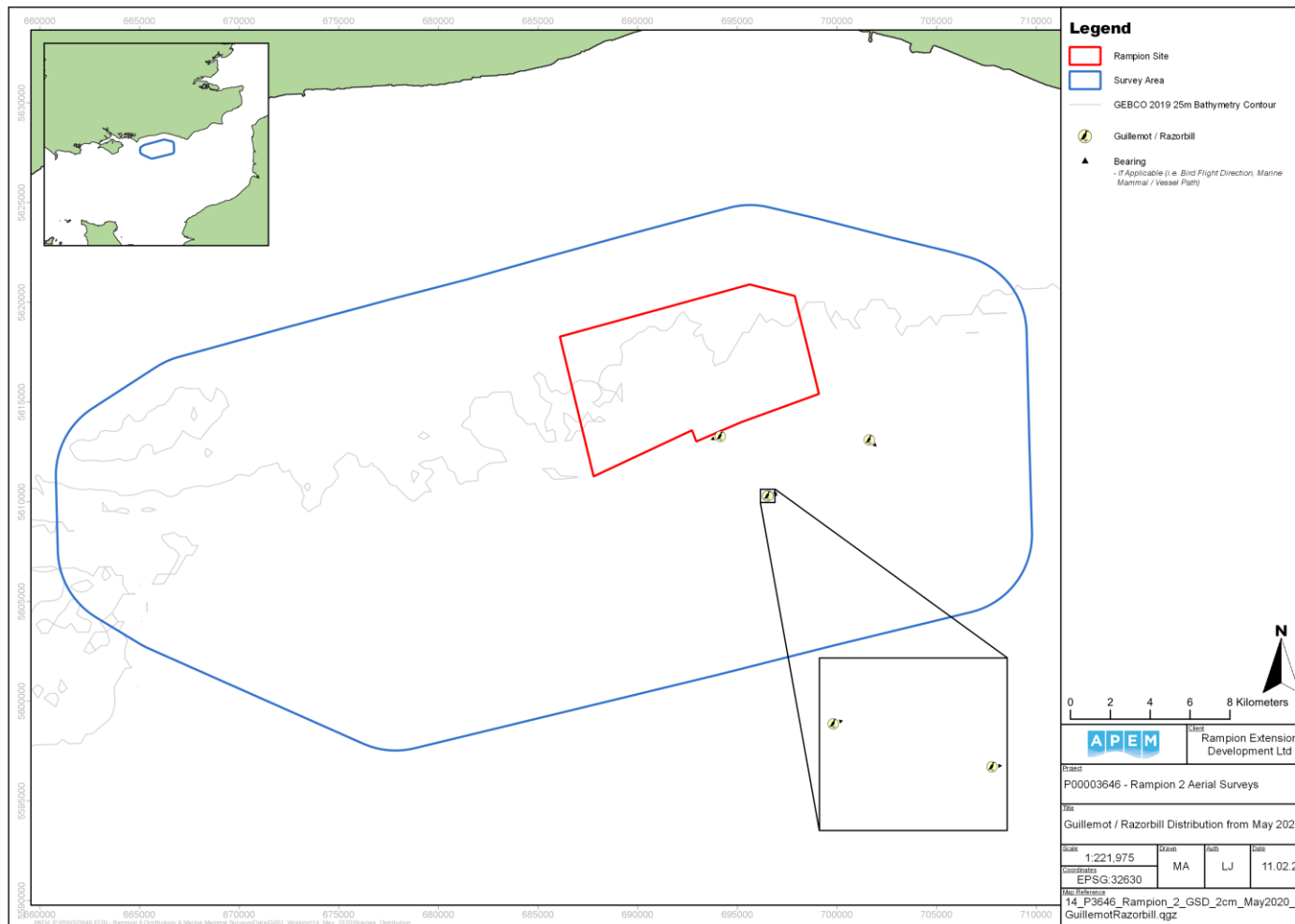


Figure 127 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in May 2020

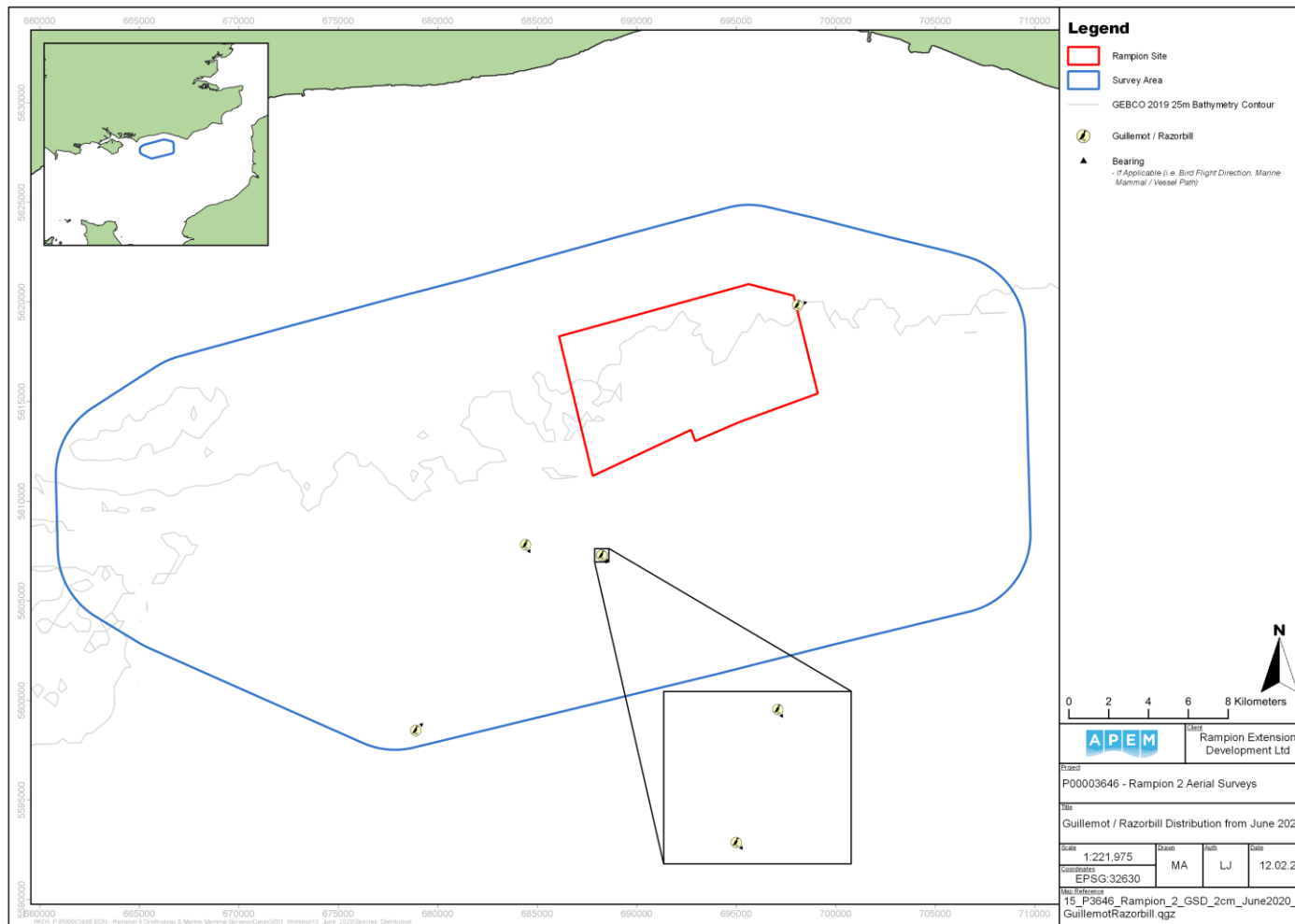


Figure 128 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in June 2020

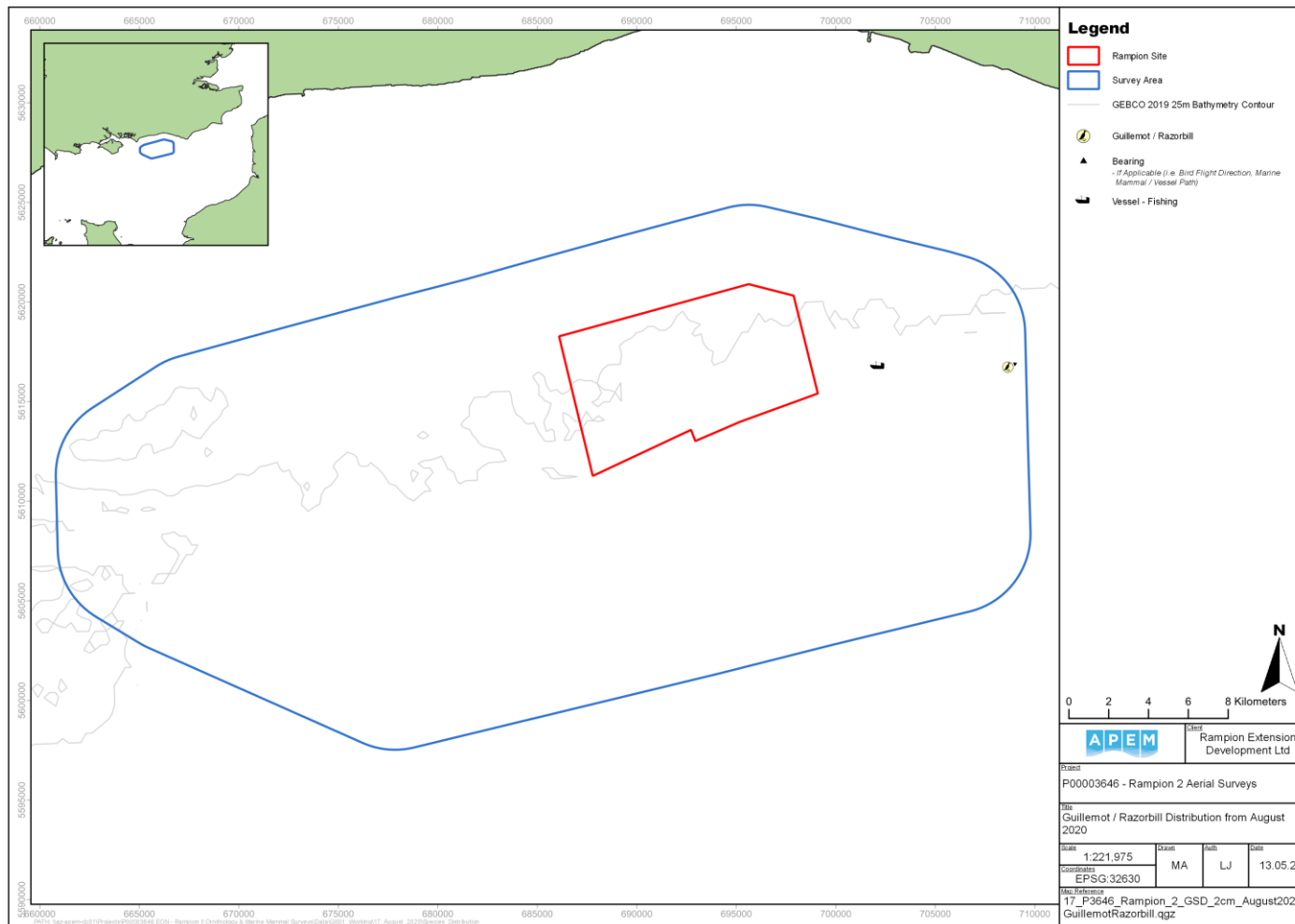


Figure 129 Location of a guillemot and / or razorbill recorded in the Rampion 2 Survey Area in August 2020

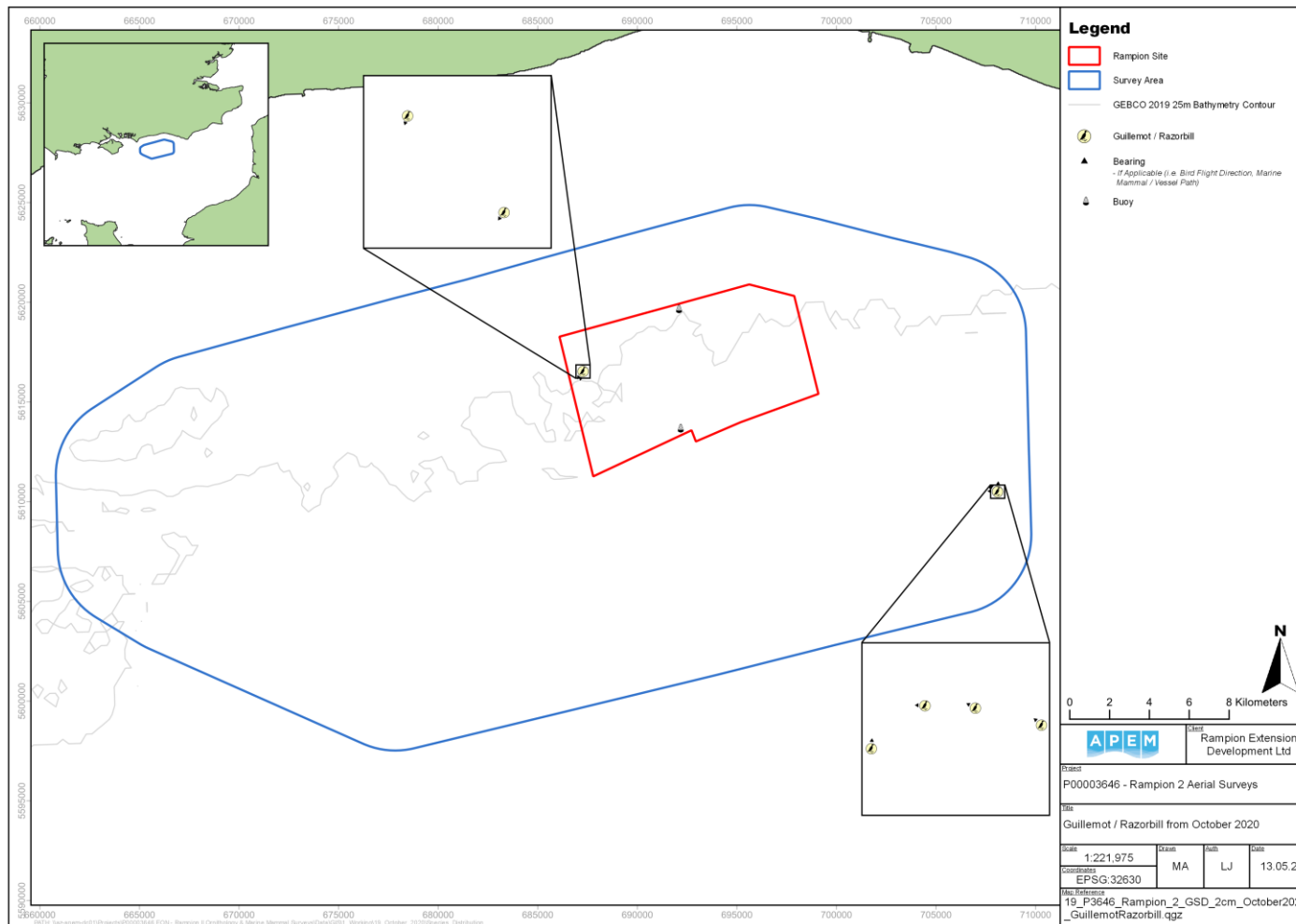


Figure 130 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in October 2020

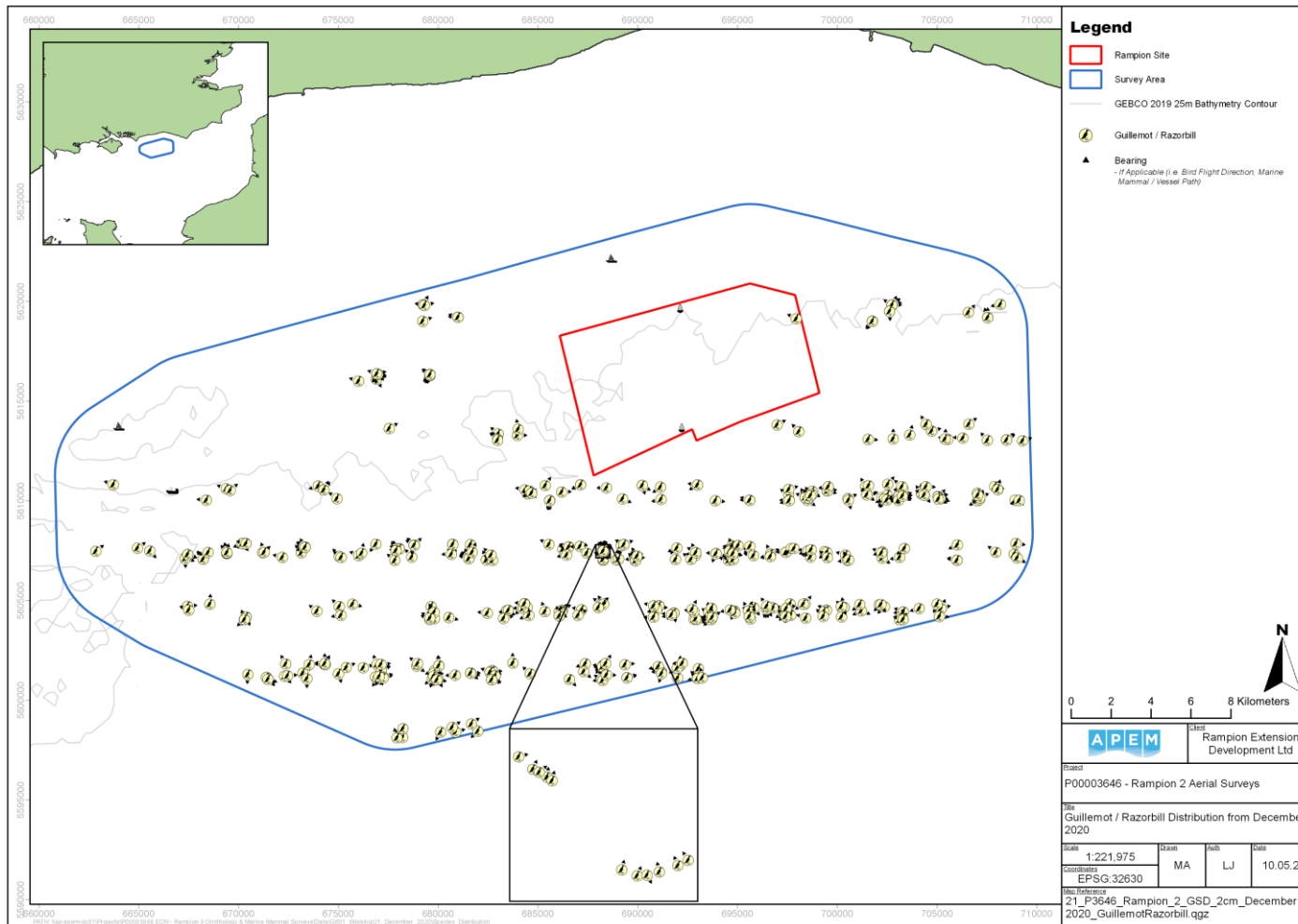


Figure 131 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in December 2020

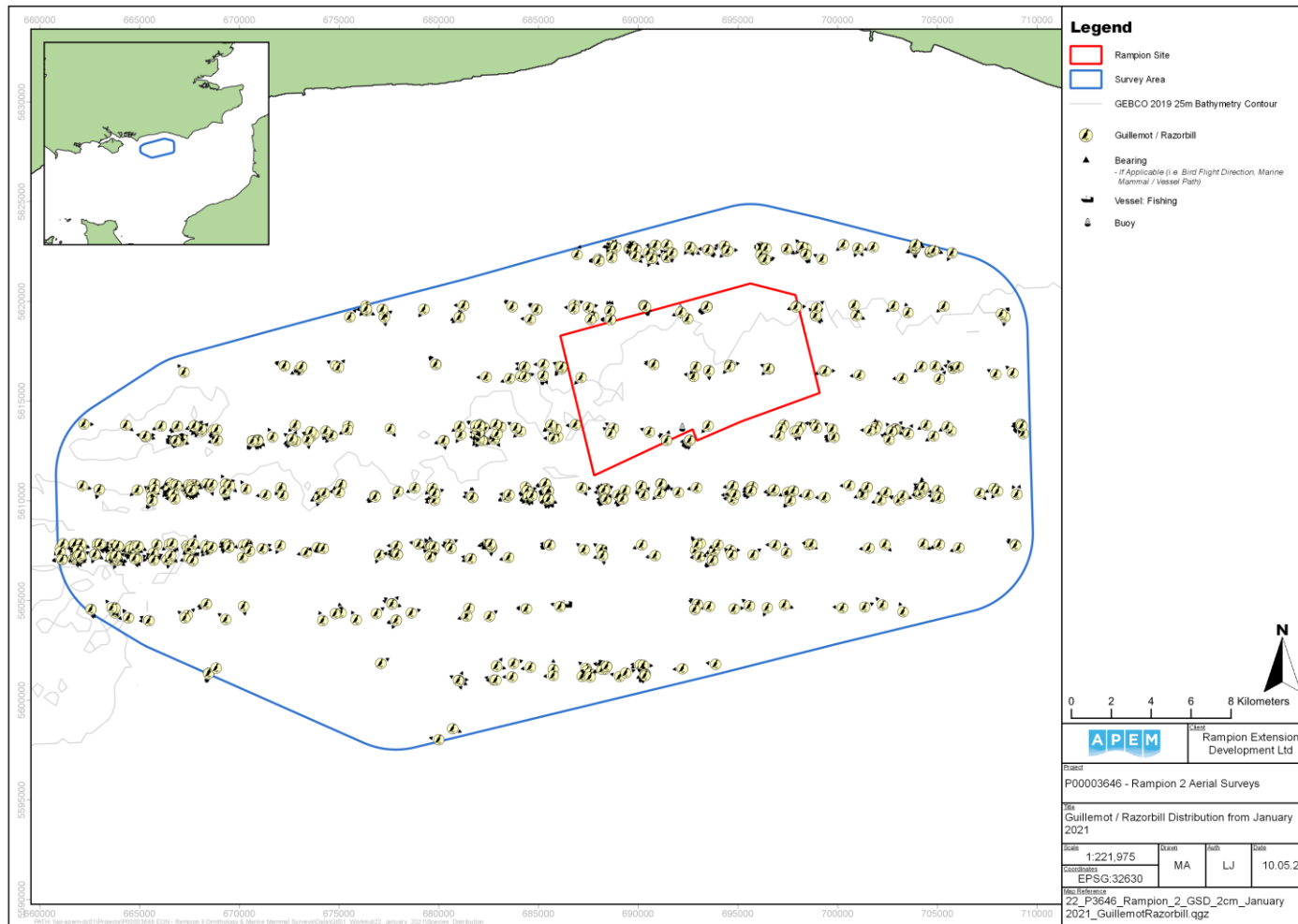


Figure 132 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in January 2021

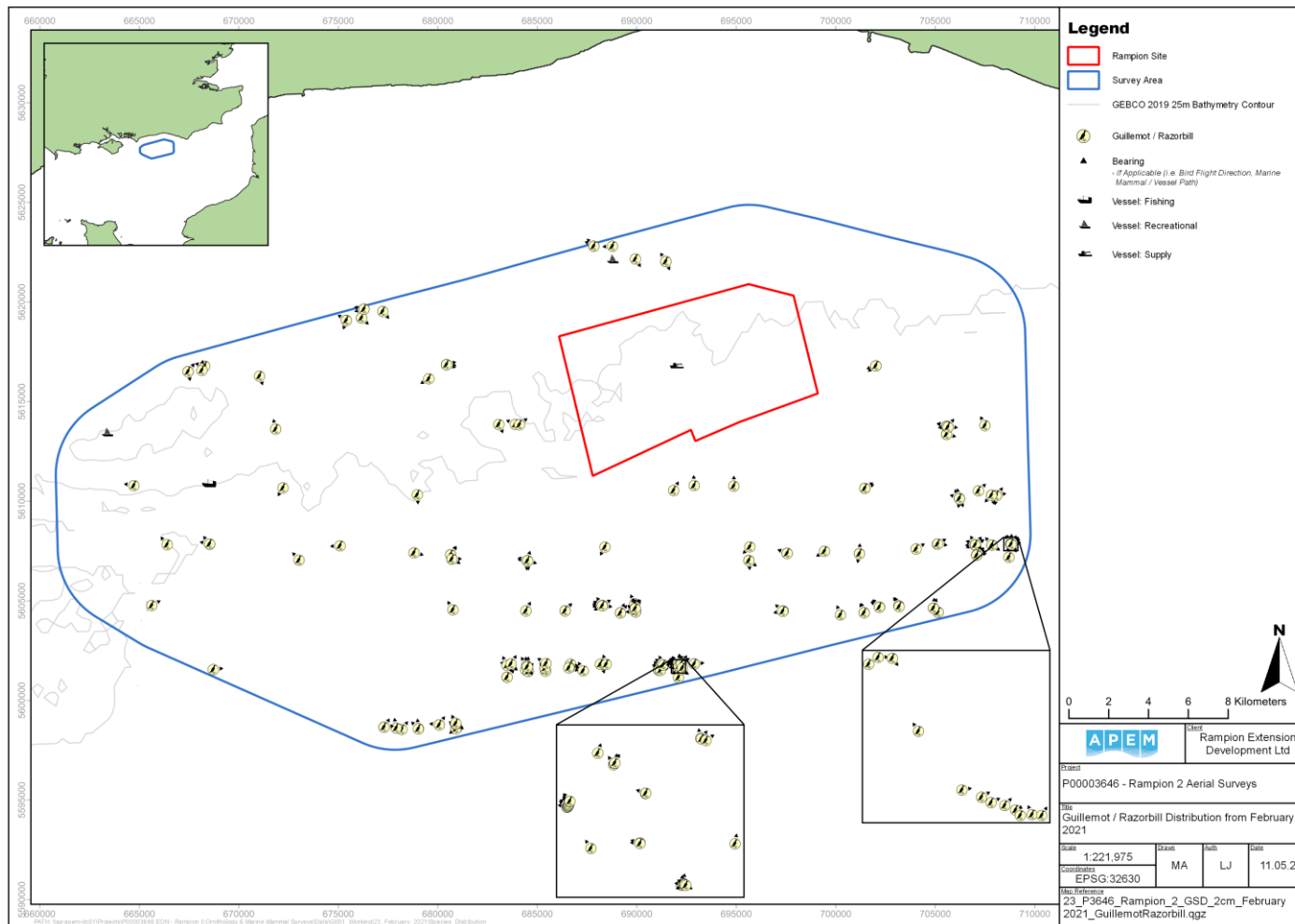


Figure 133 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in February 2021

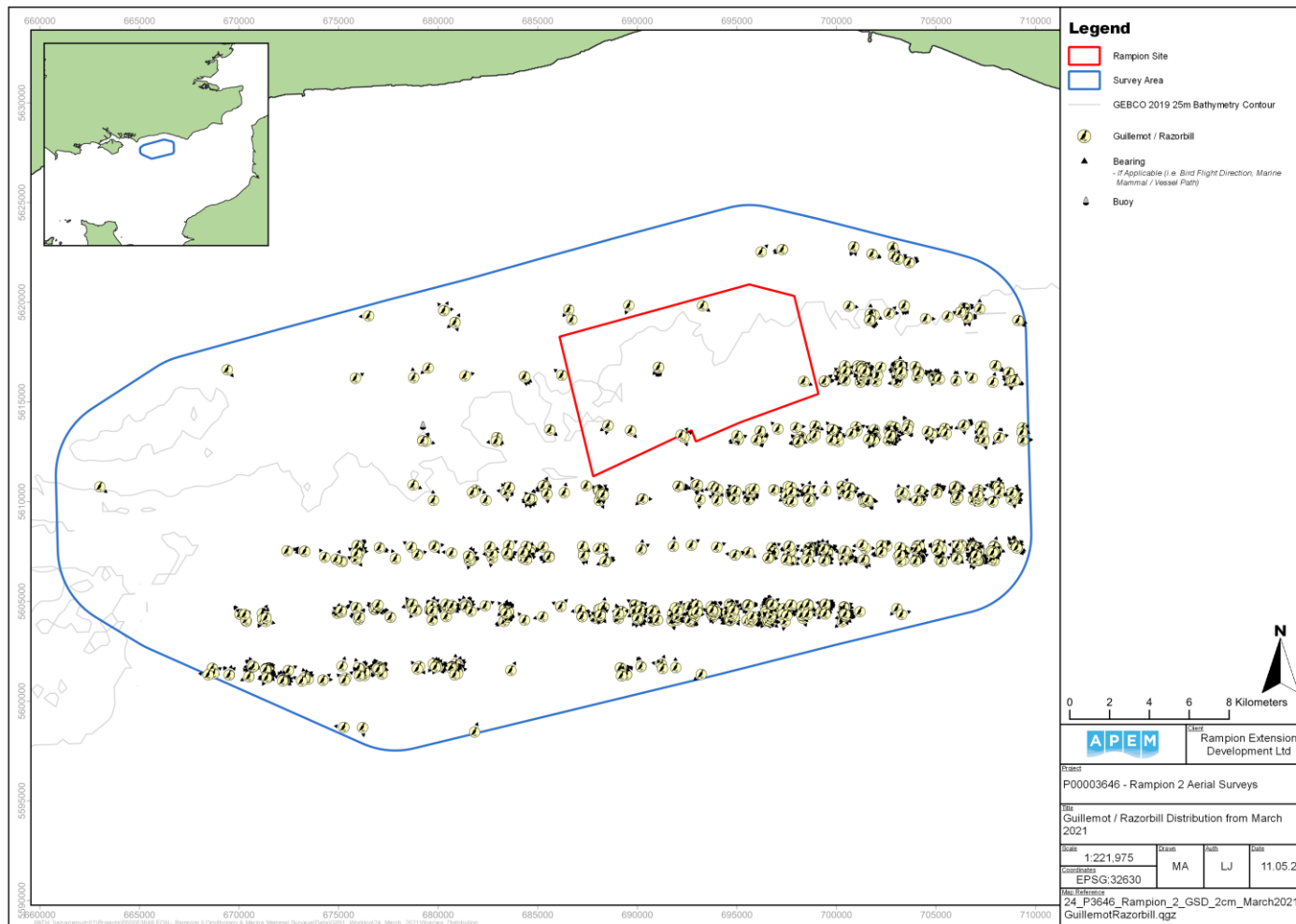


Figure 134 Distribution of guillemots and / or razorbills recorded in the Rampion 2 Survey Area in March 2021

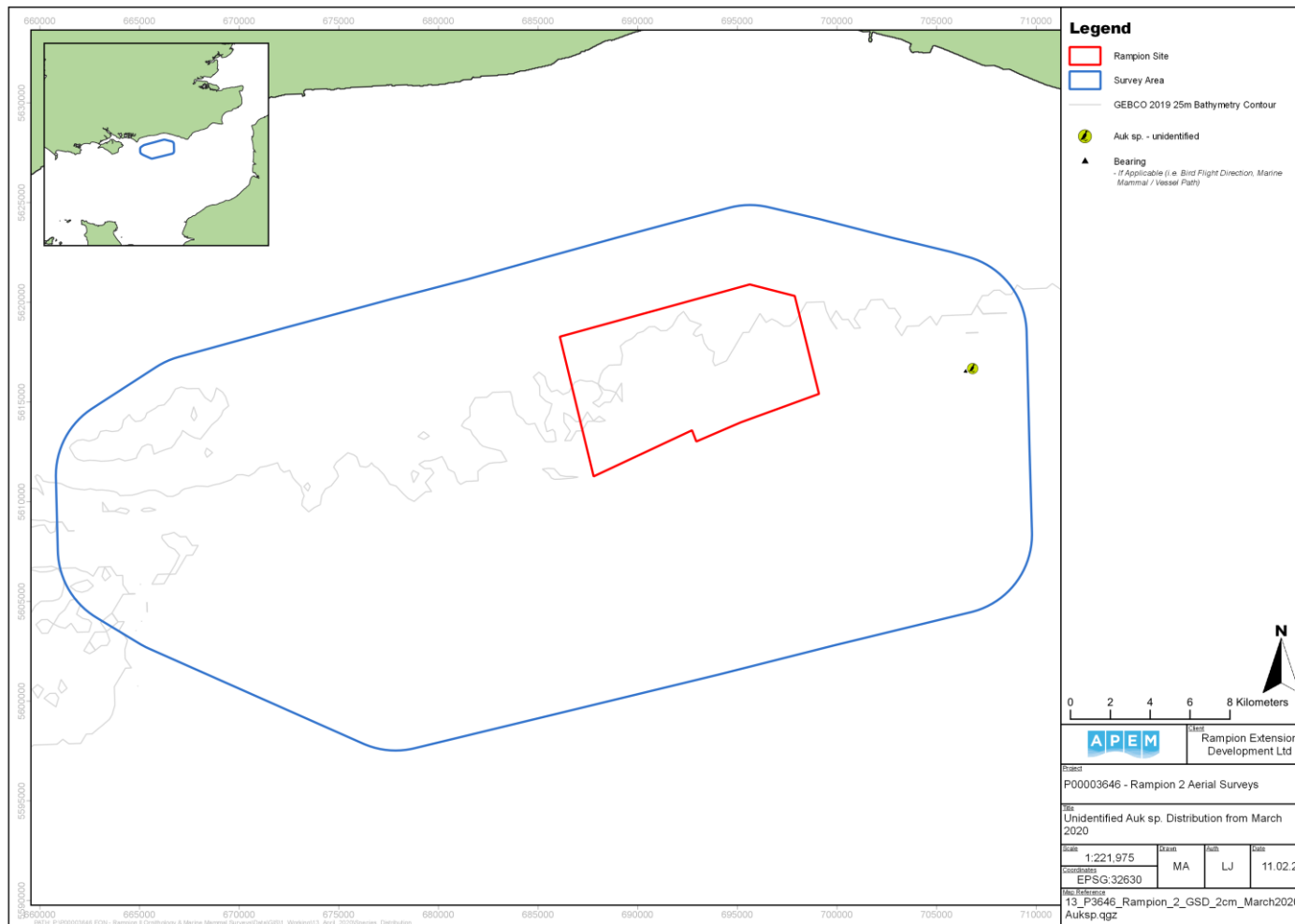


Figure 135 Location of an unidentified auk recorded in the Rampion 2 Survey Area in April 2020

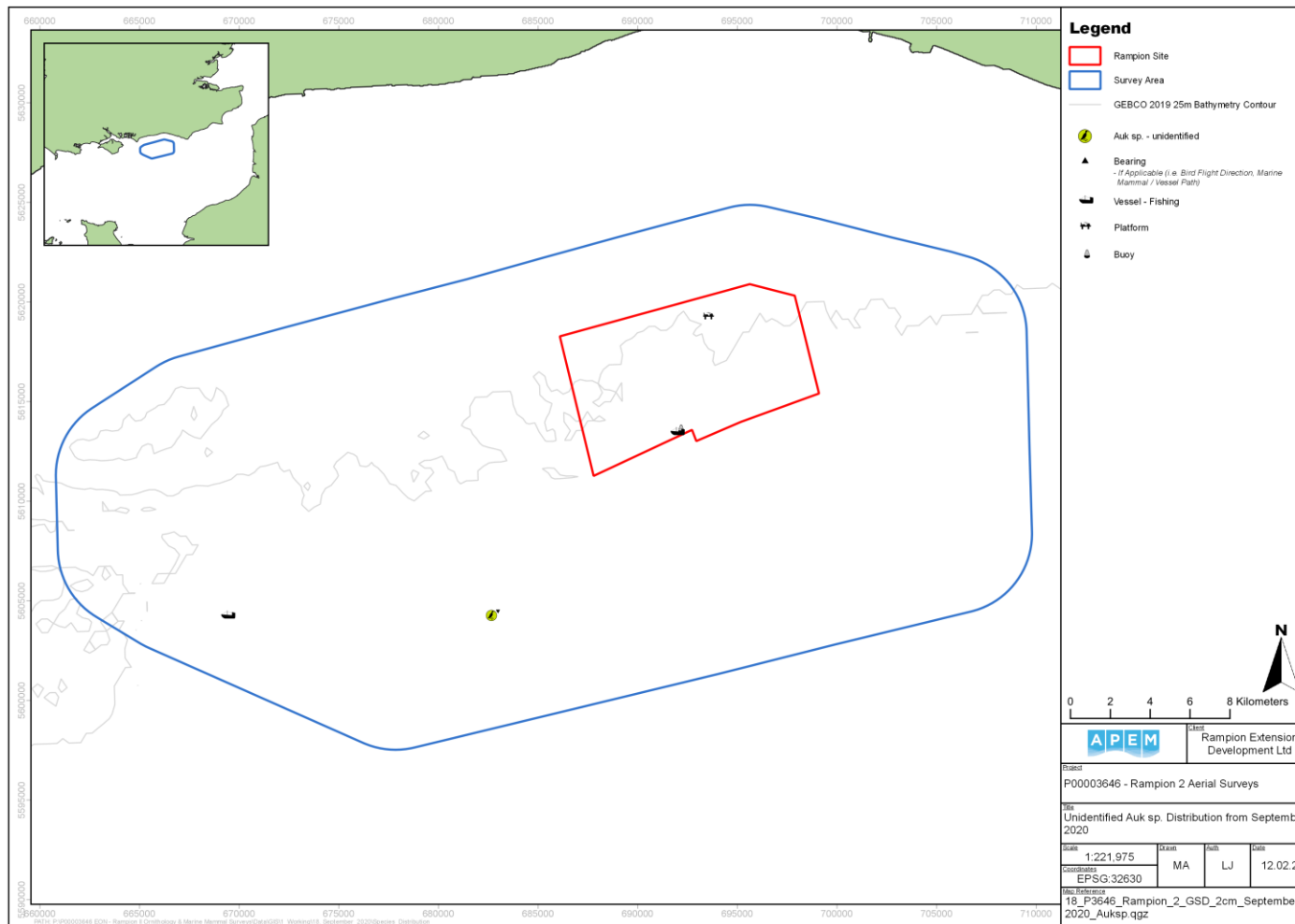


Figure 136 Location of an unidentified auk recorded in the Rampion 2 Survey Area in September 2020

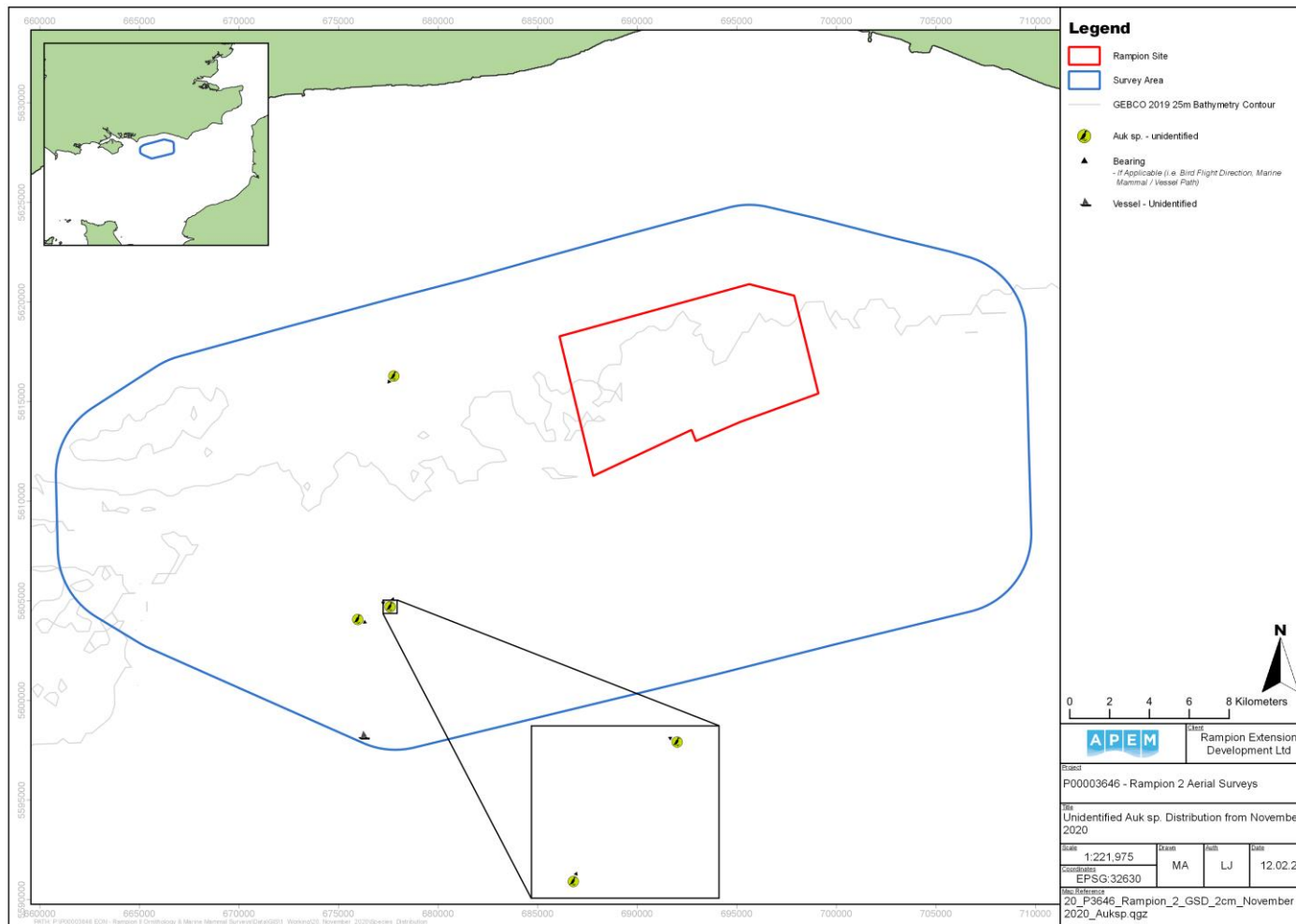


Figure 137 Distribution of unidentified auks recorded in the Rampion 2 Survey Area in November 2020

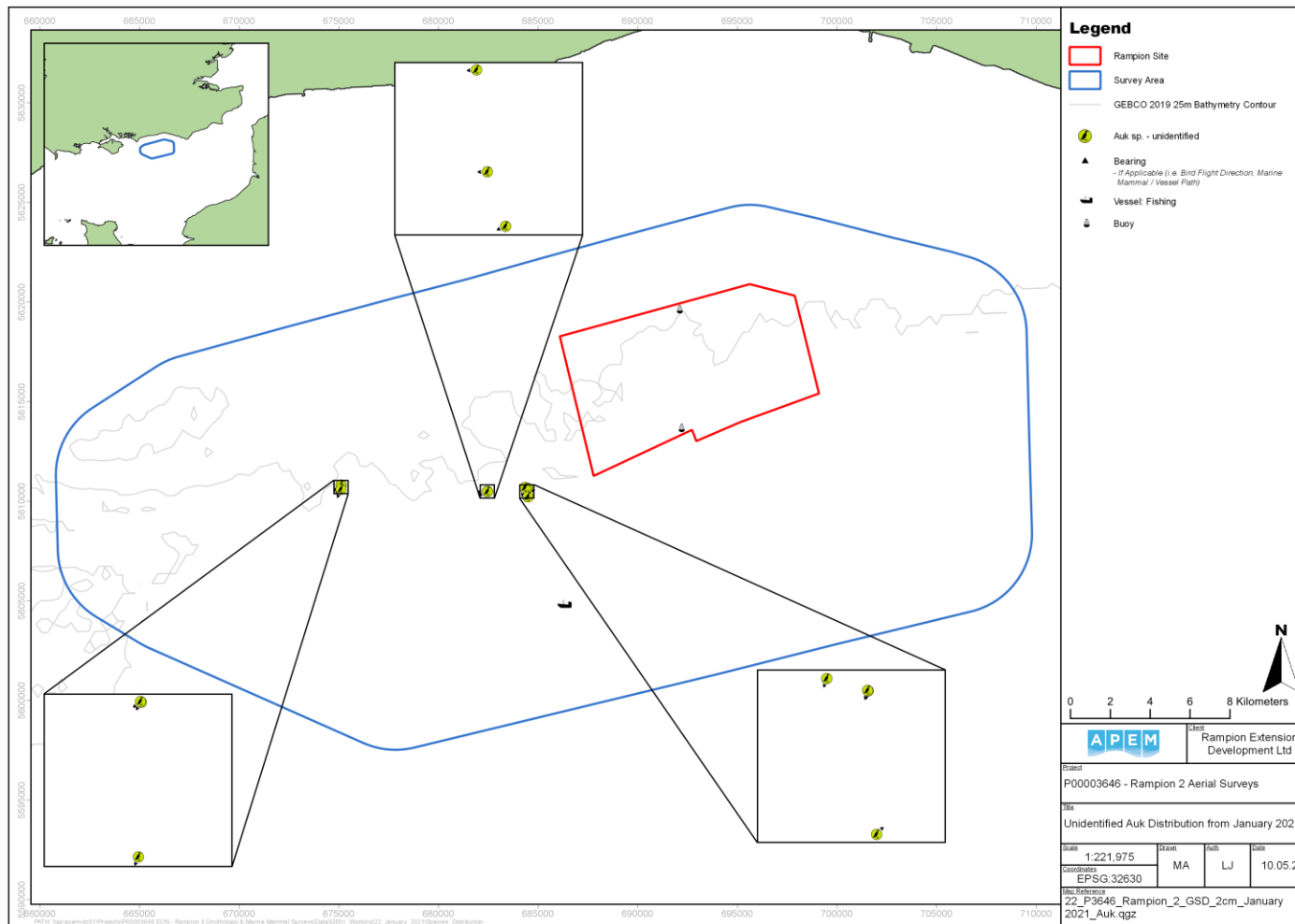


Figure 138 Distribution of unidentified auks recorded in the Rampion 2 Survey Area in January 2020

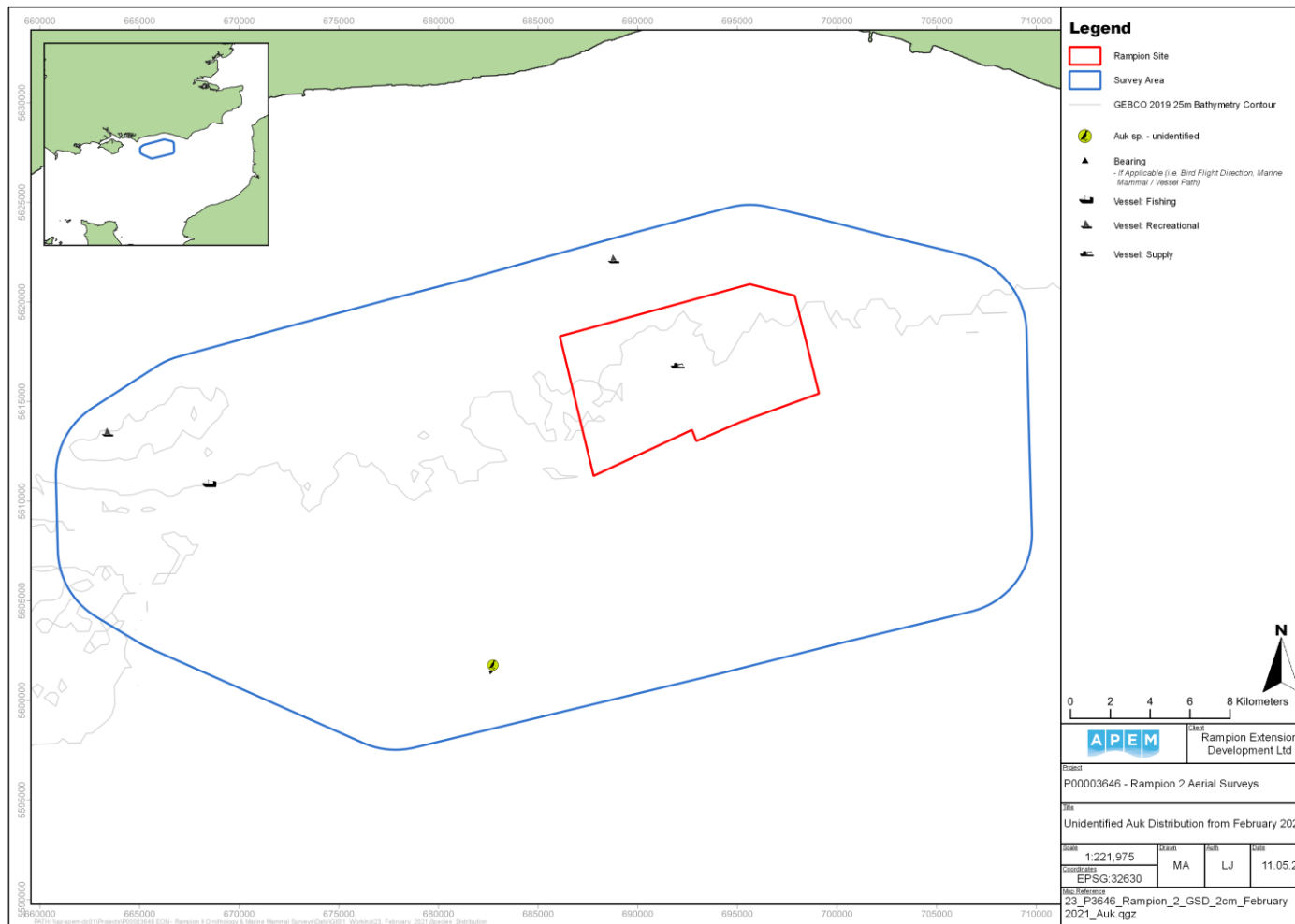


Figure 139 Location of an unidentified auk recorded in the Rampion 2 Survey Area in February 2021

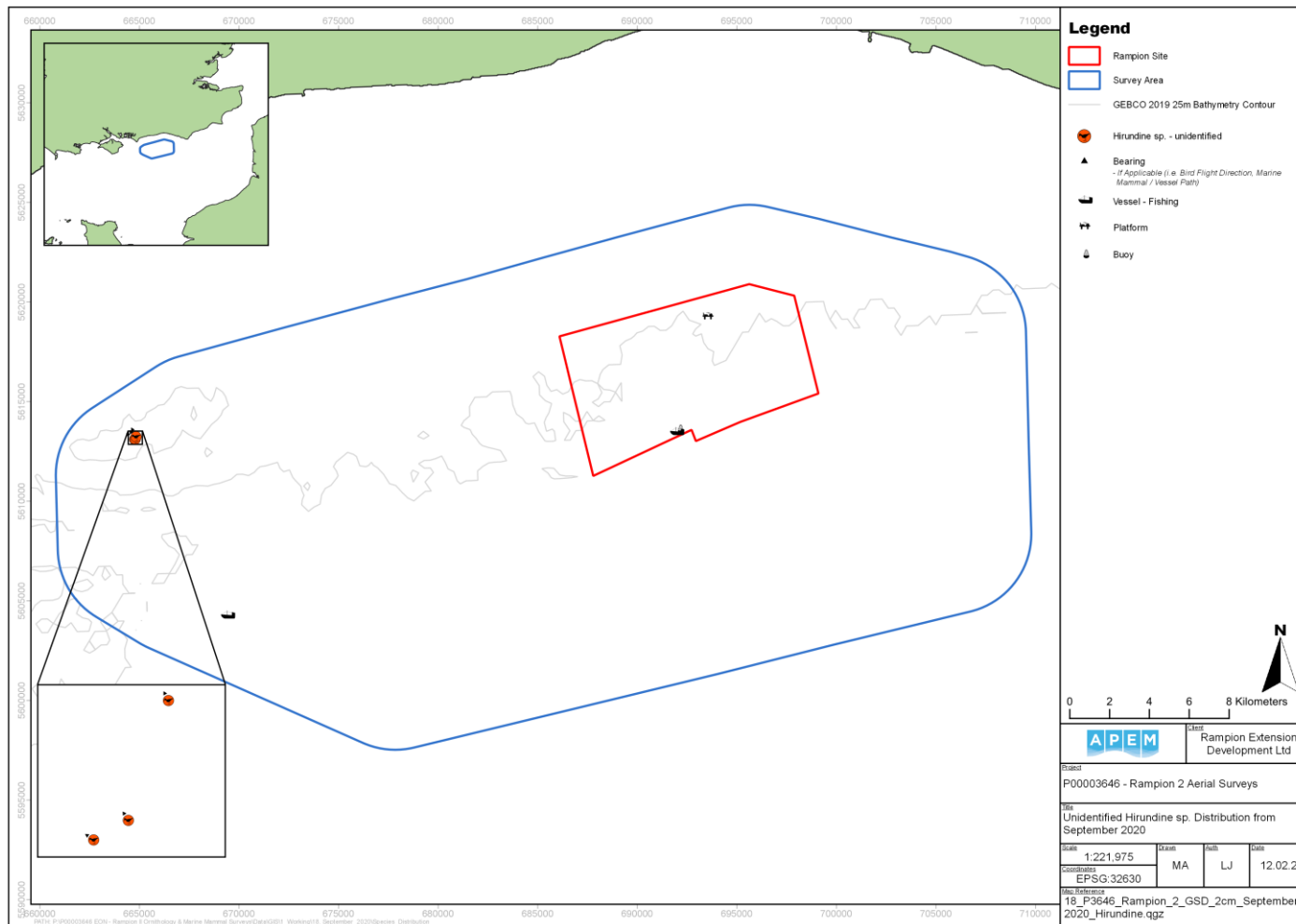


Figure 140 Distribution of unidentified hirundinids recorded in the Rampion 2 Survey Area in September 2020

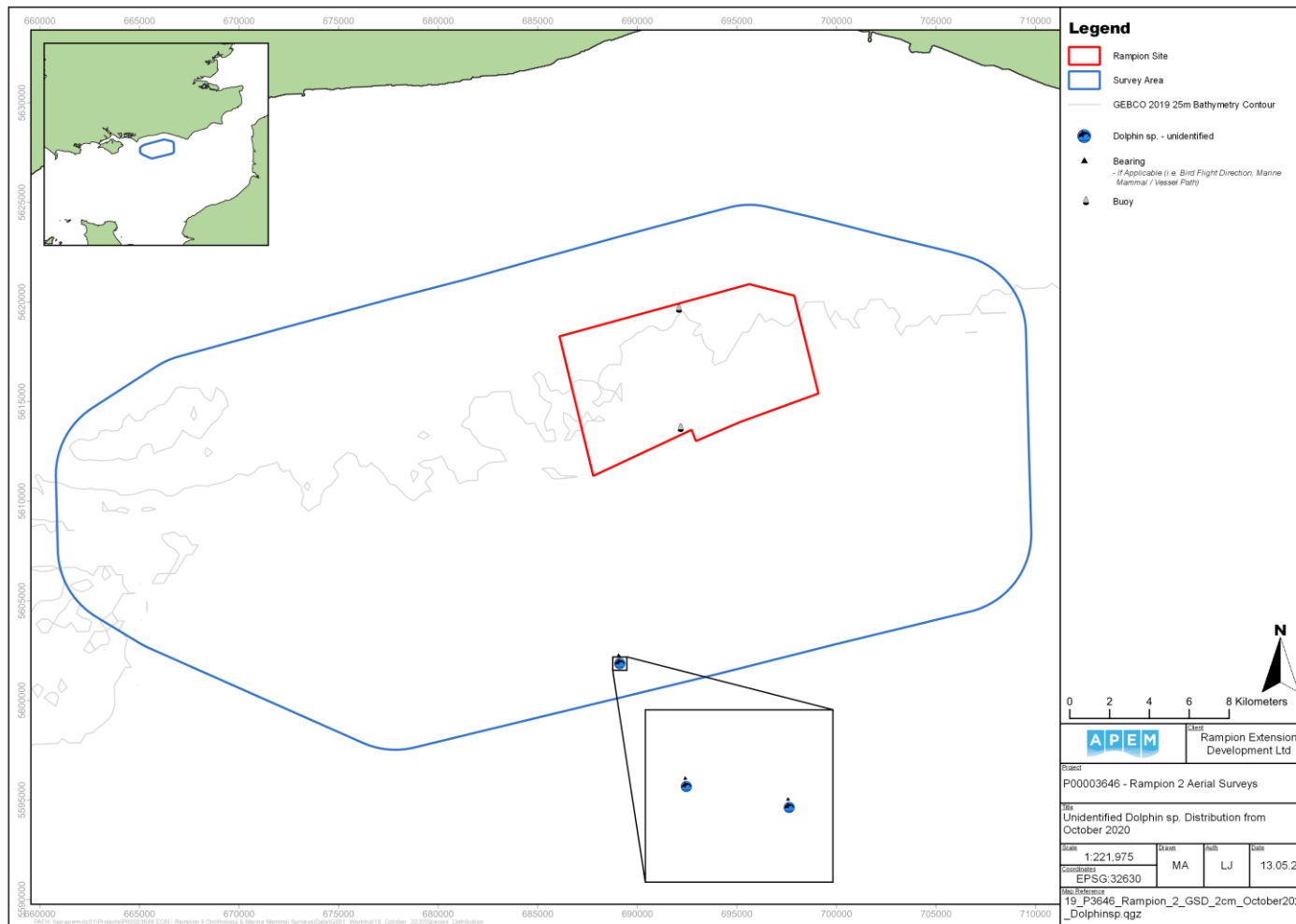


Figure 141 Distribution of unidentified dolphins recorded in the Rampion 2 Survey Area in October 2020

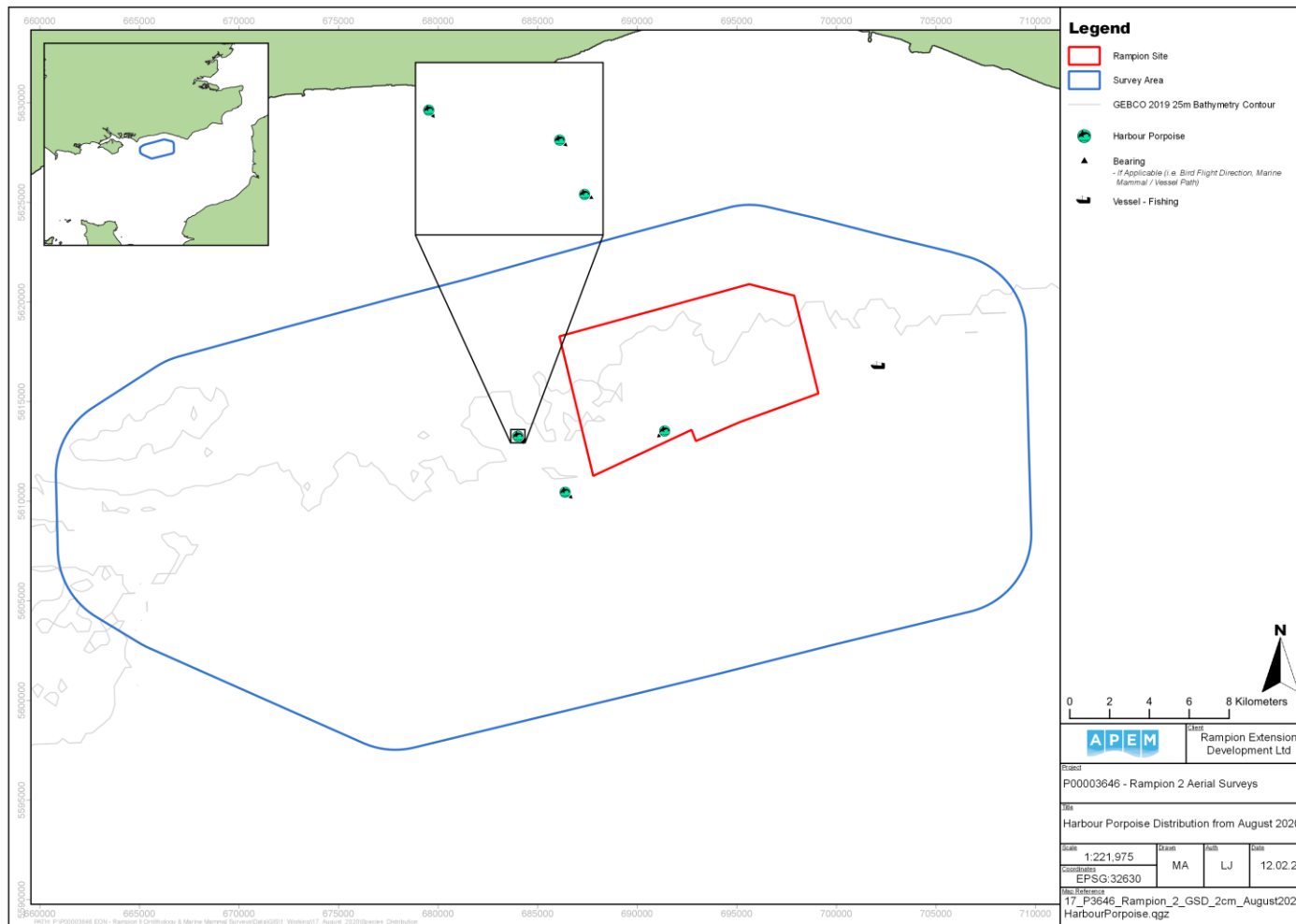


Figure 142 Distribution of harbour porpoises recorded in the Rampion 2 Survey Area in August 2020

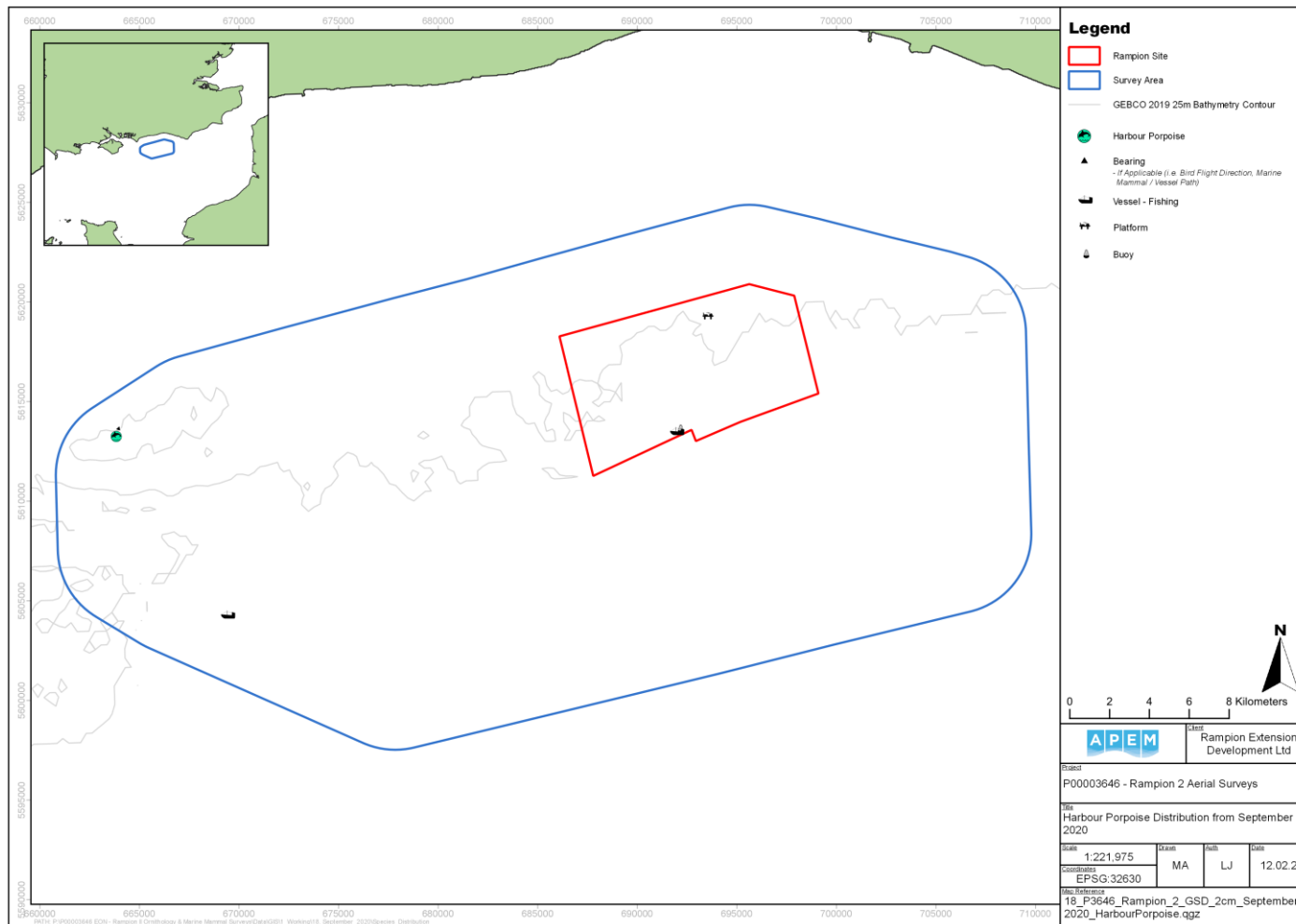


Figure 143 Location of an harbour porpoise recorded in the Rampion 2 Survey Area in September 2020

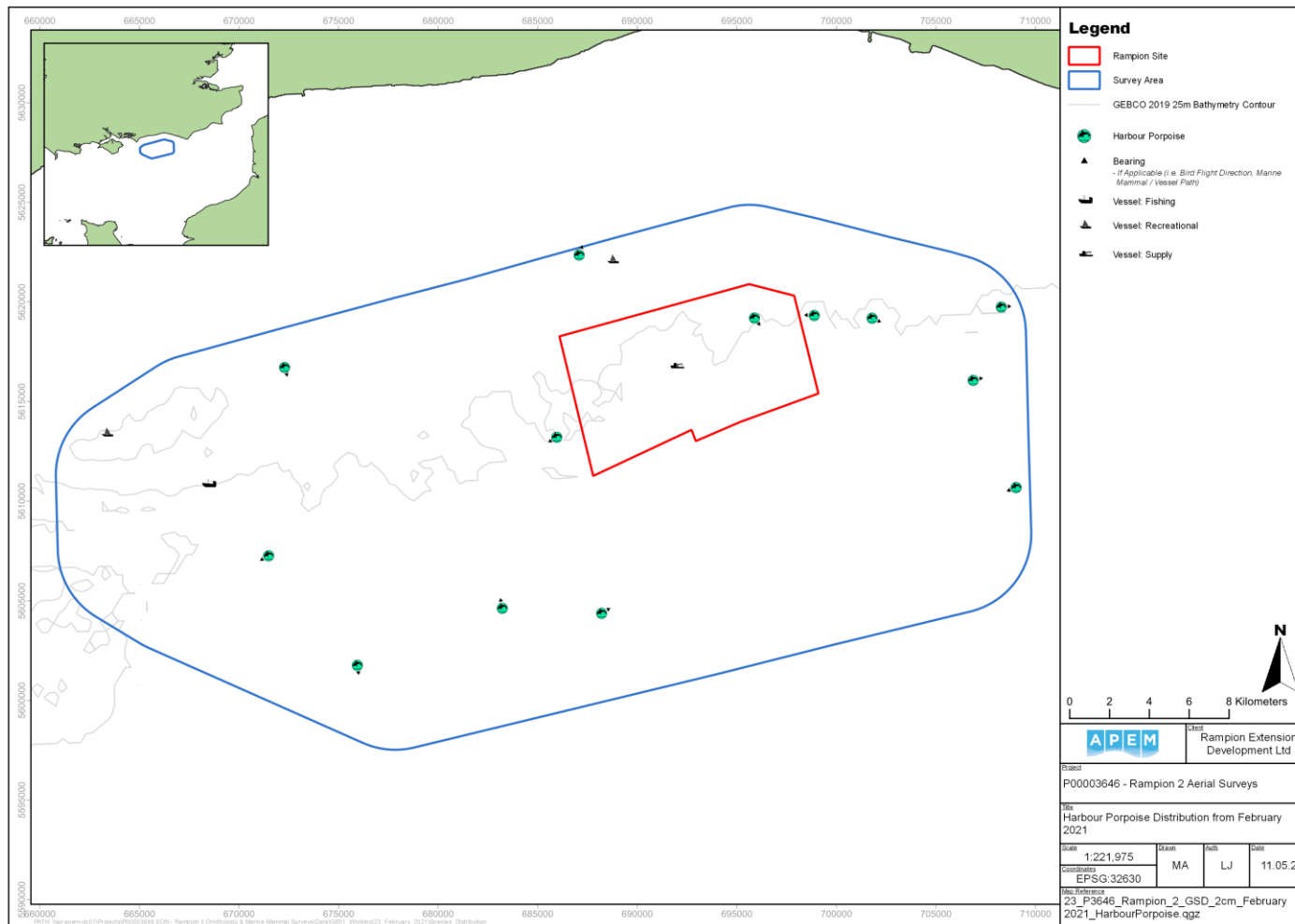


Figure 144 Distribution of harbour porpoises recorded in the Rampion 2 Survey Area in February 2021

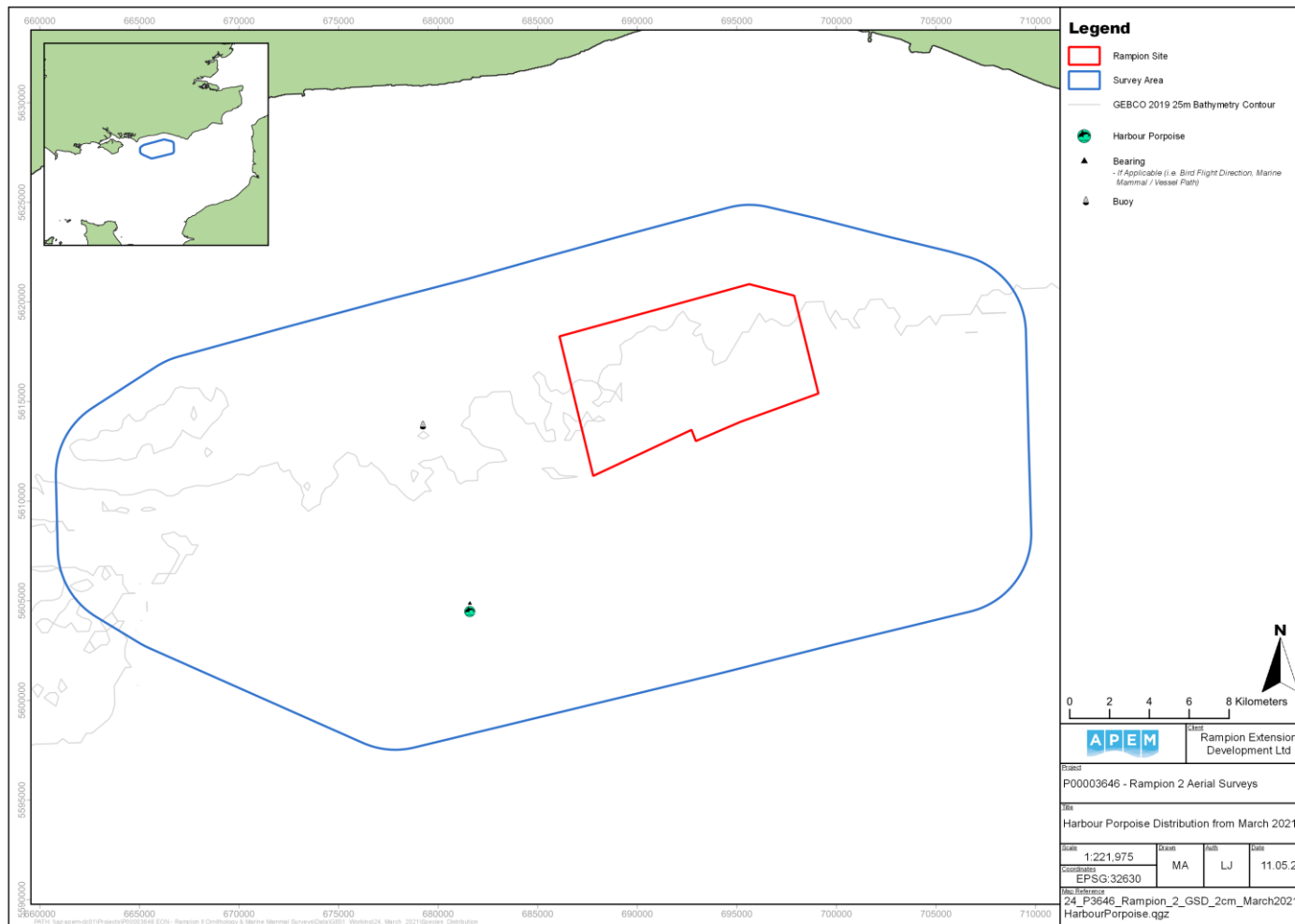


Figure 145 Location of an harbour porpoise recorded in the Rampion 2 Survey Area in March 2021

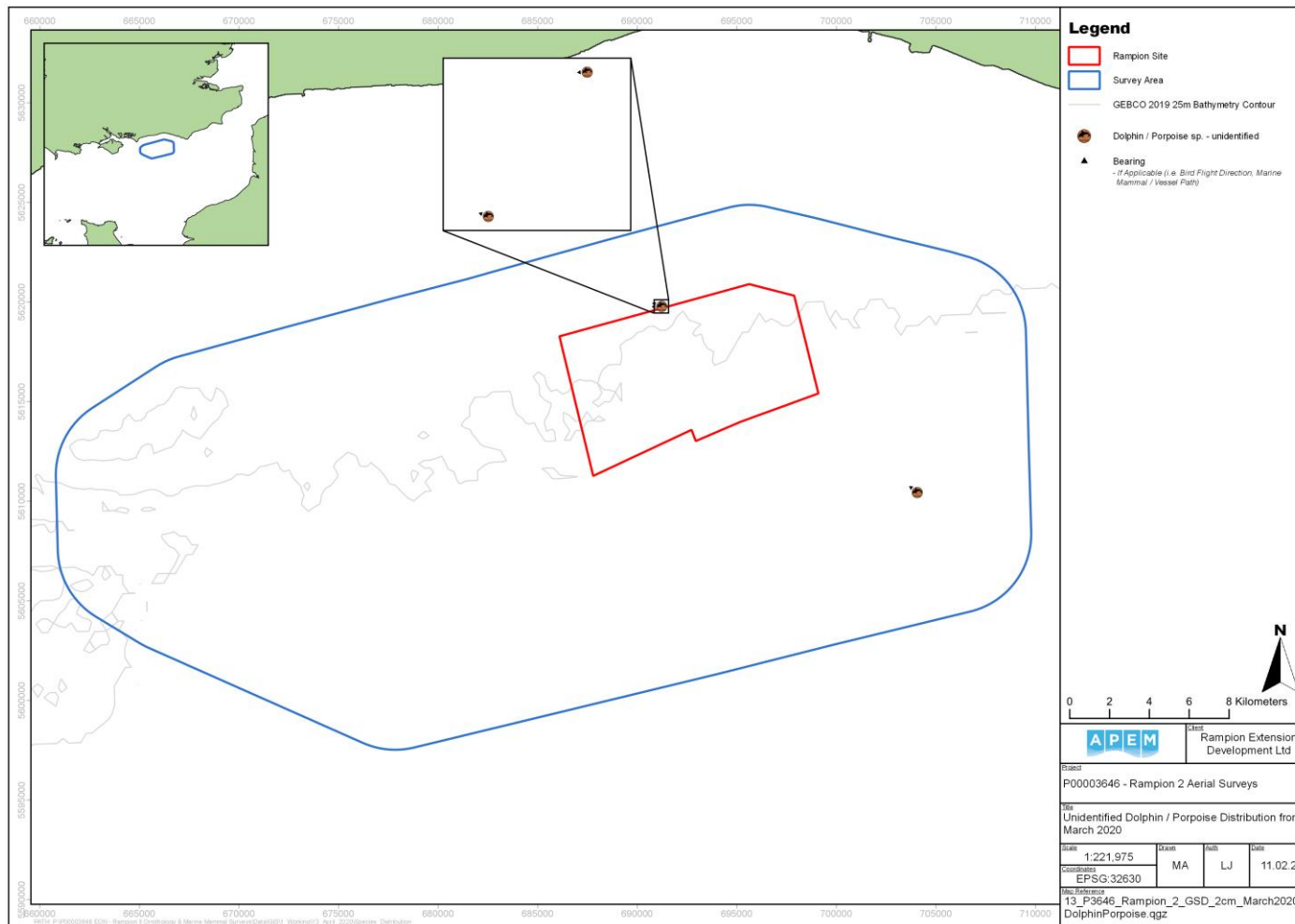


Figure 146 Distribution of unidentified dolphins and / or porpoises recorded in the Rampion 2 Survey Area in April 2020

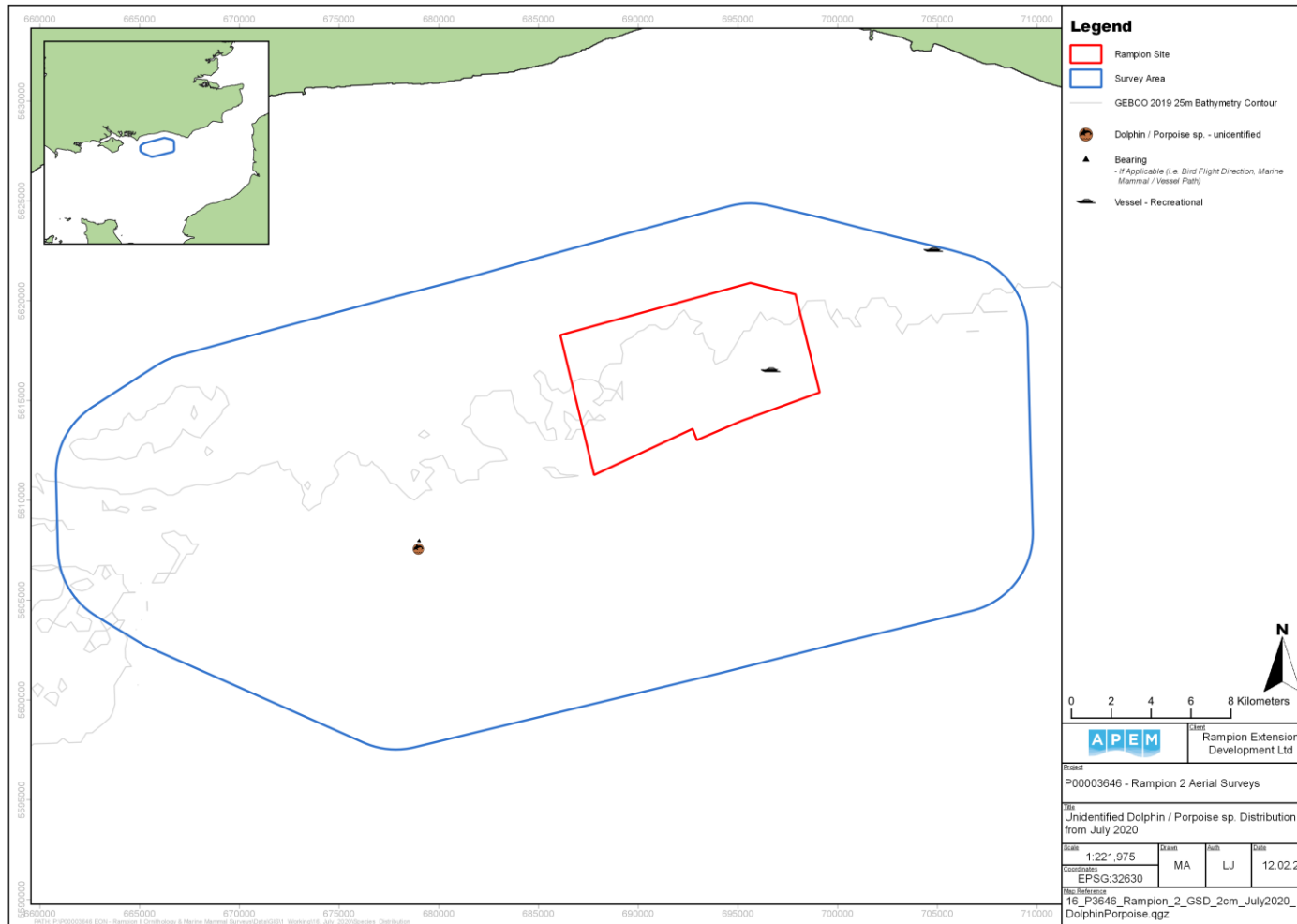


Figure 147 Location of an unidentified dolphin and / or porpoise recorded in the Rampion 2 Survey Area in July 2020

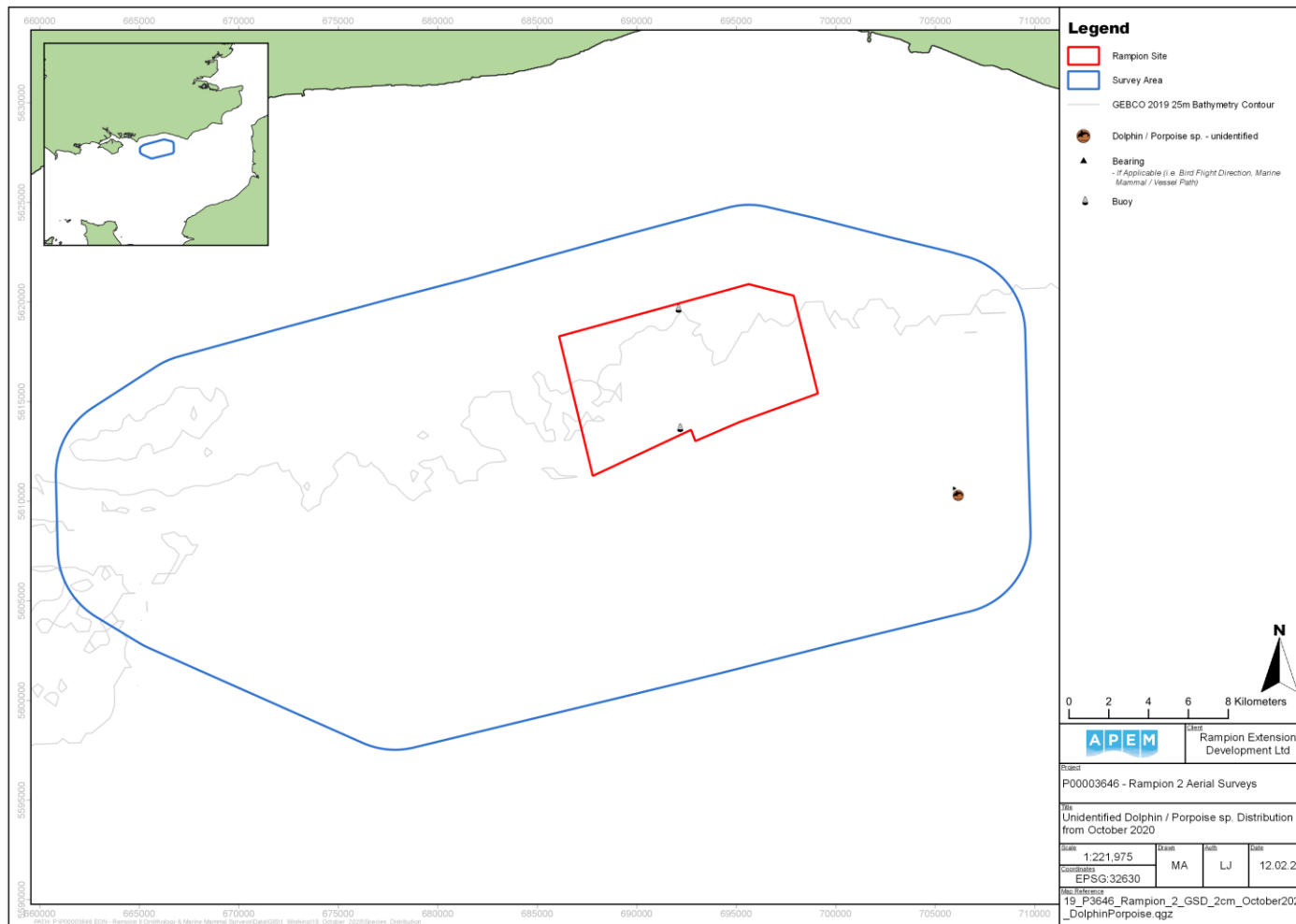


Figure 148 Location of an unidentified dolphin and / or porpoise recorded in the Rampion 2 Survey Area in October 2020

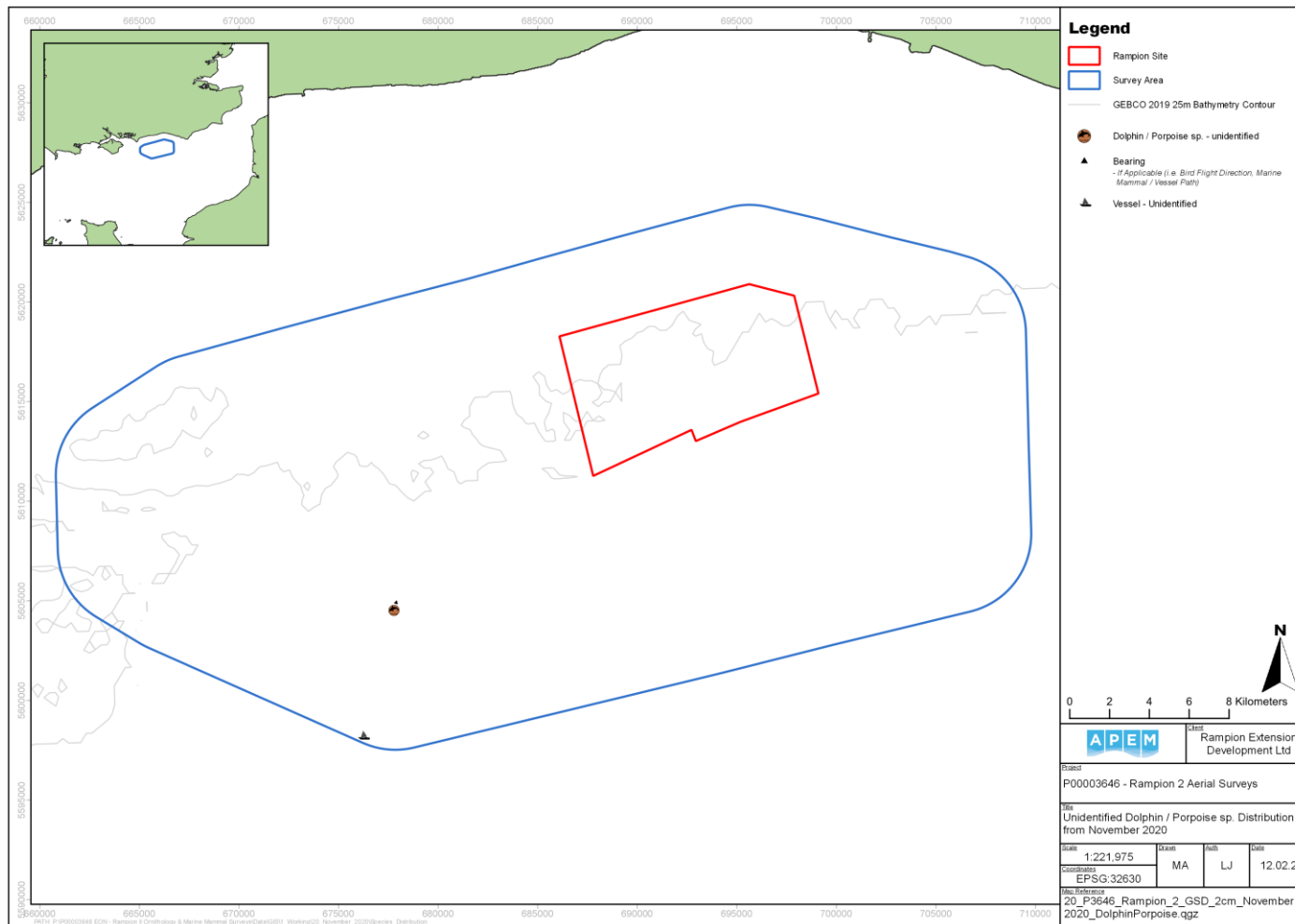


Figure 149 Location of an unidentified dolphin and / or porpoise recorded in the Rampion 2 Survey Area in November 2020

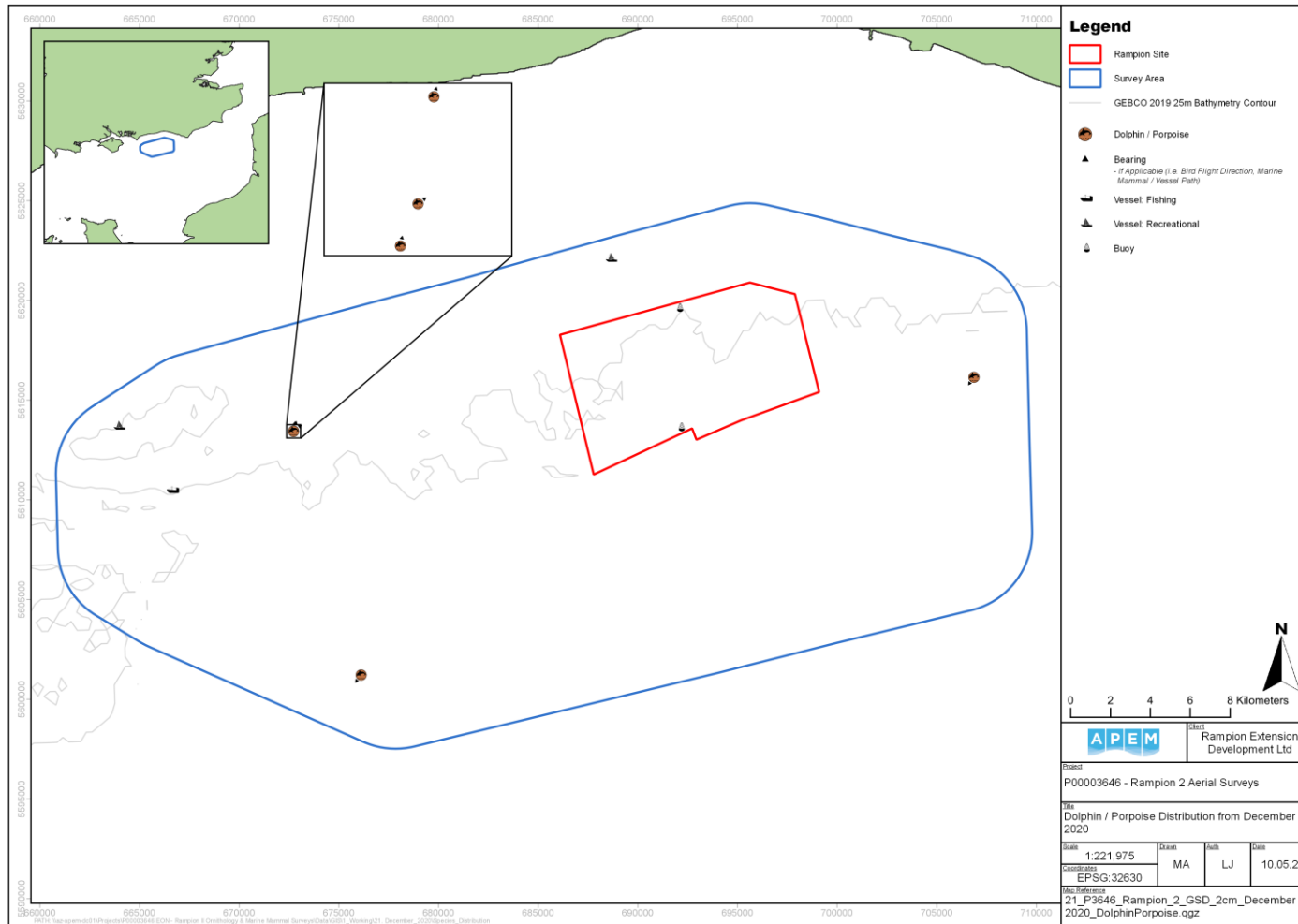


Figure 150 Distribution of unidentified dolphins and / or porpoises recorded in the Rampion 2 Survey Area in December 2020

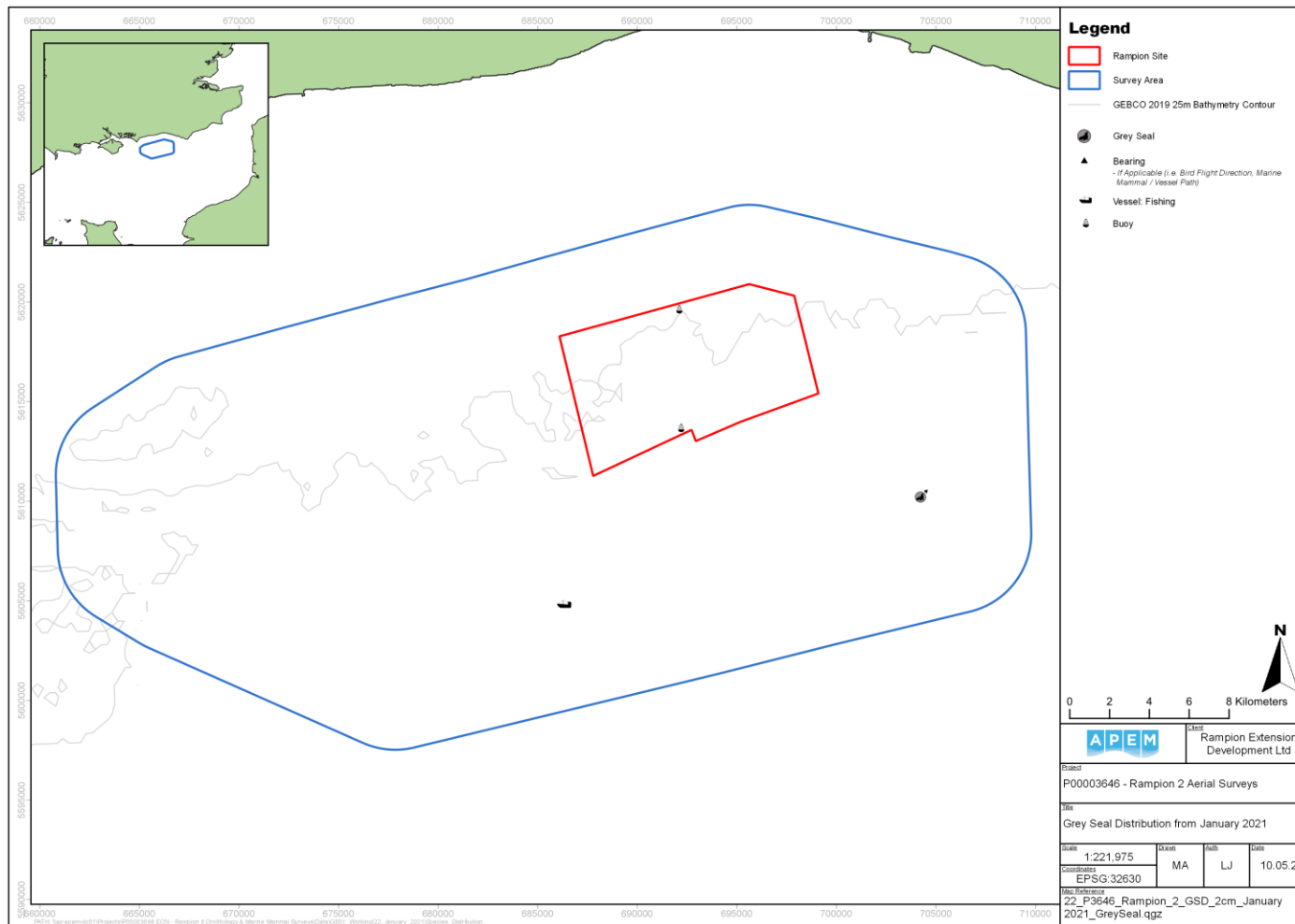


Figure 151 Distribution of grey seals recorded in the Rampion 2 Survey Area in January 2021

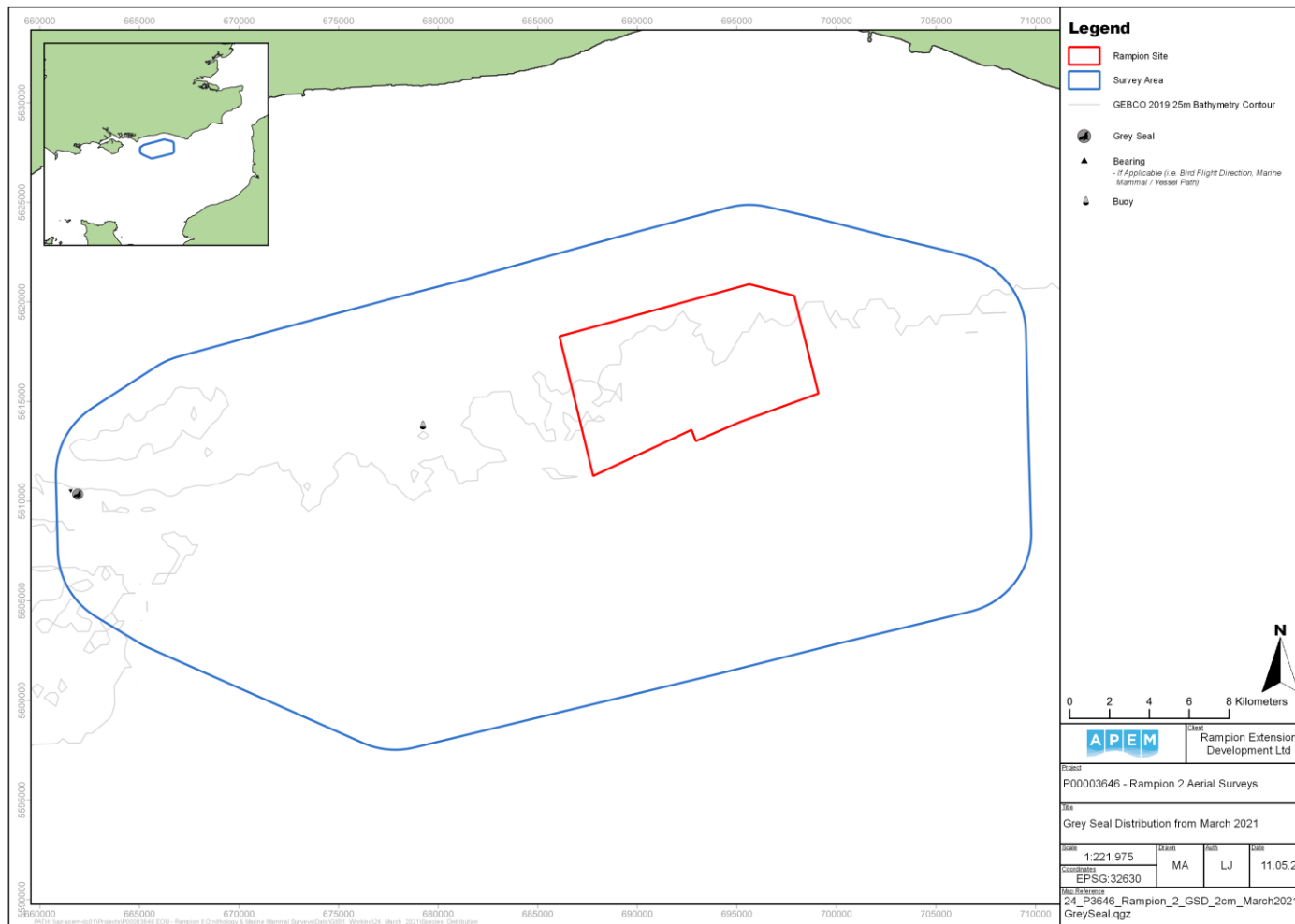


Figure 152 Distribution of grey seals recorded in the Rampion 2 Survey Area in March 2021

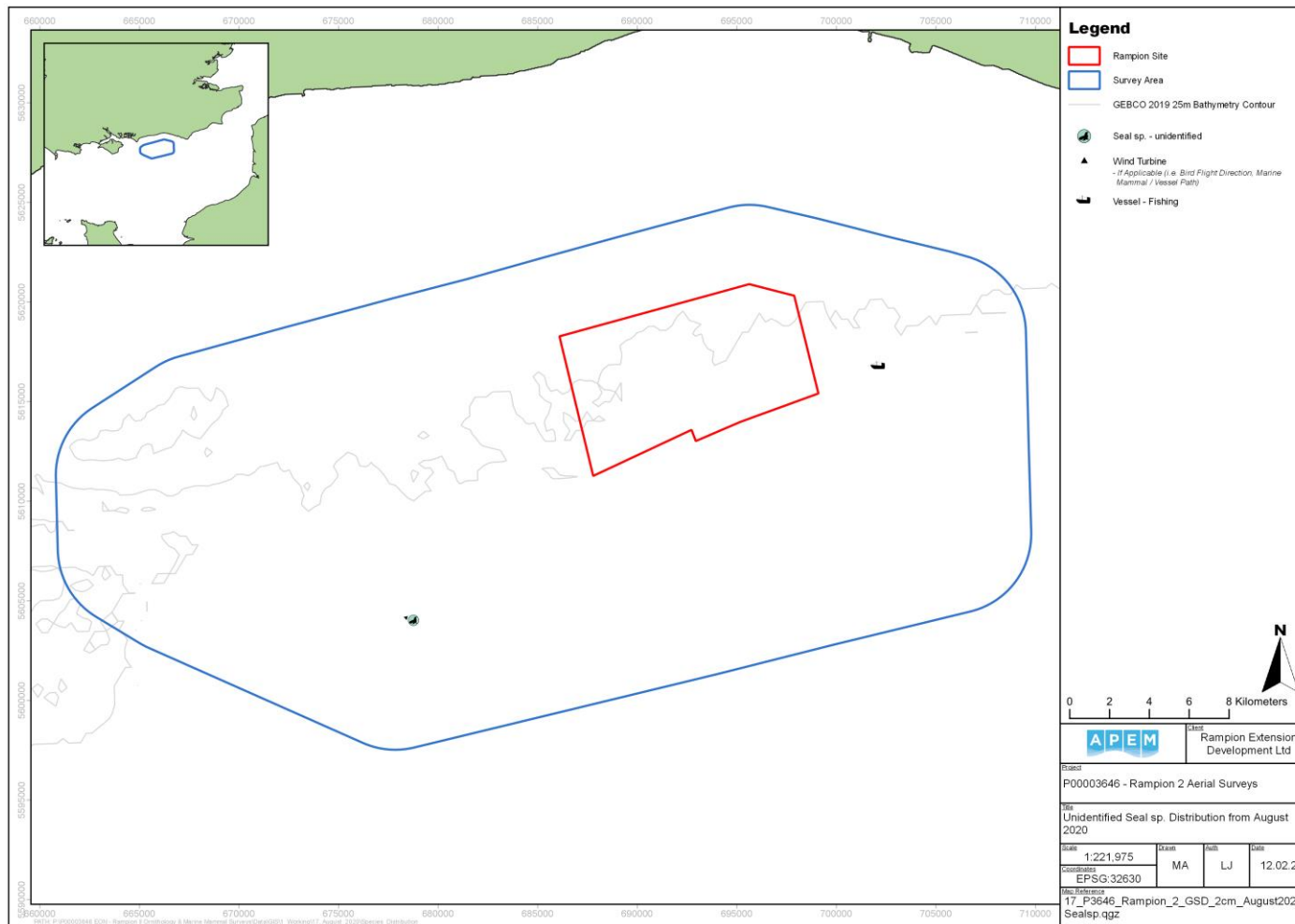


Figure 153 Location of an unidentified seal recorded in the Rampion 2 Survey Area in August 2020

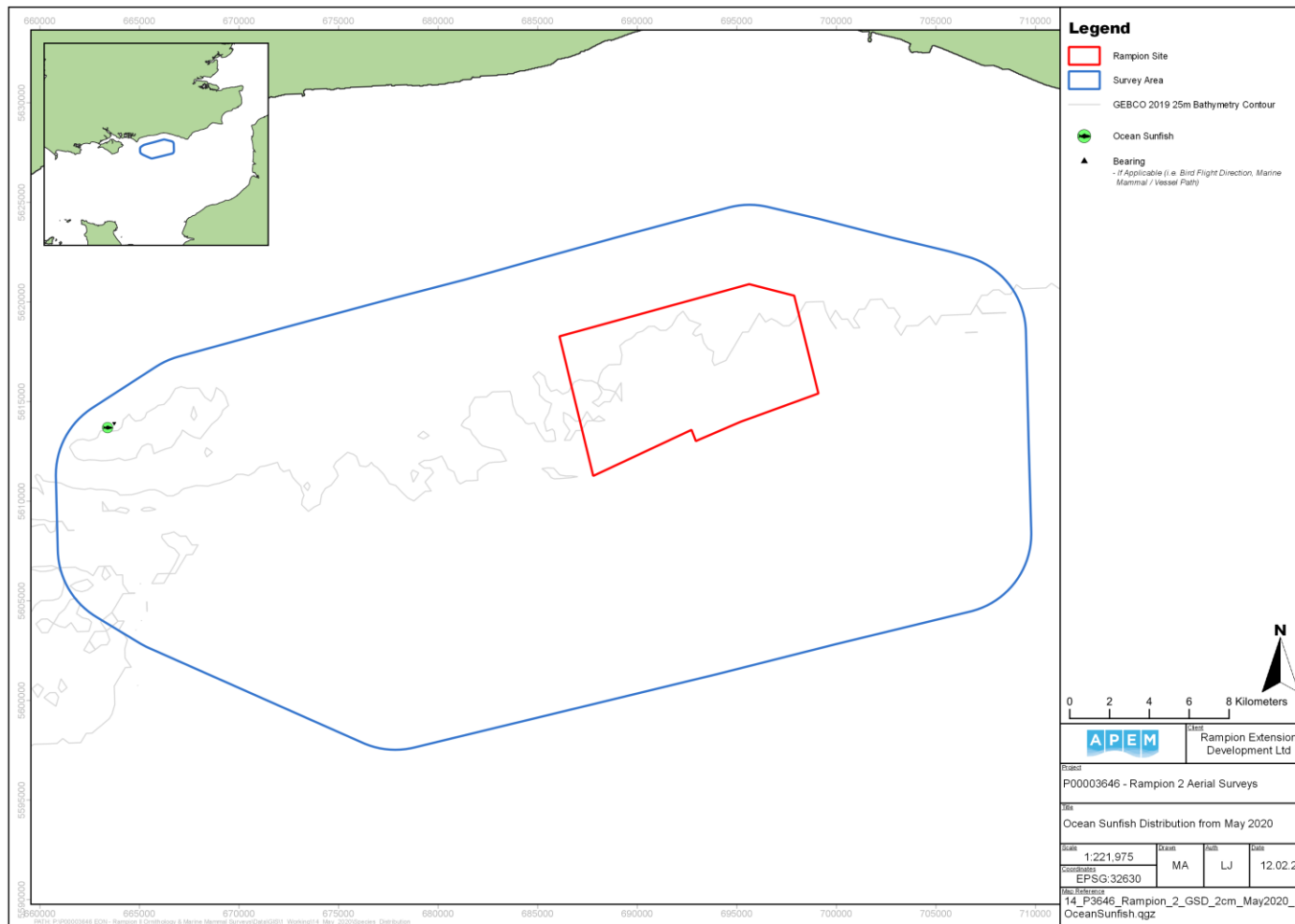


Figure 154 Distribution of ocean sunfish recorded in the Rampion 2 Survey Area in May 2020

Appendix III Species Behaviours

Table 1 Common scoter behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	7	0	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Apr-20	7	0	0	0

Table 2 Red-throated diver behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Dec-20	3	0	0	0
Jan-21	0	2	0	0
Feb-21	0	3	0	0
Mar-21	0	1	0	0

Table 3 Unidentified diver behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Feb-21	0	1	0	0
Mar-21	0	1	0	0

Table 4 Cormorant behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Oct-20	5	0	0	0
Feb-21	0	6	0	0

Table 5 Cormorant / shag behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	0	1	0	0
Mar-21	0	0	0	2
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched

Mar-21	0	0	0	2
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Table 6 Fulmar behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
May-20	1	1	0	0
Jul-20	1	0	0	0
Aug-20	1	0	0	0
Nov-20	1	0	0	0
Dec-20	0	1	0	0
Jan-21	0	1	0	0
Mar-21	0	2	0	0

Table 7 Little egret behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Dec-20	1	0	0	0

Table 8 Gannet behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	9	1	0	0
May-20	8	14	0	0
Jun-20	10	7	0	0
Jul-20	3	4	0	0
Aug-20	2	2	0	0
Sep-20	1	3	0	0
Oct-20	4	3	0	0
Nov-20	2	2	0	0
Dec-20	13	9	0	0
Jan-21	23	98	0	0
Feb-21	5	7	0	0
Mar-21	8	59	0	0

Table 9 Kittiwake behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Jun-20	2	18	0	0

Aug-20	2	0	0	0
Sep-20	1	2	0	0
Nov-20	6	6	0	0
Dec-20	140	96	0	0
Jan-21	155	61	0	0
Feb-21	29	25	0	0
Mar-21	109	193	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Nov-20	1	1	0	0
Dec-20	18	75	0	0
Jan-21	22	1	0	0
Mar-21	0	12	0	0

Table 10 Black-headed gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Jan-21	1	0	0	0
Mar-21	1	0	0	0

Table 11 Mediterranean gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Dec-20	1	0	0	0
Feb-21	1	0	0	0

Table 12 Common gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Nov-20	1	0	0	0
Dec-20	26	2	0	0
Jan-21	6	0	0	0
Feb-21	21	0	0	0
Mar-21	12	2	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Dec-20	5	0	0	0
Jan-21	1	0	0	0
Feb-21	2	0	0	0

Mar-21	1	0	0	0
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Table 13 Unidentified small gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	0	2	0	0
Jun-20	1	1	0	0
Jul-20	0	1	0	0
Aug-20	0	1	0	0
Dec-20	1	3	0	0
Jan-21	0	24	0	0
Feb-21	1	13	0	6
Mar-21	1	2	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Dec-20	0	2	0	0

Table 14 Great black-backed gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	3	5	0	0
Jul-20	2	6	0	3
Aug-20	5	6	0	5
Sep-20	3	18	0	14
Oct-20	0	2	0	1
Nov-20	1	1	0	0
Dec-20	6	11	0	8
Jan-21	13	76	0	1
Feb-21	4	23	0	6
Mar-21	6	23	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Apr-20	1	0	0	0
Aug-20	0	1	0	5
Sep-20	0	2	0	14
Oct-20	0	1	0	1
Nov-20	1	0	0	0
Dec-20	0	0	0	8
Jan-21	1	0	0	1

Feb-21	2	1	0	6
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Table 15 Herring gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	7	2	0	0
May-20	63	179	0	21
Jun-20	19	54	0	4
Jul-20	37	10	0	1
Aug-20	15	1	0	2
Sep-20	2	0	0	0
Oct-20	2	1	0	0
Nov-20	1	0	0	0
Dec-20	128	41	0	0
Jan-21	42	27	0	0
Feb-21	41	28	0	3
Mar-21	41	21	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
May-20	26	174	0	21
Jun-20	5	9	0	4
Jul-20	4	1	0	1
Aug-20	0	0	0	2
Oct-20	1	1	0	0
Dec-20	5	7	0	0
Jan-21	4	3	0	0
Feb-21	7	8	0	0
Mar-21	2	0	0	0

Table 16 Lesser blacked-backed gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	4	2	0	0
May-20	8	5	0	0
Jun-20	2	0	0	0
Jul-20	0	1	0	0
Aug-20	2	1	0	0
Sep-20	1	1	0	0
Jan-21	1	0	0	0
Feb-21	5	0	0	0

Mar-21	1	1	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Apr-20	0	1	0	0
Jun-20	1	0	0	0
Aug-20	0	1	0	0
Feb-21	3	0	0	0

Table 17 Unidentified black-backed gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
May-20	0	7	0	0
Nov-20	1	0	0	0
Jan-21	0	3	0	0
Mar-21	2	0	0	1
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Mar-21	0	0	0	1

Table 18 Unidentified large gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	0	2	0	0
May-20	4	315	0	6
Jun-20	4	4	0	0
Jul-20	0	6	0	0
Sep-20	1	0	0	0
Jan-21	0	8	0	0
Feb-21	2	33	0	0
Mar-21	2	2	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
May-20	2	208	0	6
Jun-20	1	1	0	0
Jan-21	0	2	0	0
Feb-21	2	3	0	0

Table 19 Unidentified gull behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Jun-20	0	4	0	0
Dec-20	3	6	0	0
Jan-21	0	3	0	0
Feb-21	1	5	0	1
Mar-21	2	4	0	1
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Dec-20	0	3	0	0
Mar-21	0	1	0	1

Table 20 Sandwich tern behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
May-20	3	0	0	0

Table 21 'Commic' tern behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
May-20	10	0	0	0
Aug-20	1	0	0	0
Oct-20	1	0	0	0

Table 22 Common tern behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Jun-20	36	0	0	0

Table 23 Little tern behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Jun-20	3	0	0	0

Table 24 Guillemot behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
May-20	0	15	0	0
Jun-20	0	7	0	0
Sep-20	0	2	0	0
Nov-20	4	31	0	0
Dec-20	9	391	0	0
Jan-21	6	48	0	0
Feb-21	4	77	0	0
Mar-21	1	113	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Nov-20	2	0	0	0
Dec-20	1	5	0	0
Jan-21	0	2	0	0
Feb-21	0	3	0	0

Table 25 Razorbill behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	0	2	0	0
Aug-20	0	1	0	0
Nov-20	0	30	0	0
Dec-20	41	418	0	0
Jan-21	41	1064	0	0
Feb-21	3	472	0	0
Mar-21	1	250	0	0
a) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Nov-20	0	1	0	0
Dec-20	0	7	0	0
Jan-21	0	18	0	0
Feb-21	0	20	0	0
Mar-21	0	6	0	0

Table 26 Guillemot / razorbill behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	0	6	0	0
May-20	0	4	0	0
Jun-20	0	5	0	0
Aug-20	0	1	0	0
Oct-20	0	6	0	0
Dec-20	13	538	0	0
Jan-21	102	785	0	0
Feb-21	2	231	0	0
Mar-21	0	1427	0	0
b) Rampion 1 OWF				
Survey	Flying	Sitting	Diving	Perched
Oct-20	0	2	0	0
Dec-20	0	1	0	0
Jan-21	12	22	0	0
Mar-21	0	12	0	0

Table 27 Auk species behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Apr-20	0	1	0	0
Sep-20	0	1	0	0
Nov-20	0	4	0	0
Jan-21	0	10	0	0
Feb-21	0	1	0	0

Table 28 Hirundine species behaviour

a) Rampion 2 Survey Area				
Survey	Flying	Sitting	Diving	Perched
Sep-20	3	0	0	0

Table 29 Dolphin species behaviour

a) Rampion 2 Survey Area		
Survey	Surfacing	Submerged
Oct-20	0	2

Table 30 Harbour porpoise behaviour

a) Rampion 2 Survey Area		
Survey	Surfacing	Submerged
Aug-20	2	3
Sep-20	1	0
Feb-21	1	13
Mar-21	0	1
a) Rampion 1 OWF		
Survey	Surfacing	Submerged
Aug-20	0	1
Feb-21	0	1

Table 31 Dolphin / porpoise behaviour

a) Rampion 2 Survey Area		
Survey	Surfacing	Submerged
Apr-20	0	3
Jul-20	0	1
Oct-20	0	1
Nov-20	1	0
Dec-20	0	5

Table 32 Grey seal behaviour

a) Rampion 2 Survey Area		
Survey	Surfacing	Submerged
Jan-21	0	1
Mar-21	0	1

Table 33 Seal species behaviour

a) Rampion 2 Survey Area		
Survey	Surfacing	Submerged
Aug-20	0	1

Table 34 Ocean sunfish behaviour

a) Rampion 2 Survey Area		
Survey	Surfacing	Submerged
May-20	0	1

Appendix IV Gannet and Gull Ages

Table 1 Gannet ages

a) Rampion 2 Survey Area									
Survey	Adult	First Summer	Second Summer	Third Summer	Fourth Summer	Second Winter	Third Winter	Fourth Winter	Unknown
Apr-20	10	0	0	0	0	0	0	0	0
May-20	9	0	0	0	0	0	0	0	13
Jun-20	13	0	0	2	1	0	0	0	1
Jul-20	4	1	0	0	0	0	0	0	2
Aug-20	2	0	0	0	1	0	0	0	1
Sep-20	4	0	0	0	0	0	0	0	0
Oct-20	6	0	1	0	0	0	0	0	0
Nov-20	3	0	0	0	0	0	0	0	1
Dec-20	21	0	0	0	0	0	0	0	1
Jan-21	116	0	0	0	0	0	0	1	4
Feb-21	10	0	0	0	0	0	0	0	2
Mar-21	67	0	0	0	0	0	0	0	0

Table 2 Kittiwake ages

a) Rampion 2 Survey Area			
Survey	Adult	First Winter	Unknown
Jun-20	2	0	18
Aug-20	0	0	2
Sep-20	1	0	2
Nov-20	8	1	3
Dec-20	140	3	93
Jan-21	171	5	40
Feb-21	26	5	23
Mar-21	214	10	78
b) Rampion 1 OWF			
Survey	Adult	First Winter	Unknown
Nov-20	2	0	0
Dec-20	18	0	75
Jan-21	21	2	0
Mar-21	3	0	9

Table 3 Mediterranean gull ages

a) Rampion 2 Survey Area	
Survey	Adult
Dec-20	1
Feb-21	1

Table 4 Common gull ages

a) Rampion 2 Survey Area				
Survey	Adult	First Winter	Second Winter	Unknown
Nov-20	1	0	0	0
Dec-20	24	0	0	4
Jan-21	4	0	0	2
Feb-21	15	2	0	4
Mar-21	13	0	1	0
b) Rampion 1 OWF				
Survey	Adult	First Winter	Second Winter	Unknown
Dec-20	5	0	0	0
Jan-21	1	0	0	0
Feb-21	2	0	0	0
Mar-21	1	0	0	0

Table 5 Unidentified small gull ages

a) Rampion 2 Survey Area	
Survey	Unknown
Apr-20	2
Jun-20	2
Jul-20	1
Aug-20	1
Dec-20	4
Jan-21	24
Feb-21	20
Mar-21	3
b) Rampion 1 OWF	
Survey	Unknown
Dec-20	2

Table 6 Great Black-backed Gull ages

a) Rampion 2 Survey Area									
Survey	Adult	First Summer	Second Summer	Third Summer	First Winter	Second Winter	Third Winter	Juvenile	Unknown
Apr-20	6	0	0	0	1	0	1	0	0
Jul-20	8	0	0	0	0	0	0	0	3
Aug-20	13	0	0	0	0	0	0	0	3
Sep-20	15	0	1	0	0	0	0	1	18
Oct-20	3	0	0	0	0	0	0	0	0
Nov-20	1	0	0	0	1	0	0	0	0
Dec-20	19	0	0	0	0	0	2	0	4
Jan-21	21	0	0	0	2	3	2	0	62
Feb-21	14	0	0	0	0	1	2	0	16
Mar-21	23	0	0	0	0	3	2	0	1
b) Rampion 1 OWF									
Survey	Adult	First Summer	Second Summer	Third Summer	First Winter	First Winter	Third Winter	Juvenile	Unknown
Apr-20	0	0	0	0	0	0	1	0	0
Jul-20	3	0	0	0	0	0	0	0	0
Aug-20	6	0	0	0	0	0	0	0	0
Sep-20	13	0	0	0	0	0	0	1	2
Oct-20	2	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	1	0	0	0	0
Dec-20	8	0	0	0	0	0	0	0	0
Jan-21	2	0	0	0	0	0	0	0	0
Feb-21	8	0	0	0	0	0	1	0	0

Table 7 Herring gull ages

a) Rampion 2 Survey Area									
Survey	Adult	First Summer	Second Summer	Third Summer	First Winter	Second Winter	Third Winter	Fourth Winter	Unknown
Apr-20	2	0	0	0	2	2	0	0	3
May-20	37	0	5	3	0	0	0	0	218
Jun-20	12	0	0	0	0	0	0	0	65
Jul-20	39	0	0	0	0	0	0	0	9
Aug-20	13	0	0	0	0	0	0	0	5
Sep-20	1	0	1	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0	3
Nov-20	0	0	0	0	0	0	0	0	1
Dec-20	3	0	0	0	0	0	0	0	166
Jan-21	16	0	0	0	1	11	15	0	26
Feb-21	20	0	1	0	3	6	12	0	30
Mar-21	14	0	0	0	8	18	16	0	6
b) Rampion 1 OWF									
Survey	Adult	First Summer	Second Summer	Third Summer	First Winter	Second Winter	Third Winter	Fourth Winter	Unknown
May-20	12	0	0	3	0	0	0	0	206
Jun-20	4	0	0	0	0	0	0	0	14
Jul-20	3	0	0	0	0	0	0	0	3
Aug-20	2	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0	2
Dec-20	0	0	0	0	0	0	0	0	12
Jan-21	4	0	0	0	0	0	2	0	1
Feb-21	3	0	0	0	1	0	2	0	9
Mar-21	0	0	0	0	0	0	2	0	0

Table 8 Lesser Black-backed Gull ages

a) Rampion 2 Survey Area						
Survey	Adult	Second Winter	Third Winter	Third Summer	Juvenile	Unknown
Apr-20	5	0	0	0	0	1
May-20	5	0	0	2	0	6
Jun-20	2	0	0	0	0	0
Jul-20	1	0	0	0	0	0
Aug-20	2	0	0	0	0	1
Sep-20	0	0	0	0	1	1
Jan-21	0	0	1	0	0	0
Feb-21	0	2	2	0	0	1
Mar-21	2	0	0	0	0	0
b) Rampion 1 OWF						
Survey	Adult	Second Winter	Third Winter	Third Summer	Juvenile	Unknown
Apr-20	1	0	0	0	0	0
Jun-20	1	0	0	0	0	0
Aug-20	1	0	0	0	0	0
Feb-21	0	1	1	0	0	1

Table 9 Unidentified large gull ages

a) Rampion 2 Survey Area					
Survey	Adult	First Winter	Second Winter	Second Summer	Unknown
Apr-20	0	0	0	0	2
May-20	0	0	0	0	325
Jun-20	0	0	0	0	8
Jul-20	1	0	0	0	5
Sep-20	0	0	0	1	0
Jan-21	0	0	0	0	8
Feb-21	1	0	10	0	24
Mar-21	0	2	0	0	2
b) Rampion 1 OWF					
Survey	Adult	First Winter	Second Winter	Second Summer	Unknown
May-20	0	0	0	0	216
Jun-20	0	0	0	0	2
Jan-21	0	0	0	0	2
Feb-21	0	0	2	0	3

Table 10 **Unclassified gull ages**

a) Rampion 2 Survey Area		
Survey	Adult	Unknown
Jun-20	0	4
Dec-20	0	9
Jan-21	0	3
Feb-21	0	7
Mar-21	2	5
b) Rampion 1 OWF		
Survey	Adult	Unknown
Dec-20	0	3
Mar-21	0	2