East Anglia
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East Anglia THREE

Appendix 13.2

Baseline Offshore Ornithology Technical Report

Environmental Statement
Volume 3
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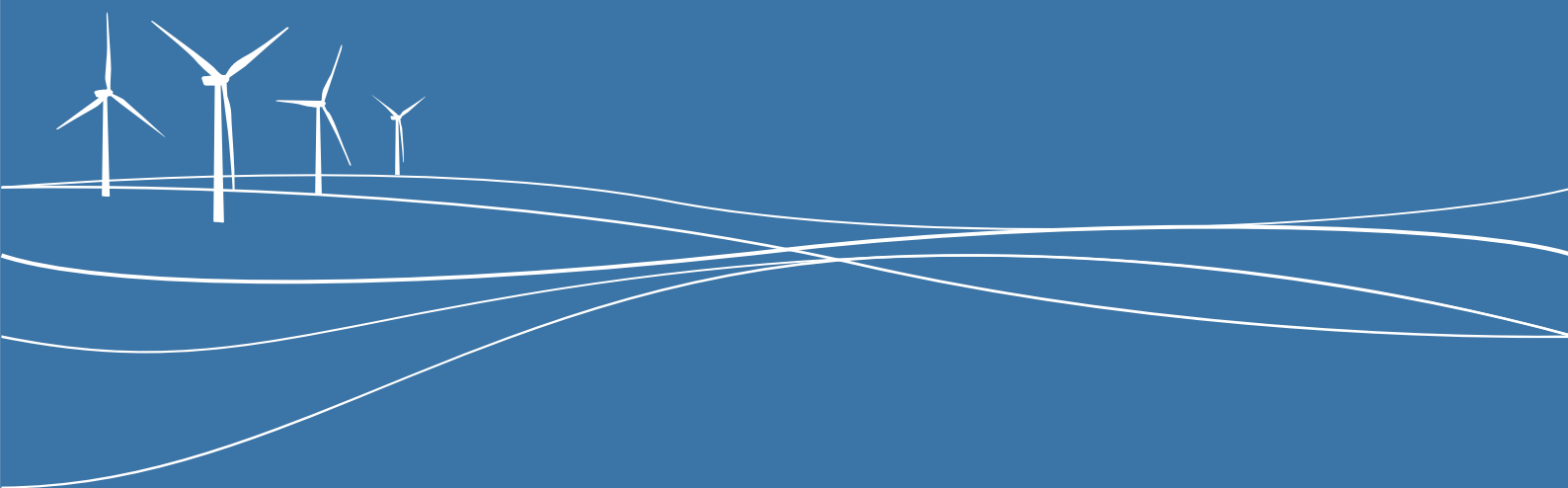

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East Anglia
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EAST ANGLIA THREE OFFSHORE WINDFARM: BASELINE OFFSHORE ORNITHOLOGY TECHNICAL REPORT

Revision B: Second Draft

DATE: 16th July 2015

APEM LTD. REF: 414044-BOTR-ES/B

APEM

East Anglia Offshore Wind

VATTENFALL

SCOTTISHPOWER RENEWABLES

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PROJECT No:	**414044**
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1 INTRODUCTION

1.1 Background

1. The proposed East Anglia THREE project would comprise offshore wind turbines, offshore converter station, inter-array cables, interconnector cables and offshore and onshore export cables taking power to an onshore converter station. The East Anglia THREE site covers an area of approximately 305km^2 and is situated 69km from its closest point to the port of Lowestoft (Figure 1.1).

2. In order to inform the Environmental Impact Assessment (EIA), there is a clear requirement to obtain site-specific data on cited habitats and species and this report focuses on marine birds. East Anglia THREE Limited (EATL) are committed to undertaking an EIA that provides the detailed level of baseline data needed to inform a robust assessment of the potential impacts of the proposed windfarm on birds. To facilitate this, surveys have been undertaken by APEM Ltd (hereafter referred to as APEM) as outlined in the East Anglia THREE Offshore Windfarm EIA Scoping Report (Royal HaskoningDHV 2012) and further clarified during subsequent consultation.

1.2 Aims of the Report

3. The aim of this report is to provide the baseline information from site-specific surveys from which the offshore ornithology EIA and Habitats Regulations Assessment (HRA) can be completed.

4. It presents the following information on marine birds derived from the 24 months of aerial survey (September 2011 to August 2013 inclusive) of the East Anglia THREE site plus 4km buffer:

    - Abundance estimates (monthly and for bio-seasons);
    - Density estimates for bio-seasons;
    - Behaviour (numbers flying and sitting on the water);
    - Flight height;
    - Flight direction; and
    - Spatial distribution.

5. Further, more detailed information and raw data are provided in a series of Annexes (A-H) to this report.

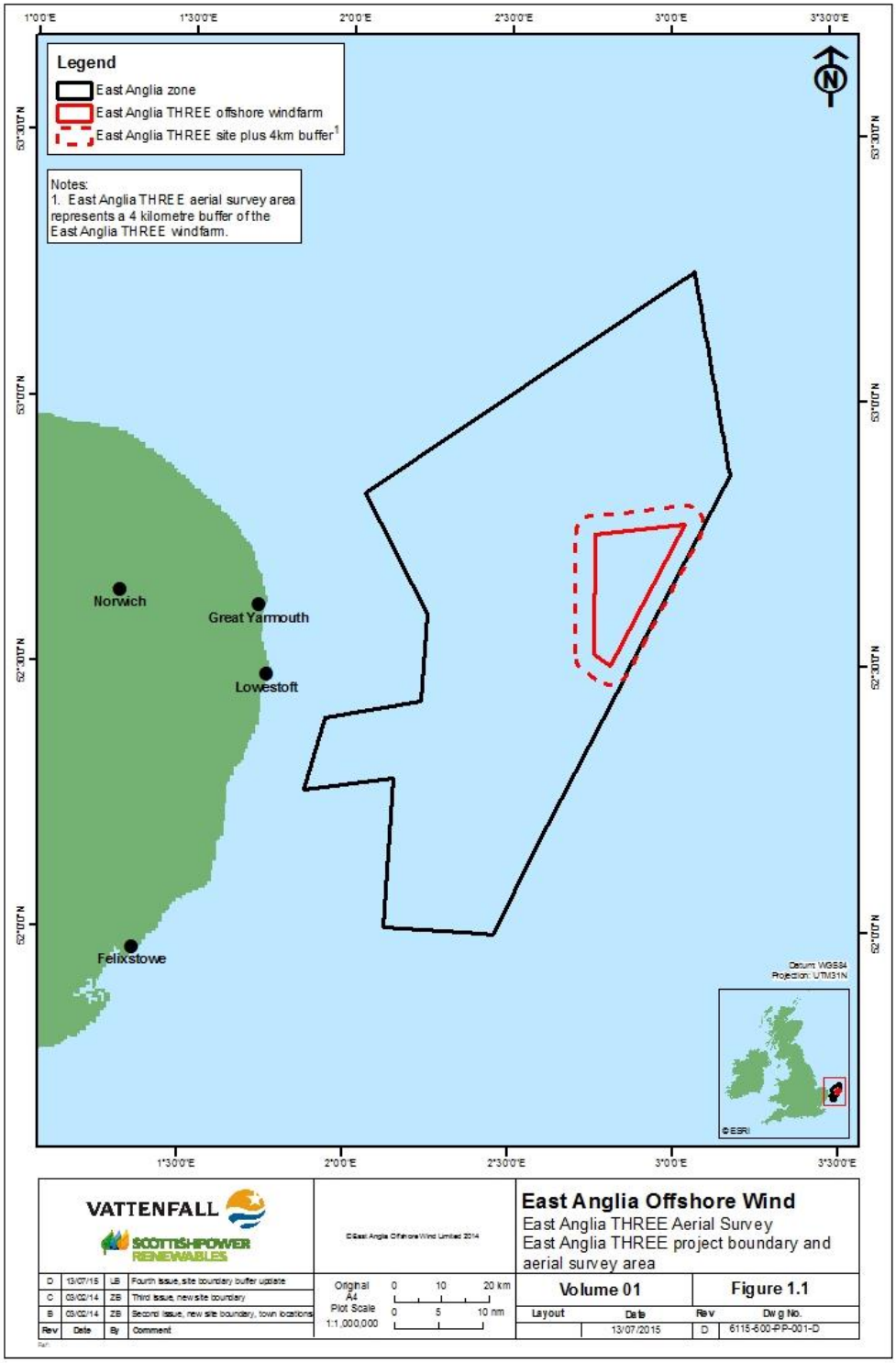

Figure 1.1. Location of the proposed East Anglia THREE windfarm site boundary and 4km buffer that the aerial surveys were conducted over, within the East Anglia Zone.

2 DATA SOURCES

2.1 Digital Aerial Survey Data

6. APEM has undertaken monthly aerial surveys from September 2011 to August 2013 inclusive in order to collect data to inform the EIA and HRA for East Anglia THREE to assess the temporal and spatial abundance and distribution of birds within the survey area. Specific data were collected from aerial surveys from across the windfarm and a four kilometre buffer placed around it. The months in which aerial digital surveys were carried out over the period 2011 to 2013 are shown in Table 2.1.

Table 2.1. Months in which Aerial Digital Surveys were conducted

Month	2011	2012	2013
January	X	✓	✓
February	X	✓	✓
March	X	✓	✓
April	X	✓	✓
May	X	✓	✓
June	X	✓	✓
July	X	✓	✓
August	X	✓	✓
September	✓	✓	X
October	✓	✓	X
November	✓	✓	X
December	✓	✓	X

2.2 Other Data Sources

7. Where the information gathered by aerial survey has been supported by information from other sources, such as published literature on seabirds, then that is identified by specific reference to that source and the full citation included in the relevant section for the references.

2.3 Bird Names

8. Throughout this report the bird species names that are used are those that are in common use amongst English ornithologists and this corresponds to the "British (English) vernacular name 2012" column of the list of English and scientific names

prepared by the British Ornithologists' Union (BOU 2012). The corresponding scientific names from that publication are listed in Annex A.

3 SURVEY AND ANALYSIS METHODS

3.1 Approach to Surveys

9. Round Three offshore windfarm sites tend to be larger, further offshore and in deeper waters than those in earlier development rounds. Projects such as East Anglia THREE are therefore situated in challenging environments, requiring a survey methodology that is flexible and reliable. High Resolution digital still photography from an aerial survey platform was selected to satisfy these needs.

10. Aerial surveys are increasingly seen as the most preferable way to carry out large scale offshore surveys for ornithology and marine mammals, providing high quality and auditable data. The aerial survey method and the subsequent analysis methods for this proposed project were the subject of consultation with Natural England (NE) and the Royal Society for the Protection of Birds (RSPB). This consultation was undertaken through the Defra Major Infrastructure and Environment Unit Evidence Plan Process. Ornithologists from NE and the RSPB participated in this process through the series of Ornithology Expert Technical Group (OETG) meetings held in 2013 and 2014. Though the surveys commenced prior to the first consultation meeting, the survey method did form part of the first Evidence Plan OETG meeting, with clarification provided to NE and RSPB on the survey method and with all parties agreeing that the survey method and number of surveys was sufficient to inform the EIA process.

3.2 High Resolution Digital Stills Methodology

11. The digital aerial survey approach has many advantages over alternative methods. It is performed from an altitude at which disturbance to target species is minimal, and is not subject to the bias of repulsion (i.e. inducing escape responses in birds, such as scoters, that can change the number recorded and affect their apparent distribution) or attraction (e.g. some bird species, such as gulls, are frequently attracted to boats). Furthermore, owing to the speed of the aircraft, it is possible to cover large areas in a single day of survey, meaning within-survey temporal variance is minimised. Images collected can be scrutinised *post hoc*, are subject to Quality Assurance, and may be stored in perpetuity. Additionally, it is possible to estimate flight height and direction of flying birds from images collected, in a way that is consistent and verifiable, unlike the more subjective measurements made from (e.g.) boat surveys.

12. A major advantage of collecting many digital still images is the resulting statistical power. Each image is a representative sample of bird distribution and abundance, and can be considered independent from every other image due to the 500m

separation between image centres. In this way, a systematic grid of many independent estimates of the abundance is formed, resulting in increased precision of abundance estimates.

13. Each survey is assessed for precision *post hoc*, to determine what level of change can confidently be measured. Precision, based on the Coefficient of Variation (CV), indicates the ratio of the mean to the standard error, the target level of precision is often set to CV ≤ 0.16. This corresponds to a level of precision at which a doubling or halving of the population is detectable between surveys (a 'Class 3' level, Bohlin 1990). In some situations, especially where abundance is very low, it is not possible to achieve the target level of precision.

14. Aerial surveys have been undertaken using either Vulcan Air P68 Observer or Britten-Norman Islander twin engine survey aircraft. These surveys involved digital still image collection using a GPS-linked bespoke flight management system.

15. Survey of the East Anglia THREE site comprises High Resolution still images taken on a grid system with a resolution of 500m between nodes and a 2cm ground sampling distance to represent a high intensity sampling regime. The East Anglia THREE survey area incorporates the East Anglia THREE windfarm footprint plus a 4km buffer.

16. Survey data comprises species, count (number of individual birds), sex, age (where possible), flight height, flight direction, position (longitude and latitude), date and time stamp of image collection.

17. Where identification to species level was not possible, reference was made to aerial data where species were identified in order to apportion records at group level to species level.

3.3 Data Analysis

3.3.1 Bird Abundance and Density Estimates

18. For each monthly aerial survey of the East Anglia THREE site plus 4km buffer, geo-referenced locations of birds contained within each image were used to generate raw counts. Bird locations contained within the boundaries of the East Anglia THREE site were then extracted using ArcGIS, providing raw count data. In the case of red-throated diver, guillemot and razorbill additional abundance estimates were made of that for the East Anglia THREE site plus a 1km buffer and a 2km buffer (Annex D). This was undertaken to permit the analysis of potentially displaced individuals for a range of displacement distances in response to the guidance issued by NE and JNCC (NE and JNCC, undated).

19. Raw counts were divided by the number of images taken to give mean number of birds per image (*i*). Abundance estimates (*N*) for each survey month were then generated by multiplying the mean number of birds per image by the total number of images required to cover the entire study area (*A*):

$$N = i\,A$$

20. 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 taken as the variability of the statistic over the population (Efron and Tibshirani 1993).

21. Measures of precision (i.e. how different sample counts are from one another) were calculated using a negative binomial estimator, suitable for a pseudo-Poisson over-dispersed distribution (Elliott 1977). This produced a CV (coefficient of variation) based on the relationship of the standard error to the mean.

22. All analysis and data manipulation 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 functions (Canty and Ripley 2010).

23. 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 original East Anglia THREE site (305km^2) calculates the density for any given species.

3.3.2 Species Identification

24. There are occasions when it is not possible to identify a particular bird on the aerial survey image to the species level and the image is identified as belonging to a higher level group e.g. 'small gulls' or 'black-backed gulls'. To avoid producing what could be an underestimate of the abundance of a particular species, those birds that are unidentified to a group level go through a process of attribution to a specific species based on the relative abundance of identified species. The possible groups and the individual species that are included in the groups are listed in Table 3.1. Fulmar, gannet, skuas, little auk and puffin were all positively identified to species level and do not form part of the higher level groupings.

Table 3.1. Bird Species that were included in the Unidentified Groups

Species	Unidentified Group 1	Unidentified Group 2
Red-throated diver	Divers	Divers
Black- throated diver		
Great northern diver		
Sabine's gull	Small gulls	Gulls
Kittiwake		
Black-headed gull		
Little gull		
Common gull		
Lesser black-backed gull	Black-backed gulls	
Great black-backed gull		
Lesser black-backed gull	Large gulls	
Herring gull		
Great black-backed gull		
Common tern	'Commic' Tern	Terns
Arctic tern		
Guillemot	Guillemot / Razorbill	Auks
Razorbill		

25. The number of unidentified birds in a group is proportioned to the specific species that are contained within that group based on the relative abundance of the positively identified species in that month's survey. For example, in the case of kittiwake, the count consists of:

    Positively identified kittiwake + proportion of unidentified small gulls + proportion of unidentified gulls

26. For common tern and Arctic tern no species specific identification is possible (size and plumage features are so close that it is impossible to separate them) and as a result there is no information on which to apportion these two species. They remain grouped in the data as 'commic' tern.

27. The ability to identify bird images to the species level has advanced considerably in recent years with advances in technology, including higher resolution cameras and more refined software to help identify species and measure species-specific parameters. The result is that for the surveys for East Anglia THREE the unidentified groups contained within the data set were limited to:

    - Unidentified divers;

- Unidentified small gulls;
- Unidentified black-backed gulls;
- Unidentified large gulls;
- 'Commic' tern; and
- Guillemot / razorbill.

28. There were no images that were categorised as:

- Unidentified gulls;
- Unidentified terns;
- Unidentified skuas; or
- Unidentified auks.

3.3.3 Attribution of Unidentified Birds

29. Although the majority of birds recorded from the surveys are identified to species level, a small number remain identified to group level only. In order to account for these unidentified birds the abundance estimates within this baseline report include an attribution of unidentified birds into the monthly abundance estimates and densities. This is based upon an apportionment of the group level identified birds between those species within that group that were identified to species level within each individual monthly abundance estimate.

30. Raw counts from the survey data and abundance estimates prior to any attribution of unidentified birds can be found in Annex B.

31. The proportion of identified species within the East Anglia THREE site plus 4km buffer was used for the apportionment of unidentified species recorded in the East Anglia THREE site. This was to ensure that an adequate number of samples were achieved and to limit the number of occurrences where there were no positively identified species in months where unidentified species were present.

32. Three instances occurred where there was no positively identified species in months where unidentified individuals were recorded by using the East Anglia THREE site plus 4km buffer proportions. Two rules were applied to such cases, with the preferable method being the first and the second was used if the first could not be.

- Use the proportion from the same month, different year; or

- Use the proportion from the same bio-period, same year.

33. Instances where this occurred were for unidentified diver species in the months: October 2011, February 2012 and May 2012. Therefore the proportions that were used for the unidentified individuals were from November 2011, February 2013 and May 2013 respectively. In each of the latter months, red-throated divers were the only species present. The only case where the second rule was used was for October 2011, where November 2011 was used which is in the autumn migration bio-period for divers (Furness 2015).

34. The proportion of flying birds in the East Anglia THREE site was used to calculate the flying bird density for use in the collision risk modelling. As the proportion of species from the East Anglia THREE site plus 4km buffer were used for apportionment of unidentified species, this meant there could be instances where there were apportioned individuals in a particular month with no behaviour information. In months where this occurred, the proportion of flying birds was derived from the same month and year as the East Anglia THREE site plus 4km buffer for each species. There was two instances of this occurring: black-throated diver in March 2012 and kittiwake in October 2011.

35. If there was no behaviour proportions in the East Anglia THREE site plus 4km buffer for a particular species in a particular month, then the same rules as stated in the apportionment of unidentified species were applied (para. 32). The only instance where this was applicable was for red-throated diver in October 2011, the proportion of birds in flight in November 2011 was used in this instance.

3.3.4 Availability Bias

36. Diving birds, such as guillemots and razorbills, spend time foraging beneath the water surface. As a result of this, an unknown number of birds may go undetected due to the snap shot nature of aerial survey techniques.

37. The correction factor applied to each species were based on data recommended by JNCC in its submission during the examination phase of East Anglia ONE (APEM 2013), referred to by JNCC as Method C. This applies a correction factor on the basis of aerial surveys recording 76% of sitting guillemots and 83% of sitting razorbills, as 24% and 17% respectively, of these species will be underwater when aerial imagery is captured (Allen 2013). Therefore to correct for availability bias the 'unavailable' birds are added to the bird totals on a monthly basis to create revised population estimates. The 'corrected' abundance estimates for guillemots and razorbills are presented in Section 4.3.17 and 4.3.18 respectively.

3.3.5 Bio-seasons

38. Bird behaviour and abundance is recognised to differ across a calendar year dependent upon the season. Separate seasons are recognised in this baseline report in order to establish the level of importance any seabird species has within the East Anglia THREE site plus 4km buffer during any particular bio-season. The bio-seasons are based on those in Furness (2015), hereafter referred to as BDMPS bio-seasons (Table 3.2). The seasons are defined within this baseline report as: winter, spring migration, migration-free breeding and autumn migration bio-seasons. For species not included in Furness (2015) bio-seasons agreed through the Evidence Plan process were used.

Table 3.2. BDMPS bio-seasons (Furness 2015) used as the basis for the species accounts presented in Section 4.3

Species	Migration - spring	Migration-free breeding	Migration - autumn	Winter
Red-throated diver	February to April	May to August	September to November	December to January
Great northern diver	March to May		September to November	December to February
Fulmar	December to March	April to August	September to October	November
Gannet	December to March	April to August	September to November	
Arctic skua	April to May	June to July	August to October	
Great skua	March to April	May to July	August to October	November to February
Lesser black-backed gull	March to April	May to July	August to October	November to February
Herring gull	January to April	May to July	August to November	December
Great black-backed gull	January to April	May to July	August to November	December
Kittiwake	January to April	May to July	August to December	
Commic tern	April to May	June	July to September	
Guillemot	December to February	March to June	July to October	November
Razorbill	January to March	April to July	August to October	November to December
Puffin	March to April	May to June	July to August	September to February

3.3.6 Spatial Distribution

39. Each bird located by the surveys is geo-referenced and this allows those locations to be related to the boundary of the East Anglia THREE site and any buffer placed around it. The spatial distribution within the site and the 4km buffer can be illustrated on a map and this has been done, for those seabird species for which there is more than a non-trivial number of observations, within Annex G. For those species with a large enough sample size, individual bio-season distribution maps have been presented to provide information on any seasonal-specific distribution based on the BDMPS bio-seasons.

40. The presentation of spatial distribution on a species map can only be carried out for the observed locations, it cannot account for the attribution of unidentified birds or for correction for the diving behaviour of species such as auks.

3.3.7 Flight Height and Direction

41. 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 and trigonometry to provide an estimate of flight height the accuracy of which varies between 1 to 5m depending on the size and position of the bird. The trigonometric calculation is based on species-specific bird measurements, image ground sample distance (GSD) (the distance between pixel centres) and the known height of the aircraft as that image was taken. These parameters are entered into APEM's flight height calculator to estimate the height of each individual bird captured in survey images. Flight height estimates are less reliable for birds that are diving or turning sharply (this affects the measurement of body length and wing span from the image), such birds are removed from the sample used to calculate flight heights. Flight height is an important behavioural consideration within ornithological EIAs and will be used in the quantification of collision risk for the proposed project. The flight heights of species recorded within the East Anglia THREE site have been collated to establish the percentage of birds flying within the proposed project's rotor sweep (i.e. the area within which a wind turbine rotates). This information is presented in Annex E (Species Behaviour Tables), with the percentage of recorded birds flying at potential collision height (PCH) calculated.

42. The direction of birds in flight was recorded for the digital still images. This was undertaken by measuring the axis of bill to tail, within APEM's bespoke image analysis software, taking the bearing relative to the bird's head. This bearing is linked to the geo-referenced image and thus provides an accurate representation of bird orientation at time of image capture. Bearings of bird directions were plotted using Oriana circular statistics software (v. 3.21 Kovach Computing Services).

Summarised circular data can be considered to have two components; mean direction, and mean vector. The former indicates directional tendencies and the latter indicates agreement around those tendencies (where $r = 1$ is complete agreement and $r = 0$ is completely random). The significance of orientation (i.e. directional agreement) is tested using (e.g.) the Rayleigh test, which tests whether the distribution is significantly different from random (Batschelet 1981). Species-specific flight directional rose diagrams are presented in Annex F. For those species with a large enough sample size, individual bio-season flight directional rose diagrams are presented in order to inform the baseline report with additional seasonal-specific information based on the BDMPS bio-seasons (see Section 3.3.5 for the description of bio-seasons).

3.3.8 Age Class Proportions

43. Knowledge of the different ages of each species of bird present within the area proposed for a windfarm can contribute to the assessment of the significance of potential impacts. This can include through identifying if that potential impact might occur to an adult bird that is part of the breeding population of a particular Special Protection Area (SPA) or if it might occur to an immature bird that is not associated with the breeding population of a particular SPA.

44. Data identifying the age of individual birds were collected routinely from the High Resolution digital surveys of the East Anglia THREE site. Annex H describes the ageing of gannet, kittiwake and large gulls from aerial digital still imagery. Data are also presented for the age class proportions on a monthly basis for gannet, lesser black-backed gull, herring gull, great black-backed gull and kittiwake.

4 ORNITHOLOGY BASELINE DERIVED FROM THE AERIAL SURVEYS

4.1 Information within Species Accounts

45. The species accounts provided in this section provide information derived from the aerial surveys. It is set out in a standard format covering:

- Abundance estimates for each month;
- Abundance estimates for the bio-seasons;
- Density estimates for each month;
- Density estimates for the bio-seasons;
- Behaviour (numbers flying and sitting on the water);
- Flight height in relation to potential collision height (PCH);
- Flight direction; and
- Spatial distribution.

4.2 Overview of Bird Species Recorded

46. The following bird species (Table 4.1) were recorded within the original East Anglia THREE site plus 4km buffer between 2011 and 2013.

Table 4.1. Bird species recorded within the original East Anglia THREE site between 2011 and 2013. Groups in italics represent those that could not be identified to species level.

Wildfowl and Divers	Gulls	Auks	Other
Red-throated diver	Sabine's gull	Guillemot	Gannet
Black-throated diver	Kittiwake	Razorbill	Fulmar
Great northern diver	Black-headed gull	Little auk	Great skua
	Little gull	Puffin	Arctic skua
	Common gull		Long-tailed skua
	Herring gull		
	Lesser black-backed gull		
	Great black-backed gull		
Diver spp	*Small gull spp*	*Guillemot / razorbill*	*'Commic' tern*
	Black-backed gull spp		
	Large gull spp		

4.3 Bird Species Accounts

47. The following species accounts present the data recorded from 24 months of aerial surveys conducted for the East Anglia THREE site only. Behavioural and distribution data are also presented in Appendices E to G.

4.3.1 Red-throated Diver

4.3.1.1 Abundance estimates

48. Red-throated divers were recorded during November 2011, March, April and December 2012, and February and March 2013. Numbers peaked during March 2012 when an estimated 199 individuals were present within the East Anglia THREE site (Table 4.2). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

49. Monthly abundance estimates following attribution of unidentified birds is provided in Table 4.2, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.2. Red-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE Site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	**49**	25	0.161	0.000	0.000	0.161	0.080
	2012	0		0.000	0.000		0.000	
Nov	2011	16	8	0.052	0.000	0.000	0.052	0.026
	2012	0		0.000	0.000		0.000	
Dec	2011	0	17	0.000	0.000	0.000	0.000	0.056
	2012	34		0.112	0.000		0.112	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	**38**	25	0.125	0.000	0.000	0.125	0.080
	2013	11		0.036	0.000		0.036	
Mar	2012	**199**	106	0.653	0.000	0.000	0.653	0.346
	2013	12		0.039	0.000		0.039	
Apr	2012	25	13	0.082	0.000	0.000	0.082	0.041
	2013	0		0.000	0.000		0.000	
May	2012	0	8	0.000	0.000	0.000	0.000	0.026
	2013	16		0.052	0.000		0.052	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.1.2 Bio-season and mean peak estimates

50. Numbers peaked in the BDMPS spring migration bio-season when an estimated 87 individuals were present within the East Anglia THREE site, with an estimated density of 0.287 birds per km^2 (Table 4.3). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.3. BDMPS bio-season mean peak abundance estimates and mean peak densities of red-throated divers within the East Anglia THREE Site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	May-Aug	4	0.013
Migration - autumn	Sep-Nov	22	0.071
Winter	Dec-Jan	17	0.056
Migration - spring	Feb-Apr	87	0.287

4.3.1.3 Behaviour and distribution

51. All 13 red-throated divers recorded in the East Anglia THREE site were recorded sitting on the water (Table 4.4).

Table 4.4. Flight height summary of red-throated divers recorded in flight from monthly aerial surveys across the East Anglia THREE Site only.

Total red-throated diver	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
13	13	0	0	0	0	N/A

52. A spatial distribution map is provided in Annex G, though red-throated diver showed no patterns or preference to specific areas within the East Anglia THREE site or 4km buffer.

4.3.2 Black-throated Diver

4.3.2.1 Abundance estimates

53. A single black-throated diver was recorded sitting during March 2012 in the East Anglia THREE site plus 4km buffer (Annex B, Table B2.2b). Monthly abundance and density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

54. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.5, (attribution methods are described in Section 3.3.3). Annex B

provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.5. Black-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	**21**	11	0.069	0.000	0.000	0.069	0.035
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.3 Great Northern Diver

4.3.3.1 Abundance estimates

55. Four great northern divers were recorded, three during March and one during April 2012. Numbers peaked during March 2012 when an estimated 123 individuals were present within the East Anglia THREE site (Table 4.6). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

56. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.6, (attribution methods are described in Section 3.3.3). Annex B

provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.6. Great northern diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)		Flying			Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	**123**	61	0.402	0.000	0.000	0.402	0.201
	2013	0		0.000	0.000		0.000	
Apr	2012	13	7	0.043	0.000	0.000	0.043	0.021
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.3.2 Bio-season and mean peak estimates

57. Numbers peaked in the spring migration BDMPS bio-season when an estimated 45 individuals were present within the East Anglia THREE site, with an estimated density of 0.148 birds per km^2 (Table 4.7). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.7. BDMPS bio-season mean peak abundance estimates and mean peak densities of great northern divers within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	N/A	N/A	N/A
Migration - autumn	Sep-Nov	0	0.000
Winter	Dec-Feb	0	0.000
Migration - spring	Mar-May	45	0.148

4.3.3.3 Behaviour and distribution

58. All of the four great northern divers recorded in the East Anglia THREE site were recorded sitting on the water (Table 4.8).

Table 4.8. Flight height summary of great northern divers recorded in flight from monthly aerial surveys across the East Anglia THREE Site only.

Total great northern diver	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
4	4	0	0	0	0	N/A

4.3.4 Fulmar

4.3.4.1 Abundance estimates

59. Fulmars were recorded during all surveys with the exception of November 2011 and July 2012. Numbers peaked during September 2012 when, based on a count of 70 birds, an estimated 1,120 (784 to 1,519) individuals were present within the East Anglia THREE site (Table 4.9). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.9. Fulmar monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	186	653	0.610	0.174	0.140	0.436	2.003
	2012	1,120		3.675	0.105		3.570	
Oct	2011	570	297	1.870	0.053	0.046	1.817	0.928
	2012	24		0.079	0.039		0.039	
Nov	2011	0	49	0.000	0.000	0.080	0.000	0.080
	2012	97		0.318	0.159		0.159	
Dec	2011	737	443	2.418	0.793	0.508	1.625	0.943
	2012	148		0.486	0.224		0.261	
Jan	2012	129	172	0.423	0.317	0.324	0.106	0.239
	2013	214		0.702	0.330		0.372	
Feb	2012	63	116	0.207	0.165	0.187	0.041	0.194
	2013	169		0.554	0.208		0.347	
Mar	2012	38	98	0.125	0.042	0.080	0.083	0.240
	2013	157		0.515	0.119		0.396	
Apr	2012	75	91	0.246	0.123	0.161	0.123	0.136
	2013	106		0.348	0.199		0.149	
May	2012	713	437	2.339	0.403	0.228	1.936	1.204
	2013	160		0.525	0.052		0.472	
Jun	2012	89	75	0.292	0.183	0.131	0.110	0.115
	2013	61		0.200	0.080		0.120	
Jul	2012	0	145	0.000	0.000	0.022	0.000	0.454
	2013	290		0.951	0.043		0.908	
Aug	2012	123	592	0.404	0.040	0.108	0.363	1.832
	2013	1,060		3.478	0.176		3.302	

4.3.4.2 Bio-season mean peak estimates

60. Numbers peaked in the BDMPS autumn migration bio-season when an estimated mean peak of 845 individuals were present within the East Anglia THREE site, with an estimated density of 2.772 birds per km^2 (Table 4.10). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.10. BDMPS bio-season mean peak abundance estimates and mean peak densities of fulmars within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	Apr-Aug	452	1.482
Migration - autumn	Sep-Oct	845	2.772
Winter	Nov	97	0.318
Migration - spring	Dec-Mar	319	1.047

4.3.4.3 Behaviour and distribution

61. Of the 468 fulmars recorded in the East Anglia THREE site, 372 were recorded sitting on the water and 96 were observed flying (Table 4.11). Of the flying birds, none were recorded flying at potential collision height (Table 4.11).

Table 4.11. Flight height summary of fulmars recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total fulmar	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
468	372	96	96	0	0	0%

62. Flight direction patterns were not evident within the bio-seasons, which are provided in Annex F.

63. Spatial distribution maps are provided in Annex G for each bio-season. During the spring migration bio-season, higher densities of fulmar were noticeable in the eastern boundary of the East Anglia THREE 4km buffer. No other bio-season demonstrated a pattern or preference of fulmars to specific areas within the East Anglia THREE site or 4km buffer.

4.3.5 Gannet

4.3.5.1 Abundance estimates

64. Gannets were recorded during all surveys with the exception of January, February, April, May and July 2012, and May and August 2013. Numbers peaked during November 2012 when, based on a count of 54 birds, an estimated 877 (633 to 1,153) individuals were present within the East Anglia THREE site (Table 4.12). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.12. Gannet monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	66	89	0.217	0.130	0.117	0.087	0.175
	2012	112		0.367	0.105		0.262	
Oct	2011	16	38	0.052	0.000	0.039	0.052	0.084
	2012	59		0.194	0.077		0.116	
Nov	2011	212	545	0.696	0.696	1.493	0.000	0.293
	2012	877		2.877	2.291		0.586	
Dec	2011	301	185	0.988	0.830	0.415	0.158	0.191
	2012	68		0.223	0.000		0.223	
Jan	2012	0	38	0.000	0.000	0.000	0.000	0.125
	2013	76		0.249	0.000		0.249	
Feb	2012	0	6	0.000	0.000	0.000	0.000	0.018
	2013	11		0.036	0.000		0.036	
Mar	2012	38	25	0.125	0.125	0.082	0.000	0.000
	2013	12		0.039	0.039		0.000	
Apr	2012	0	46	0.000	0.000	0.100	0.000	0.050
	2013	91		0.299	0.199		0.100	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	33	23	0.108	0.108	0.054	0.000	0.020
	2013	12		0.039	0.000		0.039	
Jul	2012	0	13	0.000	0.000	0.043	0.000	0.000
	2013	26		0.085	0.085		0.000	
Aug	2012	12	6	0.039	0.039	0.020	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.5.2 Bio-season mean peak estimates

65. Numbers peaked in the BDMPS autumn migration bio-season with an estimated mean peak of 349 individuals present within the East Anglia THREE site, at an estimated density of 1.146 birds per km^2 (Table 4.13). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.13. BDMPS bio-season mean peak abundance estimates and mean peak densities of gannets within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	Apr-Aug	32	0.106
Migration - autumn	Sep-Nov	349	1.146
Winter	N/A	N/A	N/A
Migration - spring	Dec-Mar	107	0.349

4.3.5.3 Behaviour and distribution

66. Of the 140 gannets recorded in the East Anglia THREE site, 42 gannets were recorded sitting on the water and 98 were observed flying (Table 4.14). Of the flying birds suitable for flight height estimation, two birds were recorded flying at potential collision height.

Table 4.14. Flight height summary of gannets recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total gannet	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
140	42	98	95	2	0	2%

Table Note: One flying gannet was unsuitable for the flight height calculation and is therefore excluded from the potential collision height categories in table

67. The flight direction recorded for this species was notably in a south-westerly direction during the BDMPS spring and autumn migration bio-seasons (Figure 4.1 and Figure 4.2). Further flight direction rose diagrams are provided in Annex F for each bio-season.

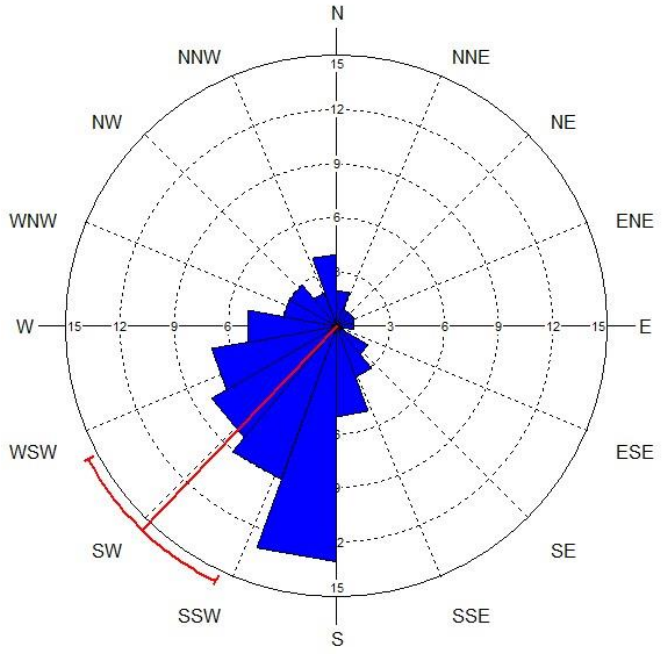

Figure 4.1. Summary of gannet flight direction (n=70) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (December to March surveys).

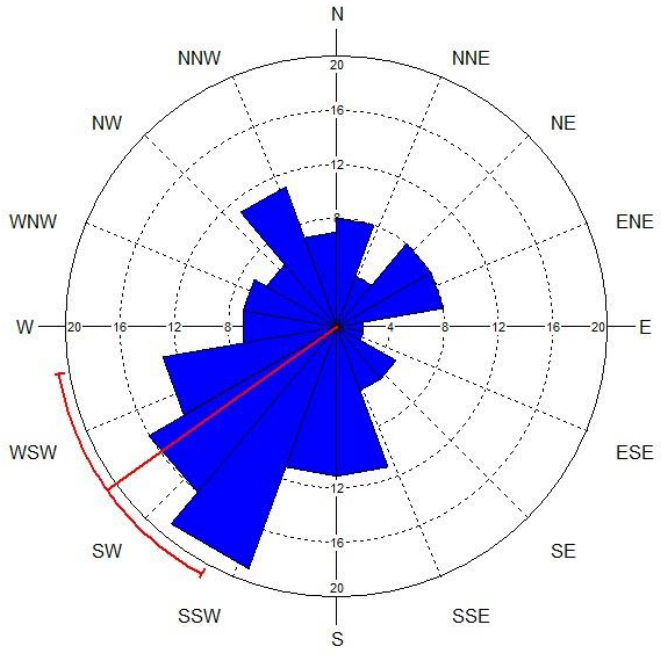

Figure 4.2. Summary of gannet flight direction (n=150) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (September to November surveys).

68. Spatial distribution maps are provided in Annex G for each bio-season. During the migration-free bio-season, higher densities of gannet were noticeable in the north-eastern boundary of the East Anglia THREE site plus 4km buffer. No other bio-season demonstrated a pattern or preference of gannets to specific areas.

4.3.6 Arctic Skua

4.3.6.1 Abundance estimates

69. Arctic skuas were recorded during the September surveys only when a total of two Arctic skuas were recorded within the East Anglia THREE site (Table 4.15). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.15. Arctic skua monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE Site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	13	15	0.043	0.000	0.026	0.043	0.021
	2012	16		0.052	0.052		0.000	

4.3.6.2 Bio-season mean peak estimates

70. The abundance estimate in the BDMPS autumn migration bio-season was an estimated five individuals present within the East Anglia THREE site, with an estimated density of 0.017 birds per km^2 (Table 4.16). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.16. BDMPS bio-season mean peak abundance estimates and mean peak densities of Arctic skuas within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	Jun-Jul	0	0.000
Migration - autumn	Aug-Oct	5	0.017
Winter	N/A	N/A	N/A
Migration - spring	Apr-May	0	0.000

4.3.6.3 Behaviour and distribution

71. Of the two birds recorded, one was recorded sitting on the water and one was flying at potential collision height.

4.3.7 Great Skua

4.3.7.1 Abundance estimates

72. Great skuas were recorded during the September 2011, October 2011 and September 2012 surveys. Numbers peaked during September 2011 with, based on a count of four birds, an abundance estimate at 53 (4 to 133) individuals within the East Anglia THREE site (Table 4.18). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.18. Great skua monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	53	43	0.174	0.174	0.113	0.000	0.026
	2012	32		0.105	0.052		0.052	
Oct	2011	33	17	0.108	0.108	0.054	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.7.2 Bio-season mean peak estimates

73. The abundance estimate in the BDMPS autumn migration bio-season was an estimated 29 individuals present within the East Anglia THREE site, with an

estimated density of 0.094 birds per km^2 (Table 4.19). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.19. BDMPS bio-season mean peak abundance estimates and mean peak densities of great skua within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	May-Jul	0	0.000
Migration - autumn	Aug-Oct	29	0.094
Winter	Nov-Feb	0	0.000
Migration - spring	Mar-Apr	0	0.000

4.3.7.3 Behaviour and distribution

74. Of the eight great skuas recorded in the East Anglia THREE site, one was recorded sitting on the water and seven were observed flying (Table 4.20). Of the flying birds, two were recorded flying at potential collision height (Table 4.20).

Table 4.20. Flight height summary of great skua recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total great skua	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
8	1	7	5	2	0	29%

75. Although the set of data on this species is limited, all observations occurred in two months (September and October). Figure 4.3 indicates a westerly direction of flight for birds flying through the proposed site.

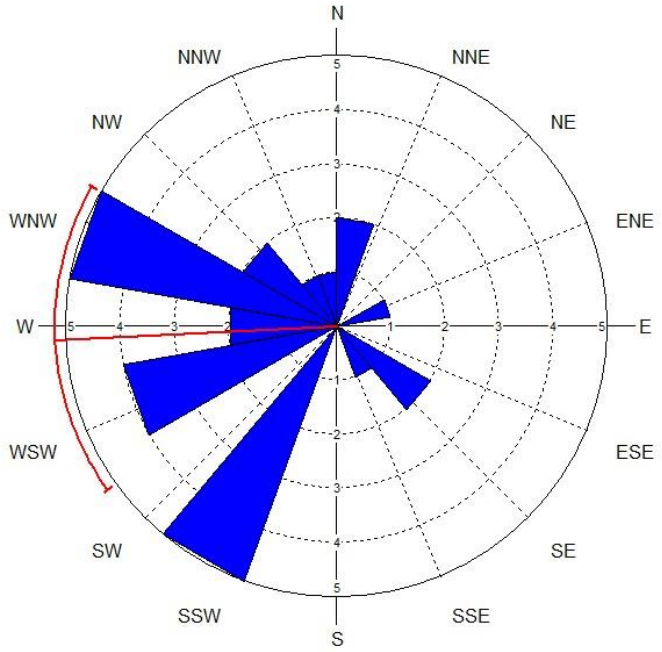

Figure 4.3. Summary of great skua flight direction (n=26) within the East Anglia THREE site plus 4km Buffer.

76. A spatial distribution map is provided in Annex G. Great skua showed a slight preference to the eastern boundary of the East Anglia THREE site plus 4km buffer.

4.3.8 Sabine's Gull

4.3.8.1 Abundance estimates

77. A single Sabine's gull was recorded during the November 2011 survey within the East Anglia THREE site (Table 4.21). This individual was recorded flying at potential collision height (22-176m). Monthly abundance and density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

78. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.21, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

79. Following attribution of unidentified birds, in November 2011 an estimated 17 birds were present with an estimated density of 0.054 birds per km ^{2}.

Table 4.21. Sabine's gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE Site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Nov	2011	**17**	8	0.054	0.054	0.027	0.000	0.000
	2012	0		0.000	0.000		0.000	

4.3.9 Kittiwake

4.3.9.1 Abundance estimates

80. Kittiwakes were recorded during all surveys with the exception of September 2011 and July 2012. Numbers peaked during December 2012, the only survey finding more than 64 birds, when an estimated 4,033 (456 to 10,595) individuals were present within the East Anglia THREE site (Table 4.22). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C. Numbers were highly variable; for example 40 were counted in the December 2011 survey compared with 354 in December 2012.

81. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.22, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.22. Kittiwake monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	24	0.000	0.000	0.000	0.000	0.079
	2012	48		0.157	0.000		0.157	
Oct	2011	**33**	34	0.107	0.043	0.061	0.064	0.052
	2012	36		0.118	0.079		0.039	
Nov	2011	**600**	341	1.969	1.552	0.855	0.418	0.262
	2012	81		0.266	0.159		0.106	
Dec	2011	**568**	2,301	1.864	1.724	1.965	0.140	5.583
	2012	4,033*		13.232	2.205		11.027	
Jan	2012	129	395	0.423	0.265	0.597	0.159	0.699
	2013	**661**		2.168	0.929		1.239	
Feb	2012	802	438	2.631	0.987	0.597	1.645	0.840
	2013	74		0.243	0.208		0.035	
Mar	2012	**64**	105	0.210	0.157	0.158	0.052	0.185
	2013	145		0.476	0.159		0.317	
Apr	2012	101	141	0.331	0.000	0.198	0.331	0.265
	2013	181		0.594	0.396		0.198	
May	2012	**74**	85	0.243	0.000	0.079	0.243	0.200
	2013	96		0.315	0.157		0.157	
Jun	2012	123	98	0.404	0.147	0.133	0.257	0.188
	2013	73		0.240	0.120		0.120	
Jul	2012	0	7	0.000	0.000	0.000	0.000	0.021
	2013	13		0.043	0.000		0.043	
Aug	2012	49	52	0.161	0.000	0.000	0.161	0.169
	2013	54		0.177	0.000		0.177	

* During this survey a vessel was captured in an image which contained 416 birds, including 267 kittiwakes. This represents 67% of kittiwakes captured during the entire survey (n=401).

4.3.9.2 Bio-season mean peak estimates

82. Numbers peaked in the BDMPS autumn migration bio-season when an estimated 954 individuals were present within the East Anglia THREE site, with an estimated density of 3.131 birds per km^2 (Table 4.23). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.23. BDMPS bio-season mean peak abundance estimates and mean peak densities of kittiwakes within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	May-Jul	77	0.254
Migration - autumn	Aug-Dec	954	3.131
Winter	N/A	N/A	N/A
Migration - spring	Jan-Apr	447	1.467

4.3.9.3 Behaviour and distribution

83. Of the 637 kittiwakes recorded in the East Anglia THREE site, 429 were sitting on the water and 208 were recorded flying (Table 4.24). Of the flying birds, 21 were recorded flying at potential collision height (Table 4.24).

Table 4.24. Flight height summary of kittiwakes recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total kittiwake	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
637	429	208	187	21	0	10%

84. The flight direction recorded for this species was notably in a north-easterly direction during the BDMPS spring migration season (Figure 4.4) and a south-westerly direction during the BDMPS autumn migration season (Figure 4.5). The flight direction recorded for this species was notably in a northerly direction during the BDMPS migration-free breeding season (Figure 4.6).

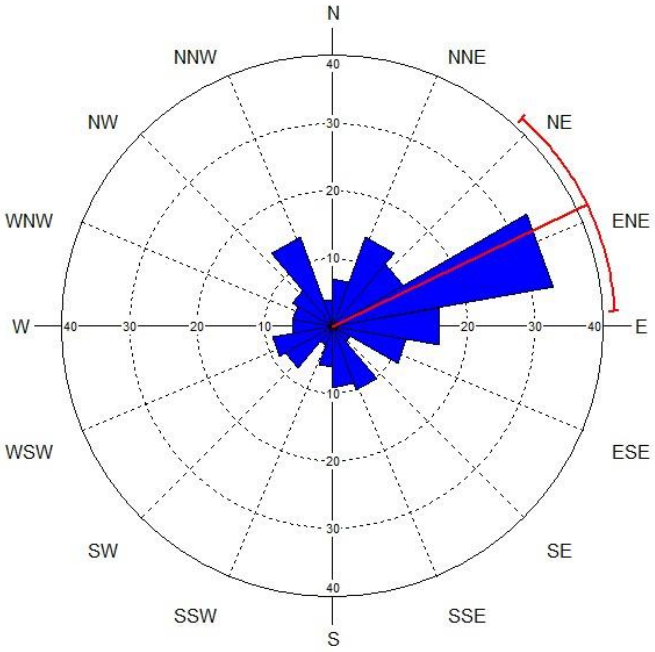

Figure 4.4. Summary of kittiwake flight direction (n=178) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (January to April surveys).

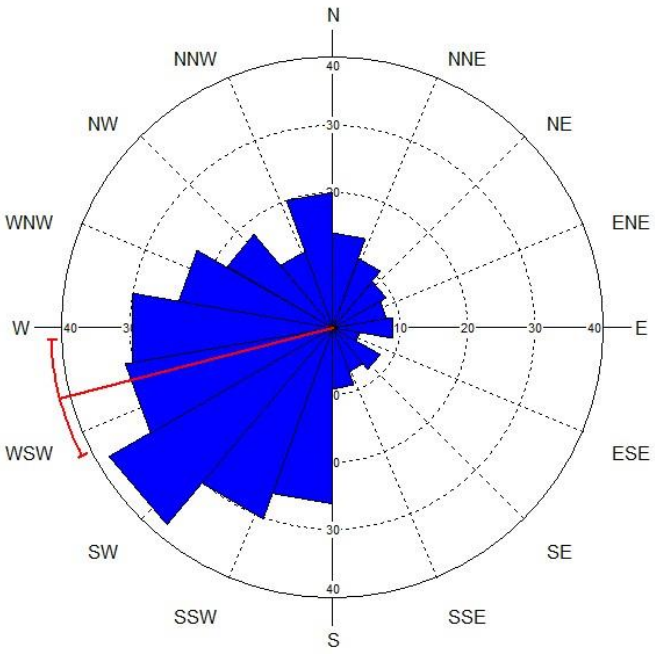

Figure 4.5. Summary of kittiwake flight direction (n=307) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (September to December surveys, no flying kittiwakes were recorded in August).

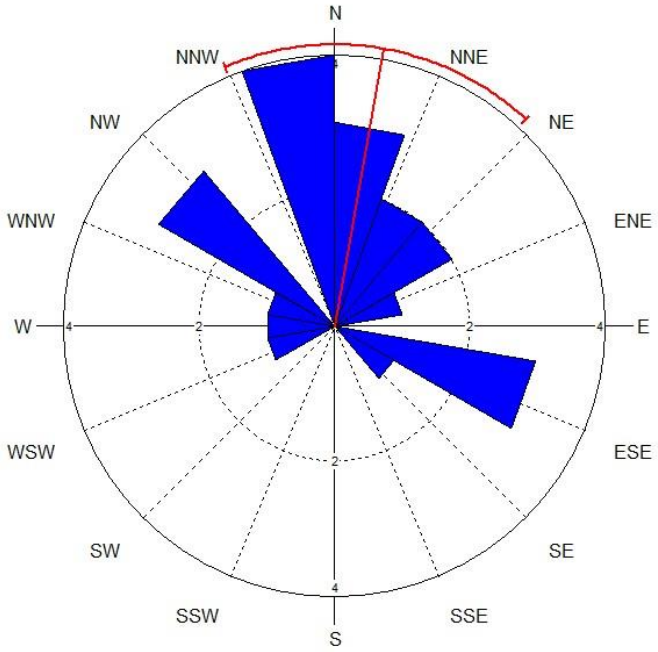

Figure 4.6. Summary of kittiwake flight direction (n=22) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (May and June surveys, no flying kittiwakes were recorded during July).

85. Spatial distribution maps are provided in Annex G for each bio-season, though kittiwake showed no patterns of preference to specific areas within the East Anglia THREE site or 4km buffer.

4.3.10 Black-headed Gull

4.3.10.1 Abundance estimates

86. Black-headed gulls were recorded in April, July and November 2012. Numbers peaked during July 2012 when an estimated 220 individuals were present within the East Anglia THREE site (Table 4.25). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

87. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.25, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.25. Black-headed gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	**26**	13	0.085	0.064	0.032	0.021	0.011
	2012	0		0.000	0.000		0.000	
Nov	2011	**1**	8	0.002	0.002	0.027	0.000	0.000
	2012	16		0.052	0.052		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	13	7	0.043	0.043	0.021	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	**220**	110	0.722	0.722	0.361	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.10.2 Bio-season mean peak estimates

88. Numbers peaked in the evidence plan migration-free breeding bio-season when an estimated 47 individuals were present within the East Anglia THREE site, with an estimated density of 0.153 birds per km^2 (Table 4.26). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.26. Evidence plan bio-season mean peak abundance estimates and mean peak densities of black-headed gulls within the East Anglia THREE site only. Note that this species was not included in Furness (2015) hence the use of bio-seasons agreed during the Evidence plan process.

Evidence Plan Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	Apr-Aug	47	0.153
Migration - autumn	Sep-Nov	14	0.046
Winter	Dec-Feb	0	0.000
Migration - spring	Mar	0	0.000

4.3.10.3 Behaviour and distribution

89. All of the black-headed gulls recorded in the East Anglia THREE site were observed flying (Table 4.27). Of the flying birds, one was recorded flying at potential collision height (Table 4.27).

Table 4.27. Flight height summary of black-headed gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total black-headed gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
4	0	4	3	1	0	25%

90. The flight direction recorded for this species was notably in a south-westerly direction (Figure 4.7).

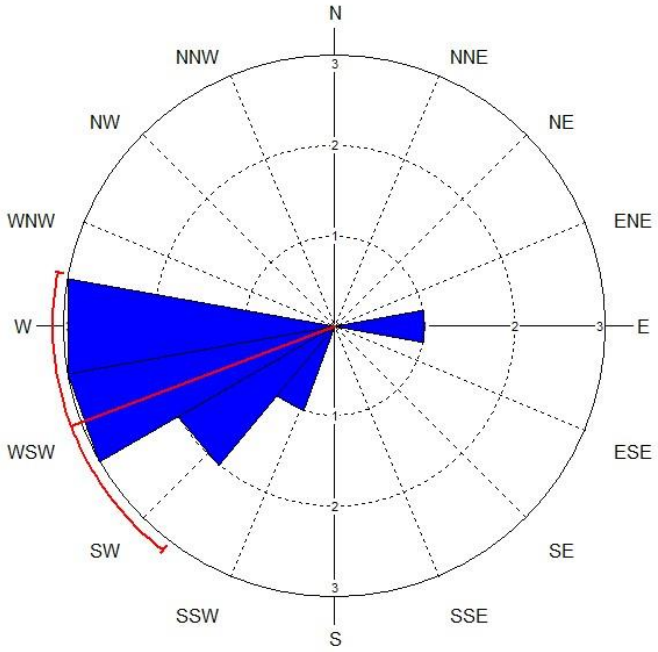

Figure 4.7. Summary of black-headed gull flight direction (n=10) within the East Anglia THREE site plus 4km Buffer.

91. A spatial distribution map is provided in Annex G, though black-headed gull showed no pattern or preference to specific areas within the East Anglia THREE site or 4km buffer.

4.3.11 Little Gull

4.3.11.1 Abundance estimates

92. Little gulls were recorded in the September 2011 survey and March, April and May 2013 surveys. Numbers peaked during May 2013 when, based on a count of 37 birds, an estimated 590 (37 to 1,660) individuals were present within the East Anglia THREE site (Table 4.28). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

93. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.28, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.28. Little gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	13	7	0.043	0.043	0.021	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	**1**	0	0.002	0.002	0.001	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	1	0.000	0.000	0.002	0.000	0.002
	2013	**2**		0.006	0.003		0.003	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	18	0.000	0.000	0.059	0.000	0.000
	2013	36		0.118	0.118		0.000	
Apr	2012	0	23	0.000	0.000	0.025	0.000	0.049
	2013	45		0.148	0.049		0.098	
May	2012	0	295	0.000	0.000	0.105	0.000	0.863
	2013	590		1.936	0.209		1.726	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.11.2 Behaviour and distribution

94. Of the 44 little gulls that were recorded in the East Anglia THREE site, 35 were recorded sitting on the water and 9 were observed flying (Table 4.29). Of the flying birds suitable for flight height estimation, one was recorded flying at potential collision height (Table 4.29).

Table 4.29. Flight height summary of little gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total little gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
44	35	9	6	1	0	14%

Table Note: Two flying little gulls were unsuitable for the flight height calculation and are therefore excluded from the potential collision height categories in table

95. The data on this species are limited and a single rose diagram from across all months is presented in Annex F.

96. A spatial distribution map is provided in Annex G, though little gull showed no pattern or preference to specific areas within the East Anglia THREE site or 4km buffer.

4.3.12 Common Gull

4.3.12.1 Abundance estimates

97. Common gulls were recorded in the February and December 2012, and January 2013 surveys. Number peaked during January 2013 with an estimated 64 individuals present within the East Anglia THREE site (Table 4.30). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

98. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.30, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.30. Common gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	**7**	3	0.021	0.021	0.011	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	6	0.000	0.000	0.018	0.000	0.000
	2012	11		0.036	0.036		0.000	
Jan	2012	0	32	0.000	0.000	0.084	0.000	0.021
	2013	**64**		0.211	0.169		0.042	
Feb	2012	38	19	0.125	0.125	0.062	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.12.2 Bio-season mean peak estimates

99. Numbers peaked in the evidence plan winter bio-season when an estimated 38 individuals were present within the East Anglia THREE site, with an estimated density of 0.124 birds per km^2 (Table 4.31). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.31. Evidence plan bio-season mean peak abundance estimates and mean peak densities of common gulls within the East Anglia THREE site only. Note that this species was not included in Furness (2015) hence the use of bio-seasons agreed during the evidence plan process.

Evidence Plan Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	Apr-Aug	0	0.000
Migration - autumn	Sep-Nov	2	0.007
Winter	Dec-Feb	38	0.124
Migration - spring	Mar	0	0.000

4.3.12.3 Behaviour and distribution

100. Of the 9 common gulls recorded in the East Anglia THREE site, one was recorded sitting on the water and eight were observed flying (Table 4.32). None of the flying birds were recorded flying at potential collision height (Table 4.32).

Table 4.32. Flight height summary of common gulls recorded in flight from monthly aerial surveys across the East Anglia THREE Site only.

Total common gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
9	1	8	8	0	0	0%

101. The data on this species are limited and a single rose diagram from across all months (noting that observations only occurred in October to January) is presented in Annex F.

102. A spatial distribution map is provided in Annex G, though common gull showed no pattern or preference to specific areas within the East Anglia THREE site or 4km buffer.

4.3.13 Lesser Black-backed Gull

4.3.13.1 Abundance estimates

103. Lesser black-backed gulls were recorded in 13 out of the 24 surveys. Numbers peaked during August 2013 when an estimated 282 (21 to 807) individuals were present within the East Anglia THREE site (Table 4.33). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

104. The abundance estimates in Table 4.33 provide information on this species after there has been the process carried out of the attribution of unidentified birds. The process of attribution is described in Section 3.3.3. Annex B provides the abundance estimates for this species before the attribution of unidentified birds and also the abundance estimates for the relevant unidentified, grouped category.

Table 4.33. Lesser black-backed gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	93	71	0.305	0.044	0.048	0.262	0.183
	2012	48		0.157	0.052		0.105	
Oct	2011	**60**	30	0.196	0.000	0.000	0.196	0.098
	2012	0		0.000	0.000		0.000	
Nov	2011	**18**	9	0.059	0.059	0.029	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	57	0.000	0.000	0.000	0.000	0.187
	2012	114		0.374	0.000		0.374	
Jan	2012	0	6	0.000	0.000	0.020	0.000	0.000
	2013	12		0.039	0.039		0.000	
Feb	2012	0	6	0.000	0.000	0.000	0.000	0.018
	2013	11		0.036	0.000		0.036	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	50	25	0.164	0.041	0.021	0.123	0.062
	2013	0		0.000	0.000		0.000	
May	2012	**57**	28	0.186	0.046	0.023	0.139	0.070
	2013	0		0.000	0.000		0.000	
Jun	2012	11	6	0.036	0.036	0.018	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	42	21	0.138	0.000	0.000	0.138	0.069
	2013	0		0.000	0.000		0.000	
Aug	2012	49	166	0.161	0.040	0.086	0.121	0.457
	2013	282		0.925	0.132		0.793	

4.3.13.2 Bio-season mean peak estimates

105. Numbers peaked in the BDMPS autumn migration bio-season when an estimated 145 individuals were present within the East Anglia THREE site, with an estimated density of 0.475 birds per km^2 (Table 4.34). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.34. BDMPS bio-season mean peak abundance estimates and mean peak densities of lesser black-backed gulls within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	May-Jul	37	0.120
Migration - autumn	Aug-Oct	145	0.475
Winter	Nov-Feb	39	0.127
Migration - spring	Mar-Apr	25	0.082

4.3.13.3 Behaviour and distribution

106. Of the 64 lesser black-backed gulls recorded in the East Anglia THREE site, 53 were recorded sitting on the water and 11 were observed flying (Table 4.35). Of the flying birds, five were recorded flying at potential collision height (Table 4.35).

Table 4.35. Flight height summary of lesser black-backed gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total lesser black-blacked gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
64	53	11	6	5	0	45%

107. Flight direction patterns were not evident within the BDMPS bio-seasons, which are provided in Annex F.

108. Spatial distribution maps are provided in Annex G for each bio-season, although lesser black-back gull showed no noticeable pattern or preference to specific areas within East Anglia THREE site or 4km buffer.

4.3.14 Herring Gull

4.3.14.1 Abundance estimates

109. Herring gulls were recorded in 12 out of the 24 surveys. Numbers peaked during December 2012 when an estimated 1,219 (107 to 3,418) individuals were present

within the East Anglia THREE site (Table 4.36). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

110. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.36, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.36. Herring gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	**46**	23	0.150	0.000	0.000	0.150	0.075
	2012	0		0.000	0.000		0.000	
Nov	2011	**105**	52	0.344	0.172	0.086	0.172	0.086
	2012	0		0.000	0.000		0.000	
Dec	2011	73	646	0.240	0.080	0.283	0.160	1.837
	2012	1,219		3.999	0.486		3.514	
Jan	2012	16	87	0.052	0.000	0.099	0.052	0.185
	2013	157		0.515	0.198		0.317	
Feb	2012	138	69	0.453	0.247	0.123	0.206	0.103
	2013	0		0.000	0.000		0.000	
Mar	2012	38	19	0.125	0.000	0.000	0.125	0.062
	2013	0		0.000	0.000		0.000	
Apr	2012	88	44	0.289	0.000	0.000	0.289	0.144
	2013	0		0.000	0.000		0.000	
May	2012	**26**	13	0.086	0.000	0.000	0.086	0.043
	2013	0		0.000	0.000		0.000	
Jun	2012	11	6	0.036	0.000	0.000	0.036	0.018
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	310	0.000	0.000	0.000	0.000	1.015
	2013	619		2.031	0.000		2.031	

4.3.14.2 Bio-season mean peak estimates

111. Numbers peaked in the BDMPS winter bio-season when an estimated 1,219 individuals were present within the East Anglia THREE site, with an estimated density

of 3.999 birds per km^2 (Table 4.37). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.37. BDMPS bio-season mean peak abundance estimates and mean peak densities of herring gulls within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	May-Jul	12	0.041
Migration - autumn	Aug-Nov	192	0.631
Winter	Dec	1,219	3.999
Migration - spring	Jan-Apr	105	0.345

4.3.14.3 Behaviour and distribution

112. Of the 205 herring gulls recorded in the East Anglia THREE site, 176 were recorded sitting on the water and 29 were observed flying (Table 4.38). Of the flying birds six were recorded flying at potential collision height (Table 4.38).

Table 4.38. Flight height summary of herring gulls recorded in flight from monthly aerial surveys across the East Anglia THREE Site only.

Total herring gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
205	176	29	23	6	0	21%

113. The flight direction recorded for this species was notably in a south-westerly direction during the autumn migration bio-season (Figure 4.8), north-easterly direction during the spring migration bio-season (Figure 4.9) and north-westerly direction during the winter bio-season (Figure 4.10). A further flight direction rose diagram is provided in Annex F for the autumn migration bio-season.

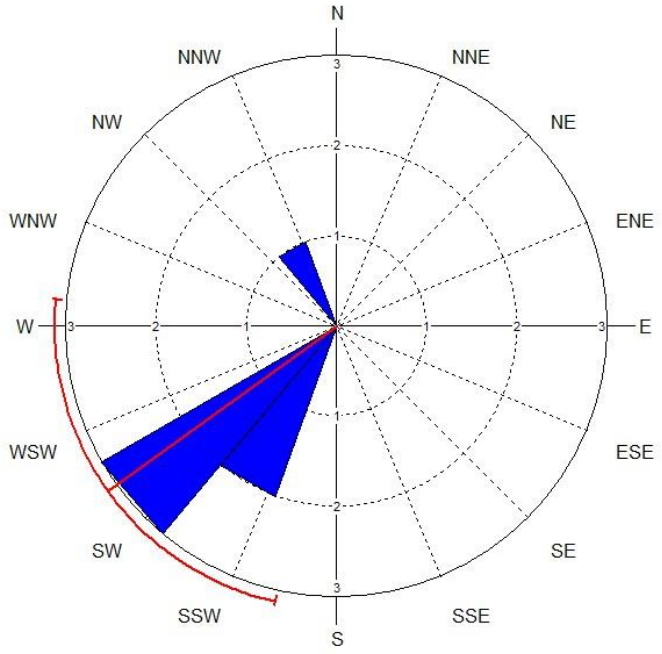

Figure 4.8. Summary of herring gull flight direction (n=6) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (September and November surveys, no flying herring gulls were recorded in August).

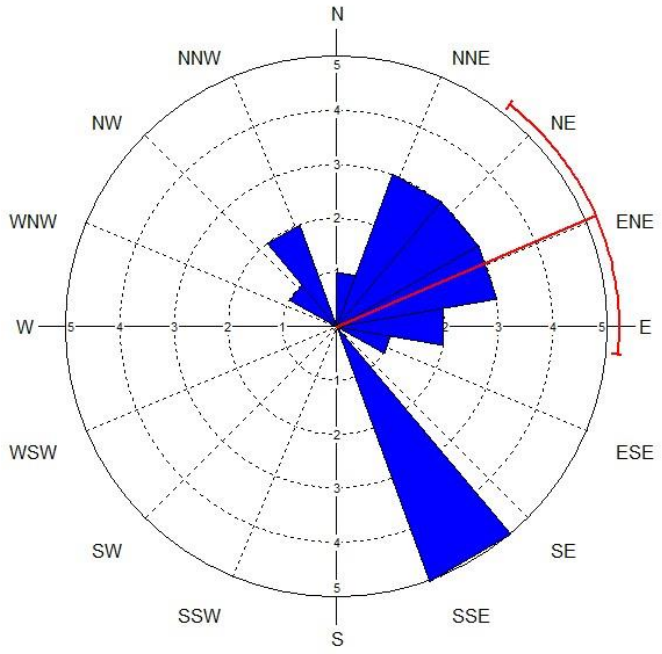

Figure 4.9. Summary of herring gull flight direction (n=21) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (January, February and March surveys, no flying herring gulls were recorded in April).

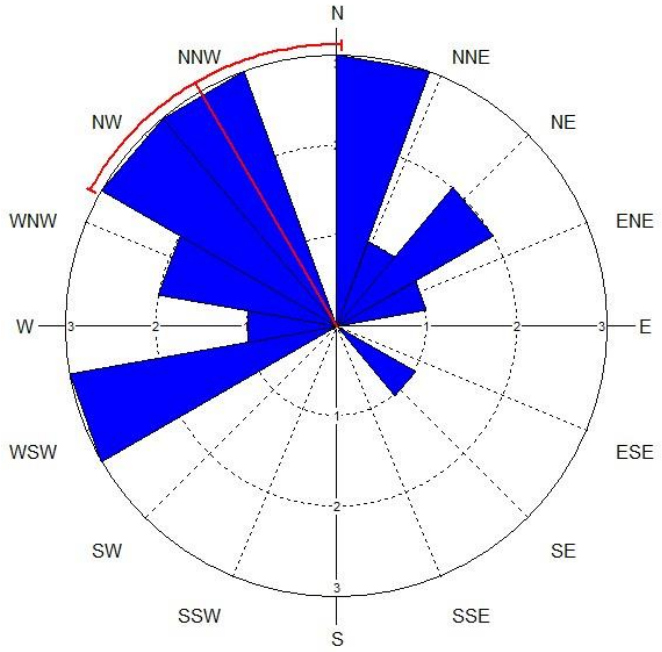

Figure 4.10. Summary of herring gull flight direction (n=20) within the East Anglia THREE site plus 4km Buffer during the winter bio-season (December surveys).

114. Spatial distribution maps are provided in Annex G for each bio-season, although herring gull showed no patterns or preference to specific areas within East Anglia THREE site or 4km buffer.

4.3.15 Great Black-backed Gull

4.3.15.1 Abundance estimates

115. Great black-backed gulls were recorded during all surveys with the exception of June, August and October 2012 and March, May, June and July 2013 surveys (Table 4.39). Numbers peaked during December 2012 when an estimated 627 (57 to 1,675) individuals were present within the East Anglia THREE site. Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

116. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.39, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

Table 4.39. Great black-backed gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE Site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	13	15	0.043	0.000	0.000	0.043	0.048
	2012	16		0.052	0.000		0.052	
Oct	2011	**43**	21	0.140	0.070	0.035	0.070	0.035
	2012	0		0.000	0.000		0.000	
Nov	2011	**56**	53	0.185	0.123	0.062	0.062	0.111
	2012	49		0.161	0.000		0.161	
Dec	2011	109	368	0.358	0.199	0.193	0.159	1.015
	2012	627		2.057	0.187		1.870	
Jan	2012	16	310	0.052	0.000	0.178	0.052	0.837
	2013	603		1.978	0.356		1.622	
Feb	2012	163	134	0.535	0.411	0.240	0.123	0.200
	2013	105		0.344	0.069		0.276	
Mar	2012	13	7	0.043	0.000	0.000	0.043	0.021
	2013	0		0.000	0.000		0.000	
Apr	2012	25	28	0.082	0.000	0.049	0.082	0.041
	2013	30		0.098	0.098		0.000	
May	2012	**28**	14	0.093	0.000	0.000	0.093	0.046
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	52	26	0.171	0.068	0.034	0.102	0.051
	2013	0		0.000	0.000		0.000	
Aug	2012	0	215	0.000	0.000	0.000	0.000	0.705
	2013	430		1.411	0.000		1.411	

4.3.15.2 Bio-season mean peak estimates

117. Numbers peaked in the BDMPS winter bio-season when an estimated 627 individuals were present within the East Anglia THREE site, with an estimated 2.057 birds per km^2 (Table 4.40). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.40. BDMPS bio-season mean peak abundance estimates and mean peak densities of great black-backed gulls within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	May-Jul	27	0.088
Migration - autumn	Aug-Nov	136	0.447
Winter	Dec	627	2.057
Migration - spring	Jan-Apr	202	0.664

4.3.15.3 Behaviour and distribution

118. Of the 192 great black-backed gulls recorded in the East Anglia THREE site, 154 were recorded sitting on the water and 38 were observed flying (Table 4.41). Of the flying birds 15 were flying at a potential collision height (Table 4.41).

Table 4.41. Flight height summary of great black-backed gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total great black-backed gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
192	154	38	23	15	0	39%

119. The flight direction recorded for this species was notably in a north-easterly direction during the spring migration bio-season (Figure 4.11). Further flight direction rose diagrams are provided in Annex F for each bio-season.

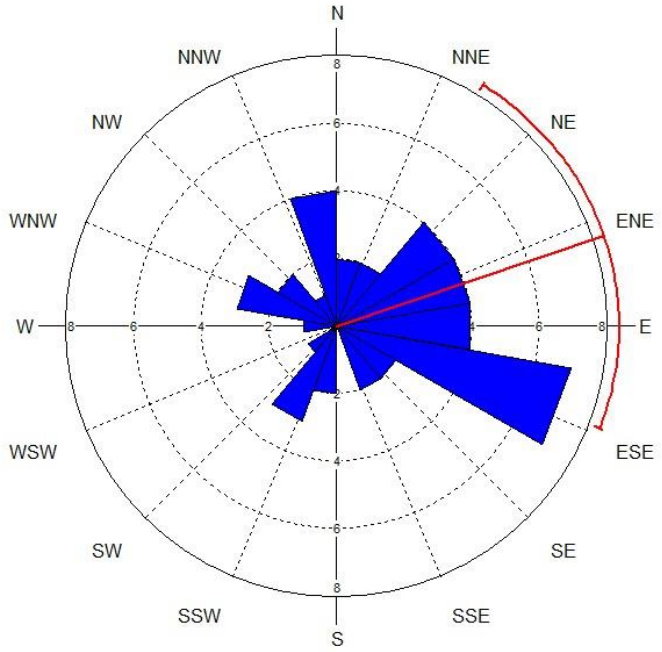

Figure 4.11. Summary of great black-backed gull flight direction (n=44) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (January, February and April surveys, no flying great black-backed gulls were recorded during March).

120. Spatial distribution maps are provided in Annex G for each bio-season. Great black-backed gull showed a slight preference to the north-eastern boundary of the East Anglia THREE site plus 4km buffer. No other bio-season demonstrated a pattern or preference of great black-backed gulls to specific areas within the East Anglia THREE site or 4km buffer.

4.3.16 'Commic' Tern

4.3.16.1 Abundance estimates

121. Commic terns were recorded during the May and September 2012 surveys, and the, April and May 2013 surveys. Numbers peaked during May 2013 when an estimated 463 (29 to 1,149) individuals were present within the East Anglia THREE site (Table 4.42). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.42. 'Commic' tern monthly mean abundance estimates (includes positively identified and proportioned out individuals) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	16	0.000	0.000	0.052	0.000	0.000
	2012	32		0.105	0.105		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	15	0.000	0.000	0.049	0.000	0.000
	2013	30		0.098	0.098		0.000	
May	2012	135	299	0.443	0.443	0.981	0.000	0.000
	2013	463		1.519	1.519		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.16.2 Behaviour and distribution

122. All of the 44 commic terns recorded in the East Anglia THREE site were observed flying (Table 4.43). No birds were recorded flying at potential collision height (Table 4.43).

Table 4.43. Flight height summary of 'commic' terns recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total 'commic' tern	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
44	0	44	44	0	0	0%

123. The set of data on this species is limited to observations in the spring and autumn migration bio-seasons. The flight direction recorded for this species was notably in a south-easterly direction during the spring migration bio-season (Figure 4.12). A further rose diagram for the autumn migration bio-seasons is presented in Annex F.

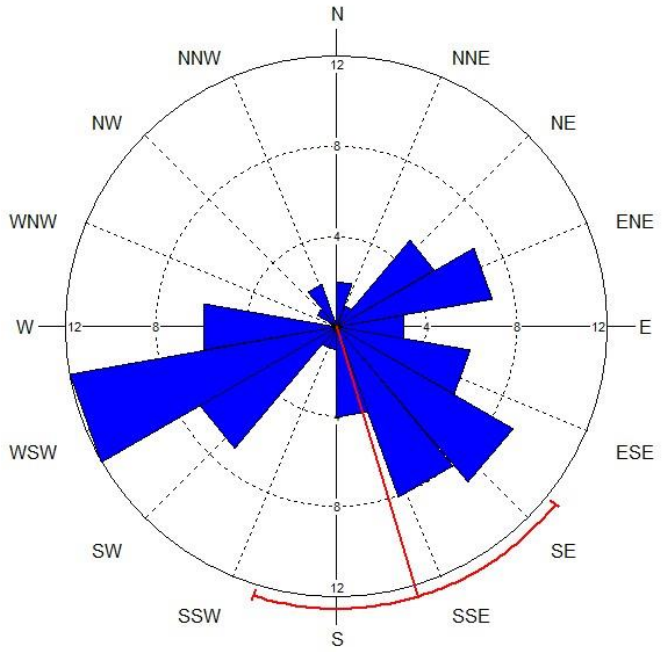

Figure 4.12. Summary of commic tern flight direction (n=75) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (April and May surveys).

124. Spatial distribution maps are provided in Annex G for each bio-season, although commic tern showed no patterns or preference to specific areas within East Anglia THREE site or 4km buffer.

4.3.17 Guillemot

4.3.17.1 Abundance estimates

125. Guillemots were recorded during all surveys with the exception of June 2013. Numbers peaked during January 2013 when, based on 202 guillemots counted in the survey, an estimated 3,349 individuals were present within the East Anglia THREE site (Table 4.44). Monthly abundance estimates for the East Anglia THREE site plus a 1km buffer, 2km buffer and 4km buffer are presented in Annex D.

126. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.44, (attribution methods are described in Section 3.3.3). Annex B

provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

127. In addition the abundance estimates have been corrected for the fact that a proportion of the birds might have been foraging underwater when the image was captured, the process for correcting for 'unavailable' birds is described in Section 4.3.4.

Table 4.44. Corrected guillemot monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**916**	700	3.005	0.000	0.000	3.005	2.297
	2012	484		1.589	0.000		1.589	
Oct	2011	**560**	387	1.837	0.000	0.019	1.837	1.251
	2012	215		0.704	0.039		0.665	
Nov	2011	**374**	238	1.226	0.172	0.112	1.054	0.667
	2012	101		0.333	0.053		0.280	
Dec	2011	**1,315**	1,398	4.315	0.000	0.019	4.315	4.568
	2012	1,481		4.858	0.037		4.820	
Jan	2012	**258**	1,803	0.846	0.000	0.000	0.846	5.917
	2013	3,349		10.987	0.000		10.987	
Feb	2012	**1,145**	1,423	3.758	0.045	0.057	3.713	4.611
	2013	1,700		5.577	0.069		5.508	
Mar	2012	**233**	932	0.764	0.086	0.043	0.678	3.016
	2013	**1,632**		5.353	0.000		5.353	
Apr	2012	**430**	693	1.412	0.000	0.000	1.412	2.273
	2013	955		3.134	0.000		3.134	
May	2012	162	291	0.531	0.000	0.000	0.531	0.954
	2013	420		1.377	0.000		1.377	
Jun	2012	29	14	0.095	0.000	0.000	0.095	0.047
	2013	0		0.000	0.000		0.000	
Jul	2012	41	55	0.134	0.000	0.000	0.134	0.181
	2013	70		0.229	0.000		0.229	
Aug	2012	259	252	0.850	0.000	0.110	0.850	0.716
	2013	245		0.802	0.221		0.581	

4.3.17.2 Bio-season mean peak estimates

128. Numbers peaked in the BDMPS spring migration bio-season when an estimated 2,176 individuals were present within the East Anglia THREE site, with an estimated density of 7.141 birds per km^2 (Table 4.45). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.45. BDMPS bio-season mean peak abundance estimates and mean peak densities of guillemots within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	Mar-Jun	759	2.490
Migration - autumn	Jul-Oct	451	1.480
Winter	Nov	374	1.226
Migration - spring	Dec-Feb	2,176	7.141

4.3.17.3 Behaviour and distribution

129. Of the 964 guillemots recorded in the East Anglia THREE site, 948 were recorded sitting on the water and 16 were observed flying (Table 4.46). No birds were recorded flying at potential collision height (Table 4.46).

Table 4.46. Flight height summary of guillemots recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total guillemot	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
964	948	16	16	0	0	0%

130. The data for this species has limited observations for each of the BDMPS bio-seasons. Despite this, the flight direction recorded for this species was notably in a south-easterly direction during the autumn migration bio-season and westerly during the winter bio-season. Rose diagrams are presented in Annex F.

131. Spatial distribution maps are provided in Annex G for each bio-season. Guillemot showed a slight preference to the north-eastern area of the East Anglia THREE site plus 4km buffer. No other bio-season demonstrated a pattern or preference of guillemots to specific areas within the East Anglia THREE site or 4km buffer.

4.3.18 Razorbill

4.3.18.1 Abundance estimates

132. Razorbills were recorded during all surveys with the exception of June 2013. Numbers peaked during February 2012 when an estimated 1,663 individuals were present within the East Anglia THREE site (Table 4.47). Monthly abundance estimates for the East Anglia THREE site plus a 1km buffer, 2km buffer and 4km buffer are presented in Annex D.

133. Monthly abundance estimates following attribution of unidentified birds are provided in Table 4.47, (attribution methods are described in Section 3.3.3). Annex B provides the raw abundance estimates before attribution of unidentified birds and also the estimated abundance of the relevant unidentified group category.

In addition the abundance estimates have been corrected for the fact that a proportion of the birds might have been foraging underwater when the image was captured, the process for correcting for 'unavailable' birds is described in Section 4.3.4.

Table 4.47. Corrected razorbill monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**504**	319	1.652	0.000	0.000	1.652	1.048
	2012	135		0.443	0.000		0.443	
Oct	2011	**901**	721	2.955	0.000	0.000	2.955	2.367
	2012	542		1.779	0.000		1.779	
Nov	2011	**1,155**	695	3.791	0.280	0.140	3.511	2.141
	2012	235		0.771	0.000		0.771	
Dec	2011	**1,051**	835	3.449	0.000	0.000	3.449	2.738
	2012	618		2.028	0.000		2.028	
Jan	2012	**660**	1,348	2.166	0.000	0.000	2.166	4.421
	2013	2,035		6.677	0.000		6.677	
Feb	2012	**1,663**	944	5.455	0.046	0.058	5.409	3.038
	2013	225		0.737	0.069		0.668	
Mar	2012	**454**	652	1.489	0.000	0.000	1.489	2.138
	2013	**849**		2.787	0.000		2.787	
Apr	2012	**1,484**	1,348	4.870	0.000	0.074	4.870	4.348
	2013	1,211		3.974	0.149		3.825	
May	2012	296	340	0.972	0.000	0.000	0.972	1.117
	2013	384		1.261	0.000		1.261	
Jun	2012	13	7	0.043	0.000	0.000	0.043	0.022
	2013	0		0.000	0.000		0.000	
Jul	2012	12	14	0.040	0.000	0.000	0.040	0.045
	2013	16		0.051	0.000		0.051	
Aug	2012	30	31	0.099	0.000	0.000	0.099	0.103
	2013	33		0.107	0.000		0.107	

4.3.18.2 Bio-season mean peak estimates

134. Numbers peaked in the BDMPS spring migration bio-season when an estimated 1,516 individuals were present within the East Anglia THREE site, with an estimated 4.973 birds per km^2 (Table 4.48). A similar abundance occurred during the winter season, with 1,103 individuals present (Table 4.48). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.48. BDMPS (a) and evidence plan (b) bio-season mean peak abundance estimates and mean peak densities of razorbills within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	Apr-Jul	474	1.556
Migration - autumn	Aug-Oct	479	1.571
Winter	Nov-Dec	1,103	3.620
Migration - spring	Jan-Mar	1,516	4.973

4.3.18.3 Behaviour and distribution

135. Of the 871 razorbills recorded in the East Anglia THREE site, 860 were recorded sitting on the water and 11 were observed flying (Table 4.49). No birds were recorded flying at potential collision height (Table 4.49).

Table 4.49. Flight height summary of razorbills recorded in flight from monthly aerial surveys across the East Anglia THREE Site only.

Total razorbill	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
871	860	11	11	0	0	0%

136. The data for this species has limited observations for each of the BDMPS bio-seasons. Despite this, the flight direction recorded for this species was notably in a north-westerly direction during the migration-free breeding bio-season. Rose diagrams for this species are presented in Annex F.

137. Spatial distribution maps are provided in Annex G for each bio-season, although razorbill showed no pattern or preference to specific areas within East Anglia THREE site or 4km buffer.

4.3.19 Little Auk

4.3.19.1 Abundance estimates

138. A total of four little auks were recorded during the November and December 2012 and January 2013 surveys within the East Anglia THREE site (Table 4.50). Monthly abundance and density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.50. Little auk monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	16	0.000	0.000	0.026	0.000	0.026
	2012	32		0.105	0.052		0.052	
Dec	2011	0	6	0.000	0.000	0.018	0.000	0.000
	2012	11		0.036	0.036		0.000	
Jan	2012	0	7	0.000	0.000	0.000	0.000	0.021
	2013	13		0.043	0.000		0.043	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

4.3.19.2 Behaviour and distribution

139. Two birds were recorded flying below potential collision height with the remaining two birds recorded sitting on the water.

140. A spatial distribution map is provided in Annex G, although little auk showed no pattern or preference to specific areas within East Anglia THREE site or 4km buffer.

4.3.20 Puffin

4.3.20.1 Abundance estimates

141. Puffins were recorded during most surveys with the exception of September and December 2011, February, March, May, June, July and September 2012, and January and June 2013. Numbers peaked during November 2011 when an estimated 358 (147 to 619) individuals were present within the East Anglia THREE site (Table 4.51). Monthly abundance estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.51. Puffin monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	33	76	0.108	0.054	0.027	0.054	0.221
	2012	118		0.387	0.000		0.387	
Nov	2011	358	195	1.175	0.107	0.053	1.068	0.586
	2012	32		0.105	0.000		0.105	
Dec	2011	0	6	0.000	0.000	0.000	0.000	0.018
	2012	11		0.036	0.000		0.036	
Jan	2012	81	41	0.266	0.000	0.000	0.266	0.133
	2013	0		0.000	0.000		0.000	
Feb	2012	0	6	0.000	0.000	0.000	0.000	0.018
	2013	11		0.036	0.000		0.036	
Mar	2012	0	6	0.000	0.000	0.000	0.000	0.020
	2013	12		0.039	0.000		0.039	
Apr	2012	50	108	0.164	0.000	0.050	0.164	0.305
	2013	166		0.545	0.099		0.446	
May	2012	0	16	0.000	0.000	0.000	0.000	0.052
	2013	32		0.105	0.000		0.105	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	7	0.000	0.000	0.000	0.000	0.021
	2013	13		0.043	0.000		0.043	
Aug	2012	49	31	0.161	0.000	0.000	0.161	0.102
	2013	13		0.043	0.000		0.043	

4.3.20.2 Bio-season mean peak estimates

142. Numbers peaked in the BDMPS winter bio-season when an estimated 97 individuals were present within the East Anglia THREE site, with an estimated 0.317 birds per km^2 (Table 4.52). Monthly density estimates for the East Anglia THREE site plus 4km buffer are presented in Annex C.

Table 4.52. Bio-season mean peak abundance estimates and mean peak densities of puffins within the East Anglia THREE site only.

BDMPS Bio-seasons	Months	Mean peak abundance	Mean peak density (birds km^{-2})
Migration-free breeding	May-Jun	16	0.052
Migration - autumn	Jul-Aug	31	0.102
Winter	Sep-Feb	97	0.317
Migration - spring	Mar-Apr	89	0.292

4.3.20.3 Behaviour and distribution

143. Of the 67 puffins recorded, 62 were recorded sitting on the water and five were observed flying (Table 4.53). No birds were recorded flying at potential collision height (Table 4.53).

Table 4.53. Flight height summary of puffins recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total puffin	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22-176 m)	Above PCH	
67	62	5	5	0	0	0%

144. A spatial distribution map is provided in Annex G, although puffin showed no pattern or preference to specific areas within East Anglia THREE site or 4km buffer.

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ANNEX A: SCIENTIFIC NAMES OF BIRD SPECIES

Table A1.1 lists the names of birds used throughout this report and the scientific names of those birds. The bird species names that have been used are those that are in common use amongst English ornithologists. This corresponds to the "British (English) vernacular name 2012" identified by the British Ornithologists' Union (BOU 2012). The corresponding scientific names are those also listed in that BOU publication.

Table A1.1. Species recorded in the East Anglia THREE site plus 4km Buffer

British (English) Vernacular Name	Scientific Name
Red-throated diver	*Gavia stellata*
Black-throated diver	*Gavia arctica*
Great northern diver	*Gavia immer*
Fulmar	*Fulmarus glacialis*
Gannet	*Morus bassanus*
Arctic skua	*Stercorarius parasiticus*
Long-tailed skua	*Stercorarius longicaudus*
Great skua	*Stercorarius skua*
Sabine's gull	*Xema sabini*
Kittiwake	*Rissa tridactyla*
Black-headed gull	*Chroicocephalus ridibundus*
Little gull	*Hydrocoloeus minutus*
Common gull	*Larus canus*
Lesser black-backed gull	*Larus fuscus*
Herring gull	*Larus argentatus*
Great black-backed gull	*Larus marinus*
Common tern	*Sterna hirundo*
Arctic tern	*Sterna paradisaea*
Guillemot	*Uria aalge*
Razorbill	*Alca torda*
Little auk	*Alle alle*
Puffin	*Fratercula arctica*

ANNEX B: MONTHLY ABUNDANCE ESTIMATES FOR EAST ANGLIA THREE BIRDS (RAW COUNTS, CONFIDENCE LIMITS, PRECISION AND DENSITIES) BEFORE ATTRIBUTION OF UNIDENTIFIED BIRDS

Annex B presents the raw counts, abundance estimates (with upper and lower confidence limits), precision and density for all species recorded from aerial surveys of the East Anglia THREE site plus 4km buffer. The abundance estimates are presented for identified species, and unidentified grouped birds prior to the attribution of unidentified birds (or correction factors for guillemots and razorbills).

Table B2.1. Red-throated diver monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	1	16	1	49	>1	0.052
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	4	51	4	127	0.50	0.167
Apr-12	2	25	2	63	0.71	0.082
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	3	34	3	80	0.58	0.112
Jan-13	0	0	0	0	N/A	0.000
Feb-13	1	11	1	32	>1	0.036
Mar-13	1	12	1	36	>1	0.039
Apr-13	0	0	0	0	N/A	0.000
May-13	1	16	1	48	>1	0.052
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	4	64	16	144	0.50	0.094
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	7	90	7	179	0.38	0.132
Apr-12	6	76	25	140	0.41	0.112
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	5	60	12	120	0.45	0.088
Jan-13	1	12	1	37	>1	0.018
Feb-13	1	11	1	33	>1	0.016
Mar-13	2	25	2	62	0.71	0.037
Apr-13	0	0	0	0	N/A	0.000
May-13	2	32	2	81	0.71	0.047
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.2. Black-throated diver monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	1	13	1	38	>1	0.019
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.3. Great northern diver monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	3	38	3	114	0.58	0.125
Apr-12	1	13	1	38	>1	0.043
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	2	26	2	64	0.71	0.038
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	4	51	4	141	0.50	0.075
Apr-12	1	13	1	38	>1	0.019
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.4. Diver species monthly counts, abundance estimates, confidence limits and precision (only includes individual divers not positively identified) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	3	49	3	114	0.58	0.161
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	3	38	3	100	0.58	0.125
Mar-12	20	254	76	483	0.22	0.833
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	6	96	32	176	0.41	0.141
Nov-11	4	64	4	192	0.50	0.094
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	3	38	3	102	0.58	0.056
Mar-12	37	474	269	717	0.16	0.695
Apr-12	0	0	0	0	N/A	0.000
May-12	3	39	3	91	0.58	0.057
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.5. Fulmar monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	14	186	80	305	0.27	0.610
Oct-11	35	570	375	798	0.17	1.870
Nov-11	0	0	0	0	N/A	0.000
Dec-11	61	737	266	1,365	0.13	2.418
Jan-12	8	129	32	243	0.35	0.423
Feb-12	5	63	13	125	0.45	0.207
Mar-12	3	38	3	89	0.58	0.125
Apr-12	6	75	25	138	0.41	0.246
May-12	58	713	455	1,009	0.13	2.339
Jun-12	8	89	33	156	0.35	0.292
Jul-12	0	0	0	0	N/A	0.000
Aug-12	10	123	49	209	0.31	0.404
Sep-12	70	1,120	784	1,519	0.12	3.675
Oct-12	2	24	2	59	0.71	0.079
Nov-12	6	97	32	179	0.41	0.318
Dec-12	13	148	57	251	0.28	0.486
Jan-13	17	214	50	491	0.24	0.702
Feb-13	16	169	84	274	0.25	0.554
Mar-13	13	157	60	278	0.28	0.515
Apr-13	7	106	30	197	0.38	0.348
May-13	10	160	48	287	0.32	0.525
Jun-13	5	61	12	122	0.45	0.200
Jul-13	22	290	158	434	0.21	0.951
Aug-13	79	1,060	322	2,094	0.11	3.478

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	44	563	397	755	0.15	0.826
Oct-11	75	1,203	882	1,572	0.12	1.765
Nov-11	4	64	16	128	0.50	0.094
Dec-11	249	3,040	1,966	4,176	0.06	4.460
Jan-12	20	323	178	501	0.22	0.474
Feb-12	6	76	25	140	0.41	0.112
Mar-12	5	64	13	128	0.45	0.094
Apr-12	33	420	255	611	0.17	0.616
May-12	135	1,752	1,337	2,180	0.09	2.570
Jun-12	20	230	126	333	0.22	0.337
Jul-12	4	42	4	104	0.50	0.062
Aug-12	29	359	235	495	0.18	0.527
Sep-12	151	2,301	1,844	2,758	0.08	3.376
Oct-12	4	49	12	98	0.50	0.072
Nov-12	17	275	130	437	0.24	0.403
Dec-12	32	384	240	576	0.18	0.563
Jan-13	27	333	136	630	0.19	0.489
Feb-13	30	326	195	467	0.18	0.478
Mar-13	86	1,069	335	2,125	0.11	1.568
Apr-13	13	176	68	298	0.28	0.258
May-13	16	259	129	420	0.25	0.380
Jun-13	42	519	222	877	0.15	0.761
Jul-13	52	668	450	938	0.14	0.980
Aug-13	111	1,441	701	2,454	0.09	2.114

Table B2.6. Gannet monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	5	66	13	146	0.45	0.217
Oct-11	1	16	1	49	>1	0.052
Nov-11	13	212	81	375	0.28	0.696
Dec-11	25	301	181	434	0.20	0.988
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	3	38	3	102	0.58	0.125
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	3	33	3	78	0.58	0.108
Jul-12	0	0	0	0	N/A	0.000
Aug-12	1	12	1	37	>1	0.039
Sep-12	7	112	16	256	0.38	0.367
Oct-12	5	59	12	130	0.45	0.194
Nov-12	54	877	633	1,153	0.14	2.877
Dec-12	6	68	11	159	0.41	0.223
Jan-13	6	76	13	176	0.41	0.249
Feb-13	1	11	1	32	>1	0.036
Mar-13	1	12	1	36	>1	0.039
Apr-13	6	91	15	181	0.41	0.299
May-13	0	0	0	0	N/A	0.000
Jun-13	1	12	1	37	>1	0.039
Jul-13	2	26	2	66	0.71	0.085
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	11	141	64	243	0.30	0.207
Oct-11	6	96	32	192	0.41	0.141
Nov-11	28	449	257	706	0.19	0.659
Dec-11	72	879	635	1,148	0.12	1.290
Jan-12	1	16	1	48	>1	0.023
Feb-12	0	0	0	0	N/A	0.000
Mar-12	3	38	3	102	0.58	0.056
Apr-12	3	38	3	76	0.58	0.056
May-12	0	0	0	0	N/A	0.000
Jun-12	8	92	23	184	0.35	0.135
Jul-12	0	0	0	0	N/A	0.000
Aug-12	5	62	12	124	0.45	0.091
Sep-12	32	488	290	701	0.18	0.716
Oct-12	12	147	61	258	0.29	0.216
Nov-12	129	2,088	1,667	2,574	0.09	3.063
Dec-12	14	168	72	288	0.27	0.246
Jan-13	13	161	62	296	0.28	0.236
Feb-13	3	33	3	76	0.58	0.048
Mar-13	1	12	1	37	>1	0.018
Apr-13	58	786	257	1,693	0.13	1.153
May-13	1	16	1	65	>1	0.023
Jun-13	3	37	3	86	0.58	0.054
Jul-13	2	26	2	64	0.71	0.038
Aug-13	3	39	3	91	0.58	0.057

Table B2.7. Arctic skua monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	1	13	1	40	>1	0.043
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	1	16	1	48	>1	0.052
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	2	26	2	64	0.71	0.038
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	2	30	2	76	0.71	0.044
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	1	13	1	39	>1	0.019
Aug-13	0	0	0	0	N/A	0.000

Table B2.8. Long-tailed skua monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	1	13	1	38	>1	0.019
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.9. Great skua monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	4	53	4	133	0.50	0.174
Oct-11	2	33	2	81	0.71	0.108
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	2	32	2	80	0.71	0.105
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	11	141	51	243	0.30	0.207
Oct-11	11	176	80	289	0.30	0.258
Nov-11	0	0	0	0	N/A	0.000
Dec-11	1	12	1	37	>1	0.018
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	3	46	3	91	0.58	0.067
Oct-12	1	12	1	37	>1	0.018
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.1. Sabine's Gull monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	1	16	1	49	>1	0.052
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	1	16	1	48	>1	0.023
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.11. Kittiwake monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	33	537	342	765	0.17	1.762
Dec-11	40	483	338	653	0.16	1.585
Jan-12	8	129	32	243	0.35	0.423
Feb-12	64	802	288	1,580	0.13	2.631
Mar-12	4	51	13	102	0.50	0.167
Apr-12	8	101	8	264	0.35	0.331
May-12	3	37	3	86	0.58	0.121
Jun-12	11	123	33	234	0.30	0.404
Jul-12	0	0	0	0	N/A	0.000
Aug-12	4	49	12	111	0.50	0.161
Sep-12	3	48	3	112	0.58	0.157
Oct-12	3	36	3	83	0.58	0.118
Nov-12	5	81	16	162	0.45	0.266
Dec-12	354	4,033	456	10,595	0.05	13.232
Jan-13	49	617	416	844	0.14	2.024
Feb-13	7	74	21	137	0.38	0.243
Mar-13	12	145	48	254	0.29	0.476
Apr-13	12	181	91	287	0.29	0.594
May-13	6	96	32	176	0.41	0.315
Jun-13	6	73	12	147	0.41	0.240
Jul-13	1	13	1	39	>1	0.043
Aug-13	4	54	4	134	0.50	0.177

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	2	26	2	77	0.71	0.038
Oct-11	5	80	16	176	0.45	0.117
Nov-11	106	1,700	1,155	2,358	0.10	2.494
Dec-11	154	1,880	1,429	2,369	0.08	2.758
Jan-12	47	760	436	1,212	0.15	1.115
Feb-12	110	1,397	813	2,286	0.10	2.050
Mar-12	11	141	64	231	0.30	0.207
Apr-12	19	242	102	420	0.23	0.355
May-12	8	104	39	182	0.35	0.153
Jun-12	23	264	115	471	0.21	0.387
Jul-12	0	0	0	0	N/A	0.000
Aug-12	9	111	50	186	0.33	0.163
Sep-12	8	122	46	213	0.35	0.179
Oct-12	9	110	49	184	0.33	0.161
Nov-12	17	275	146	437	0.24	0.403
Dec-12	401	4,810	936	11,802	0.05	7.057
Jan-13	143	1,766	1,235	2,384	0.08	2.591
Feb-13	18	195	98	326	0.24	0.286
Mar-13	17	211	99	335	0.24	0.310
Apr-13	33	447	271	637	0.17	0.656
May-13	25	404	178	743	0.20	0.593
Jun-13	24	296	37	766	0.20	0.434
Jul-13	2	26	2	64	0.71	0.038
Aug-13	6	78	13	156	0.41	0.114

Table B2.12. Black-headed gull monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	1	13	1	38	>1	0.043
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	2	21	2	63	0.71	0.069
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	1	16	1	49	>1	0.052
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	4	64	4	192	0.50	0.094
Nov-11	1	16	1	48	>1	0.023
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	1	13	1	38	>1	0.019
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	4	42	4	94	0.50	0.062
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	1	16	1	49	>1	0.023
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.13. Little gull monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	1	13	1	40	>1	0.043
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	3	36	3	97	0.58	0.118
Apr-13	3	45	3	121	0.58	0.148
May-13	37	590	37	1,660	0.16	1.936
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	1	13	1	38	>1	0.019
Oct-11	0	0	0	0	N/A	0.000
Nov-11	1	16	1	48	>1	0.023
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	1	12	1	50	>1	0.018
Sep-12	1	15	1	61	>1	0.022
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	6	74	6	210	0.41	0.109
Feb-13	0	0	0	0	N/A	0.000
Mar-13	3	37	3	99	0.58	0.054
Apr-13	3	41	3	108	0.58	0.060
May-13	50	808	81	2,246	0.14	1.185
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.14. Common gull monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	3	38	3	88	0.58	0.125
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	1	11	1	34	>1	0.036
Jan-13	5	60	12	133	0.45	0.197
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	1	16	1	48	>1	0.023
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	7	89	25	178	0.38	0.131
Mar-12	0	0	0	0	N/A	0.000
Apr-12	1	13	1	38	>1	0.019
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	2	24	2	60	0.71	0.035
Jan-13	14	173	62	296	0.27	0.254
Feb-13	1	11	1	33	>1	0.016
Mar-13	0	0	0	0	N/A	0.000
Apr-13	1	14	1	41	>1	0.021
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.15. Small gull species monthly counts, abundance estimates, confidence limits and precision (only includes unidentified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	4	65	16	130	0.50	0.213
Nov-11	4	65	16	130	0.50	0.213
Dec-11	7	85	36	157	0.38	0.279
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	1	13	1	38	>1	0.043
Apr-12	0	0	0	0	N/A	0.000
May-12	3	37	3	86	0.58	0.121
Jun-12	0	0	0	0	N/A	0.000
Jul-12	19	199	115	294	0.23	0.653
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	4	50	13	101	0.50	0.164
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	2	26	2	77	0.71	0.038
Oct-11	8	128	48	225	0.35	0.188
Nov-11	8	128	48	225	0.35	0.188
Dec-11	12	147	73	232	0.29	0.216
Jan-12	1	16	1	65	>1	0.023
Feb-12	0	0	0	0	N/A	0.000
Mar-12	5	64	13	128	0.45	0.094
Apr-12	0	0	0	0	N/A	0.000
May-12	6	78	26	143	0.41	0.114
Jun-12	0	0	0	0	N/A	0.000
Jul-12	43	449	313	596	0.15	0.659
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	7	86	12	198	0.38	0.126
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.16. Lesser black-backed gull monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	7	93	27	172	0.38	0.305
Oct-11	3	49	3	114	0.58	0.161
Nov-11	1	16	1	49	>1	0.052
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	4	50	4	113	0.50	0.164
May-12	4	49	12	98	0.50	0.161
Jun-12	1	11	1	33	>1	0.036
Jul-12	4	42	4	126	0.50	0.138
Aug-12	4	49	12	98	0.50	0.161
Sep-12	3	48	3	112	0.58	0.157
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	10	114	10	342	0.32	0.374
Jan-13	1	12	1	36	>1	0.039
Feb-13	1	11	1	32	>1	0.036
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	21	282	21	807	0.22	0.925

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	11	141	51	256	0.30	0.207
Oct-11	10	160	64	273	0.32	0.235
Nov-11	4	64	4	144	0.50	0.094
Dec-11	2	24	2	61	0.71	0.035
Jan-12	2	32	2	97	0.71	0.047
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	7	89	25	165	0.38	0.131
May-12	21	273	117	454	0.22	0.401
Jun-12	2	23	2	57	0.71	0.034
Jul-12	7	73	10	188	0.38	0.107
Aug-12	6	74	25	136	0.41	0.109
Sep-12	5	76	15	152	0.45	0.112
Oct-12	0	0	0	0	N/A	0.000
Nov-12	4	65	4	194	0.50	0.095
Dec-12	16	192	36	456	0.25	0.282
Jan-13	10	124	12	309	0.32	0.182
Feb-13	3	33	3	87	0.58	0.048
Mar-13	2	25	2	62	0.71	0.037
Apr-13	6	81	27	149	0.41	0.119
May-13	0	0	0	0	N/A	0.000
Jun-13	11	136	37	272	0.30	0.200
Jul-13	1	13	1	39	>1	0.019
Aug-13	25	325	39	857	0.20	0.477

Table B2.17. Herring gull monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	2	33	2	81	0.71	0.108
Nov-11	6	98	16	195	0.41	0.322
Dec-11	6	73	12	157	0.41	0.240
Jan-12	1	16	1	49	>1	0.052
Feb-12	11	138	50	251	0.30	0.453
Mar-12	3	38	3	89	0.58	0.125
Apr-12	7	88	13	176	0.38	0.289
May-12	2	25	2	62	0.71	0.082
Jun-12	1	11	1	33	>1	0.036
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	107	1,219	107	3,418	0.10	3.999
Jan-13	13	157	48	289	0.28	0.515
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	46	619	46	1,816	0.15	2.031

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	11	141	26	307	0.30	0.207
Oct-11	12	192	32	481	0.29	0.282
Nov-11	14	225	96	353	0.27	0.330
Dec-11	17	208	85	354	0.24	0.305
Jan-12	13	210	48	420	0.28	0.308
Feb-12	17	216	89	368	0.24	0.317
Mar-12	6	77	13	167	0.41	0.113
Apr-12	9	115	38	216	0.33	0.169
May-12	3	39	3	91	0.58	0.057
Jun-12	1	11	1	34	>1	0.016
Jul-12	2	21	2	52	0.71	0.031
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	1	16	1	49	>1	0.023
Dec-12	116	1,391	180	3,658	0.09	2.041
Jan-13	40	494	222	877	0.16	0.725
Feb-13	1	11	1	33	>1	0.016
Mar-13	1	12	1	37	>1	0.018
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	1	12	1	37	>1	0.018
Jul-13	0	0	0	0	N/A	0.000
Aug-13	49	636	49	1,792	0.14	0.933

Table B2.18. Great black-backed gull monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	1	13	1	40	>1	0.043
Oct-11	2	33	2	81	0.71	0.108
Nov-11	3	49	3	114	0.58	0.161
Dec-11	9	109	48	193	0.33	0.358
Jan-12	1	16	1	49	>1	0.052
Feb-12	13	163	63	313	0.28	0.535
Mar-12	1	13	1	38	>1	0.043
Apr-12	2	25	2	75	0.71	0.082
May-12	2	25	2	74	0.71	0.082
Jun-12	0	0	0	0	N/A	0.000
Jul-12	5	52	10	126	0.45	0.171
Aug-12	0	0	0	0	N/A	0.000
Sep-12	1	16	1	48	>1	0.052
Oct-12	0	0	0	0	N/A	0.000
Nov-12	3	49	3	130	0.58	0.161
Dec-12	55	627	57	1,675	0.13	2.057
Jan-13	50	603	109	1,266	0.14	1.978
Feb-13	10	105	21	211	0.32	0.344
Mar-13	0	0	0	0	N/A	0.000
Apr-13	2	30	2	76	0.71	0.098
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	32	430	32	1,291	0.18	1.411

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	4	51	4	128	0.50	0.075
Oct-11	9	144	48	273	0.33	0.211
Nov-11	15	241	112	417	0.26	0.354
Dec-11	20	244	122	391	0.22	0.358
Jan-12	11	178	65	323	0.30	0.261
Feb-12	31	394	216	609	0.18	0.578
Mar-12	1	13	1	51	>1	0.019
Apr-12	5	64	13	140	0.45	0.094
May-12	9	117	13	260	0.33	0.172
Jun-12	0	0	0	0	N/A	0.000
Jul-12	5	52	10	115	0.45	0.076
Aug-12	0	0	0	0	N/A	0.000
Sep-12	3	46	3	107	0.58	0.067
Oct-12	0	0	0	0	N/A	0.000
Nov-12	19	308	32	664	0.23	0.452
Dec-12	96	1,151	384	2,423	0.10	1.689
Jan-13	116	1,433	469	3,088	0.09	2.102
Feb-13	32	347	65	803	0.18	0.509
Mar-13	0	0	0	0	N/A	0.000
Apr-13	5	68	14	135	0.45	0.100
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	35	454	35	1,311	0.17	0.666

Table B2.19. Black-backed gull species monthly counts, abundance estimates, confidence limits and precision (only includes unidentified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	1	13	1	38	>1	0.019
Oct-11	1	16	1	48	>1	0.023
Nov-11	0	0	0	0	N/A	0.000
Dec-11	1	12	1	37	>1	0.018
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.20. Large gull species monthly counts, abundance estimates, confidence limits and precision (only includes unidentified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	2	33	2	81	0.71	0.108
Nov-11	1	16	1	49	>1	0.052
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	1	12	1	37	>1	0.039
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	2	32	2	80	0.71	0.047
Nov-11	1	16	1	64	>1	0.023
Dec-11	0	0	0	0	N/A	0.000
Jan-12	1	16	1	48	>1	0.023
Feb-12	0	0	0	0	N/A	0.000
Mar-12	1	13	1	38	>1	0.019
Apr-12	0	0	0	0	N/A	0.000
May-12	3	39	3	91	0.58	0.057
Jun-12	0	0	0	0	N/A	0.000
Jul-12	4	42	10	84	0.50	0.062
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.21. Commic tern monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	11	135	11	406	0.30	0.443
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	2	32	2	80	0.71	0.105
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	2	30	2	76	0.71	0.098
May-13	29	463	29	1,149	0.19	1.519
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	1	16	1	48	>1	0.023
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	15	195	15	506	0.26	0.286
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	1	12	1	37	>1	0.018
Sep-12	2	30	2	76	0.71	0.044
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	4	54	4	108	0.50	0.079
May-13	56	905	226	1,697	0.13	1.328
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	1	13	1	39	>1	0.019

Table B2.22. Guillemot monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	49	650	424	942	0.14	2.133
Oct-11	24	391	212	586	0.20	1.283
Nov-11	17	277	130	440	0.24	0.909
Dec-11	77	929	639	1266	0.11	3.048
Jan-12	7	113	49	194	0.38	0.371
Feb-12	64	802	539	1,141	0.13	2.631
Mar-12	14	178	76	318	0.27	0.584
Apr-12	26	327	113	629	0.20	1.073
May-12	10	123	49	221	0.32	0.404
Jun-12	2	22	2	56	0.71	0.072
Jul-12	3	31	3	84	0.58	0.102
Aug-12	16	197	61	369	0.25	0.646
Sep-12	23	368	176	608	0.21	1.207
Oct-12	14	166	71	272	0.27	0.545
Nov-12	5	81	16	179	0.45	0.266
Dec-12	99	1,128	797	1,504	0.10	3.701
Jan-13	202	2,545	1,752	3,453	0.07	8.350
Feb-13	123	1,297	938	1,676	0.09	4.255
Mar-13	102	1,232	809	1,740	0.10	4.042
Apr-13	48	726	408	1,088	0.14	2.382
May-13	20	319	160	511	0.22	1.047
Jun-13	0	0	0	0	N/A	0.000
Jul-13	4	53	13	118	0.50	0.174
Aug-13	15	202	67	377	0.26	0.663

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	124	1,588	1,140	2,100	0.09	2.330
Oct-11	43	690	449	1,010	0.15	1.012
Nov-11	72	1,155	850	1,524	0.12	1.695
Dec-11	147	1795	1,416	2,222	0.08	2.633
Jan-12	27	436	259	663	0.19	0.640
Feb-12	128	1,625	1,232	2,019	0.09	2.384
Mar-12	31	397	218	628	0.18	0.582
Apr-12	94	1,197	815	1,617	0.10	1.756
May-12	17	221	117	337	0.24	0.324
Jun-12	5	57	11	115	0.45	0.084
Jul-12	4	42	4	104	0.50	0.062
Aug-12	31	384	211	607	0.18	0.563
Sep-12	43	655	411	930	0.15	0.961
Oct-12	49	601	393	822	0.14	0.882
Nov-12	26	421	210	664	0.20	0.618
Dec-12	200	2,399	1,895	2,927	0.07	3.520
Jan-13	405	5,002	3,990	6,052	0.05	7.339
Feb-13	249	2,703	2,215	3,170	0.06	3.966
Mar-13	249	3,094	2,361	3,901	0.06	4.539
Apr-13	201	2,723	1,937	3,590	0.07	3.995
May-13	35	566	356	808	0.17	0.830
Jun-13	2	25	2	62	0.71	0.037
Jul-13	16	206	77	360	0.25	0.302
Aug-13	35	454	273	688	0.17	0.666

Table B2.23. Razorbill monthly counts, abundance estimates, confidence limits and precision (only includes positively identified individuals) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	30	398	225	584	0.18	1.306
Oct-11	42	684	423	961	0.15	2.244
Nov-11	57	928	619	1,287	0.13	3.045
Dec-11	66	798	544	1,112	0.12	2.618
Jan-12	24	388	194	615	0.20	1.273
Feb-12	99	1,241	853	1,693	0.10	4.072
Mar-12	29	369	102	725	0.19	1.211
Apr-12	98	1,232	365	2,715	0.10	4.042
May-12	20	246	111	406	0.22	0.807
Jun-12	1	11	1	33	>1	0.036
Jul-12	1	10	1	31	>1	0.033
Aug-12	2	25	2	61	0.71	0.082
Sep-12	7	112	32	224	0.38	0.367
Oct-12	38	450	249	651	0.16	1.476
Nov-12	12	195	97	309	0.29	0.640
Dec-12	45	513	285	797	0.15	1.683
Jan-13	134	1,689	1,159	2,306	0.09	5.542
Feb-13	18	190	84	316	0.24	0.623
Mar-13	58	701	411	1,027	0.13	2.300
Apr-13	67	1,013	695	1,345	0.12	3.324
May-13	20	319	160	511	0.22	1.047
Jun-13	0	0	0	0	N/A	0.000
Jul-13	1	13	1	39	>1	0.043
Aug-13	2	27	2	67	0.71	0.089

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	54	691	474	935	0.14	1.014
Oct-11	79	1,267	914	1,668	0.11	1.859
Nov-11	168	2,694	2,133	3,400	0.08	3.952
Dec-11	155	1,893	1,502	2,308	0.08	2.777
Jan-12	52	841	550	1,148	0.14	1.234
Feb-12	252	3,200	2,514	3,987	0.06	4.695
Mar-12	46	589	295	961	0.15	0.864
Apr-12	202	2,571	1,502	4,112	0.07	3.772
May-12	42	545	350	779	0.15	0.800
Jun-12	4	46	4	103	0.50	0.067
Jul-12	4	42	10	84	0.50	0.062
Aug-12	4	50	12	99	0.50	0.073
Sep-12	17	259	122	427	0.24	0.380
Oct-12	89	1,092	785	1,423	0.11	1.602
Nov-12	31	502	308	696	0.18	0.736
Dec-12	86	1,032	684	1,415	0.11	1.514
Jan-13	153	1,890	1,297	2,544	0.08	2.773
Feb-13	72	782	543	1,031	0.12	1.147
Mar-13	125	1,553	1,106	2,050	0.09	2.278
Apr-13	113	1,531	1,138	1,937	0.09	2.246
May-13	49	792	549	1,067	0.14	1.162
Jun-13	1	12	1	37	>1	0.018
Jul-13	2	26	2	64	0.71	0.038
Aug-13	5	65	13	130	0.45	0.095

Table B2.24. Guillemot / Razorbill monthly counts, abundance estimates, confidence limits and precision (only includes birds unidentified birds recorded as either guillemot or razorbill) for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	5	66	13	133	0.45	0.217
Oct-11	6	98	33	179	0.41	0.322
Nov-11	4	65	16	147	0.50	0.213
Dec-11	12	145	60	242	0.29	0.476
Jan-12	15	243	97	405	0.26	0.797
Feb-12	17	213	100	351	0.24	0.699
Mar-12	1	13	1	38	>1	0.043
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	1	12	1	36	>1	0.039
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	7	90	26	166	0.38	0.132
Oct-11	13	208	96	353	0.28	0.305
Nov-11	9	144	64	241	0.33	0.211
Dec-11	20	244	134	366	0.22	0.358
Jan-12	33	533	323	776	0.17	0.782
Feb-12	43	546	330	787	0.15	0.801
Mar-12	1	13	1	38	>1	0.019
Apr-12	1	13	1	38	>1	0.019
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	2	25	2	74	0.71	0.037
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	0	0	0	0	N/A	0.000
Dec-12	0	0	0	0	N/A	0.000
Jan-13	0	0	0	0	N/A	0.000
Feb-13	0	0	0	0	N/A	0.000
Mar-13	2	25	2	62	0.71	0.037
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.25. Little auk monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	0	0	0	0	N/A	0.000
Jan-12	0	0	0	0	N/A	0.000
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	2	32	2	81	0.71	0.105
Dec-12	1	11	1	34	>1	0.036
Jan-13	1	13	1	38	>1	0.043
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	0	0	0	0	N/A	0.000
Nov-11	0	0	0	0	N/A	0.000
Dec-11	2	24	2	73	0.71	0.035
Jan-12	3	48	3	129	0.58	0.070
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	0	0	0	0	N/A	0.000
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	0	0	0	0	N/A	0.000
Sep-12	0	0	0	0	N/A	0.000
Oct-12	0	0	0	0	N/A	0.000
Nov-12	5	81	16	162	0.45	0.119
Dec-12	1	12	1	36	>1	0.018
Jan-13	2	25	2	62	0.71	0.037
Feb-13	0	0	0	0	N/A	0.000
Mar-13	0	0	0	0	N/A	0.000
Apr-13	0	0	0	0	N/A	0.000
May-13	0	0	0	0	N/A	0.000
Jun-13	0	0	0	0	N/A	0.000
Jul-13	0	0	0	0	N/A	0.000
Aug-13	0	0	0	0	N/A	0.000

Table B2.26. Puffin monthly counts, abundance estimates, confidence limits and precision for: a) East Anglia THREE site only; b) East Anglia THREE site plus 4km Buffer.

a. East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	2	33	2	81	0.71	0.108
Nov-11	22	358	147	619	0.21	1.175
Dec-11	0	0	0	0	N/A	0.000
Jan-12	5	81	16	146	0.45	0.266
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	4	50	4	151	0.50	0.164
May-12	0	0	0	0	N/A	0.000
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	4	49	4	148	0.50	0.161
Sep-12	0	0	0	0	N/A	0.000
Oct-12	10	118	36	237	0.32	0.387
Nov-12	2	32	2	81	0.71	0.105
Dec-12	1	11	1	34	>1	0.036
Jan-13	0	0	0	0	N/A	0.000
Feb-13	1	11	1	32	>1	0.036
Mar-13	1	12	1	48	>1	0.039
Apr-13	11	166	45	302	0.30	0.545
May-13	2	32	2	80	0.71	0.105
Jun-13	0	0	0	0	N/A	0.000
Jul-13	1	13	1	39	>1	0.043
Aug-13	1	13	1	40	>1	0.043

b. East Anglia THREE site plus 4km Buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (birds km^{-2})
Sep-11	0	0	0	0	N/A	0.000
Oct-11	3	48	3	112	0.58	0.070
Nov-11	29	465	225	754	0.19	0.682
Dec-11	1	12	1	37	>1	0.018
Jan-12	14	226	48	436	0.27	0.332
Feb-12	0	0	0	0	N/A	0.000
Mar-12	0	0	0	0	N/A	0.000
Apr-12	17	216	76	395	0.24	0.317
May-12	1	13	1	39	>1	0.019
Jun-12	0	0	0	0	N/A	0.000
Jul-12	0	0	0	0	N/A	0.000
Aug-12	8	99	12	235	0.35	0.145
Sep-12	4	61	15	122	0.50	0.089
Oct-12	13	159	61	282	0.28	0.233
Nov-12	11	178	81	291	0.30	0.261
Dec-12	7	84	12	192	0.38	0.123
Jan-13	4	49	12	99	0.50	0.072
Feb-13	6	65	11	130	0.41	0.095
Mar-13	5	62	12	124	0.45	0.091
Apr-13	22	298	149	474	0.21	0.437
May-13	7	113	32	210	0.38	0.166
Jun-13	0	0	0	0	N/A	0.000
Jul-13	1	13	1	39	>1	0.019
Aug-13	2	26	2	65	0.71	0.038

ANNEX C: SPECIES-SPECIFIC MONTHLY ABUNDANCE ESTIMATES AND DENSITIES FOR EAST ANGLIA THREE SITE PLUS 4KM BUFFER AFTER ATTRIBUTION OF UNIDENTIFIED SPECIES

Annex C presents abundance estimates for all species recorded from aerial surveys of the East Anglia THREE site plus 4km buffer. The abundance estimates are presented for species only and include any attribution of unidentified birds into the monthly abundance estimates and densities. The only exception is for 'Commic' tern, as common and Arctic tern are difficult to split from survey imagery.

Table C3.1. Red-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	**96**	48	0.141	0.000	0.000	0.141	0.070
	2012	0		0.000	0.000		0.000	
Nov	2011	**128**	64	0.188	0.000	0.000	0.188	0.094
	2012	0		0.000	0.000		0.000	
Dec	2011	0	30	0.000	0.000	0.000	0.000	0.044
	2012	60		0.088	0.000		0.088	
Jan	2012	0	6	0.000	0.000	0.000	0.000	0.009
	2013	12		0.018	0.000		0.018	
Feb	2012	**38**	25	0.056	0.000	0.000	0.056	0.036
	2013	11		0.016	0.000		0.016	
Mar	2012	**367**	196	0.538	0.077	0.038	0.461	0.249
	2013	25		0.037	0.000		0.037	
Apr	2012	76	38	0.112	0.000	0.000	0.112	0.056
	2013	0		0.000	0.000		0.000	
May	2012	**39**	36	0.057	0.000	0.000	0.057	0.052
	2013	32		0.047	0.000		0.047	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.2. Black-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	**53**	26	0.077	0.000	0.000	0.077	0.039
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.3. Great northern diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	26	13	0.038	0.000	0.000	0.038	0.019
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	**209**	105	0.307	0.000	0.000	0.307	0.153
	2013	0		0.000	0.000		0.000	
Apr	2012	13	7	0.019	0.000	0.000	0.019	0.010
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.4. Fulmar monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	563	1,432	0.826	0.206	0.215	0.619	1.886
	2012	2,301		3.376	0.224		3.152	
Oct	2011	1,203	626	1.765	0.094	0.056	1.671	0.862
	2012	49		0.072	0.018		0.054	
Nov	2011	64	170	0.094	0.023	0.107	0.070	0.142
	2012	275		0.403	0.190		0.214	
Dec	2011	3,040	1,712	4.460	2.006	1.126	2.454	1.385
	2012	384		0.563	0.246		0.317	
Jan	2012	323	328	0.474	0.237	0.209	0.237	0.272
	2013	333		0.489	0.181		0.308	
Feb	2012	76	201	0.112	0.093	0.142	0.019	0.153
	2013	326		0.478	0.191		0.287	
Mar	2012	64	567	0.094	0.038	0.447	0.056	0.384
	2013	1,069		1.568	0.857		0.711	
Apr	2012	420	298	0.616	0.112	0.135	0.504	0.302
	2013	176		0.258	0.159		0.099	
May	2012	1,752	1,006	2.570	0.419	0.257	2.152	1.218
	2013	259		0.380	0.095		0.285	
Jun	2012	230	375	0.337	0.202	0.137	0.135	0.412
	2013	519		0.761	0.073		0.689	
Jul	2012	42	355	0.062	0.031	0.044	0.031	0.477
	2013	668		0.980	0.057		0.924	
Aug	2012	359	900	0.527	0.073	0.132	0.454	1.189
	2013	1,441		2.114	0.190		1.924	

Table C3.5. Gannet monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	141	315	0.207	0.113	0.224	0.094	0.237
	2012	488		0.716	0.336		0.380	
Oct	2011	96	122	0.141	0.117	0.122	0.023	0.057
	2012	147		0.216	0.126		0.090	
Nov	2011	449	1,269	0.659	0.565	1.387	0.094	0.474
	2012	2,088		3.063	2.208		0.855	
Dec	2011	879	524	1.290	1.021	0.563	0.269	0.205
	2012	168		0.246	0.106		0.141	
Jan	2012	16	89	0.023	0.023	0.030	0.000	0.100
	2013	161		0.236	0.036		0.200	
Feb	2012	0	17	0.000	0.000	0.000	0.000	0.024
	2013	33		0.048	0.000		0.048	
Mar	2012	38	25	0.056	0.056	0.037	0.000	0.000
	2013	12		0.018	0.018		0.000	
Apr	2012	38	412	0.056	0.019	0.198	0.037	0.406
	2013	786		1.153	0.378		0.775	
May	2012	0	8	0.000	0.000	0.012	0.000	0.000
	2013	16		0.023	0.023		0.000	
Jun	2012	92	65	0.135	0.084	0.051	0.051	0.043
	2013	37		0.054	0.018		0.036	
Jul	2012	0	13	0.000	0.000	0.019	0.000	0.000
	2013	26		0.038	0.038		0.000	
Aug	2012	62	51	0.091	0.036	0.028	0.055	0.046
	2013	39		0.057	0.019		0.038	

Table C3.6. Arctic skua monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	26	28	0.038	0.019	0.032	0.019	0.010
	2012	30		0.044	0.044		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	7	0.000	0.000	0.010	0.000	0.000
	2013	13		0.019	0.019		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.7. Long-tailed skua monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	13	7	0.019	0.019	0.010	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.8. Great skua monthly mean abundance estimates monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	141	94	0.207	0.207	0.126	0.000	0.011
	2012	46		0.067	0.045		0.022	
Oct	2011	176	94	0.258	0.258	0.138	0.000	0.000
	2012	12		0.018	0.018		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	12	6	0.018	0.018	0.009	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.9. Sabine's gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	**17**	9	0.025	0.025	0.013	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.10. Kittiwake monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**43**	83	0.064	0.064	0.032	0.000	0.089
	2012	122		0.179	0.000		0.179	
Oct	2011	**144**	127	0.211	0.085	0.087	0.127	0.099
	2012	110		0.161	0.090		0.072	
Nov	2011	**1,824**	1,050	2.677	1.818	1.004	0.859	0.536
	2012	275		0.403	0.190		0.214	
Dec	2011	**2,027**	3,419	2.974	2.452	2.027	0.521	2.988
	2012	4,810		7.057	1.601		5.455	
Jan	2012	**776**	1,309	1.138	0.581	0.669	0.557	1.252
	2013	**1,841**		2.702	0.756		1.946	
Feb	2012	1,397	796	2.050	1.025	0.640	1.025	0.528
	2013	195		0.286	0.254		0.032	
Mar	2012	**205**	208	0.301	0.219	0.173	0.082	0.132
	2013	211		0.310	0.127		0.182	
Apr	2012	242	345	0.355	0.093	0.275	0.262	0.230
	2013	447		0.656	0.457		0.199	
May	2012	**182**	293	0.267	0.100	0.145	0.167	0.285
	2013	404		0.593	0.190		0.403	
Jun	2012	264	280	0.387	0.101	0.096	0.286	0.315
	2013	296		0.434	0.090		0.344	
Jul	2012	0	13	0.000	0.000	0.000	0.000	0.019
	2013	26		0.038	0.000		0.038	
Aug	2012	111	95	0.163	0.000	0.000	0.163	0.139
	2013	78		0.114	0.000		0.114	

Table C3.11. Black-headed gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	**115**	58	0.169	0.127	0.063	0.042	0.021
	2012	0		0.000	0.000		0.000	
Nov	2011	**17**	17	0.025	0.025	0.024	0.000	0.000
	2012	16		0.023	0.023		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	13	7	0.019	0.019	0.010	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	**491**	246	0.720	0.720	0.360	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.12. Little gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**22**	18	0.032	0.032	0.016	0.000	0.011
	2012	15		0.022	0.000		0.022	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	**17**	9	0.025	0.025	0.013	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	39	0.000	0.000	0.028	0.000	0.028
	2013	**77**		0.113	0.057		0.057	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	19	0.000	0.000	0.027	0.000	0.000
	2013	37		0.054	0.054		0.000	
Apr	2012	0	21	0.000	0.000	0.010	0.000	0.020
	2013	41		0.060	0.020		0.040	
May	2012	0	404	0.000	0.000	0.166	0.000	0.427
	2013	808		1.185	0.332		0.854	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	12	6	0.018	0.018	0.009	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.13. Common gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	**29**	14	0.042	0.042	0.021	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	12	0.000	0.000	0.018	0.000	0.000
	2012	24		0.035	0.035		0.000	
Jan	2012	0	90	0.000	0.000	0.095	0.000	0.038
	2013	**180**		0.265	0.189		0.076	
Feb	2012	89	50	0.131	0.131	0.073	0.000	0.000
	2013	11		0.016	0.016		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	13	14	0.019	0.019	0.010	0.000	0.010
	2013	14		0.021	0.000		0.021	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.14. Lesser black-backed gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**151**	113	0.221	0.080	0.051	0.141	0.115
	2012	76		0.112	0.022		0.089	
Oct	2011	**179**	89	0.262	0.000	0.000	0.262	0.131
	2012	0		0.000	0.000		0.000	
Nov	2011	**66**	65	0.097	0.073	0.036	0.024	0.060
	2012	65		0.095	0.000		0.095	
Dec	2011	**25**	109	0.037	0.000	0.026	0.037	0.133
	2012	192		0.282	0.053		0.229	
Jan	2012	**33**	79	0.049	0.024	0.030	0.024	0.085
	2013	124		0.182	0.036		0.146	
Feb	2012	0	17	0.000	0.000	0.016	0.000	0.008
	2013	33		0.048	0.032		0.016	
Mar	2012	0	13	0.000	0.000	0.000	0.000	0.018
	2013	25		0.037	0.000		0.037	
Apr	2012	89	85	0.131	0.037	0.058	0.093	0.066
	2013	81		0.119	0.079		0.040	
May	2012	**298**	149	0.437	0.062	0.031	0.375	0.187
	2013	0		0.000	0.000		0.000	
Jun	2012	23	80	0.034	0.034	0.017	0.000	0.100
	2013	136		0.200	0.000		0.200	
Jul	2012	**94**	54	0.138	0.020	0.010	0.118	0.069
	2013	13		0.019	0.000		0.019	
Aug	2012	74	200	0.109	0.036	0.056	0.072	0.236
	2013	325		0.477	0.076		0.401	

Table C.15. Herring gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	141	71	0.207	0.019	0.009	0.188	0.094
	2012	0		0.000	0.000		0.000	
Oct	2011	**204**	102	0.300	0.000	0.000	0.300	0.150
	2012	0		0.000	0.000		0.000	
Nov	2011	**232**	124	0.340	0.121	0.061	0.219	0.121
	2012	16		0.023	0.000		0.023	
Dec	2011	208	800	0.305	0.036	0.176	0.269	0.997
	2012	1,391		2.041	0.317		1.724	
Jan	2012	**218**	356	0.320	0.025	0.094	0.295	0.428
	2013	494		0.725	0.163		0.562	
Feb	2012	216	114	0.317	0.186	0.093	0.130	0.073
	2013	11		0.016	0.000		0.016	
Mar	2012	**88**	50	0.129	0.000	0.009	0.129	0.065
	2013	12		0.018	0.018		0.000	
Apr	2012	115	58	0.169	0.000	0.000	0.169	0.084
	2013	0		0.000	0.000		0.000	
May	2012	**43**	21	0.062	0.000	0.000	0.062	0.031
	2013	0		0.000	0.000		0.000	
Jun	2012	11	12	0.016	0.000	0.000	0.016	0.017
	2013	12		0.018	0.000		0.018	
Jul	2012	**27**	14	0.040	0.020	0.010	0.020	0.010
	2013	0		0.000	0.000		0.000	
Aug	2012	0	318	0.000	0.000	0.000	0.000	0.467
	2013	636		0.933	0.000		0.933	

Table C3.16. Great black-backed gull monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**54**	50	0.080	0.040	0.020	0.040	0.054
	2012	46		0.067	0.000		0.067	
Oct	2011	**161**	80	0.236	0.052	0.026	0.184	0.092
	2012	0		0.000	0.000		0.000	
Nov	2011	**248**	278	0.364	0.194	0.121	0.170	0.287
	2012	308		0.452	0.048		0.404	
Dec	2011	**255**	703	0.374	0.224	0.253	0.150	0.778
	2012	1,151		1.689	0.281		1.407	
Jan	2012	**185**	809	0.271	0.074	0.182	0.197	1.005
	2013	1,433		2.102	0.290		1.812	
Feb	2012	394	371	0.578	0.280	0.164	0.298	0.380
	2013	347		0.509	0.048		0.461	
Mar	2012	**15**	7	0.022	0.000	0.000	0.022	0.011
	2013	0		0.000	0.000		0.000	
Apr	2012	64	66	0.094	0.038	0.069	0.056	0.028
	2013	68		0.100	0.100		0.000	
May	2012	**128**	64	0.187	0.000	0.000	0.187	0.094
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	**67**	34	0.098	0.039	0.020	0.059	0.029
	2013	0		0.000	0.000		0.000	
Aug	2012	0	227	0.000	0.000	0.019	0.000	0.314
	2013	454		0.666	0.038		0.628	

Table C3.17. Commic tern monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	15	0.000	0.000	0.022	0.000	0.000
	2012	30		0.044	0.044		0.000	
Oct	2011	16	8	0.023	0.023	0.012	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Dec	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Jan	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	27	0.000	0.000	0.040	0.000	0.000
	2013	54		0.079	0.079		0.000	
May	2012	195	550	0.286	0.286	0.807	0.000	0.000
	2013	905		1.328	1.328		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	12	13	0.018	0.018	0.018	0.000	0.000
	2013	13		0.019	0.019		0.000	

Table C3.18. Guillemot monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**1,651**	1,153	2.422	0.000	0.000	2.422	1.691
	2012	655		0.961	0.000		0.961	
Oct	2011	**763**	682	1.120	0.000	0.009	1.120	0.992
	2012	601		0.882	0.018		0.864	
Nov	2011	**1,198**	810	1.758	0.146	0.133	1.611	1.055
	2012	421		0.618	0.119		0.499	
Dec	2011	**1,914**	2,156	2.808	0.000	0.009	2.808	3.155
	2012	2,399		3.520	0.018		3.502	
Jan	2012	**618**	2,810	0.907	0.000	0.000	0.907	4.123
	2013	5,002		7.339	0.000		7.339	
Feb	2012	**1,809**	2,256	2.654	0.104	0.084	2.550	3.226
	2013	2,703		3.966	0.064		3.902	
Mar	2012	**402**	1,756	0.590	0.038	0.019	0.552	2.558
	2013	**3,111**		4.564	0.000		4.564	
Apr	2012	**1,201**	1,962	1.762	0.019	0.039	1.743	2.839
	2013	2,723		3.995	0.060		3.935	
May	2012	221	394	0.324	0.000	0.000	0.324	0.577
	2013	566		0.830	0.000		0.830	
Jun	2012	57	41	0.084	0.000	0.000	0.084	0.060
	2013	25		0.037	0.000		0.037	
Jul	2012	42	124	0.062	0.000	0.000	0.062	0.182
	2013	206		0.302	0.000		0.302	
Aug	2012	**406**	430	0.596	0.000	0.048	0.596	0.583
	2013	454		0.666	0.095		0.571	

Table C3.19. Razorbill monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	**718**	489	1.054	0.000	0.000	1.054	0.717
	2012	259		0.380	0.000		0.380	
Oct	2011	**1,402**	1,247	2.056	0.000	0.000	2.056	1.829
	2012	1,092		1.602	0.000		1.602	
Nov	2011	**2,795**	1,648	4.100	0.220	0.110	3.881	2.309
	2012	502		0.736	0.000		0.736	
Dec	2011	**2,018**	1,525	2.961	0.000	0.000	2.961	2.238
	2012	1,032		1.514	0.000		1.514	
Jan	2012	**1,192**	1,541	1.749	0.000	0.000	1.749	2.261
	2013	1,890		2.773	0.000		2.773	
Feb	2012	**3,562**	2,172	5.226	0.083	0.081	5.143	3.105
	2013	782		1.147	0.080		1.068	
Mar	2012	**597**	1,079	0.876	0.019	0.028	0.856	1.555
	2013	**1,561**		2.291	0.037		2.254	
Apr	2012	**2,580**	2,055	3.785	0.056	0.068	3.729	2.948
	2013	1,531		2.246	0.080		2.167	
May	2012	545	669	0.800	0.000	0.000	0.800	0.981
	2013	792		1.162	0.000		1.162	
Jun	2012	46	29	0.067	0.000	0.000	0.067	0.043
	2013	12		0.018	0.000		0.018	
Jul	2012	42	34	0.062	0.000	0.000	0.062	0.050
	2013	26		0.038	0.000		0.038	
Aug	2012	**53**	59	0.078	0.000	0.000	0.078	0.086
	2013	65		0.095	0.000		0.095	

Table C3.20. Little auk monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Oct	2011	0	0	0.000	0.000	0.000	0.000	0.000
	2012	0		0.000	0.000		0.000	
Nov	2011	0	41	0.000	0.000	0.036	0.000	0.024
	2012	81		0.119	0.071		0.048	
Dec	2011	24	18	0.035	0.000	0.009	0.035	0.018
	2012	12		0.018	0.018		0.000	
Jan	2012	48	37	0.070	0.023	0.012	0.047	0.042
	2013	25		0.037	0.000		0.037	
Feb	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Mar	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Apr	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
May	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	

Table C3.21. Puffin monthly mean abundance estimates and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (flying and sitting)			Flying		Sitting	
		Abundance estimate	Mean abundance	Density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})	Density (birds km^{-2})	Mean density (birds km^{-2})
Sep	2011	0	31	0.000	0.000	0.000	0.000	0.045
	2012	61		0.089	0.000		0.089	
Oct	2011	48	104	0.070	0.023	0.012	0.047	0.140
	2012	159		0.233	0.000		0.233	
Nov	2011	465	322	0.682	0.047	0.024	0.635	0.448
	2012	178		0.261	0.000		0.261	
Dec	2011	12	48	0.018	0.000	0.000	0.018	0.070
	2012	84		0.123	0.000		0.123	
Jan	2012	226	138	0.332	0.000	0.000	0.332	0.202
	2013	49		0.072	0.000		0.072	
Feb	2012	0	33	0.000	0.000	0.000	0.000	0.048
	2013	65		0.095	0.000		0.095	
Mar	2012	0	31	0.000	0.000	0.009	0.000	0.036
	2013	62		0.091	0.018		0.073	
Apr	2012	216	257	0.317	0.000	0.020	0.317	0.357
	2013	298		0.437	0.040		0.397	
May	2012	13	63	0.019	0.000	0.000	0.019	0.092
	2013	113		0.166	0.000		0.166	
Jun	2012	0	0	0.000	0.000	0.000	0.000	0.000
	2013	0		0.000	0.000		0.000	
Jul	2012	0	7	0.000	0.000	0.000	0.000	0.010
	2013	13		0.019	0.000		0.019	
Aug	2012	99	63	0.145	0.000	0.000	0.145	0.092
	2013	26		0.038	0.000		0.038	

ANNEX D: MONTHLY ABUNDANCE ESTIMATES AND DENSITIES FOR RED-THROATED DIVER, GUILLEMOT AND RAZORBILL (LATTER TWO SPECIES CORRECTED) IN THE EAST ANGLIA THREE SITE PLUS 1KM, 2KM AND 4KM BUFFERS

Annex D provides density information of the individuals recorded sitting on the water surface and the total (flying and sitting) recorded of three species: red-throated diver, guillemot and razorbill for the East Anglia THREE site plus 1km, 2km and 4km buffers. The proportion of individuals recorded on the water surface was calculated using the East Anglia site plus 1km, 2km and 4km buffers using the behaviour information for each species. The mean abundance estimates and density were calculated by averaging the same calendar months per survey year (i.e. January 2012 and January 2013).

The density figures include the apportionment of unidentified species recorded as diver species and guillemot / razorbill (apportionment methodology described in Section 4.3.3). In addition, for counts of just the individuals that were observed sitting on the water surface, an availability bias correction factor was applied to guillemot and razorbill abundance estimates to account for individuals expected to be below the water surface at the moment that the digital image was captured. The availability bias correction factors that were applied separately for guillemot and razorbill were based on data recommended by JNCC in its submission during the examination phase of East Anglia ONE, referred to by JNCC as 'Method C' (Allen 2013). The species specific correction factors are listed in Table D4.1.

Table D4.1. Correction Factors ('Method C') for Guillemot and Razorbill

Species	Correction factor
Guillemot	0.76
Razorbill	0.83

Table D4.2. Red-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site only.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000
	2012	0		0.000		0.000	
Oct	2011	**49**	25	0.161	0.080	0.161	0.080
	2012	0		0.000		0.000	
Nov	2011	16	8	0.052	0.026	0.052	0.026
	2012	0		0.000		0.000	
Dec	2011	0	17	0.000	0.056	0.000	0.056
	2012	34		0.112		0.112	
Jan	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Feb	2012	**38**	25	0.125	0.080	0.125	0.080
	2013	11		0.036		0.036	
Mar	2012	**199**	106	0.653	0.346	0.653	0.346
	2013	12		0.039		0.039	
Apr	2012	25	13	0.082	0.041	0.082	0.041
	2013	0		0.000		0.000	
May	2012	0	8	0.000	0.026	0.000	0.026
	2013	16		0.052		0.052	
Jun	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	

Table D4.3. Red-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 1km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000
	2012	0		0.000		0.000	
Oct	2011	**49**	25	0.126	0.063	0.126	0.063
	2012	0		0.000		0.000	
Nov	2011	32	16	0.082	0.041	0.082	0.041
	2012	0		0.000		0.000	
Dec	2011	0	18	0.000	0.045	0.000	0.045
	2012	35		0.090		0.090	
Jan	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Feb	2012	**31**	21	0.080	0.053	0.080	0.053
	2013	10		0.026		0.026	
Mar	2012	**216**	114	0.553	0.292	0.553	0.292
	2013	12		0.031		0.031	
Apr	2012	63	32	0.162	0.081	0.162	0.081
	2013	0		0.000		0.000	
May	2012	**12**	14	0.031	0.036	0.031	0.036
	2013	16		0.041		0.041	
Jun	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	

Table D4.4. Red-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 2km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000
	2012	0		0.000		0.000	
Oct	2011	**81**	41	0.169	0.084	0.169	0.084
	2012	0		0.000		0.000	
Nov	2011	32	16	0.067	0.033	0.067	0.033
	2012	0		0.000		0.000	
Dec	2011	0	18	0.000	0.036	0.000	0.036
	2012	35		0.073		0.073	
Jan	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Feb	2012	**31**	21	0.064	0.043	0.064	0.043
	2013	10		0.021		0.021	
Mar	2012	**301**	157	0.626	0.326	0.626	0.326
	2013	12		0.025		0.025	
Apr	2012	63	32	0.131	0.066	0.131	0.066
	2013	0		0.000		0.000	
May	2012	**25**	29	0.052	0.059	0.052	0.059
	2013	32		0.067		0.067	
Jun	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	

Table D4.5. Red-throated diver monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	0	0	0.000	0.000	0.000	0.000
	2012	0		0.000		0.000	
Oct	2011	**96**	48	0.141	0.070	0.141	0.070
	2012	0		0.000		0.000	
Nov	2011	**128**	64	0.188	0.094	0.188	0.094
	2012	0		0.000		0.000	
Dec	2011	0	30	0.000	0.044	0.000	0.044
	2012	60		0.088		0.088	
Jan	2012	0	6	0.000	0.009	0.000	0.009
	2013	12		0.018		0.018	
Feb	2012	**38**	25	0.056	0.036	0.056	0.036
	2013	11		0.016		0.016	
Mar	2012	**367**	196	0.538	0.287	0.461	0.249
	2013	25		0.037		0.037	
Apr	2012	76	38	0.112	0.056	0.112	0.056
	2013	0		0.000		0.000	
May	2012	**39**	36	0.057	0.052	0.057	0.052
	2013	32		0.047		0.047	
Jun	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Jul	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	
Aug	2012	0	0	0.000	0.000	0.000	0.000
	2013	0		0.000		0.000	

Table D4.6. Guillemot corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**916**	700	3.005	2.297	3.005	2.297
	2012	484		1.589		1.589	
Oct	2011	**560**	387	1.837	1.271	1.837	1.251
	2012	215		0.704		0.665	
Nov	2011	**374**	238	1.226	0.779	1.054	0.667
	2012	101		0.333		0.280	
Dec	2011	**1,315**	1,398	4.315	4.587	4.315	4.568
	2012	1,481		4.858		4.820	
Jan	2012	**258**	1,803	0.846	5.917	0.846	5.917
	2013	3,349		10.987		10.987	
Feb	2012	**1,145**	1,423	3.758	4.668	3.713	4.611
	2013	1,700		5.577		5.508	
Mar	2012	**233**	932	0.764	3.058	0.678	3.016
	2013	**1,632**		5.353		5.353	
Apr	2012	430	693	1.412	2.273	1.412	2.273
	2013	955		3.134		3.134	
May	2012	162	291	0.531	0.954	0.531	0.954
	2013	420		1.377		1.377	
Jun	2012	29	14	0.095	0.047	0.095	0.047
	2013	0		0.000		0.000	
Jul	2012	41	55	0.134	0.181	0.134	0.181
	2013	70		0.229		0.229	
Aug	2012	259	252	0.850	0.826	0.850	0.716
	2013	245		0.802		0.581	

Table D4.7. Guillemot corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 1km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**1,175**	896	3.017	2.301	3.017	2.301
	2012	617		1.584		1.584	
Oct	2011	**627**	469	1.610	1.204	1.610	1.189
	2012	311		0.798		0.767	
Nov	2011	**518**	374	1.329	0.959	1.060	0.721
	2012	230		0.590		0.382	
Dec	2011	**1,649**	1,760	4.234	4.517	4.234	4.502
	2012	1,870		4.800		4.770	
Jan	2012	**316**	2,362	0.812	6.063	0.812	6.063
	2013	4,408		11.315		11.315	
Feb	2012	**1,216**	1,661	3.122	4.265	3.065	4.210
	2013	2,107		5.407		5.354	
Mar	2012	**268**	1,307	0.689	3.355	0.621	3.322
	2013	**2,346**		6.022		6.022	
Apr	2012	**519**	1,285	1.331	3.299	1.331	3.281
	2013	2,052		5.267		5.230	
May	2012	213	415	0.547	1.066	0.547	1.066
	2013	617		1.584		1.584	
Jun	2012	59	36	0.152	0.091	0.152	0.091
	2013	12		0.030		0.030	
Jul	2012	41	89	0.105	0.228	0.105	0.228
	2013	137		0.351		0.351	
Aug	2012	296	286	0.760	0.733	0.760	0.648
	2013	275		0.706		0.536	

Table D4.8. Guillemot corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 2km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**1,658**	1,155	3.450	2.404	3.450	2.404
	2012	653		1.358		1.358	
Oct	2011	**799**	652	1.662	1.357	1.662	1.344
	2012	505		1.051		1.026	
Nov	2011	**810**	530	1.685	1.103	1.474	0.914
	2012	251		0.522		0.354	
Dec	2011	**1,786**	1,914	3.717	3.982	3.717	3.969
	2012	2,041		4.246		4.222	
Jan	2012	**373**	2,859	0.775	5.948	0.775	5.948
	2013	5,345		11.120		11.120	
Feb	2012	**1,408**	2,003	2.928	4.167	2.858	4.099
	2013	2,598		5.406		5.341	
Mar	2012	**335**	1,669	0.698	3.473	0.644	3.445
	2013	**3,003**		6.247		6.247	
Apr	2012	**671**	1,744	1.397	3.629	1.397	3.600
	2013	2,817		5.862		5.803	
May	2012	233	447	0.485	0.929	0.485	0.929
	2013	661		1.374		1.374	
Jun	2012	59	36	0.123	0.074	0.123	0.074
	2013	12		0.025		0.025	
Jul	2012	41	89	0.085	0.185	0.085	0.185
	2013	137		0.285		0.285	
Aug	2012	314	363	0.654	0.755	0.654	0.686
	2013	411		0.855		0.718	

Table D4.9. Guillemot corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**2,172**	1,517	3.187	2.225	3.187	2.225
	2012	862		1.264		1.264	
Oct	2011	**1,004**	896	1.474	1.314	1.474	1.305
	2012	787		1.155		1.137	
Nov	2011	**1,545**	1,037	2.267	1.521	2.120	1.388
	2012	528		0.775		0.656	
Dec	2011	**2,518**	2,835	3.694	4.160	3.694	4.151
	2012	3,153		4.626		4.608	
Jan	2012	**813**	3,697	1.193	5.425	1.193	5.425
	2013	6,582		9.656		9.656	
Feb	2012	**2,358**	2,950	3.459	4.329	3.356	4.245
	2013	3,543		5.198		5.134	
Mar	2012	**521**	2,307	0.764	3.385	0.726	3.366
	2013	**4,093**		6.005		6.005	
Apr	2012	**1,576**	2,573	2.313	3.775	2.294	3.736
	2013	3,570		5.238		5.178	
May	2012	291	518	0.427	0.760	0.427	0.760
	2013	745		1.093		1.093	
Jun	2012	75	54	0.110	0.079	0.110	0.079
	2013	33		0.048		0.048	
Jul	2012	55	163	0.081	0.239	0.081	0.239
	2013	271		0.398		0.398	
Aug	2012	**534**	556	0.784	0.815	0.784	0.768
	2013	577		0.846		0.751	

Table D4.10. Razorbill corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**504**	319	1.652	1.048	1.652	1.048
	2012	135		0.443		0.443	
Oct	2011	**901**	721	2.955	2.367	2.955	2.367
	2012	542		1.779		1.779	
Nov	2011	**1,155**	695	3.791	2.281	3.511	2.141
	2012	235		0.771		0.771	
Dec	2011	**1,051**	835	3.449	2.738	3.449	2.738
	2012	618		2.028		2.028	
Jan	2012	**660**	1,348	2.166	4.421	2.166	4.421
	2013	2,035		6.677		6.677	
Feb	2012	**1,663**	944	5.455	3.096	5.409	3.038
	2013	225		0.737		0.668	
Mar	2012	**454**	652	1.489	2.138	1.489	2.138
	2013	**849**		2.787		2.787	
Apr	2012	1,484	1,348	4.870	4.422	4.870	4.348
	2013	1,211		3.974		3.825	
May	2012	296	340	0.972	1.117	0.972	1.117
	2013	384		1.261		1.261	
Jun	2012	13	7	0.043	0.022	0.043	0.022
	2013	0		0.000		0.000	
Jul	2012	12	14	0.040	0.045	0.040	0.045
	2013	16		0.051		0.051	
Aug	2012	30	31	0.099	0.103	0.099	0.103
	2013	33		0.107		0.107	

Table D4.11. Razorbill corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 1km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**511**	333	1.310	0.855	1.310	0.855
	2012	155		0.399		0.399	
Oct	2011	**1,121**	884	2.877	2.270	2.877	2.270
	2012	648		1.664		1.664	
Nov	2011	**1,877**	1,114	4.818	2.859	4.601	2.751
	2012	351		0.900		0.900	
Dec	2011	**1,238**	1,051	3.177	2.699	3.177	2.699
	2012	865		2.221		2.221	
Jan	2012	**766**	1,415	1.966	3.632	1.966	3.632
	2013	2,064		5.298		5.298	
Feb	2012	**1,866**	1,142	4.789	2.931	4.672	2.833
	2013	418		1.072		0.993	
Mar	2012	**472**	781	1.212	2.004	1.212	2.004
	2013	**1,089**		2.796		2.796	
Apr	2012	**1,707**	1,555	4.382	3.992	4.382	3.936
	2013	1,403		3.602		3.490	
May	2012	360	423	0.925	1.087	0.925	1.087
	2013	487		1.249		1.249	
Jun	2012	13	7	0.034	0.017	0.034	0.017
	2013	0		0.000		0.000	
Jul	2012	12	14	0.031	0.036	0.031	0.036
	2013	16		0.040		0.040	
Aug	2012	30	31	0.077	0.080	0.077	0.080
	2013	33		0.084		0.084	

Table D4.12. Razorbill corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 2km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**615**	414	1.280	0.861	1.280	0.861
	2012	212		0.441		0.441	
Oct	2011	**1,296**	1,122	2.697	2.334	2.697	2.334
	2012	947		1.970		1.970	
Nov	2011	**2,570**	1,499	5.346	3.119	5.105	2.999
	2012	429		0.892		0.892	
Dec	2011	**1,702**	1,376	3.540	2.862	3.540	2.862
	2012	1,049		2.183		2.183	
Jan	2012	**926**	1,524	1.927	3.171	1.927	3.171
	2013	2,122		4.414		4.414	
Feb	2012	**2,087**	1,312	4.342	2.729	4.247	2.628
	2013	536		1.116		1.009	
Mar	2012	**488**	920	1.015	1.914	1.015	1.914
	2013	**1,352**		2.813		2.813	
Apr	2012	**2,070**	1,807	4.306	3.759	4.306	3.701
	2013	1,544		3.212		3.095	
May	2012	396	501	0.825	1.042	0.825	1.042
	2013	605		1.258		1.258	
Jun	2012	13	12	0.028	0.025	0.028	0.025
	2013	11		0.023		0.023	
Jul	2012	37	27	0.078	0.055	0.078	0.055
	2013	16		0.033		0.033	
Aug	2012	30	47	0.063	0.098	0.063	0.098
	2013	64		0.133		0.133	

Table D4.13. Razorbill corrected monthly mean abundance estimates (estimates including positively identified and proportioned out individuals are in bold) and monthly mean densities from aerial survey data within the East Anglia THREE site plus 4km Buffer.

Survey Month	Year	Total birds (sitting and flying)				Birds sitting on the water only	
		Population estimate	Monthly mean estimate	Density (birds km^{-2})	Monthly mean density (birds km^{-2})	Density (birds km^{-2})	Monthly mean density (birds km^{-2})
Sep	2011	**865**	589	1.270	0.864	1.270	0.864
	2012	312		0.458		0.458	
Oct	2011	**1,689**	1,502	2.478	2.204	2.478	2.204
	2012	1,316		1.930		1.930	
Nov	2011	**3,337**	1,971	4.895	2.891	4.676	2.781
	2012	605		0.887		0.887	
Dec	2011	**2,432**	1,837	3.567	2.696	3.567	2.696
	2012	1,243		1.824		1.824	
Jan	2012	**1,436**	1,857	2.107	2.724	2.107	2.724
	2013	2,277		3.341		3.341	
Feb	2012	**4,280**	2,606	6.279	3.823	6.196	3.741
	2013	931		1.366		1.286	
Mar	2012	**716**	1,296	1.051	1.902	1.032	1.874
	2013	**1,876**		2.752		2.716	
Apr	2012	**3,100**	2,467	4.549	3.619	4.493	3.551
	2013	1,833		2.690		2.610	
May	2012	657	805	0.963	1.182	0.963	1.182
	2013	954		1.400		1.400	
Jun	2012	55	35	0.081	0.051	0.081	0.051
	2013	14		0.021		0.021	
Jul	2012	51	41	0.074	0.060	0.074	0.060
	2013	31		0.046		0.046	
Aug	2012	**64**	71	0.093	0.104	0.093	0.104
	2013	78		0.115		0.115	

ANNEX E: SPECIES-SPECIFIC BIRD BEHAVIOUR INFORMATION

Annex E presents behaviour data for all species recorded from the aerial surveys of the East Anglia THREE site. Where birds were recorded in flight the data is also presented as the percentage of birds flying at potential collision height (PCH).

Table E5.1. Flight height summary of red-throated divers recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total red-throated diver	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
13	13	0	0	0	0	N/A

Table E5.2. Flight height summary of great northern divers recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total great northern diver	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
4	4	0	0	0	0	N/A

Table E5.3. Flight height summary of diver species recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total diver sp.	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
26	26	0	N/A	N/A	N/A	N/A

Table E5.4. Flight height summary of fulmars recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total fulmar	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
468	372	96	96	0	0	0%

Table E5.5. Flight height summary of gannets recorded in flight from monthly aerial surveys across the East Anglia THREE site and 4km buffer.

Total gannet	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
408	156	251	234	17	0	6.7%

Table Note: One flying gannet was unsuitable for the flight height calculation and is therefore excluded from the potential collision height categories in table

Table E5.6. Flight height summary of Arctic skuas recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total Arctic skua	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
2	1	1	0	1	0	100%

Table E5.7. Flight height summary of great skuas recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total great skua	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
8	1	7	5	2	0	29%

Table E5.8. Flight height summary of Sabine's gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total Sabine's gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
1	0	1	0	1	0	100%

Table E5.9. Flight height summary of kittiwakes recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total kittiwake	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
637	429	208	187	21	0	10%

Table E5.10. Flight height summary of black-headed gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total black-headed gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
4	0	4	3	1	0	25%

Table E5.11. Flight height summary of little gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total little gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
44	35	9	6	1	0	14%

Table Note: Two flying little gulls were unsuitable for the flight height calculation and are therefore excluded from the potential collision height categories in table

Table E5.12. Flight height summary of common gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total common gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
9	1	8	8	0	0	0%

Table E5.13. Flight height summary of small gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total small gull sp.	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
42	37	5	N/A	N/A	N/A	N/A

Table E5.14. Flight height summary of lesser black-backed gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total lesser black-backed gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
64	53	11	6	5	0	45%

Table E5.15. Flight height summary of herring gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total herring gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
205	176	29	23	6	0	21%

Table E5.16. Flight height summary of great black-backed gulls recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total great black-backed gull	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
192	154	38	23	15	0	39%

Table E5.17. Flight height summary of large gull species recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total large gull sp.	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
4	0	4	N/A	N/A	N/A	N/A

Table E5.18. Flight height summary of commic terns recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total 'commic' tern	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
44	0	44	44	0	0	0%

Table E5.19. Flight height summary of guillemots recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total guillemot	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
964	948	16	16	0	0	0%

Table E5.20. Flight height summary of razorbills recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total razorbill	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
871	860	11	11	0	0	0%

Table E5.21. Flight height summary of guillemot / razorbills recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total guillemot / razorbill	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
61	59	2	N/A	N/A	N/A	N/A

Table E5.22. Flight height summary of little auks recorded in flight from monthly aerial surveys across East Anglia THREE site only.

Total little auk	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
4	2	2	2	0	0	0%

Table E5.23. Flight height summary of puffins recorded in flight from monthly aerial surveys across the East Anglia THREE site only.

Total puffins	Sitting birds	Flying birds				Site-specific percentage of flying birds at PCH
		Total flying	Below PCH	At PCH (22 - 176m)	Above PCH (176m+)	
67	62	5	5	0	0	0%

ANNEX F: SPECIES-SPECIFIC FLIGHT DIRECTION ROSE DIAGRAMS

Annex F presents species specific flight direction rose diagrams to illustrate the flight directional data of birds within the East Anglia THREE site plus 4km buffer. Seabirds with a sufficient number of records per BDMPS bio-season are presented in separate rose diagrams to allow for the seasonal flight direction to be observed (Furness 2015). Where a species was only recorded in very small numbers a single rose diagram presents all observations during all bio-seasons. The red line represents the mean angle of the data and the arcs either side represent the confidence limits (95%) of the mean.

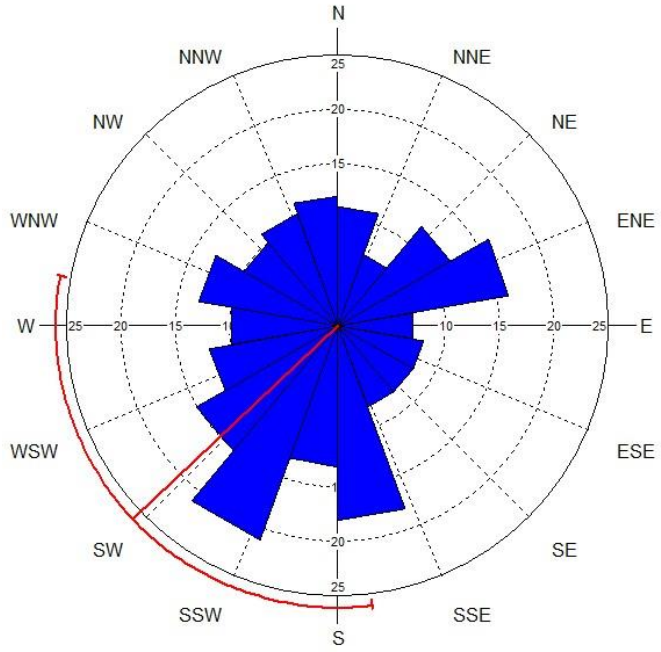


Figure F6.1a. Summary of fulmar flight direction (n=212) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (December to March surveys).

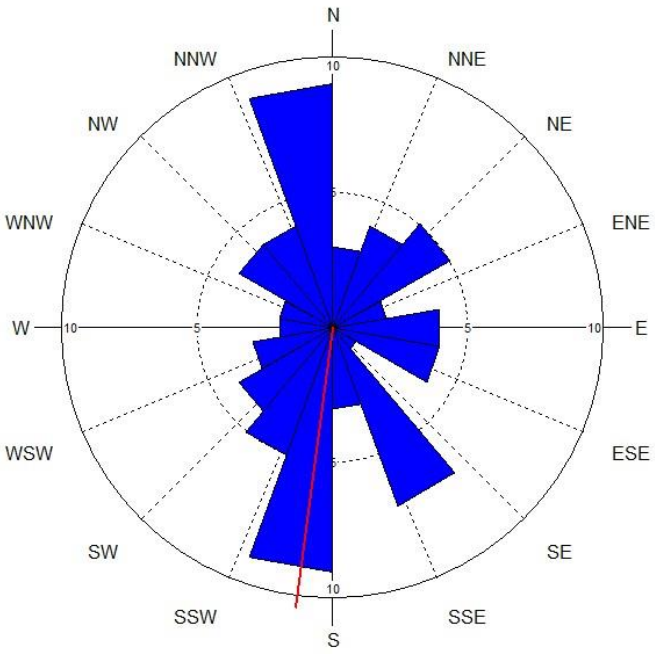


Figure F6.1b. Summary of fulmar flight direction (n=75) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (April to August surveys).

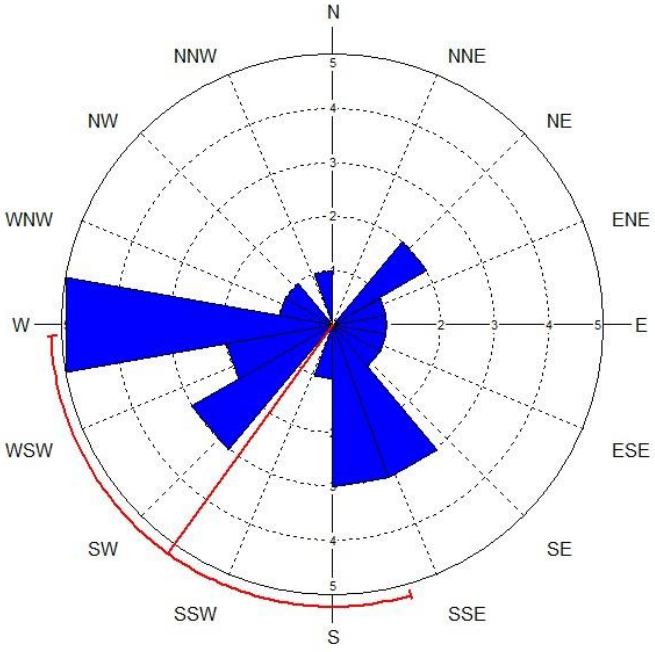


Figure F6.1c. Summary of fulmar flight direction (n=26) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (September and October surveys).

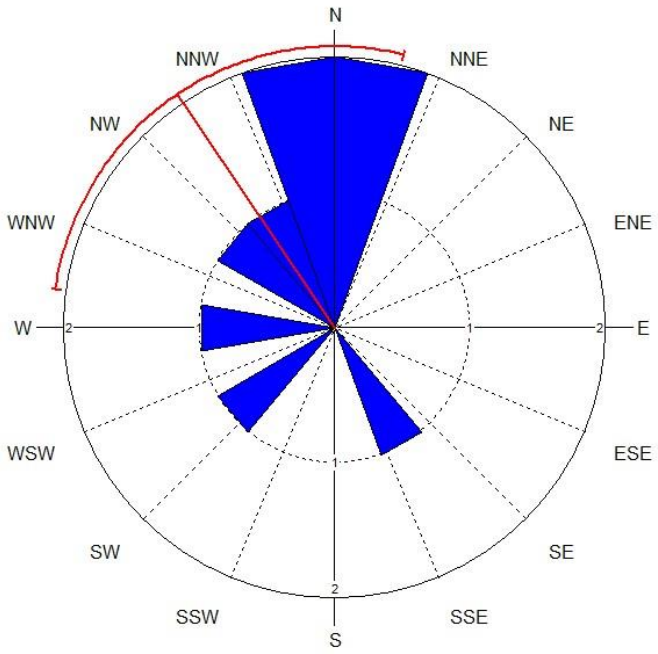


Figure F6.1d. Summary of fulmar flight direction (n=9) within the East Anglia THREE site plus 4km Buffer during the winter bio-season (November suveys).

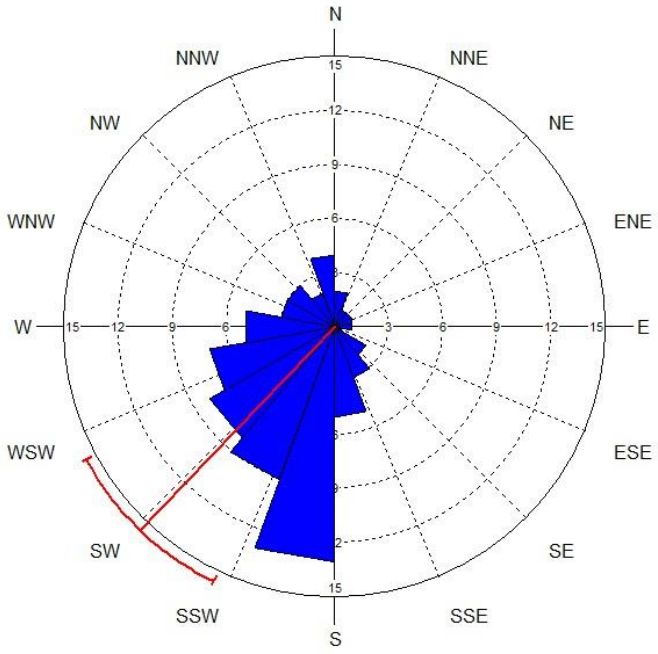


Figure F6.2a. Summary of gannet flight direction (n=70) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (December to March surveys, no flying gannets were recorded in February).

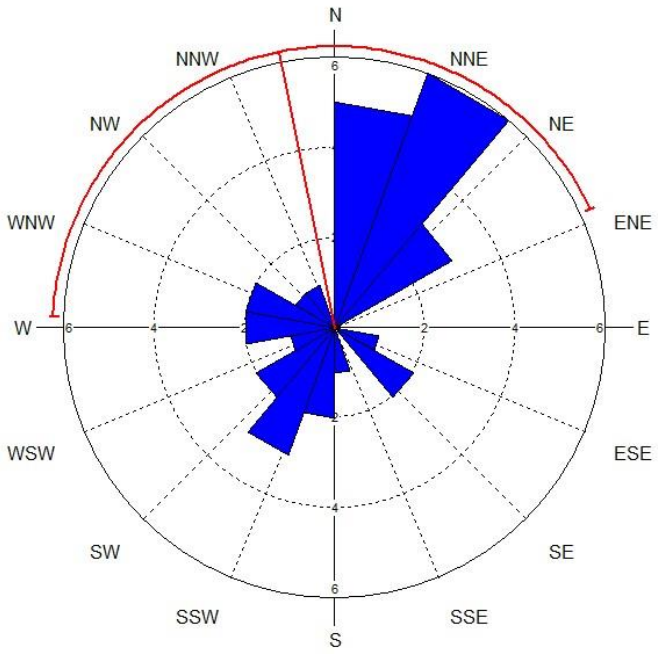


Figure F6.2b. Summary of gannet flight direction (n=32) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (April to August surveys).

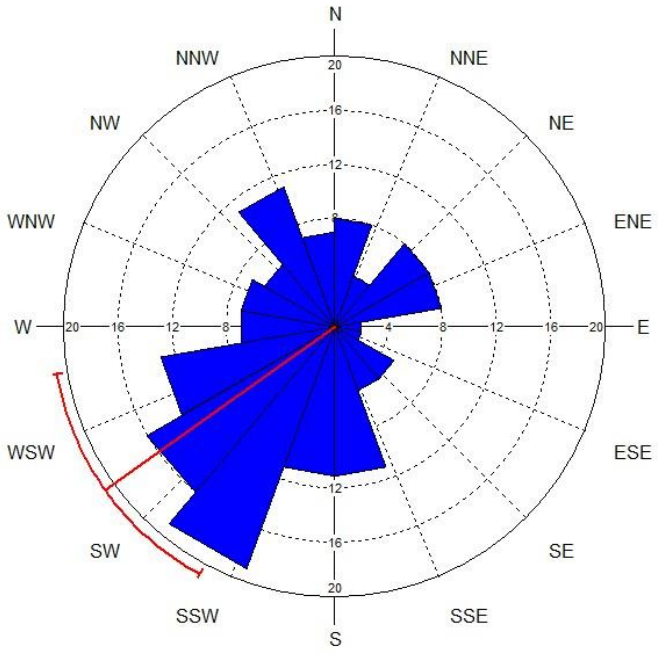


Figure F6.2c. Summary of gannet flight direction (n=150) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (September to November surveys).

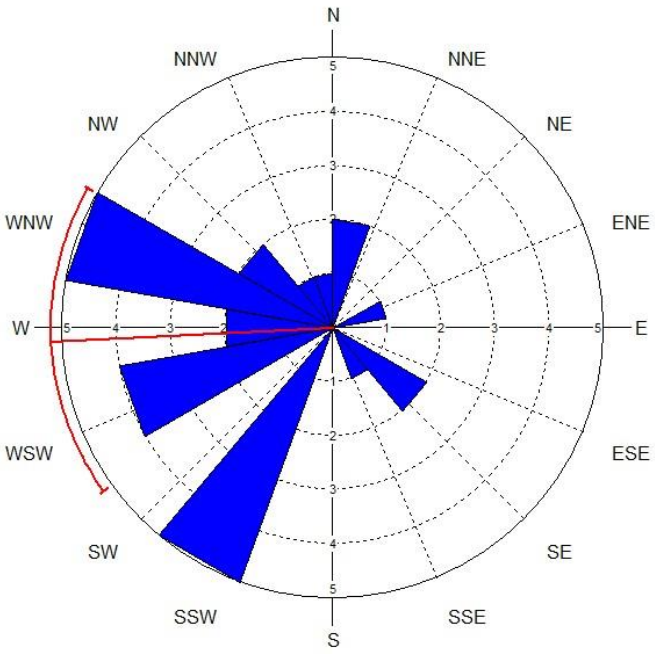


Figure F6.3. Summary of great skua flight direction (n=26) within the East Anglia THREE site plus 4km Buffer.

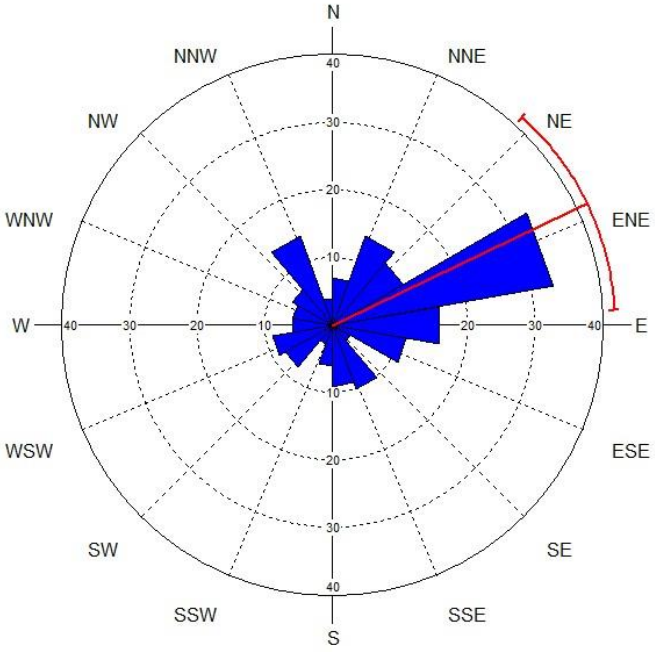


Figure F6.4a. Summary of kittiwake flight direction (n=178) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (January to April surveys).

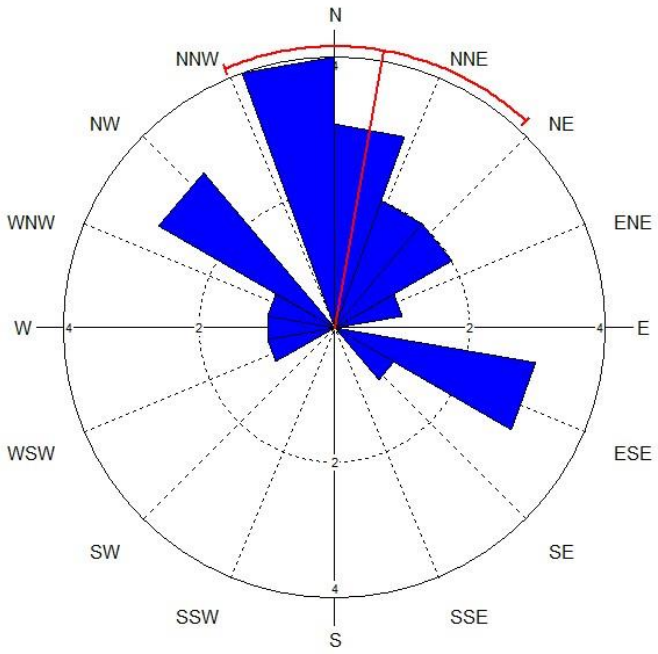


Figure F6.4b. Summary of kittiwake flight direction (n=22) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (May and June surveys, no flying kittiwakes were recorded in July).

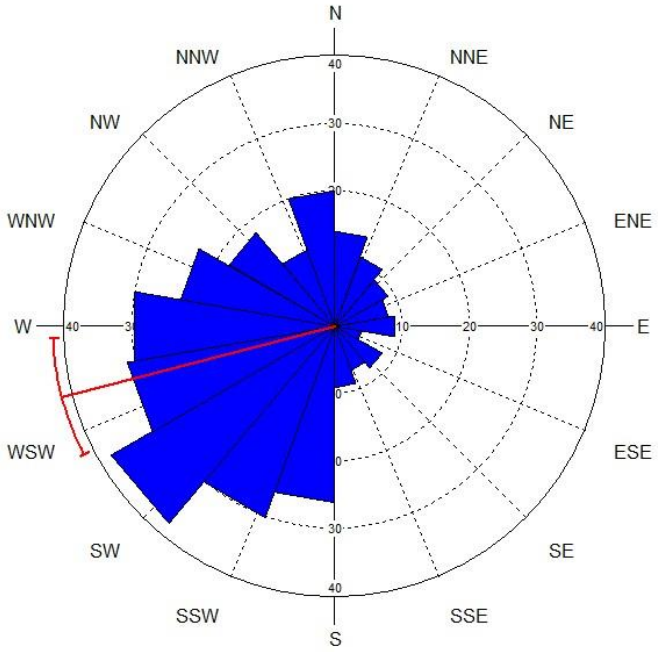


Figure F6.4c. Summary of kittiwake flight direction (n=307) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (September to December surveys, no flying kittiwakes were recorded in August).

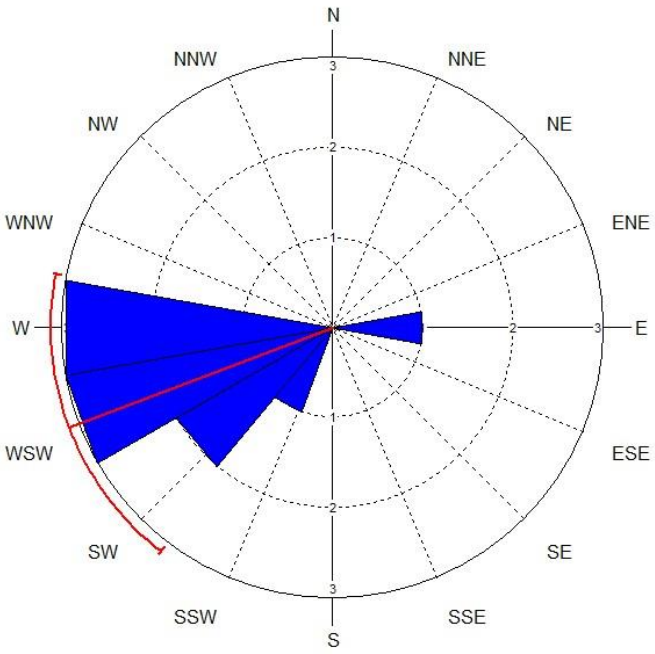


Figure F6.5. Summary of black-headed gull flight direction (n=10) within the East Anglia THREE site plus 4km Buffer.

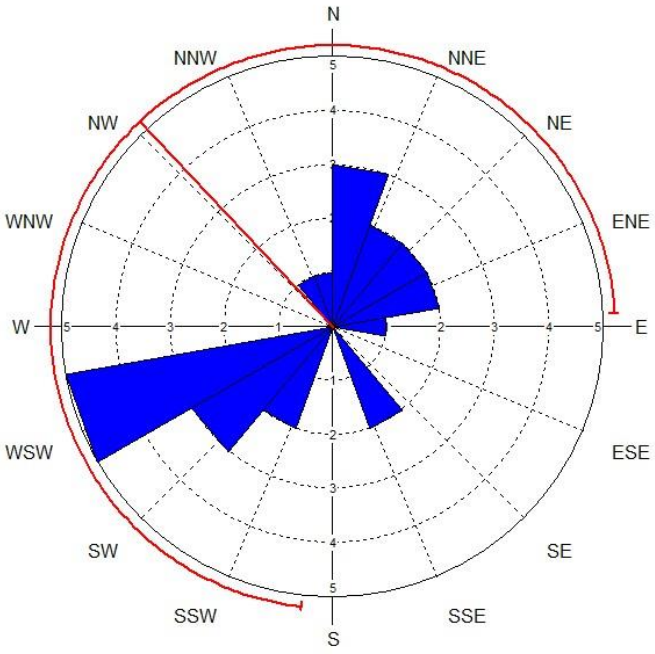


Figure F6.6. Summary of little gull flight direction (n=24) within the East Anglia THREE site plus 4km Buffer.

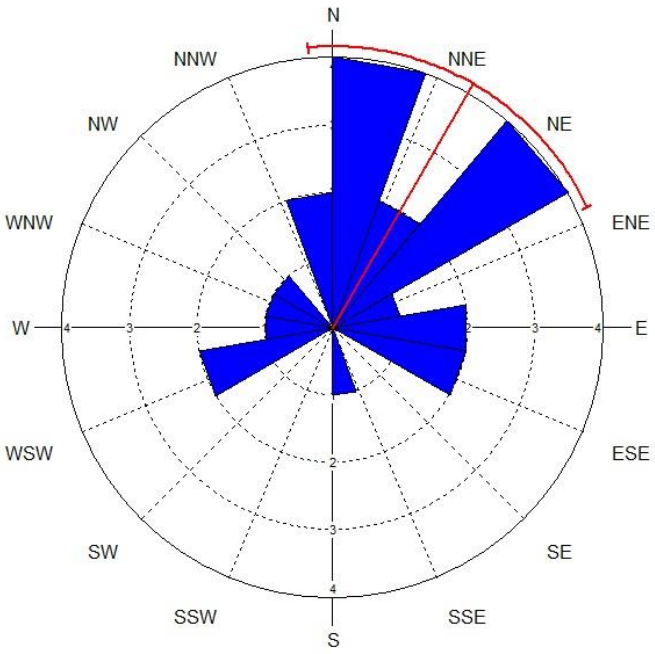


Figure F6.7. Summary of common gull flight direction (n=23) within the East Anglia THREE site plus 4km Buffer.

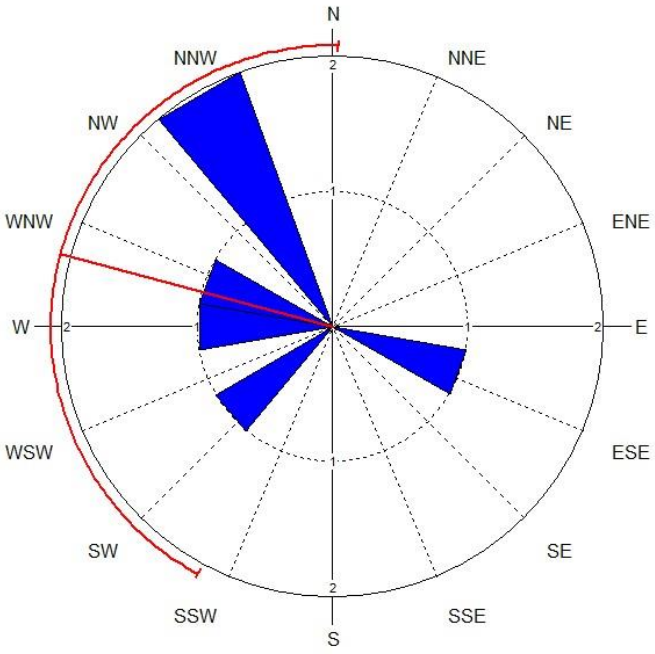


Figure F6.8a. Summary of lesser black-backed gull flight direction (n=6) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (April surveys, no flying lesser black-backed gulls were recorded in the March surveys).

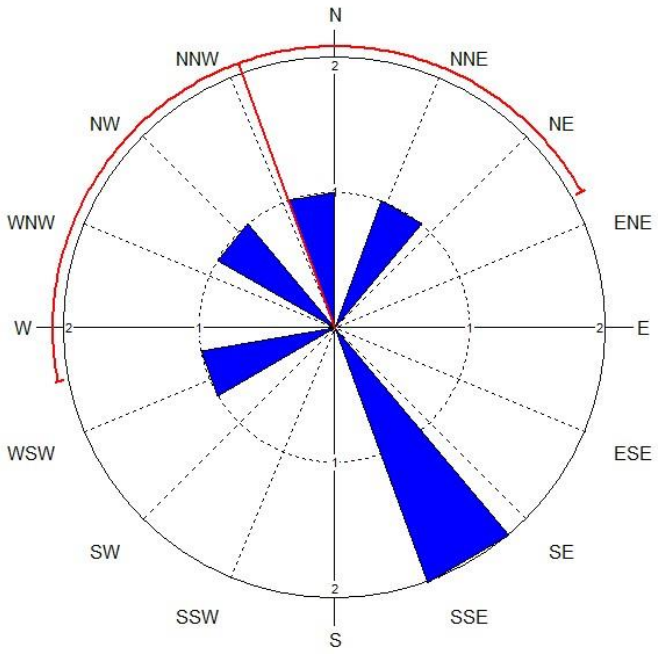


Figure F6.8b. Summary of lesser black-backed gull flight direction (n=6) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (May to July surveys).

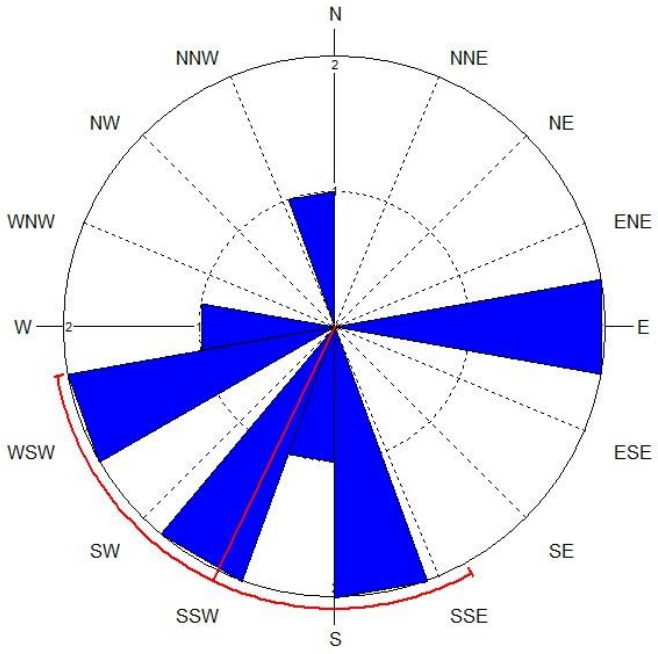


Figure F6.8c. Summary of lesser black-backed gull flight direction (n=11) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (August and September surveys, no flying lesser black-backed gulls were recorded in the October surveys).

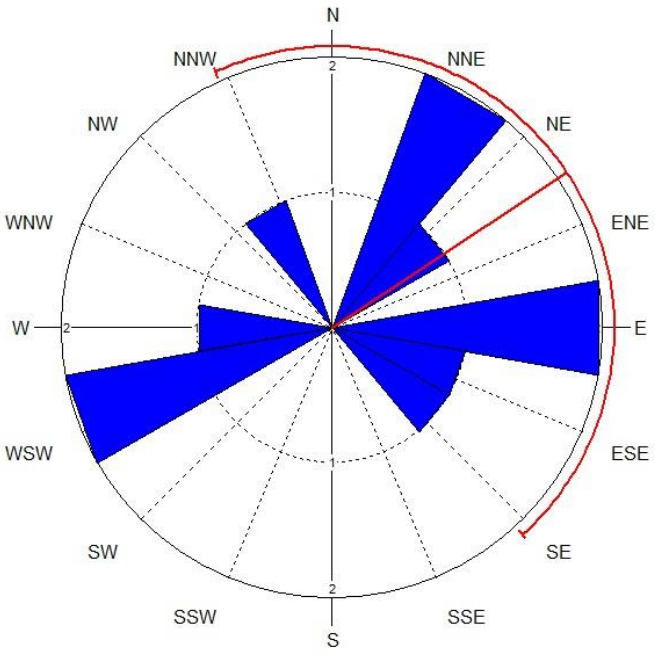


Figure F6.8d. Summary of lesser black-backed gull flight direction (n=11) within the East Anglia THREE site plus 4km Buffer during the winter bio-season (November to February surveys).

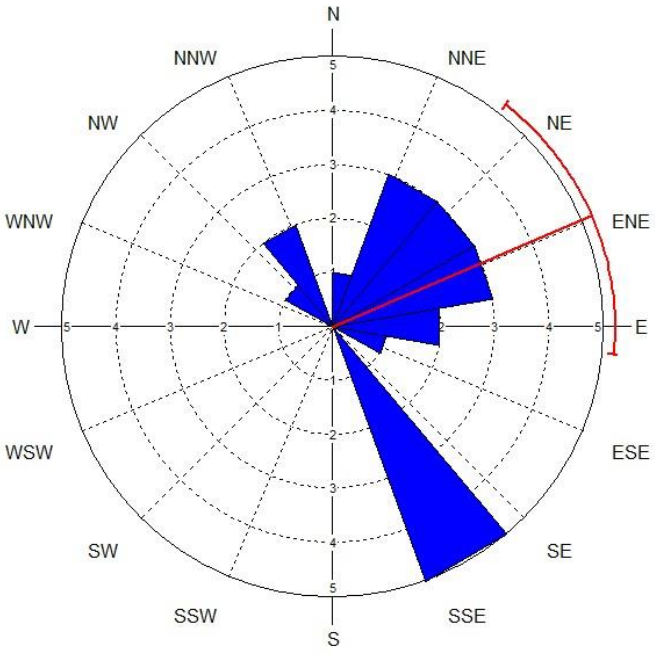


Figure F6.9a. Summary of herring gull flight direction (n=21) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (January to March surveys, no flying herring gulls were recorded in the April surveys).

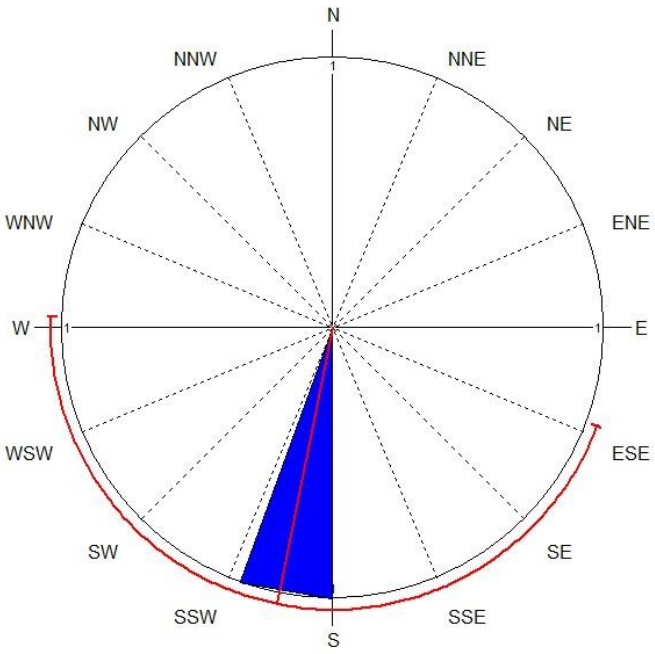


Figure F6.9b. Summary of herring gull flight direction (n=1) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (July surveys, no flying herring gulls were recorded in the May or June surveys).

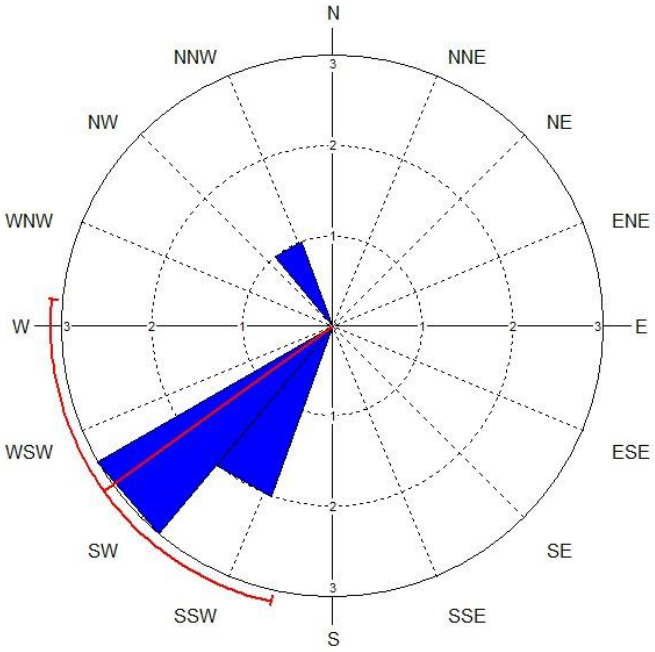


Figure F6.9c. Summary of herring gull flight direction (n=6) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (September and November surveys, no flying herring gulls were recorded in the August or October surveys).

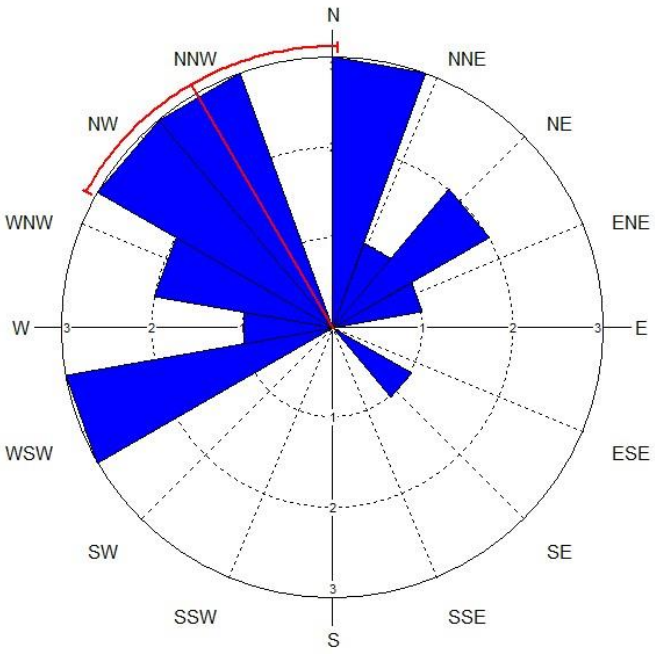


Figure F6.9d. Summary of herring gull flight direction (n=20) within the East Anglia THREE site plus 4km Buffer during the winter bio-season (December surveys).

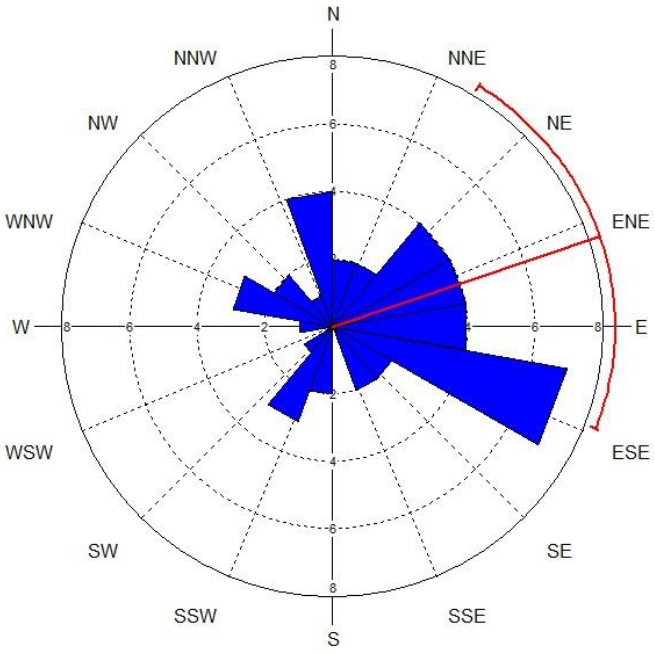


Figure F6.10a. Summary of great black-backed gull flight direction (n=44) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (January to April surveys).

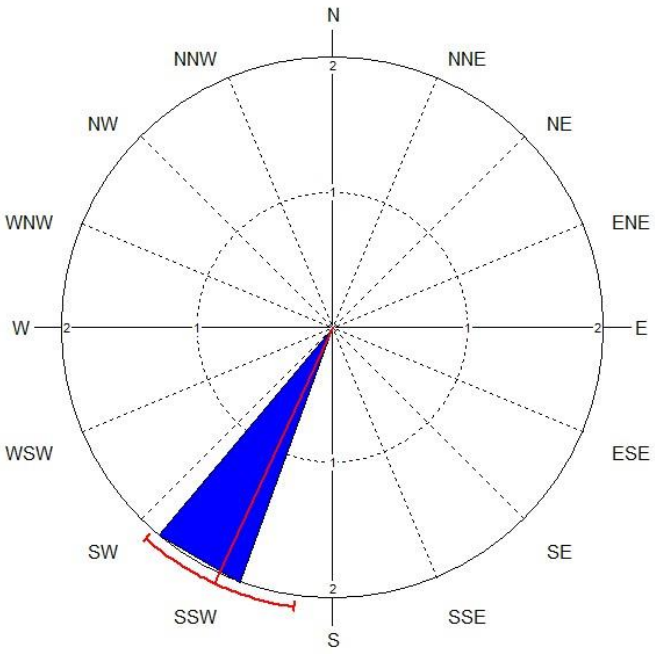


Figure F6.10b. Summary of great black-backed gull flight direction (n=2) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (July surveys, no great black-backed gulls were recorded in the May or June surveys).

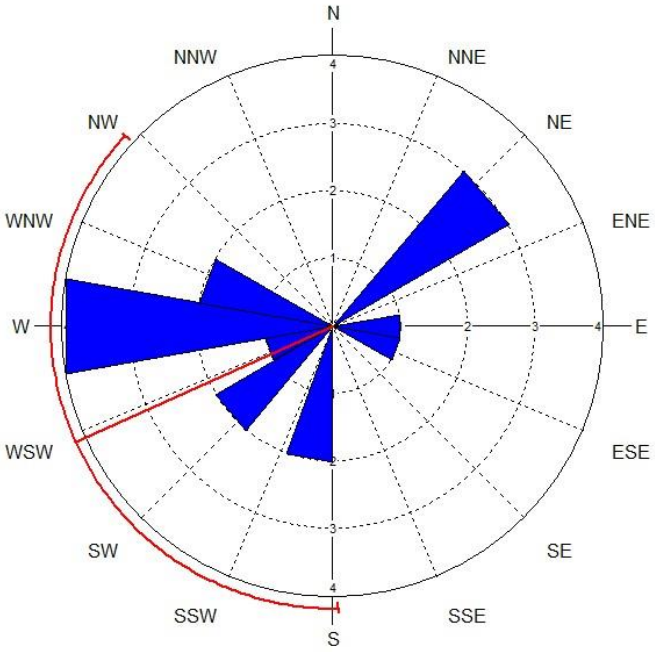


Figure F6.10c. Summary of great black-backed gull flight direction (n=16) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (August to November surveys).

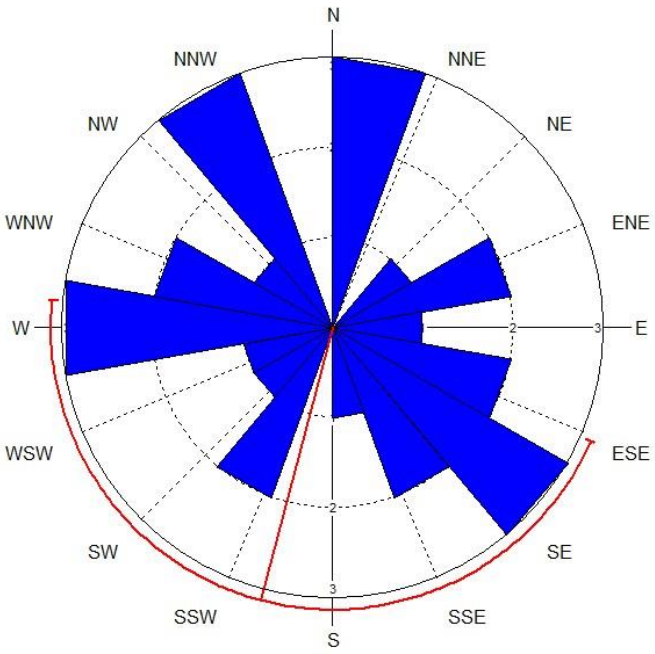


Figure F6.10d. Summary of great black-backed gull flight direction (n=28) within the East Anglia THREE site plus 4km Buffer during the winter bio-season (December surveys).

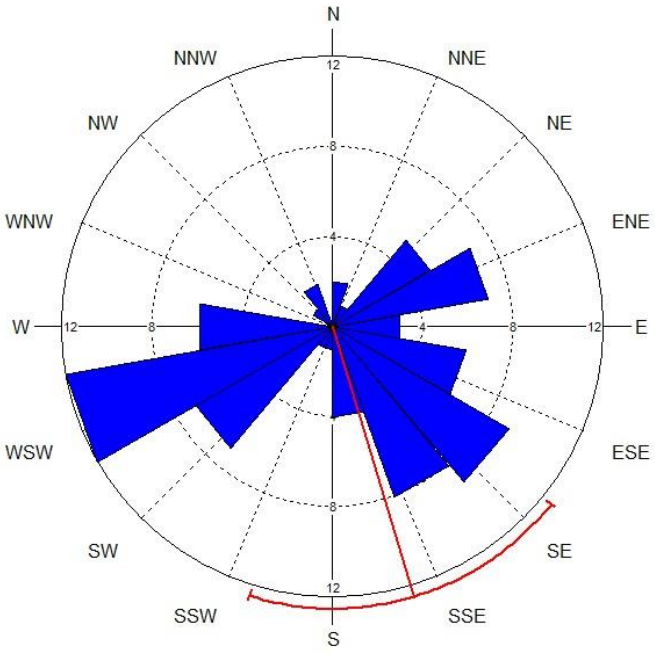


Figure F6.11a. Summary of commic tern flight direction (n=75) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (April and May surveys).

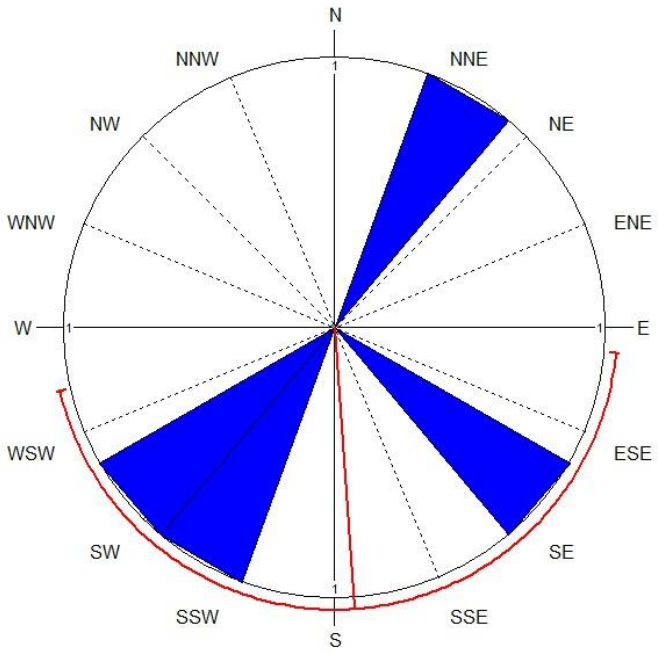


Figure F6.11b. Summary of commic tern flight direction (n=4) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (July to September surveys).

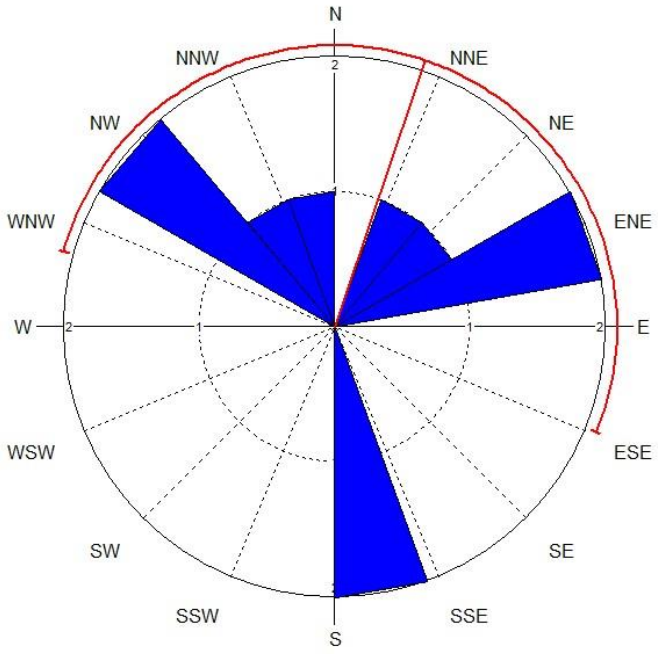


Figure F6.12a. Summary of guillemot flight direction (n=10) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (December and February surveys, no flying guillemots were recorded during the January surveys).

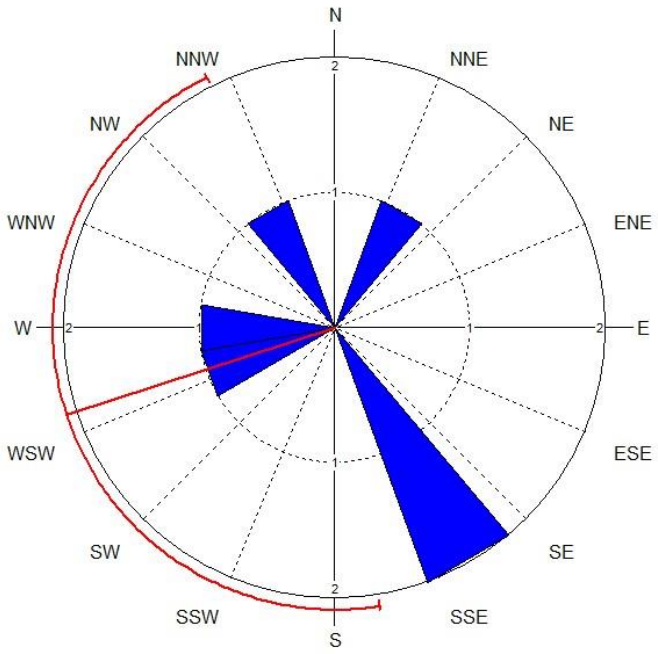


Figure F6.12b. Summary of guillemot flight direction (n=6) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (March and April surveys, no flying guillemots were recorded during theMay and June surveys).

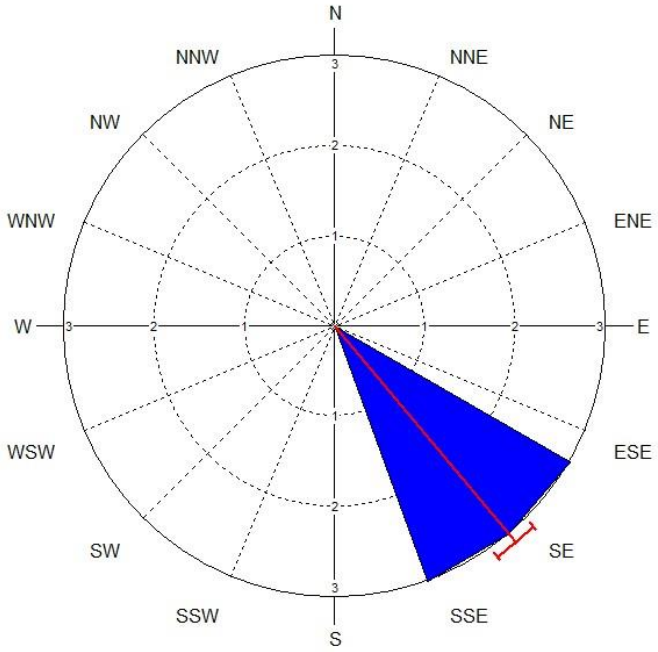


Figure F6.12c. Summary of guillemot flight direction (n=6) within the East Anglia THREE site plus 4km Buffer during the autumn migration bio-season (August and October surveys, no flying guillemots were recorded during the July or September surveys).

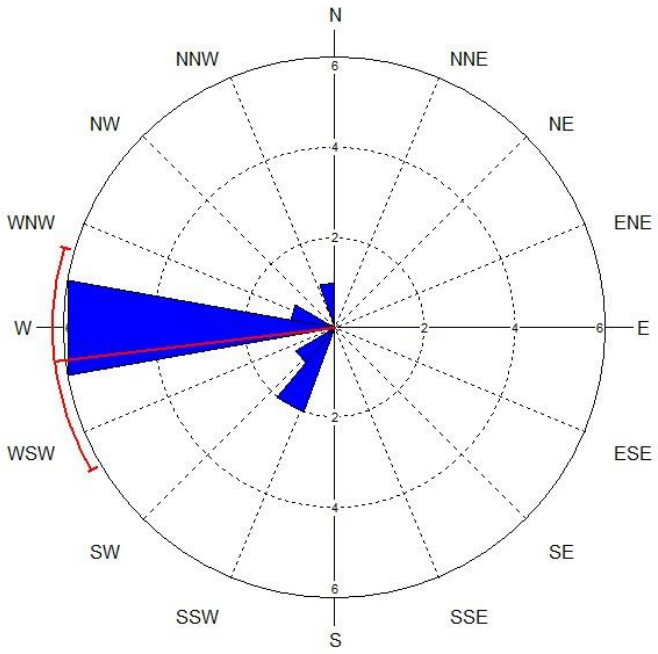


Figure F6.12d. Summary of guillemot flight direction (n=11) within the East Anglia THREE site plus 4km Buffer during the winter bio-season (November surveys).

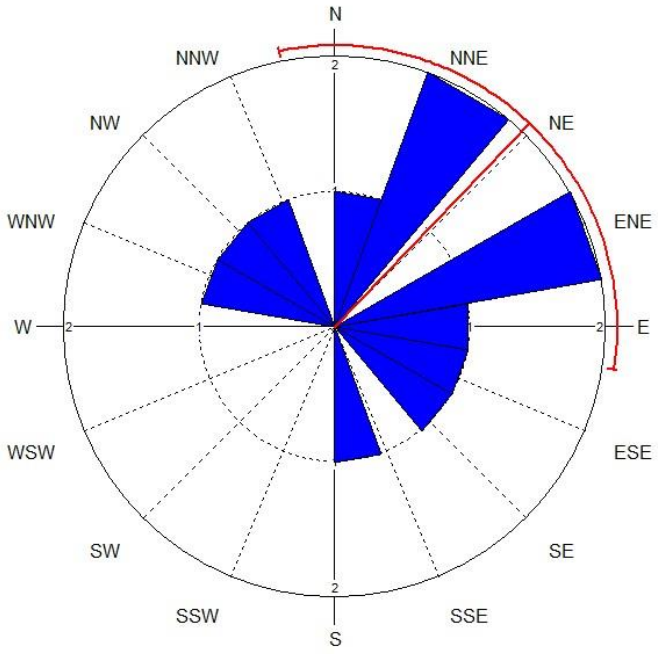


Figure F6.13a. Summary of razorbill flight direction (n=12) within the East Anglia THREE site plus 4km Buffer during the spring migration bio-season (February and March surveys, no flying razorbills were recorded during the January surveys).

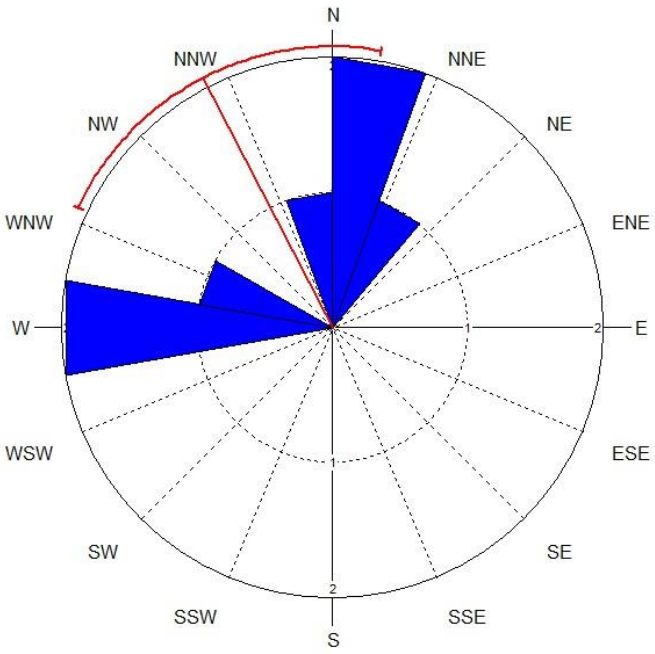


Figure F6.13b. Summary of razorbill flight direction (n=7) within the East Anglia THREE site plus 4km Buffer during the migration-free breeding bio-season (April surveys, no flying razorbills were recorded during the June or July surveys).

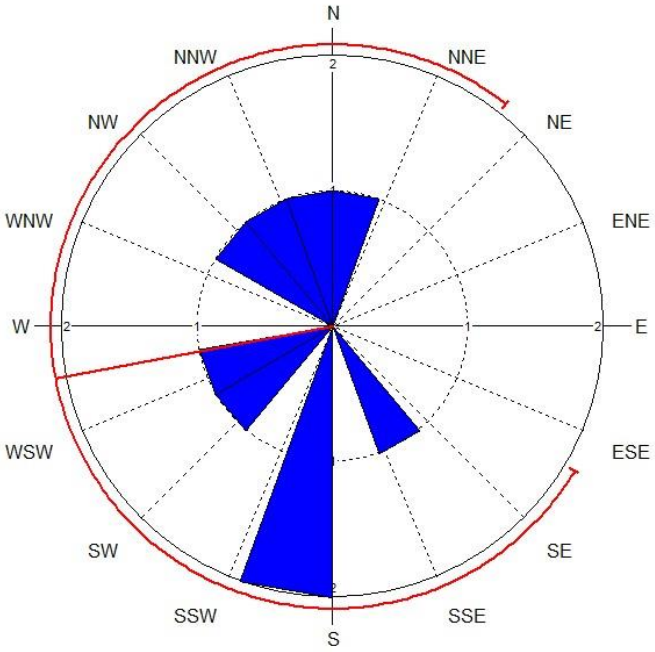


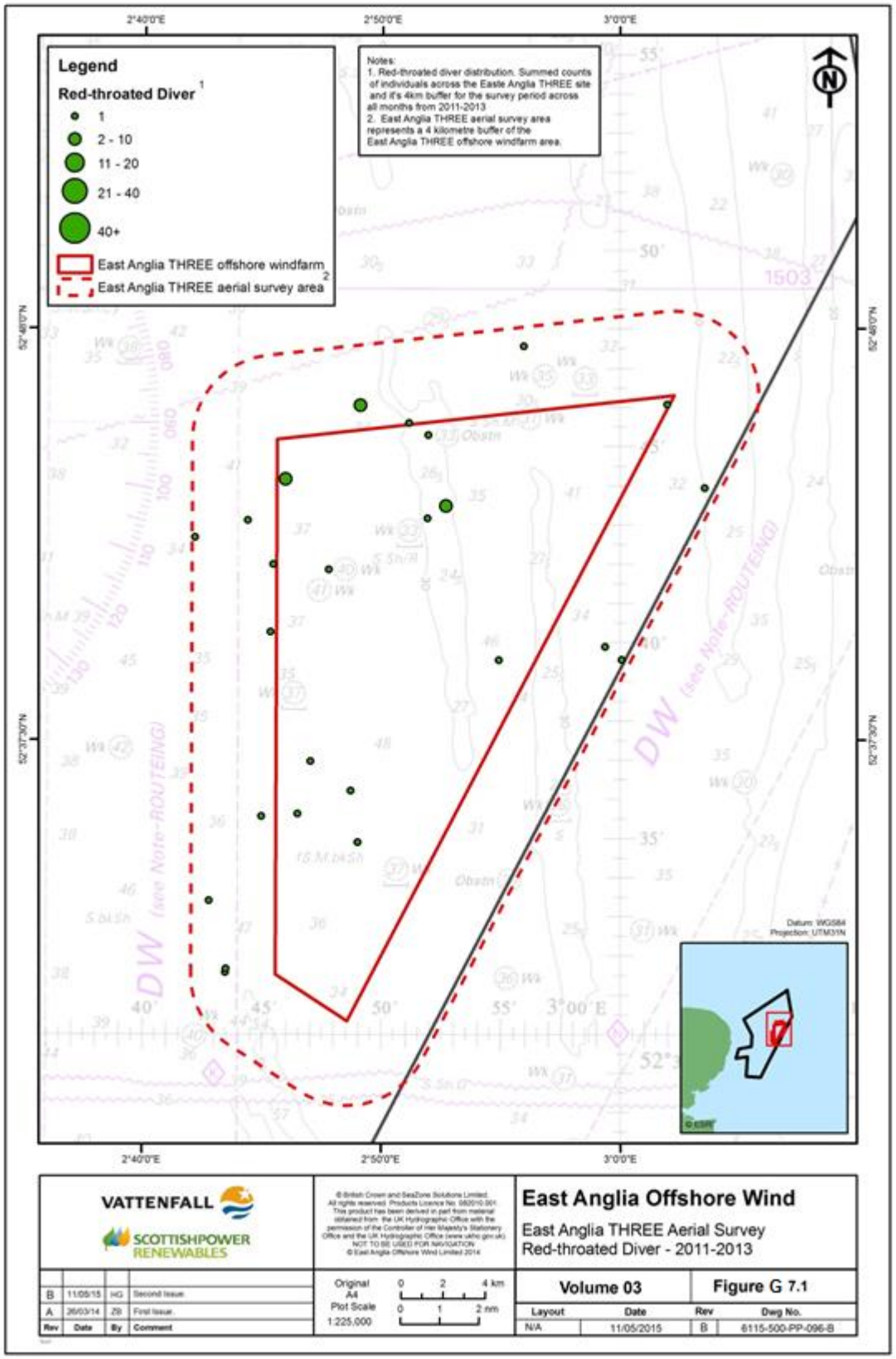
Figure F6.13c. Summary of razorbill flight direction (n=9) within the East Anglia THREE site plus 4km Buffer during the winter bio-season (November 2011 survey, no flying razorbills were recorded in December).

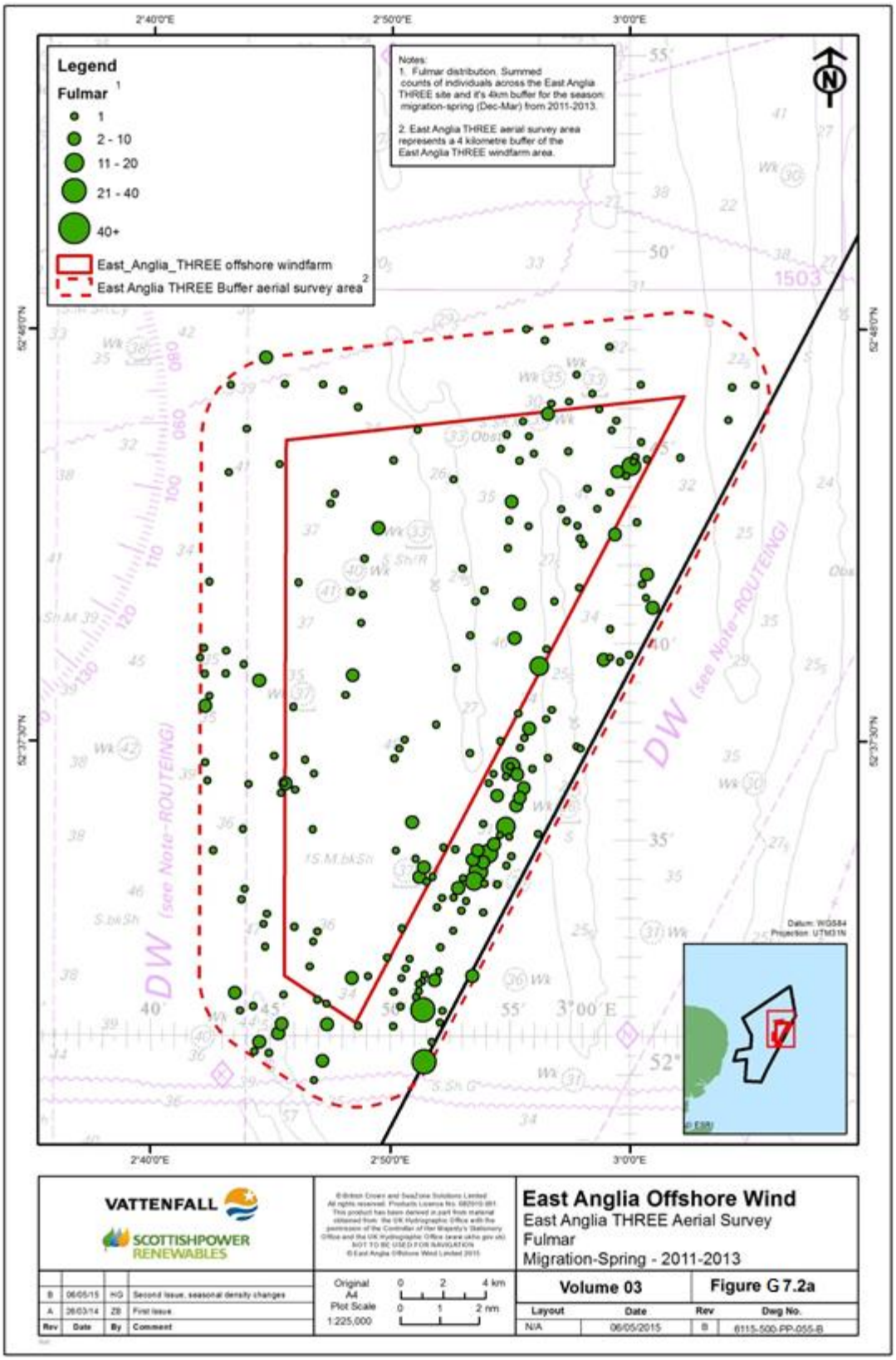
ANNEX G: SPECIES-SPECIFIC SPATIAL DISTRIBUTION MAPS

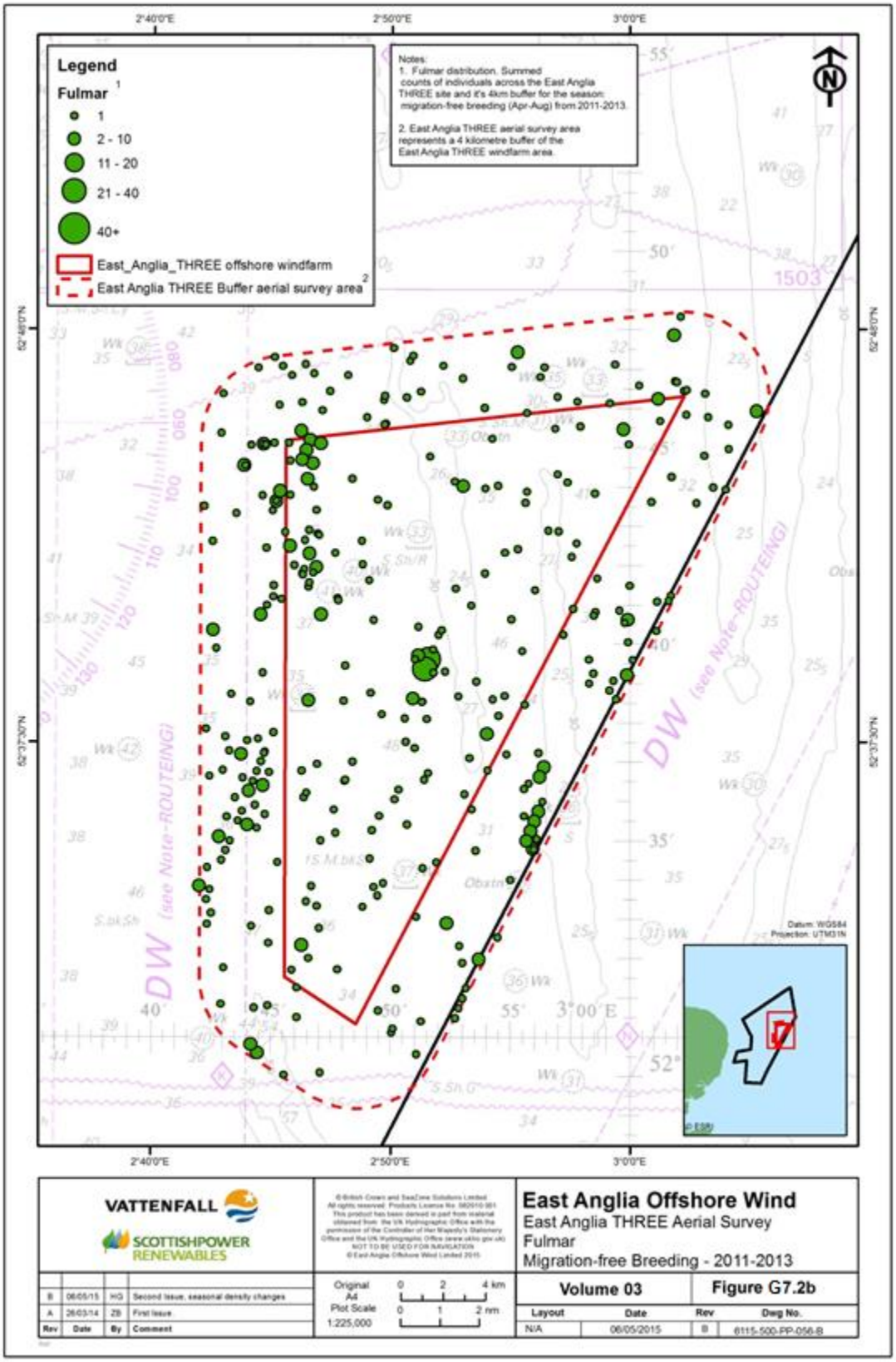
Annex G presents species specific spatial distribution maps for birds within the East Anglia THREE site plus 4km buffer. Seabirds with a sufficient number of records per BDMPS bio-season are presented in separate maps to present the seasonal distribution (Furness 2015). Where a species was only recorded in very small numbers a distribution map presents all observations during all bio-seasons. The following accounts for all species that are presented in this appendix:

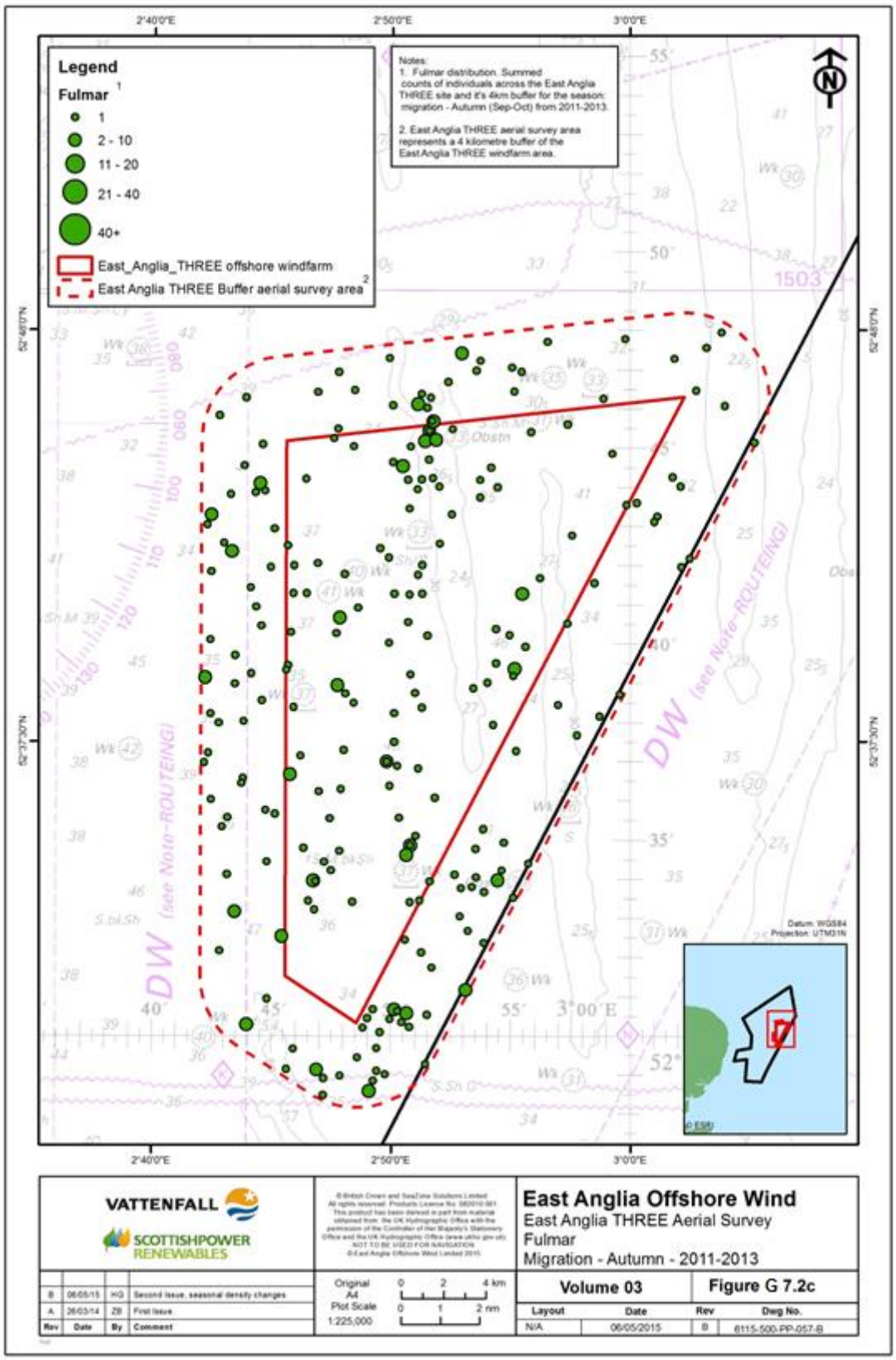
- Red-throated diver: Figure G7.1 (all observations and seasons in a single map);
- Fulmar: Figures G7.2a to G7.2d (spring migration, migration-free breeding, autumn migration and Winter bio-seasons);
- Gannet : Figures G7.3a to G7.3c (spring migration, migration-free breeding, autumn migration bio-seasons);
- Great skua: Figure G7.4 (all observations and seasons in a single map);
- Kittiwake: Figures G7.5a to G7.5c (spring migration, migration-free breeding, autumn migration bio-seasons);
- Black-headed gull: Figure G7.6 (all observations and seasons in a single map);
- Little gull: Figure G7.7 (all observations and seasons in a single map);
- Common gull: Figure G7.8 (all observations and seasons in a single map);
- Lesser black-backed gull: Figures G7.9a to G7.9d (spring migration, migration-free breeding, autumn migration and winter bio-seasons);
- Herring gull: Figures G7.10a to G7.11d (spring migration, migration-free breeding, autumn migration and winter bio-seasons);
- Great black-backed gull: Figures G7.11a to G7.11d (spring migration, migration-free breeding, autumn migration and winter bio-seasons);
- 'Commic' tern: Figures G7.12a and G7.12b (spring migration and autumn migration bio-seasons);
- Guillemot: Figures G7.13a to G7.13d (spring migration, migration-free breeding, autumn migration and Winter bio-seasons);
- Razorbill: Figures G7.14a to G7.14d (spring migration, migration-free breeding, autumn migration and Winter bio-seasons);

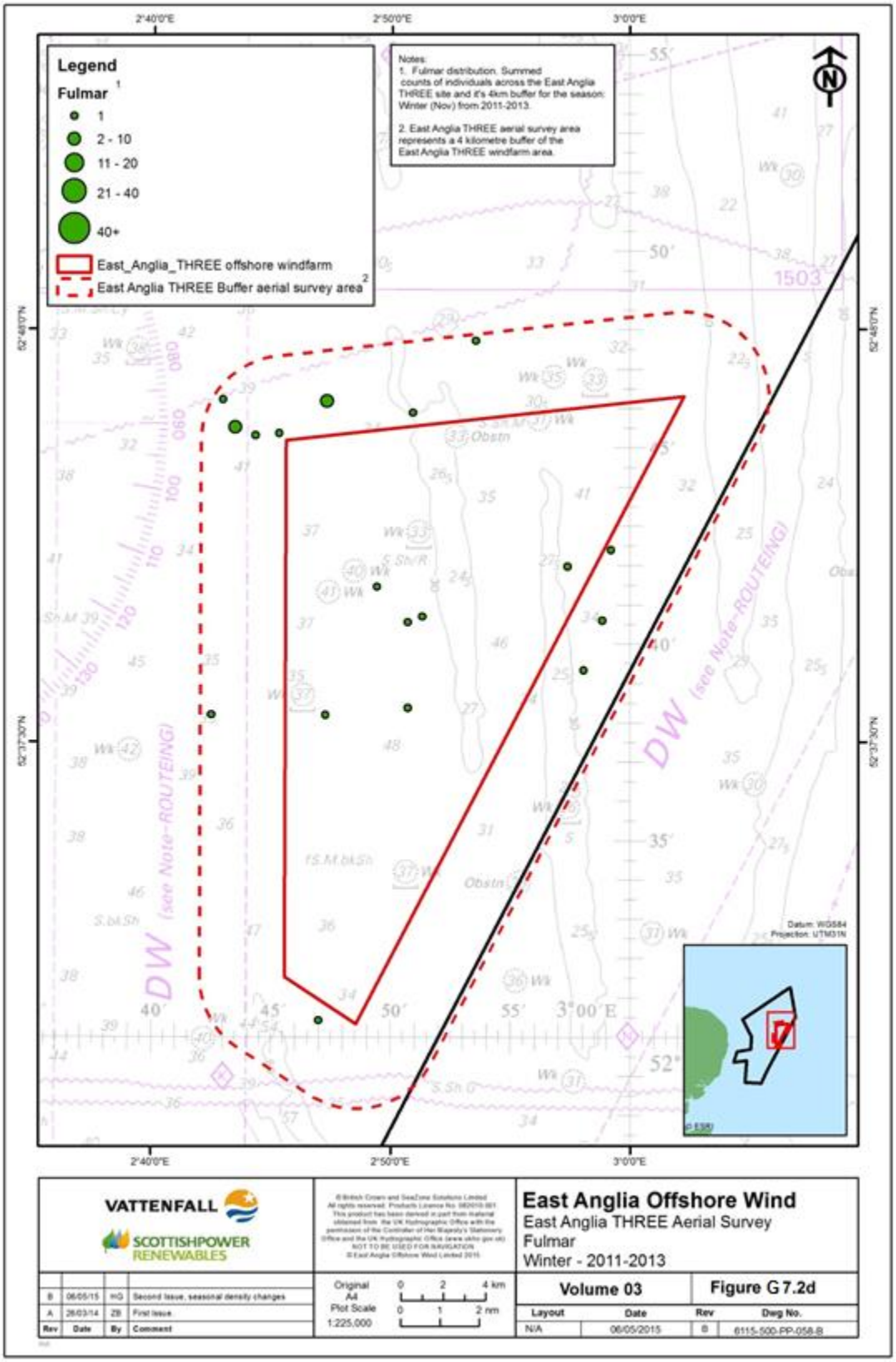
- Little auk: Figure G7.15 (all observations and seasons in a single map); and
- Puffin: Figures G7.16a to G7.16d (spring migration, migration-free breeding, autumn migration and Winter bio-seasons).

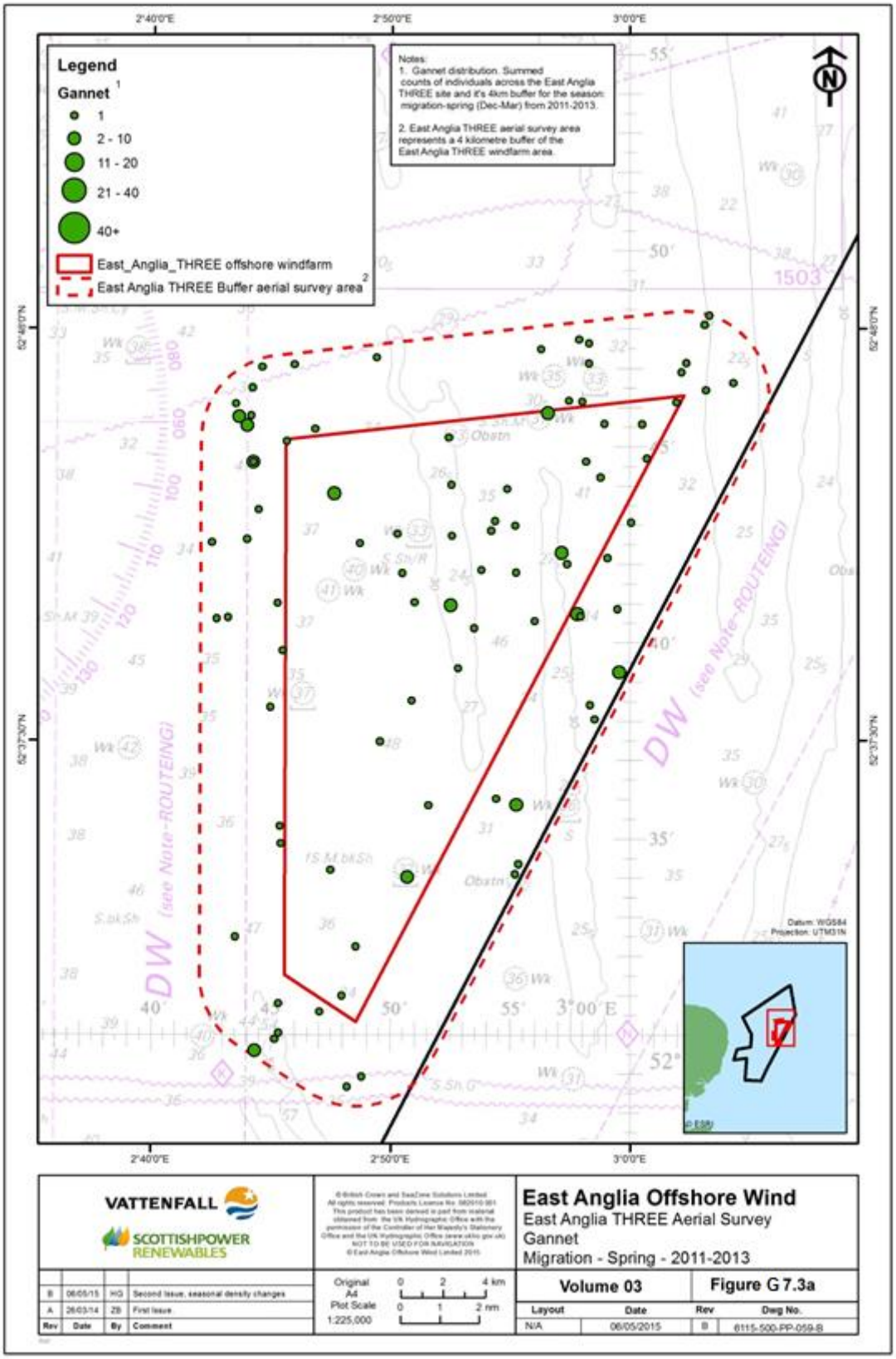

Legend
Red-throated Diver 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE aerial survey area 2
Notes:
1. Red-throated diver distribution. Summed counts of individuals across the Easte Anglia THREE site and it's 4km buffer for the survey period across all months from 2011-2013
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE offshore windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°40'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Red-throated Diver - 2011-2013
Volume 03
Figure G 7.1
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-096-B
B 11/05/15 HG Second Issue
A 26/03/14 ZB First Issue
Rev Date By Comment

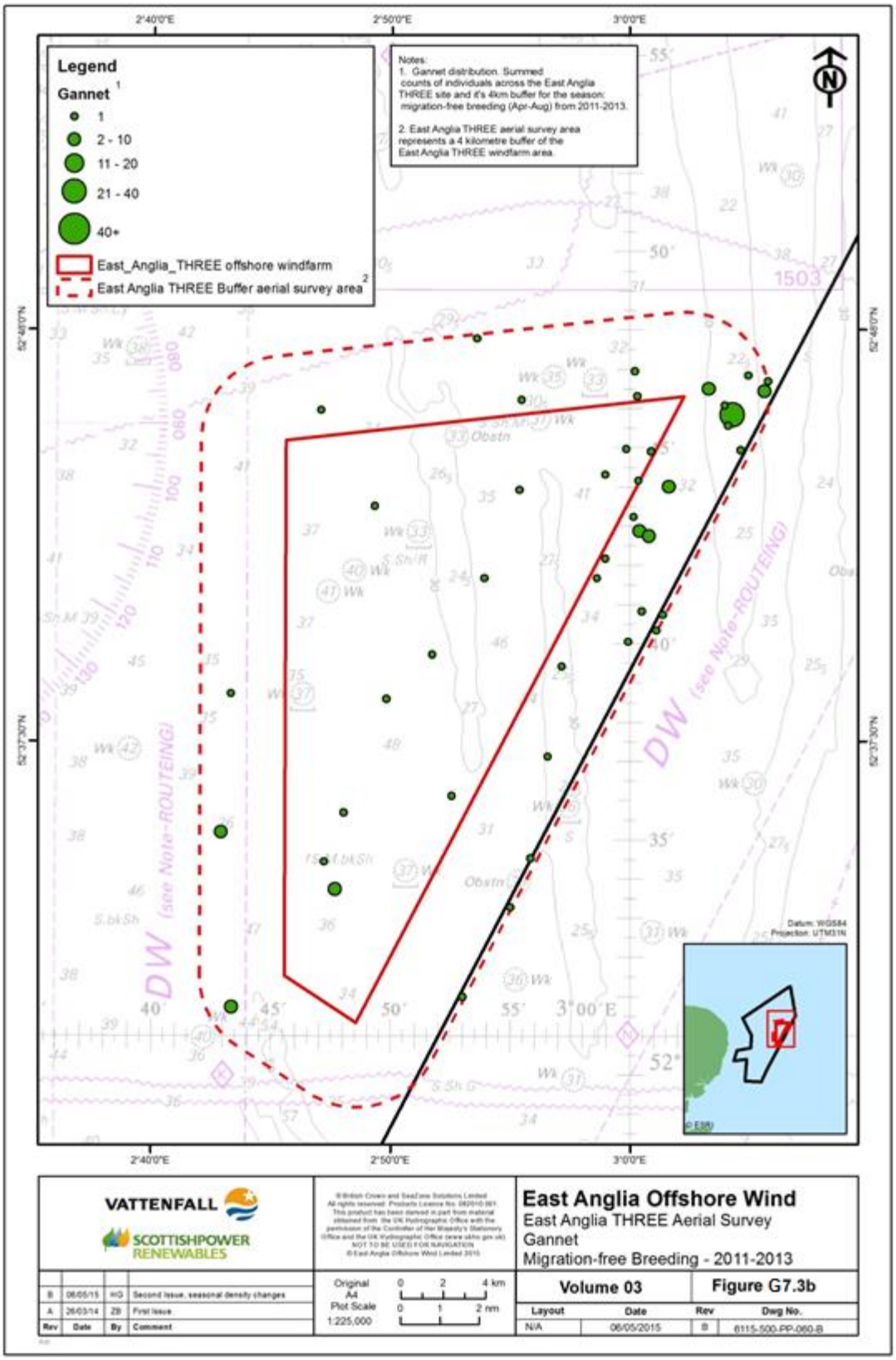

Legend
Fulmar 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Fulmar distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-spring (Dec-Mar) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Fulmar
Migration-Spring - 2011-2013
Volume 03
Figure G 7.2a
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-055-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

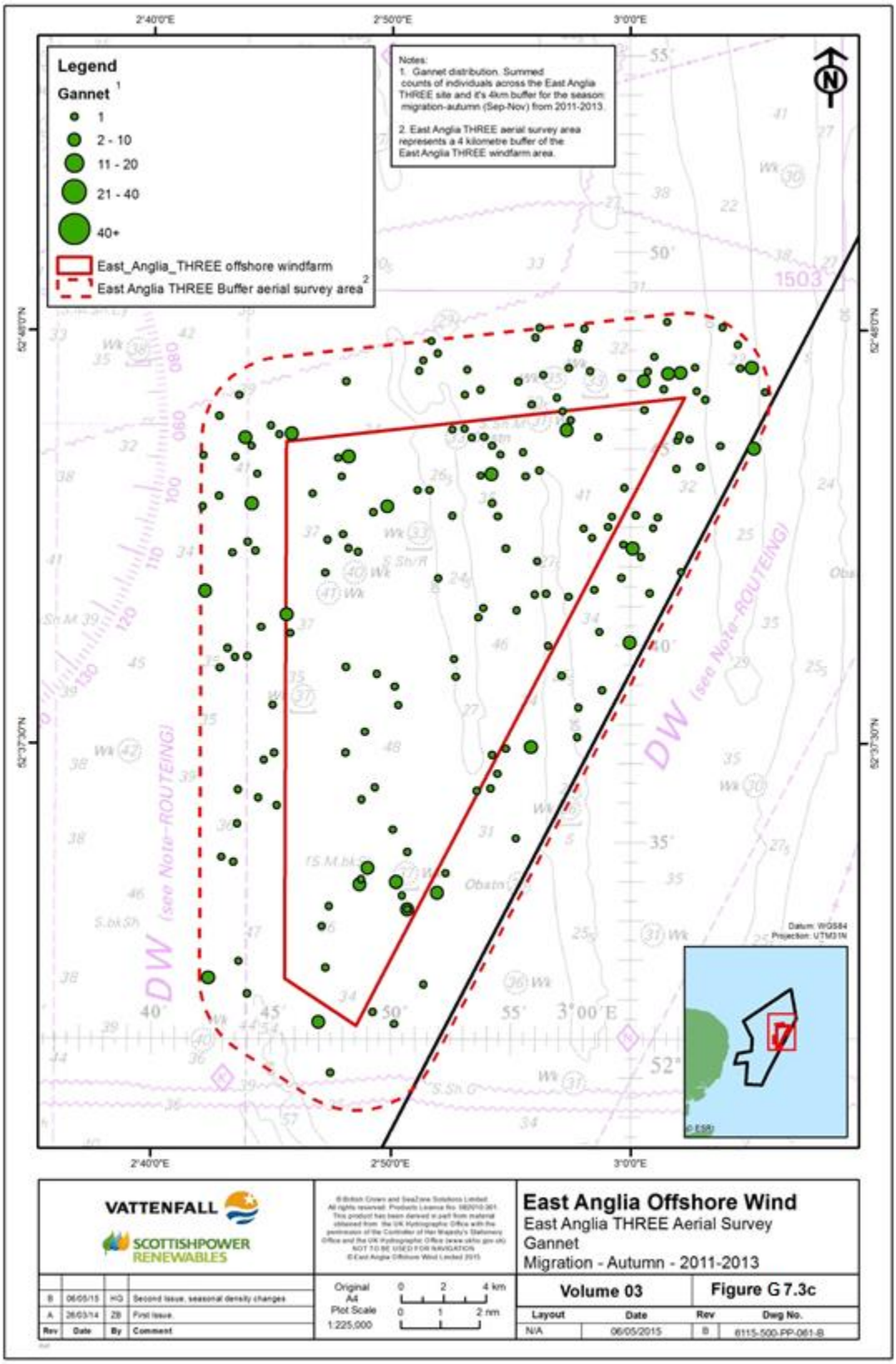

Legend
Fulmar 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Fulmar distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (Apr-Aug) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Fulmar
Migration-free Breeding - 2011-2013
Volume 03
Figure G7.2b
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-056-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

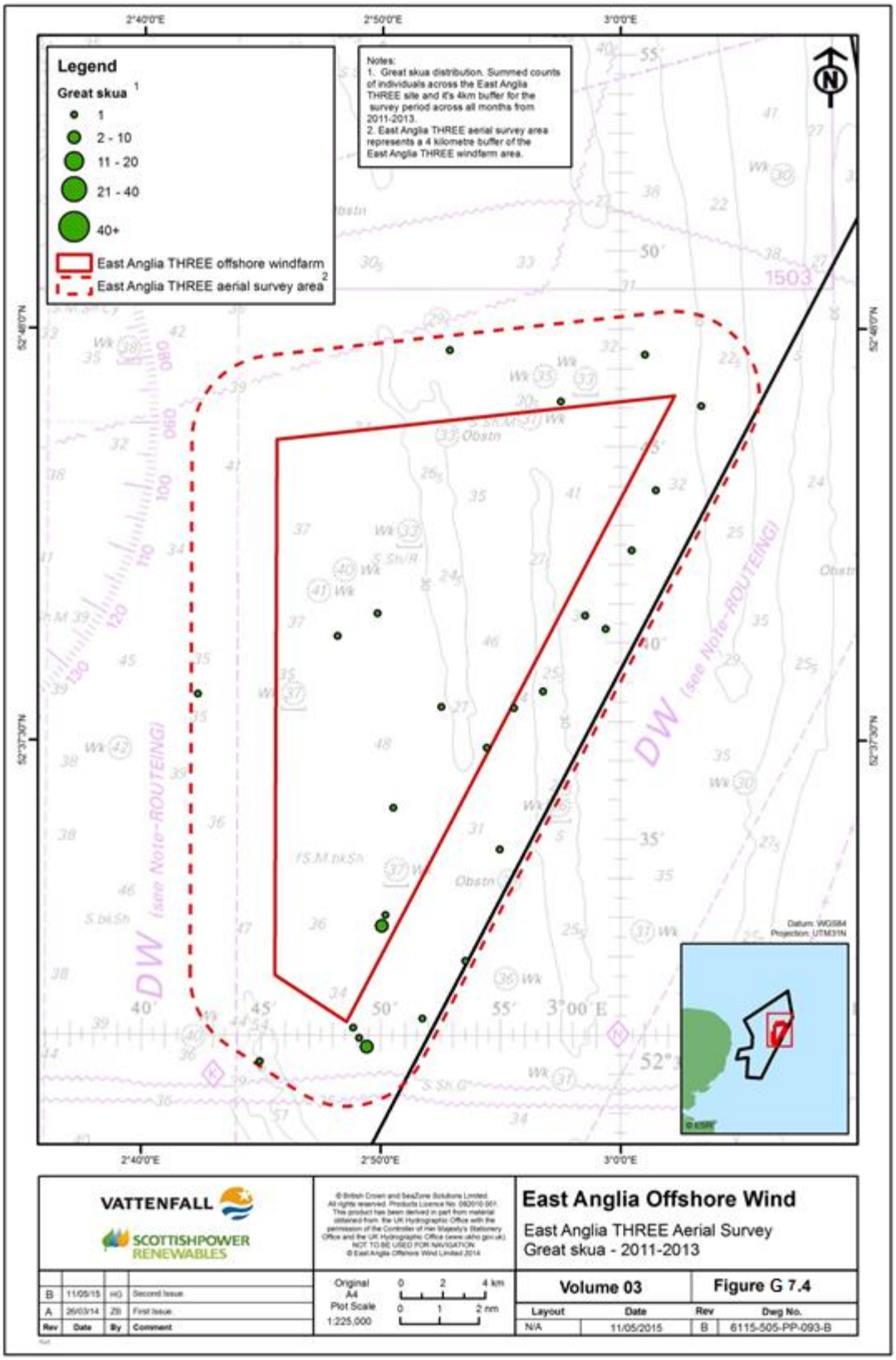

Legend
Fulmar 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Fulmar distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - Autumn (Sep-Oct) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Fulmar
Migration - Autumn - 2011-2013
Volume 03
Figure G 7.2c
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-057-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

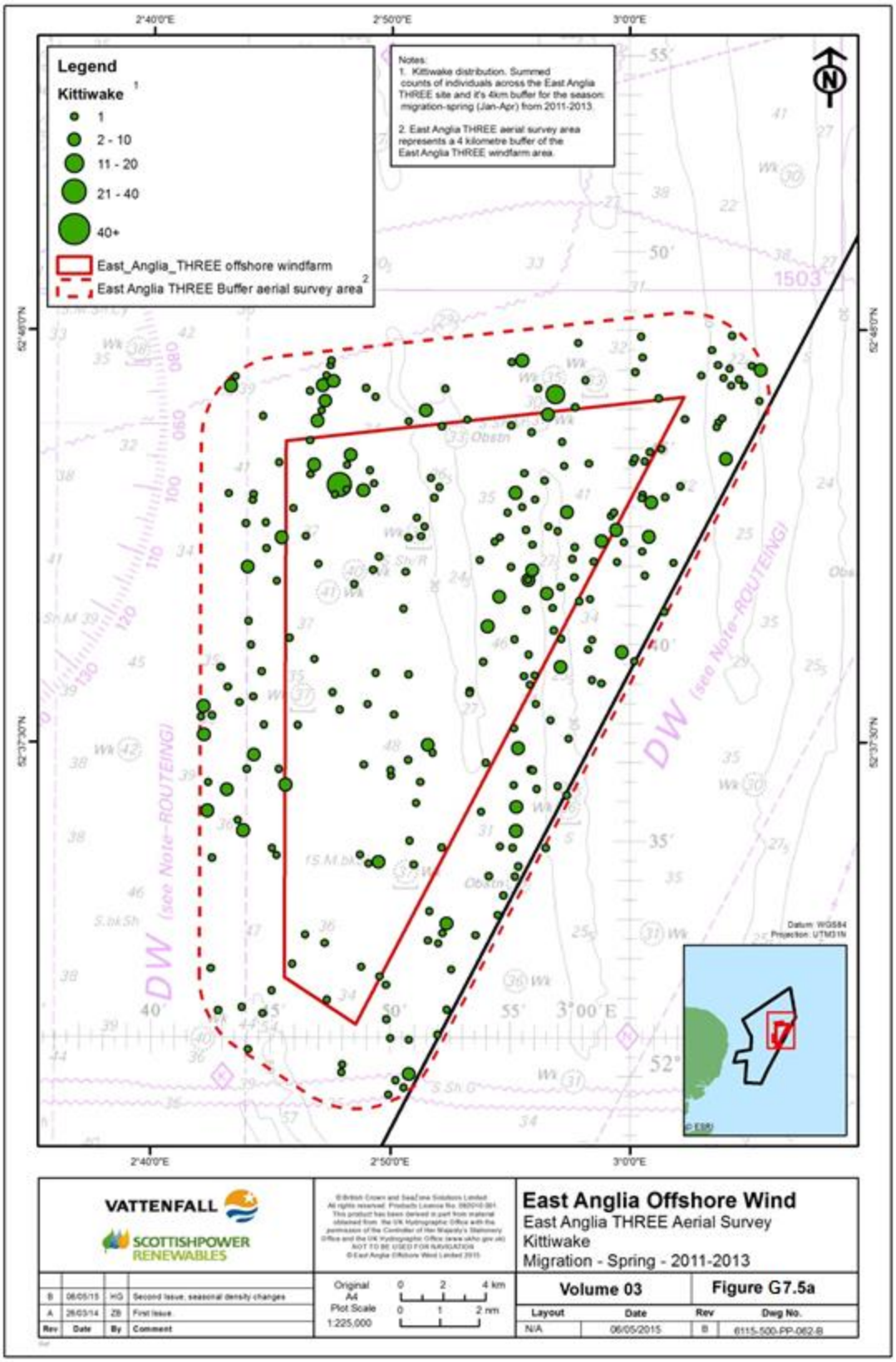

Legend
Fulmar 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Fulmar distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: Winter (Nov) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Fulmar
Winter - 2011-2013
Volume 03
Figure G 7.2d
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-058-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

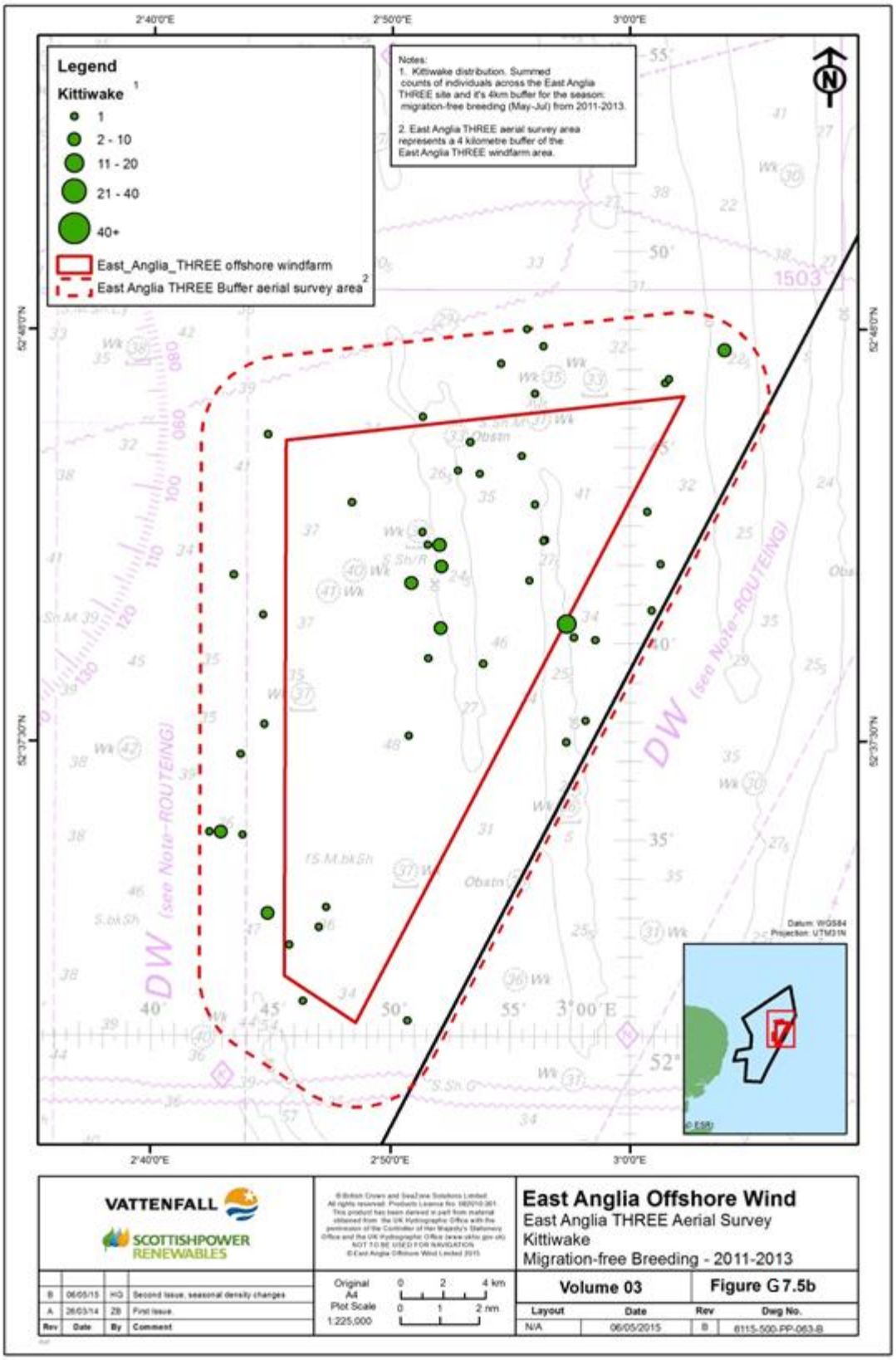

Legend
Gannet 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Gannet distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-spring (Dec-Mar) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Gannet
Migration - Spring - 2011-2013
Volume 03
Figure G 7.3a
Original A4
Plot Scale 1:225,000
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-059-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

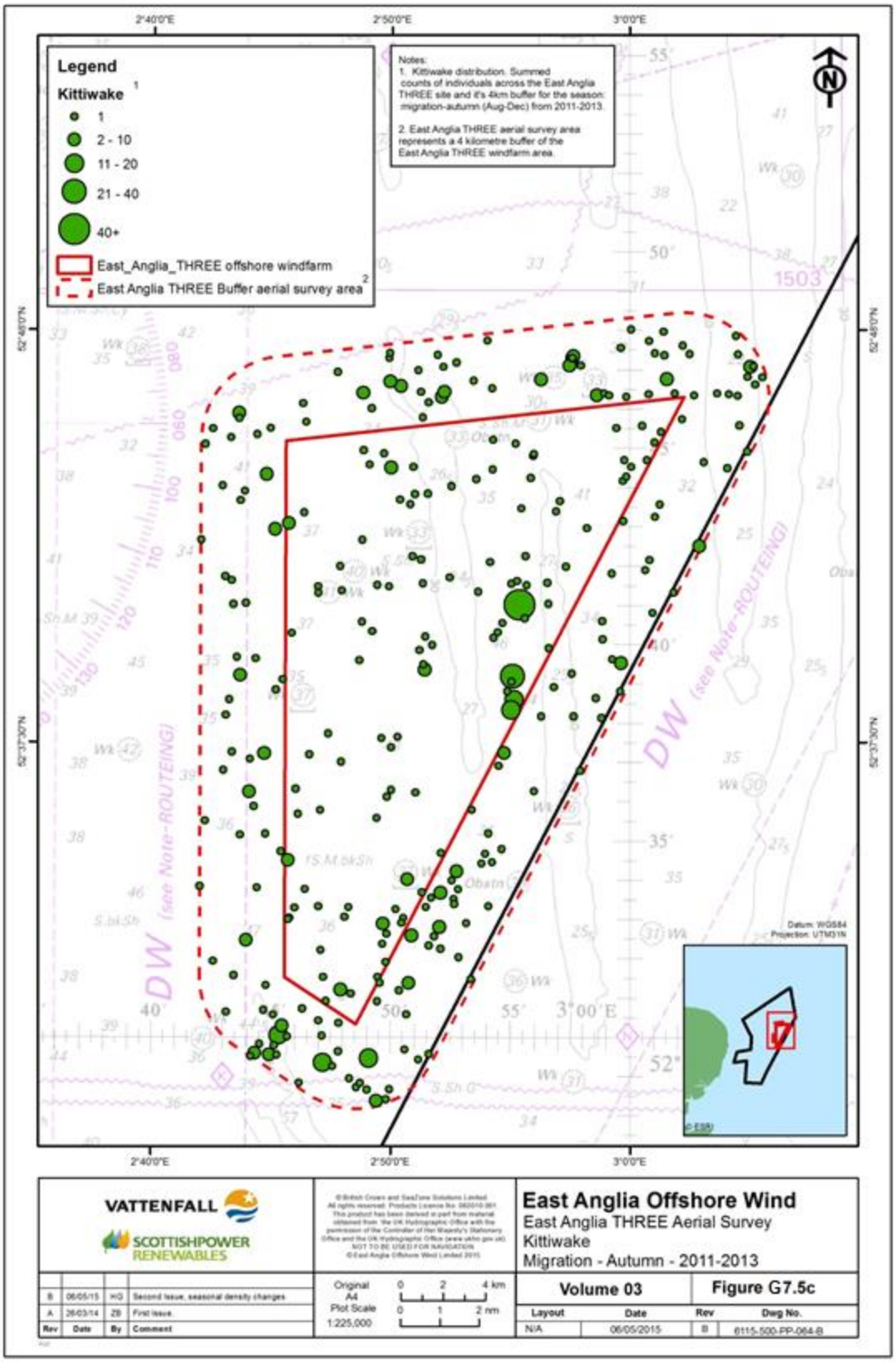

Legend
Gannet 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Gannet distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (Apr-Aug) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
DW (see Note-ROUTEING)
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
3°00'E
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Gannet
Migration-free Breeding - 2011-2013
Volume 03
Figure G7.3b
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-060-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

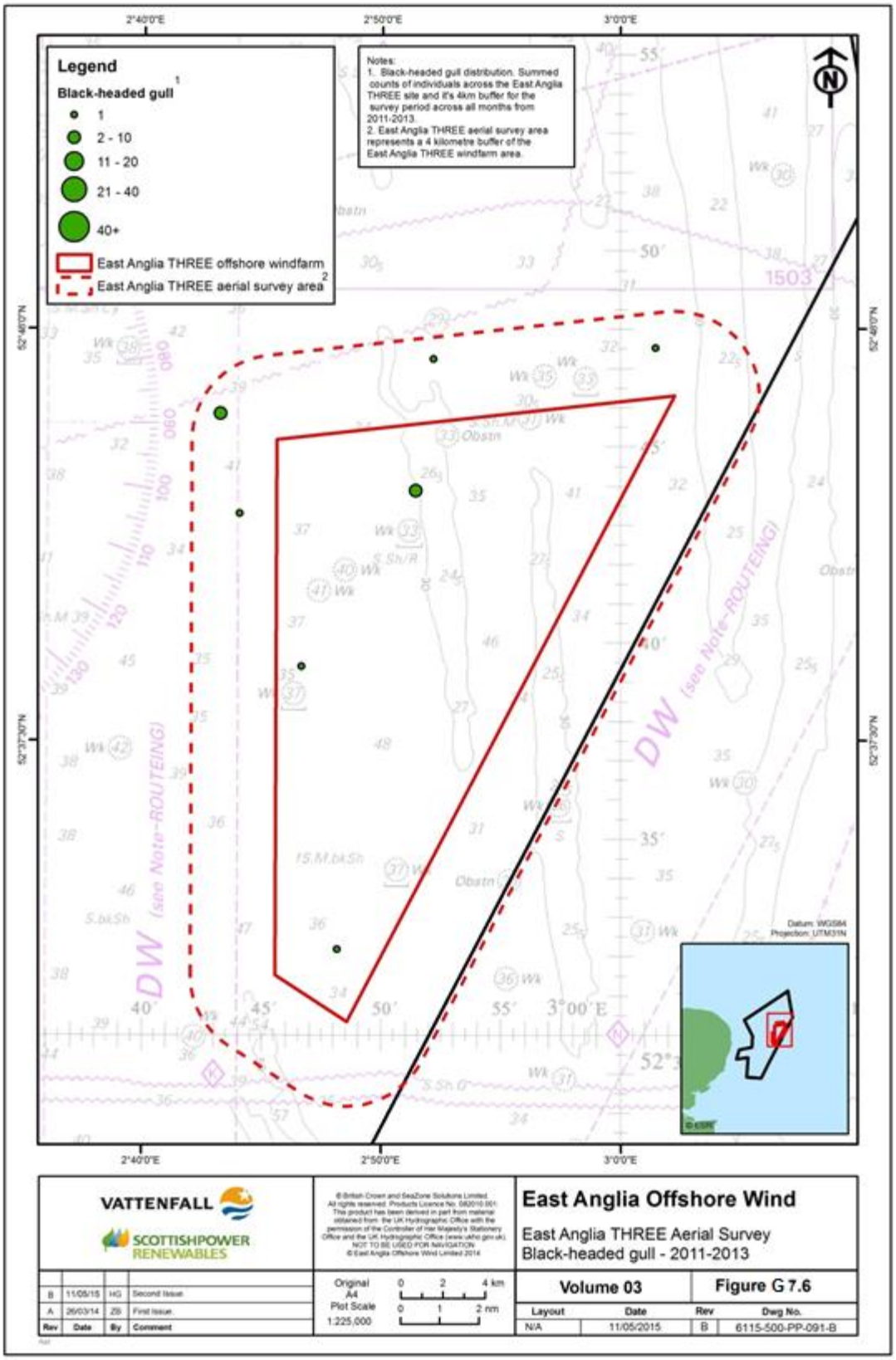

Legend
Gannet 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Gannet distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-autumn (Sep-Nov) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°45'0"N
52°27'0"N
52°37'0"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Gannet
Migration - Autumn - 2011-2013
Volume 03
Figure G 7.3c
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-061-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

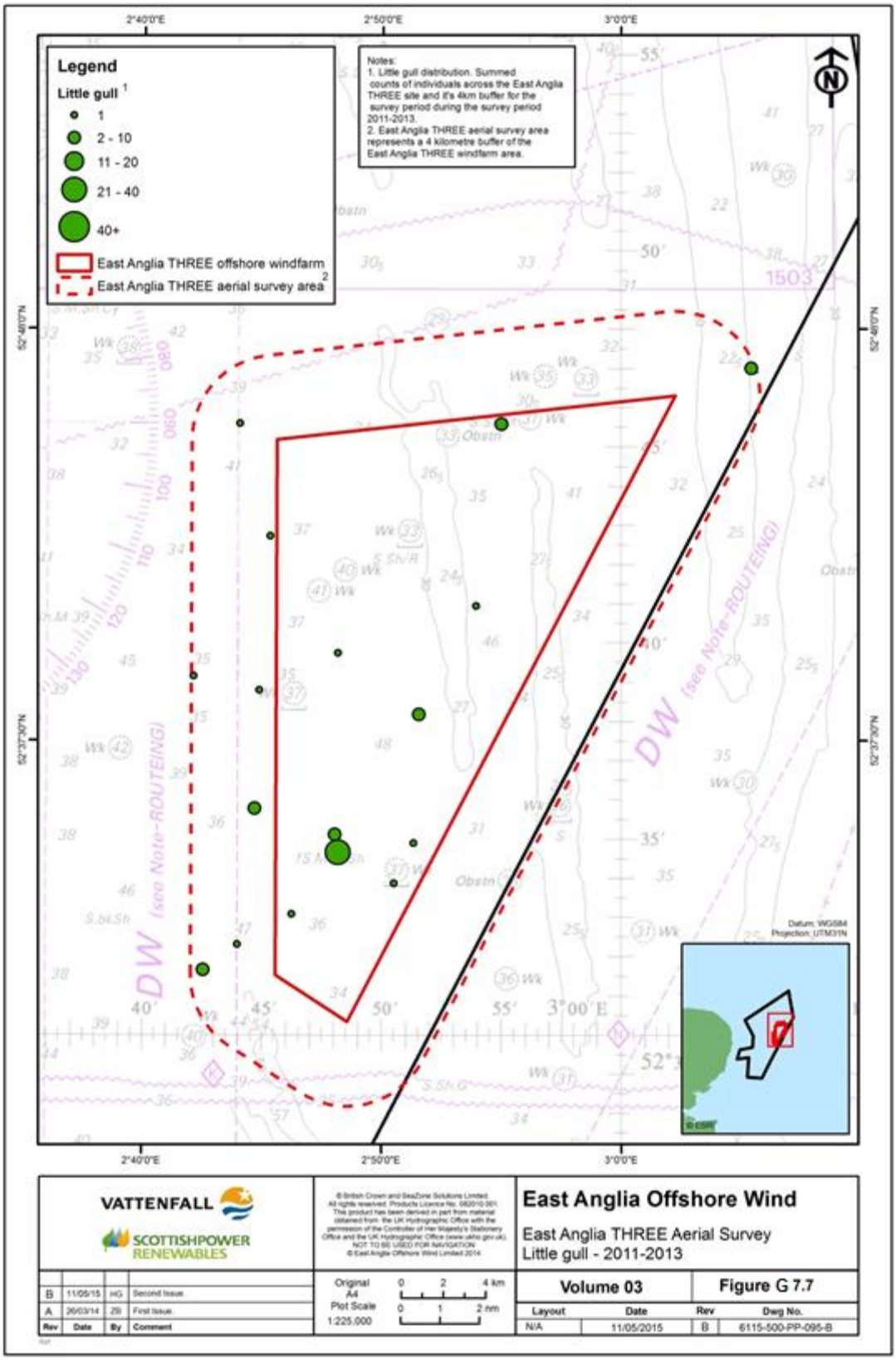

Legend
Great skua 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE aerial survey area 2
Notes:
1. Great skua distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the survey period across all months from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Great skua - 2011-2013
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Volume 03
Figure G 7.4
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-505-PP-093-B
B 11/05/15 HG Second Issue
A 26/03/14 ZB First Issue
Rev Date By Comment

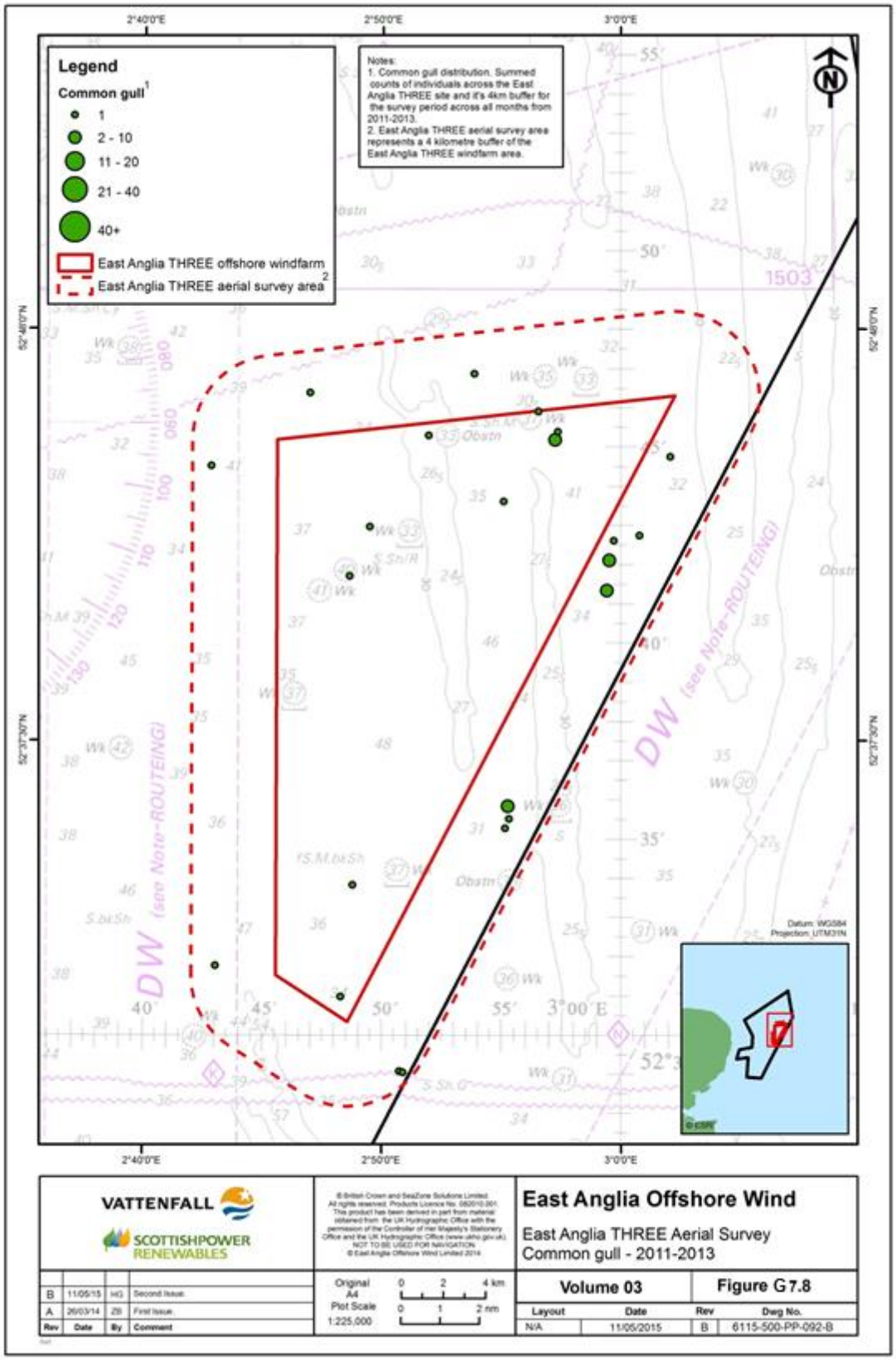

Legend
Kittiwake 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Kittiwake distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-spring (Jan-Apr) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°40'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Kittiwake
Migration - Spring - 2011-2013
Volume 03
Figure G7.5a
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-062-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

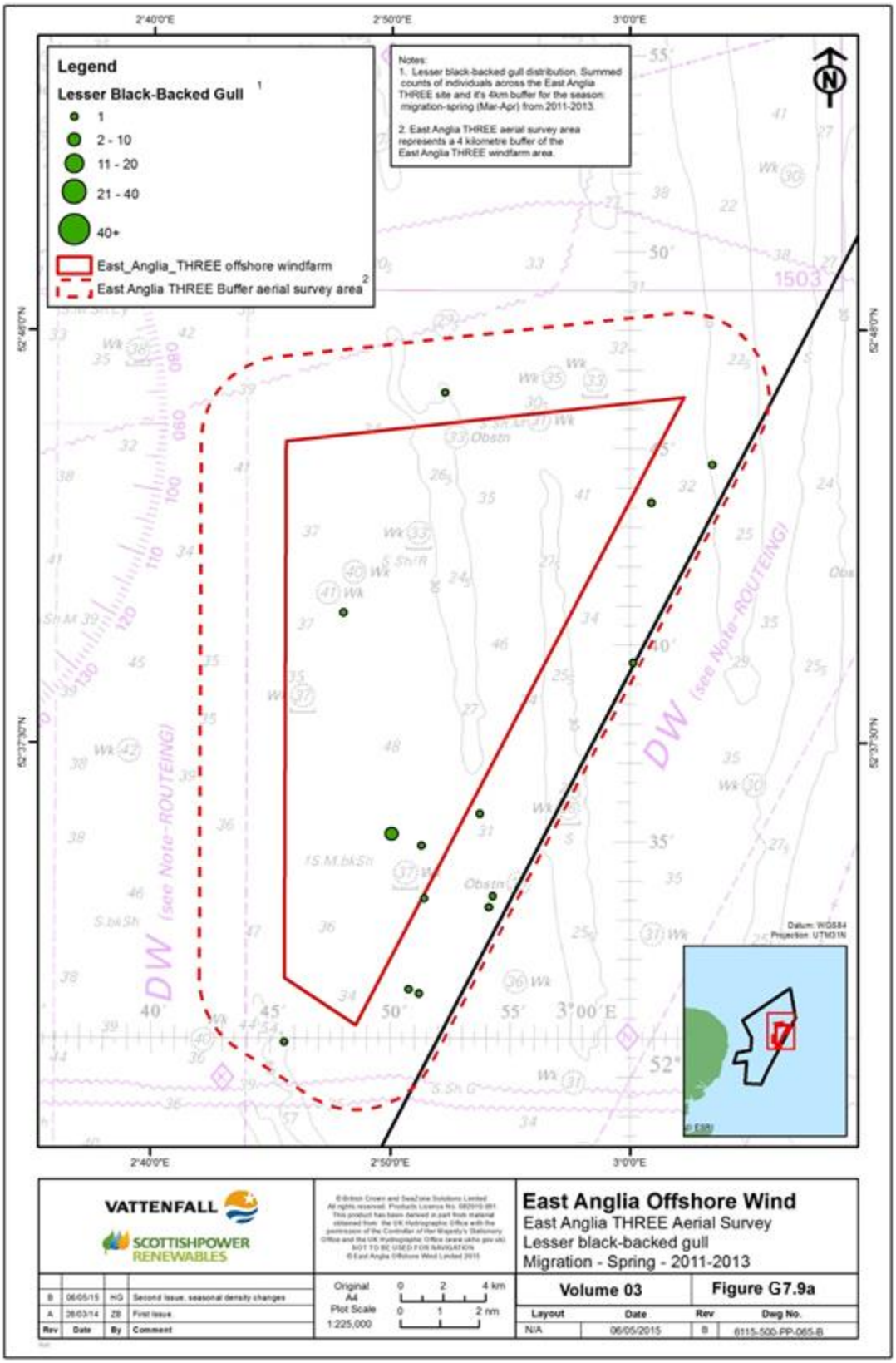

Legend
Kittiwake 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Kittiwake distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (May-Jul) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Kittiwake
Migration-free Breeding - 2011-2013
Volume 03
Figure G 7.5b
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-063-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

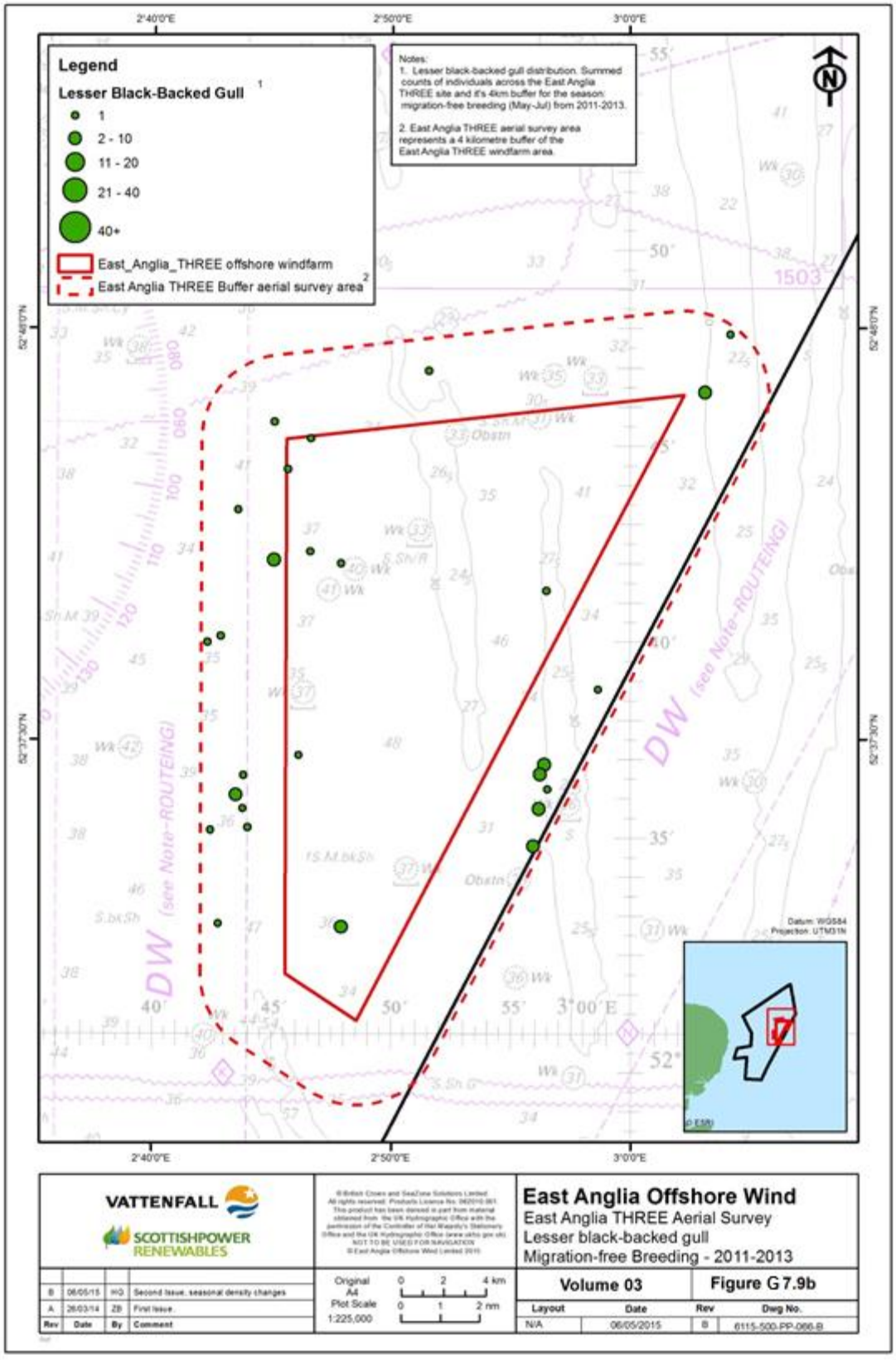

Legend
Kittiwake 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Kittiwake distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-autumn (Aug-Dec) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Kittiwake
Migration - Autumn - 2011-2013
Volume 03
Figure G7.5c
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-064-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue.
Rev Date By Comment

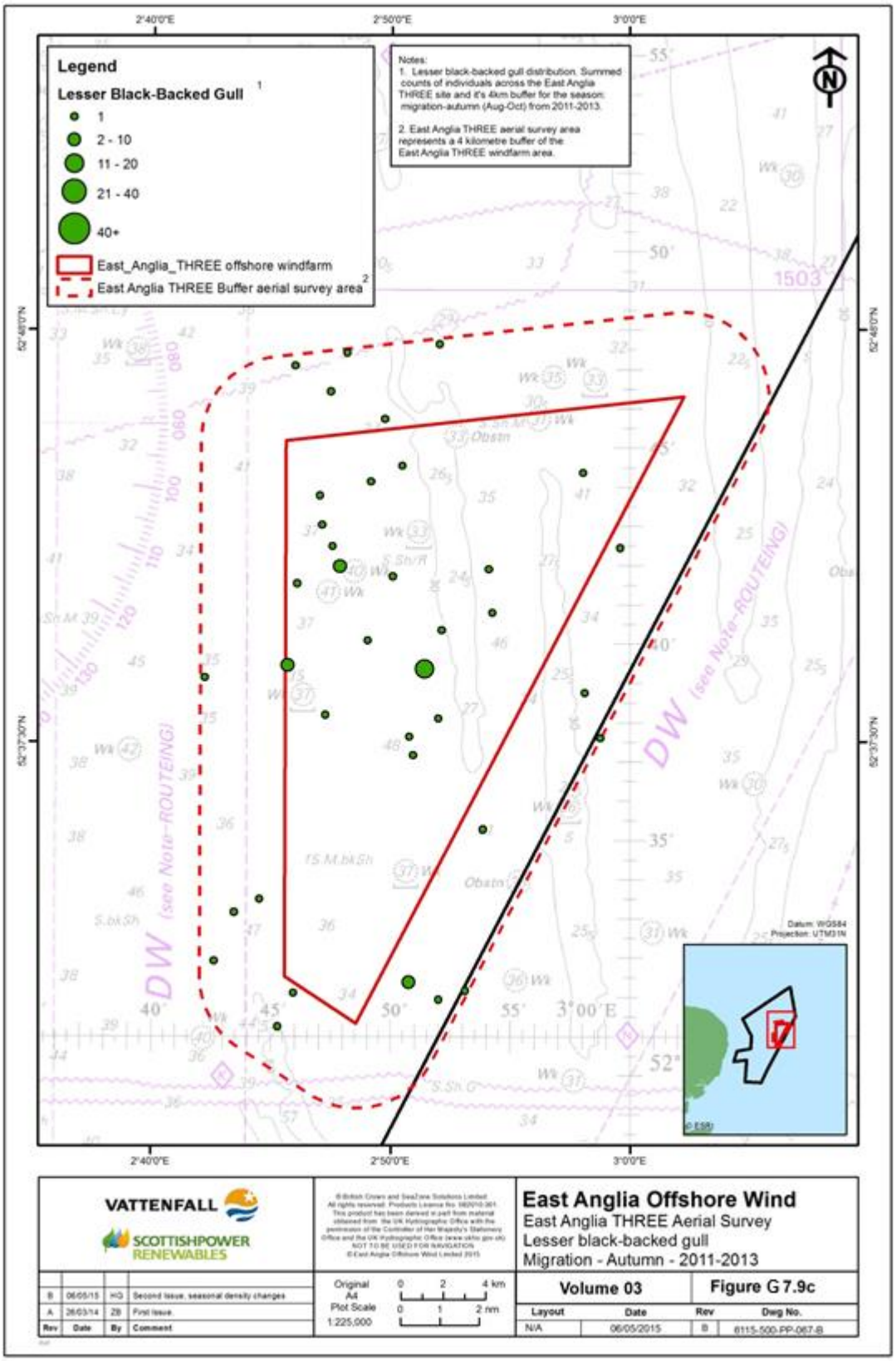

Legend
Black-headed gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE aerial survey area 2
Notes:
1. Black-headed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the survey period across all months from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
DW (see Note-ROUTEING)
2°40'0"E
2°50'0"E
3°0'0"E
52°46'0"N
52°37'30"N
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Black-headed gull - 2011-2013
Volume 03
Figure G 7.6
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-091-B
B 11/05/15 HG Second Issue
A 26/03/14 ZB First Issue
Rev Date By Comment

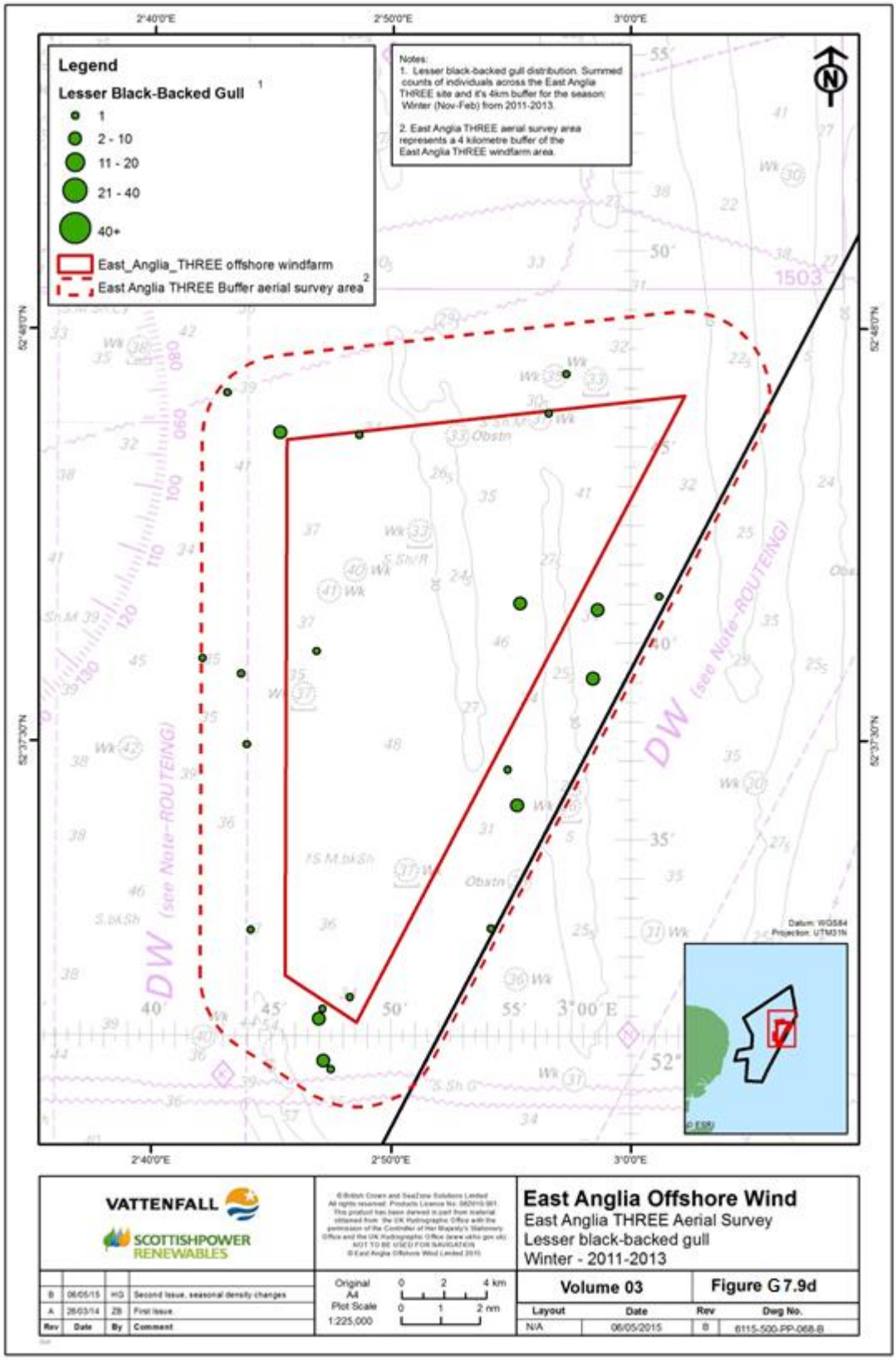

Legend
Little gull [1]
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE aerial survey area [2]
Notes:
1. Little gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the survey period during the survey period 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
DW (see Note-ROUTEING)
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°36'0"N
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Little gull - 2011-2013
Original A4
Plot Scale 1:225,000
Volume 03
Figure G 7.7
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-095-B
B 11/05/15 HG Second Issue
A 26/03/14 ZB First Issue
Rev Date By Comment

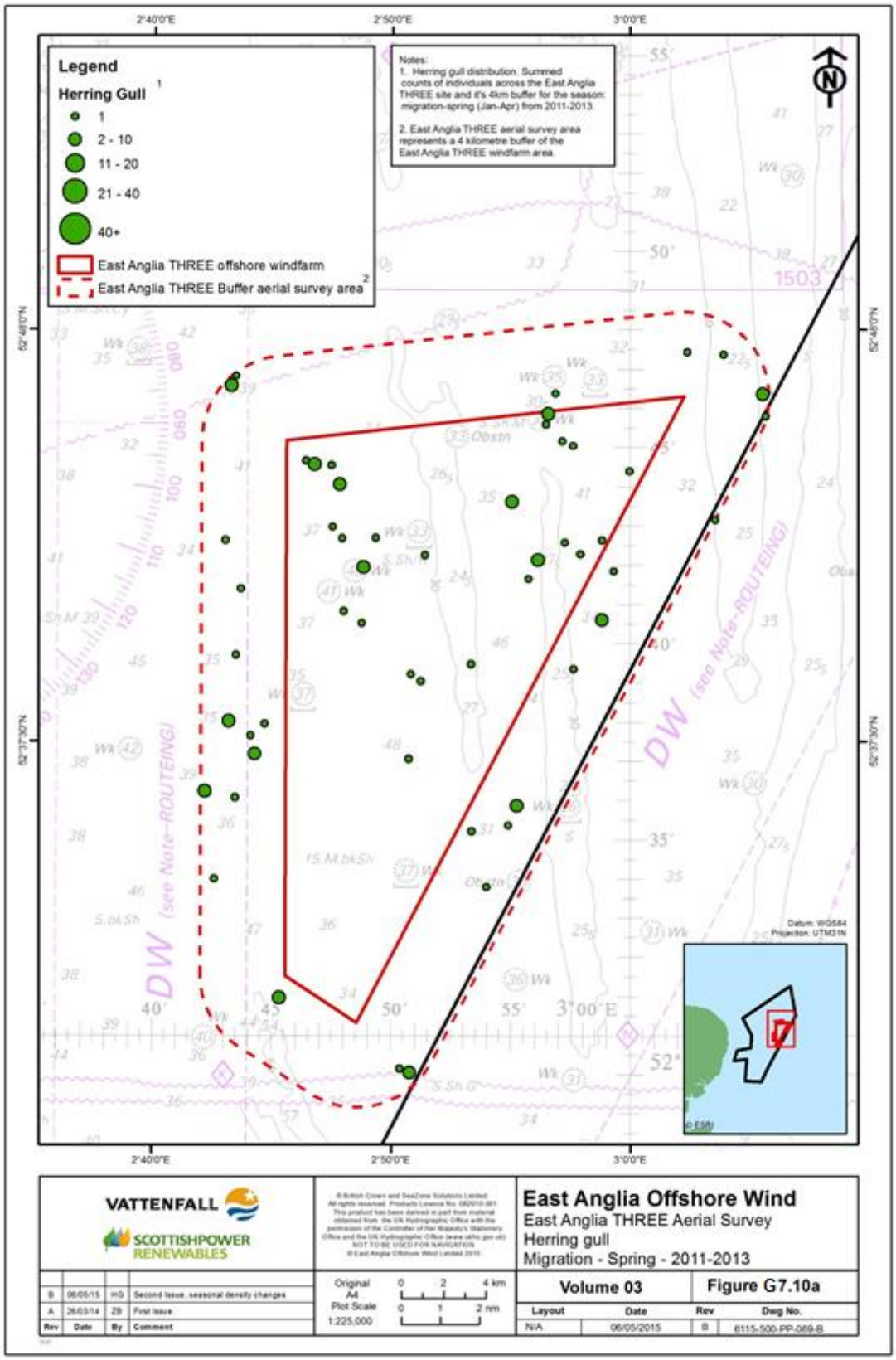

Legend
Common gull[1]
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE aerial survey area[2]
Notes:
1. Common gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the survey period across all months from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Common gull - 2011-2013
Volume 03
Figure G7.8
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-092-B
B 11/05/15 WG Second Issue.
A 26/03/14 ZB First Issue.
Rev Date By Comment

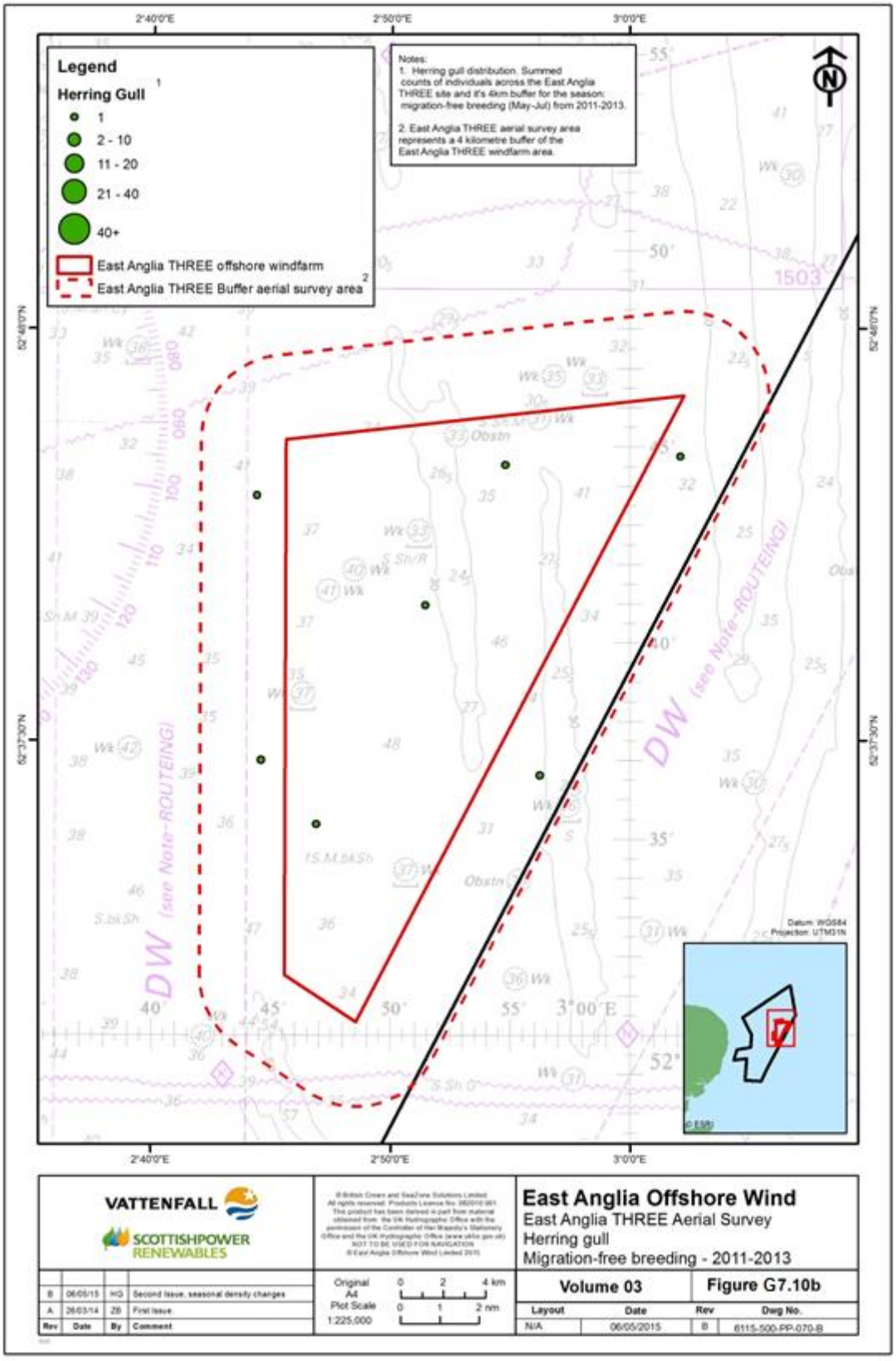

Legend
Lesser Black-Backed Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Lesser black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-spring (Mar-Apr) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
DW (see Note-ROUTEING)
2°40'0"E
2°50'0"E
3°0'0"E
52°49'0"N
52°37'30"N
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Lesser black-backed gull
Migration - Spring - 2011-2013
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Volume 03
Figure G7.9a
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-065-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

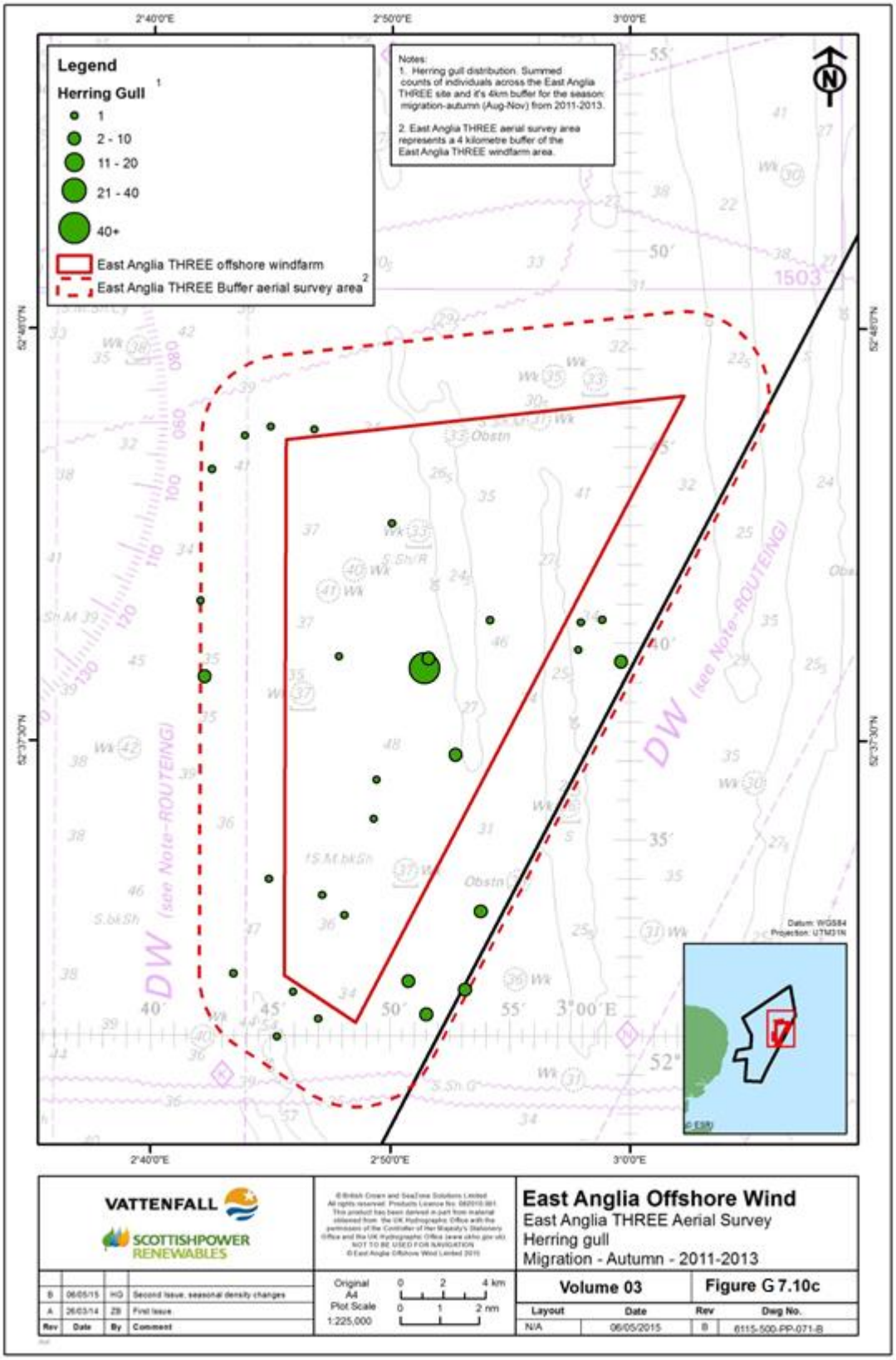

Legend
Lesser Black-Backed Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Lesser black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (May-Jul) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Lesser black-backed gull
Migration-free Breeding - 2011-2013
Volume 03
Figure G 7.9b
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-066-B

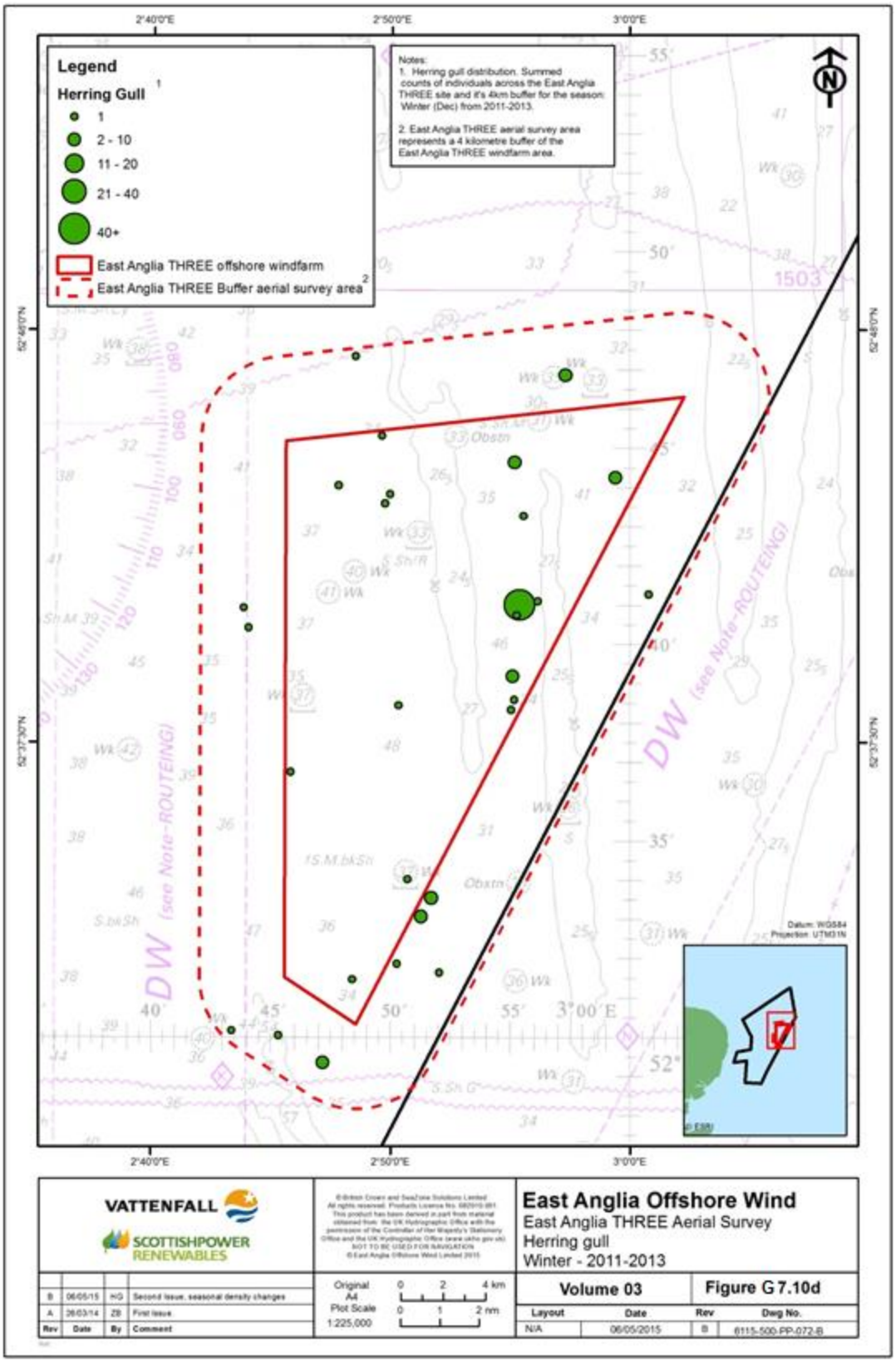

Legend
Lesser Black-Backed Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Lesser black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-autumn (Aug-Oct) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
DW (see Note-ROUTEING)
2°40'0"E
2°50'0"E
3°0'0"E
52°40'0"N
52°30'0"N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Lesser black-backed gull
Migration - Autumn - 2011-2013
Volume 03
Figure G 7.9c
Original A4 Plot Scale 1:225,000
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-067-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

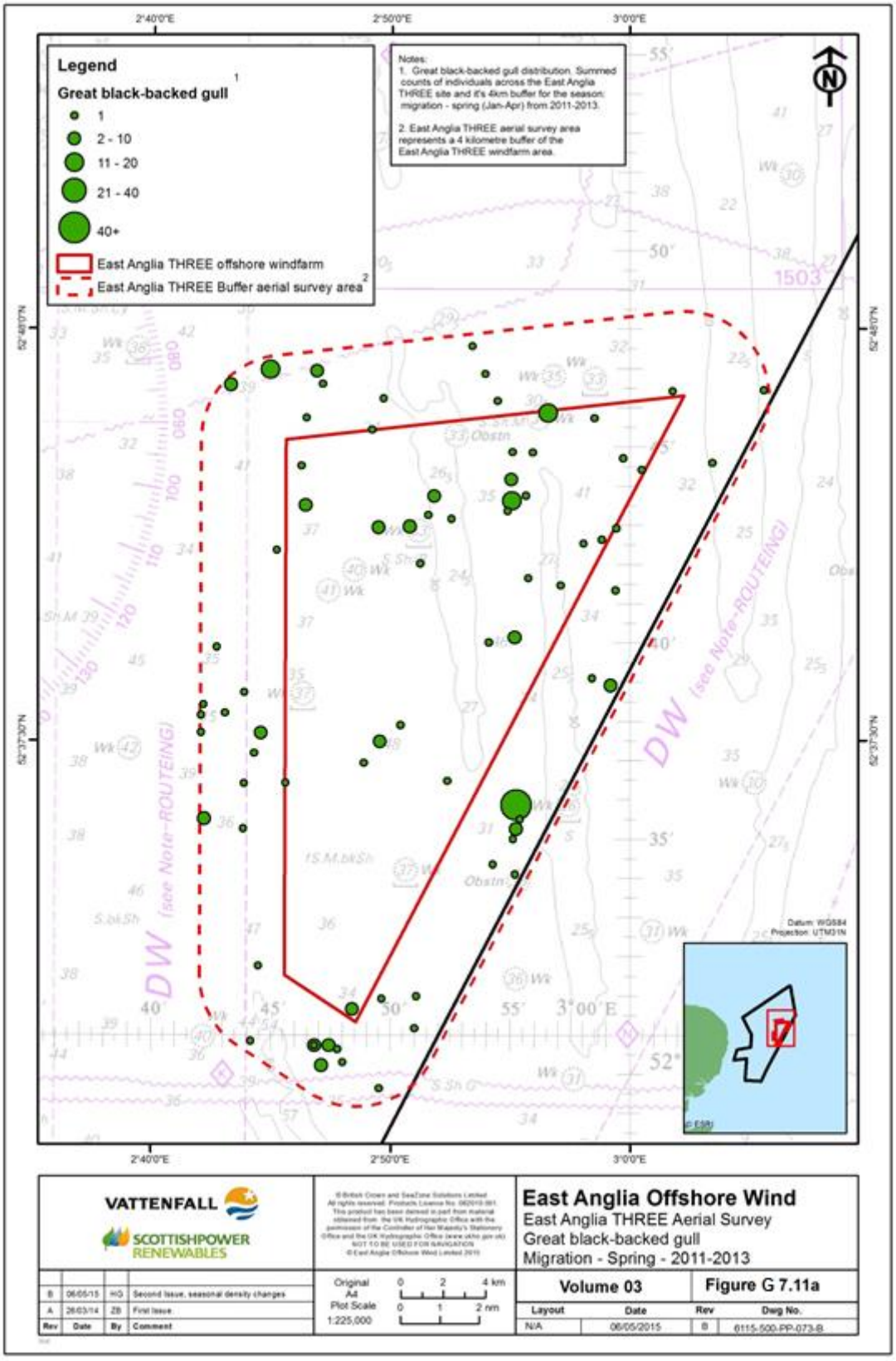

Legend
Lesser Black-Backed Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East_Anglia_THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Lesser black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: Winter (Nov-Feb) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Lesser black-backed gull
Winter - 2011-2013
Volume 03
Figure G 7.9d
Original A4 Plot Scale 1:225,000
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-068-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

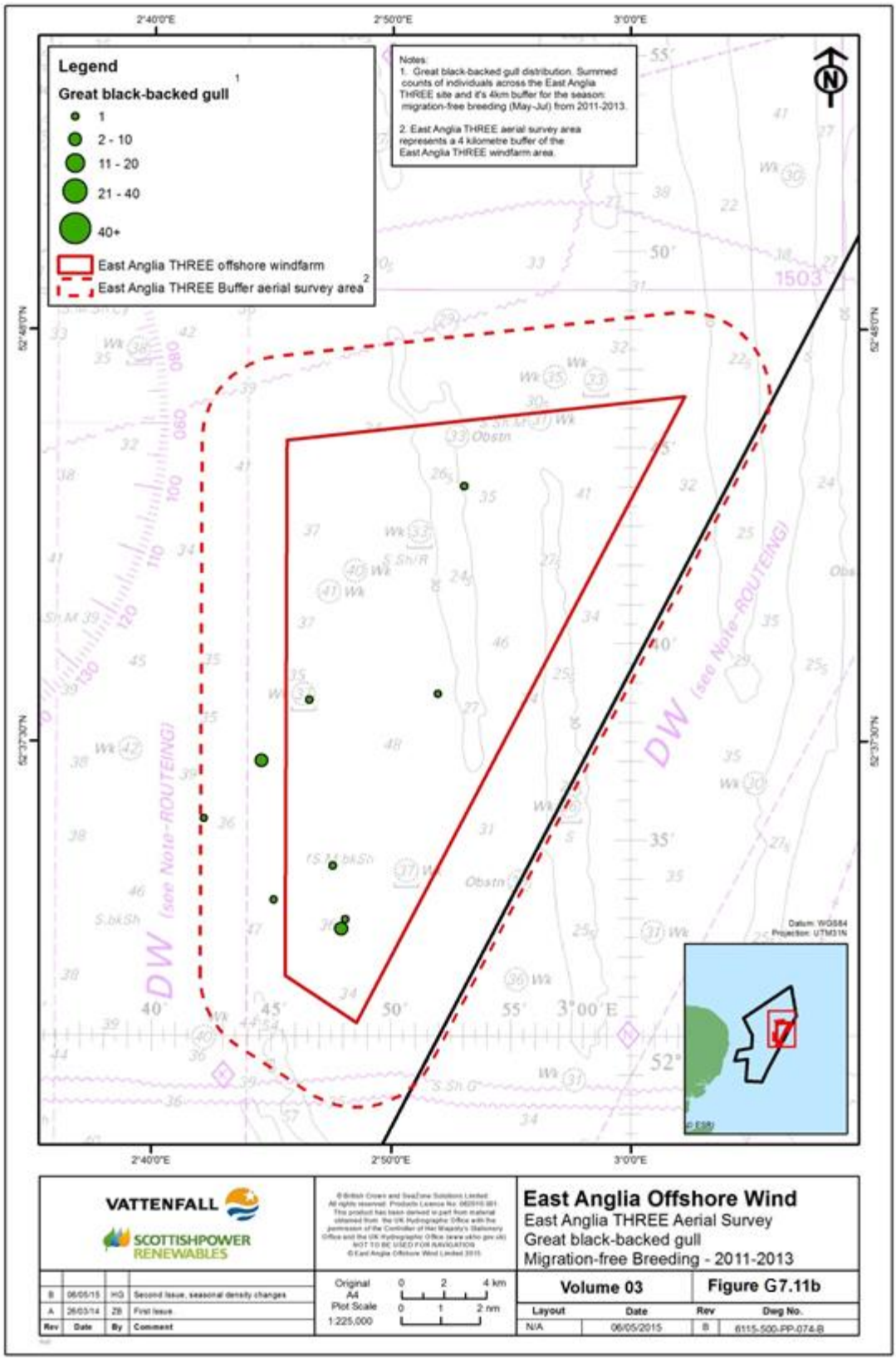

Legend
Herring Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Herring gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-spring (Jan-Apr) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°40'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Herring gull
Migration - Spring - 2011-2013
Volume 03
Figure G7.10a
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-069-B

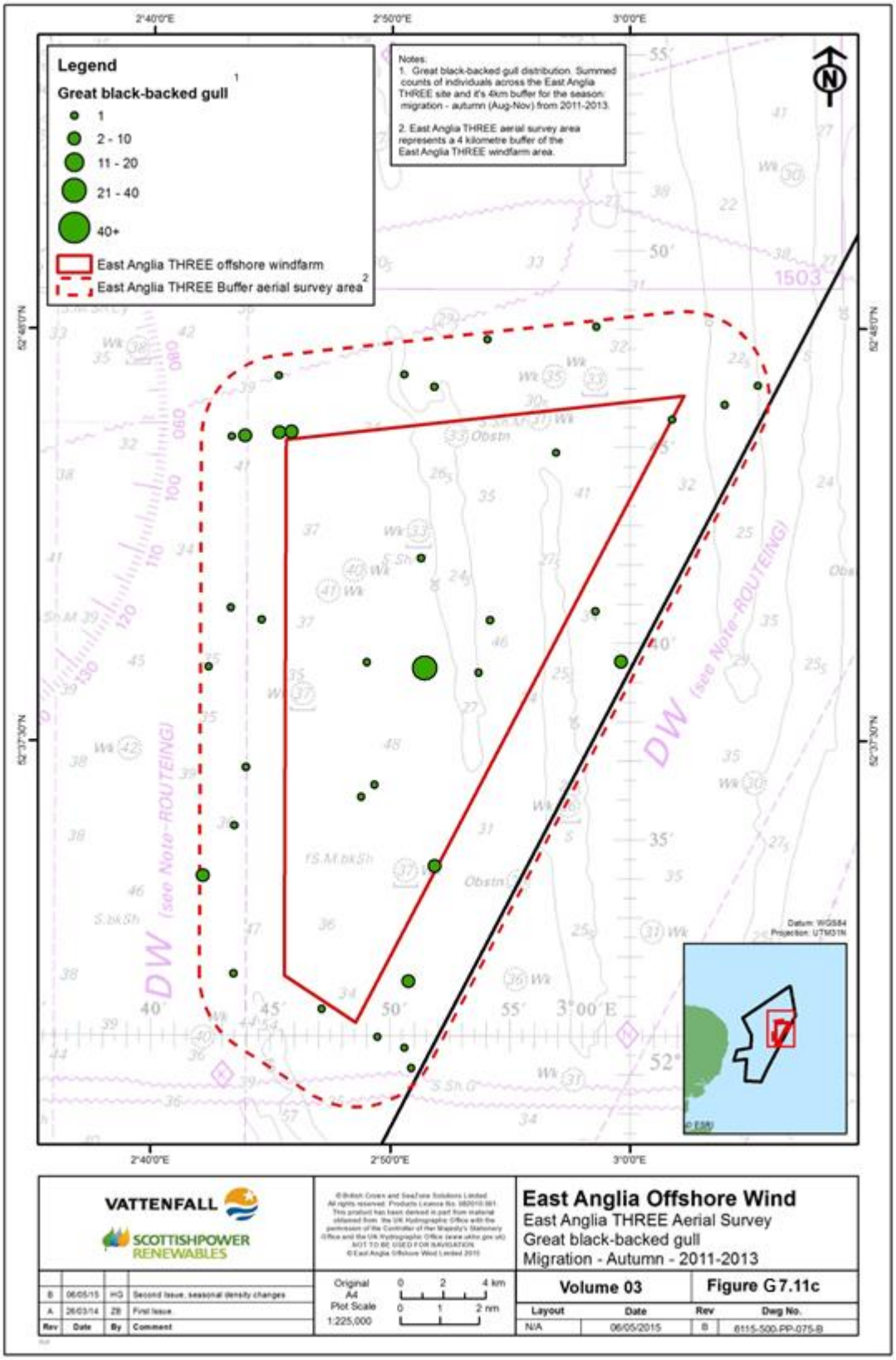

Legend
Herring Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Herring gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (May-Jul) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Herring gull
Migration-free breeding - 2011-2013
Volume 03
Figure G7.10b
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-070-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue.
Rev Date By Comment

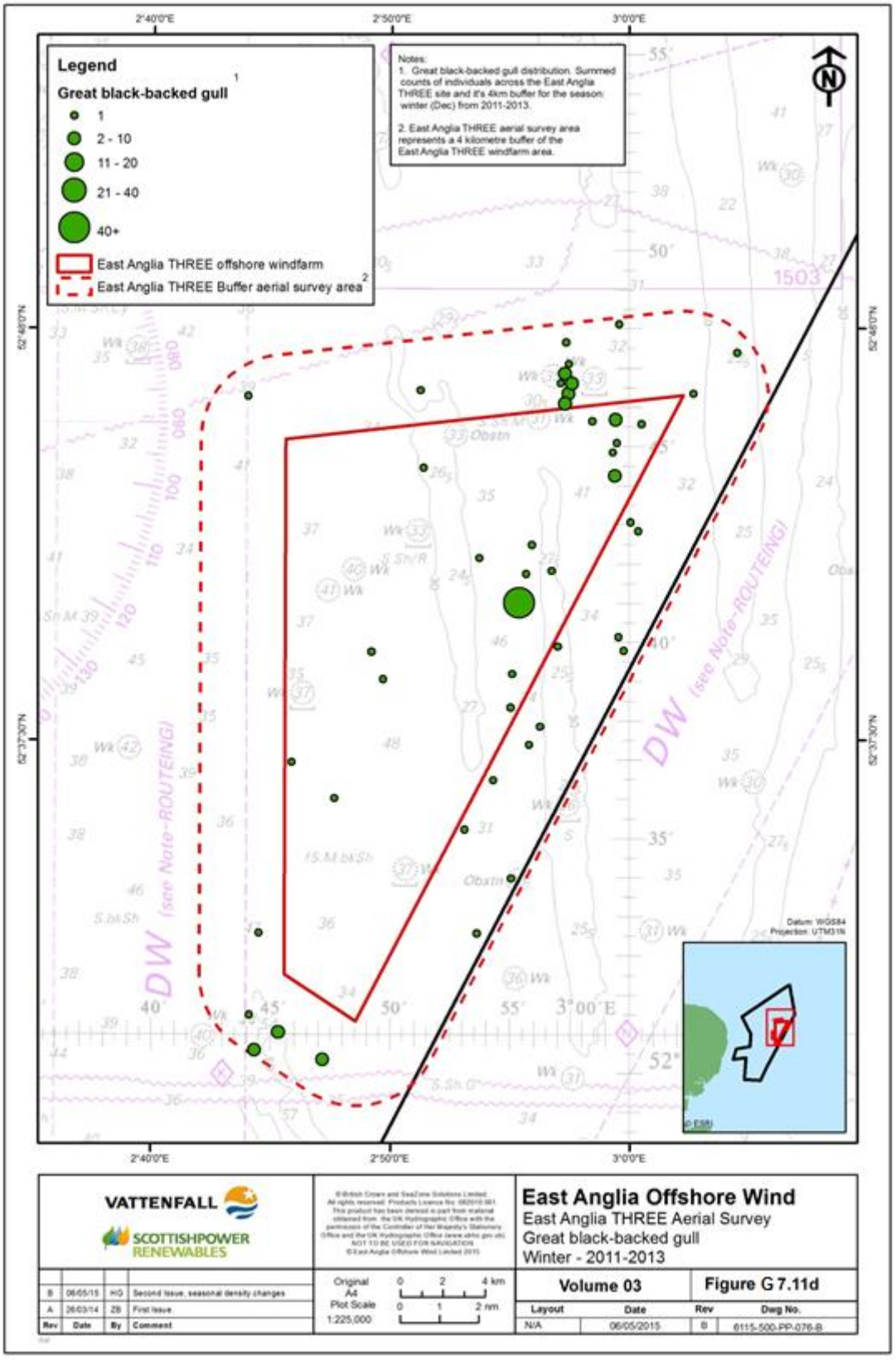

Legend
Herring Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Herring gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-autumn (Aug-Nov) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Herring gull
Migration - Autumn - 2011-2013
Volume 03
Figure G 7.10c
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-071-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

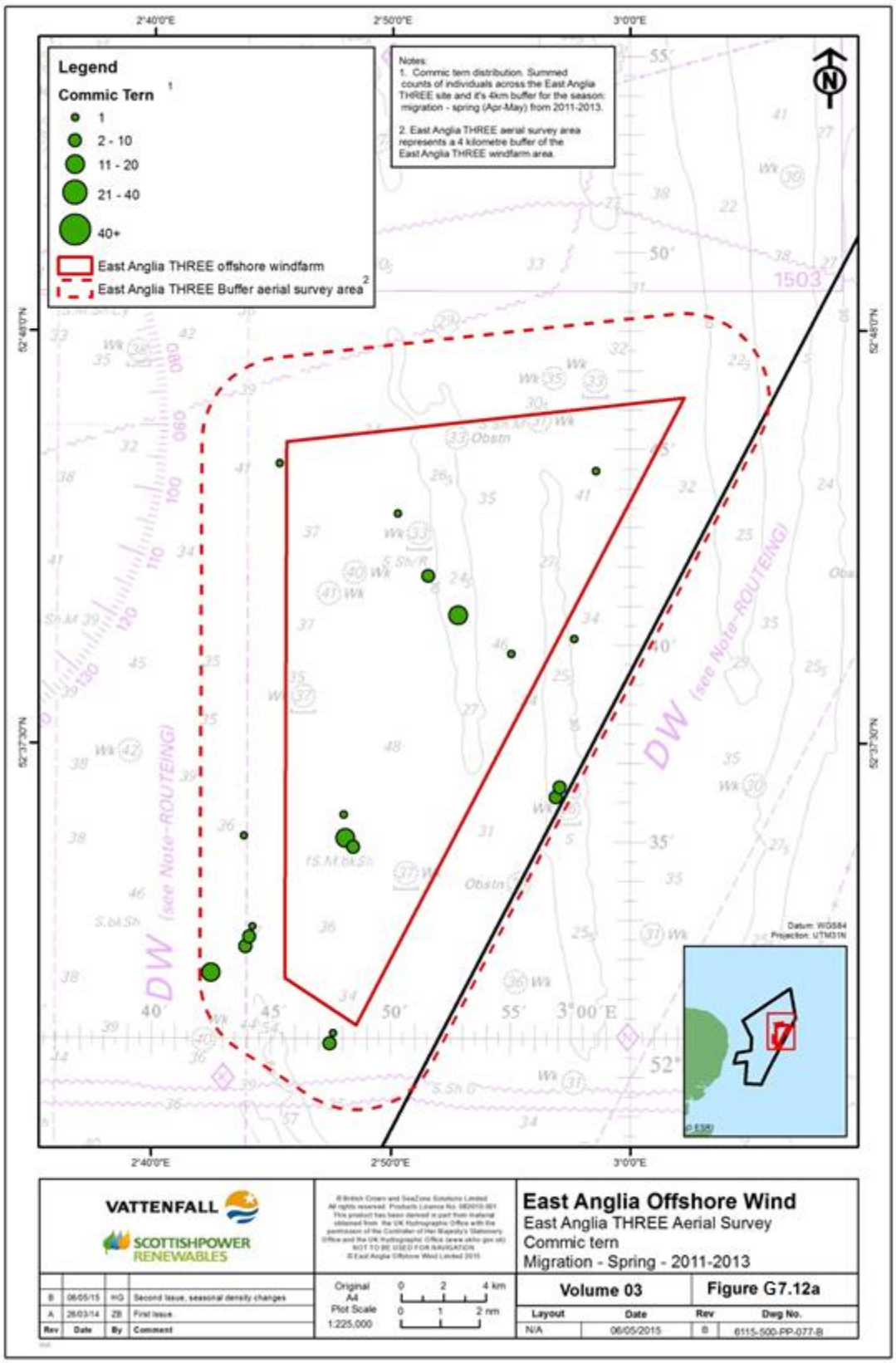

Legend
Herring Gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Herring gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: Winter (Dec) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Herring gull
Winter - 2011-2013
Volume 03
Figure G 7.10d
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-072-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

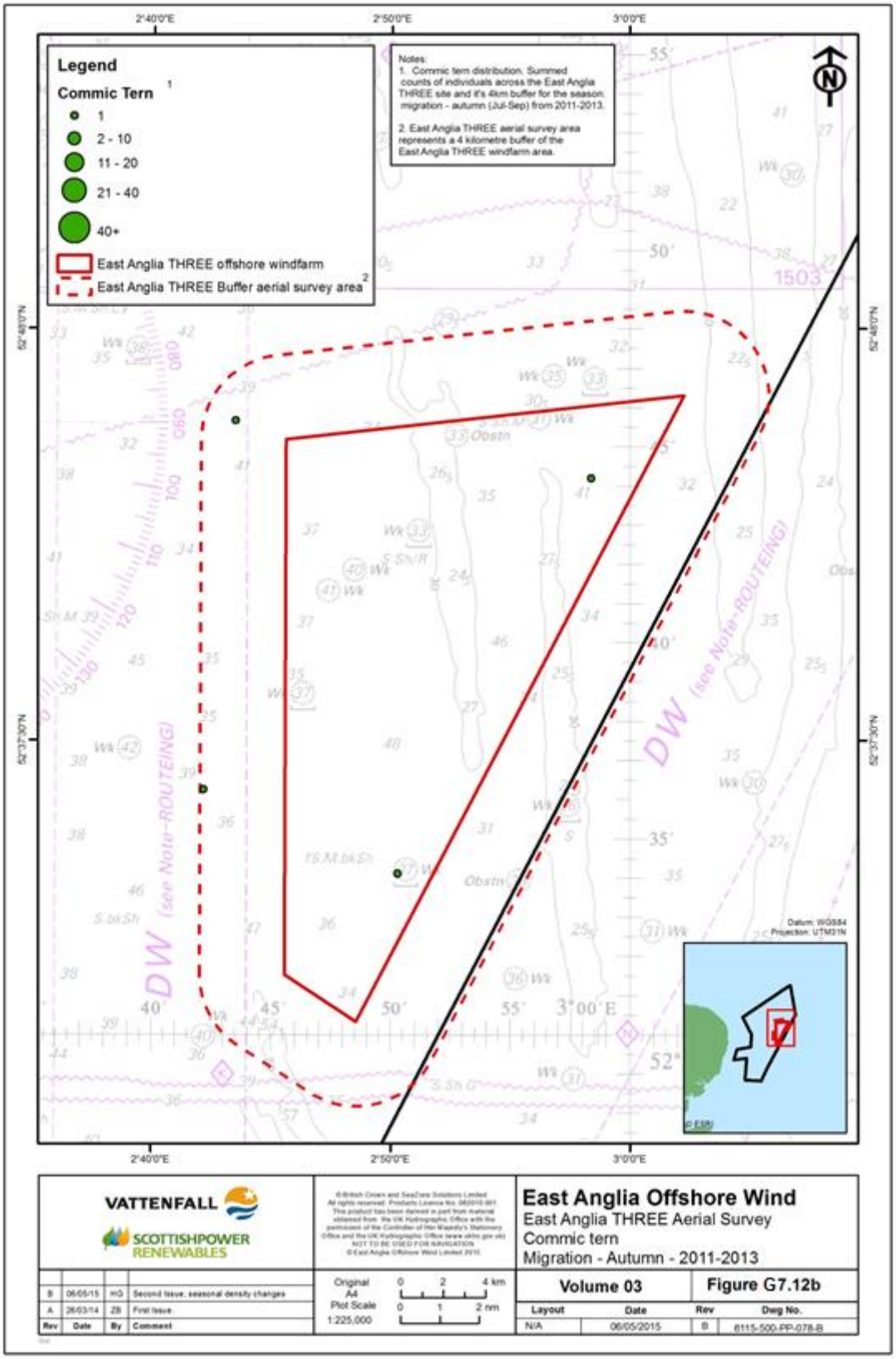

Legend
Great black-backed gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Great black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - spring (Jan-Apr) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Great black-backed gull
Migration - Spring - 2011-2013
Volume 03
Figure G 7.11a
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-073-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

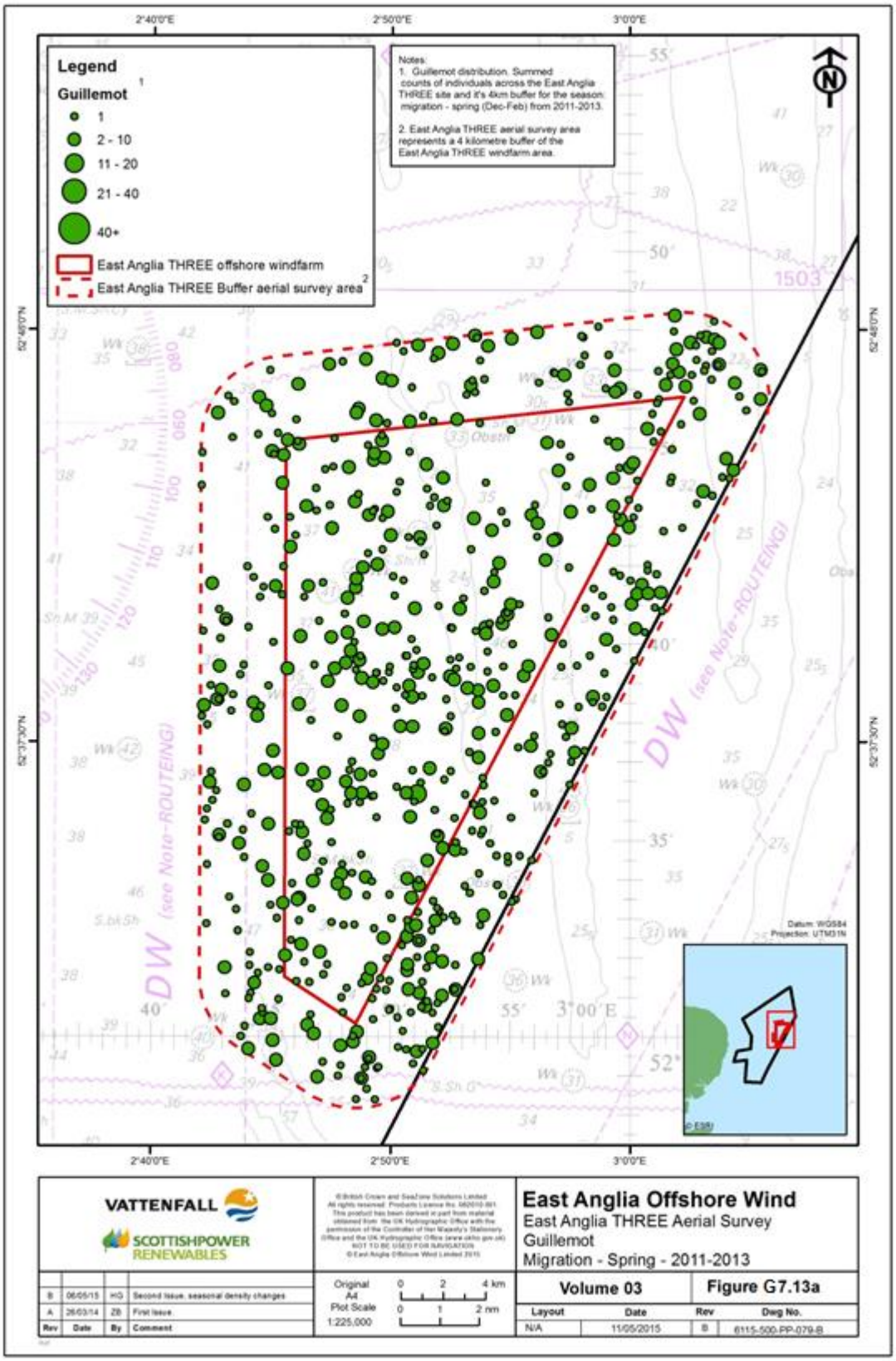

Legend
Great black-backed gull
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area
2
Notes:
1. Great black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (May-Jul) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Great black-backed gull
Migration-free Breeding - 2011-2013
Volume 03
Figure G7.11b
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-074-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

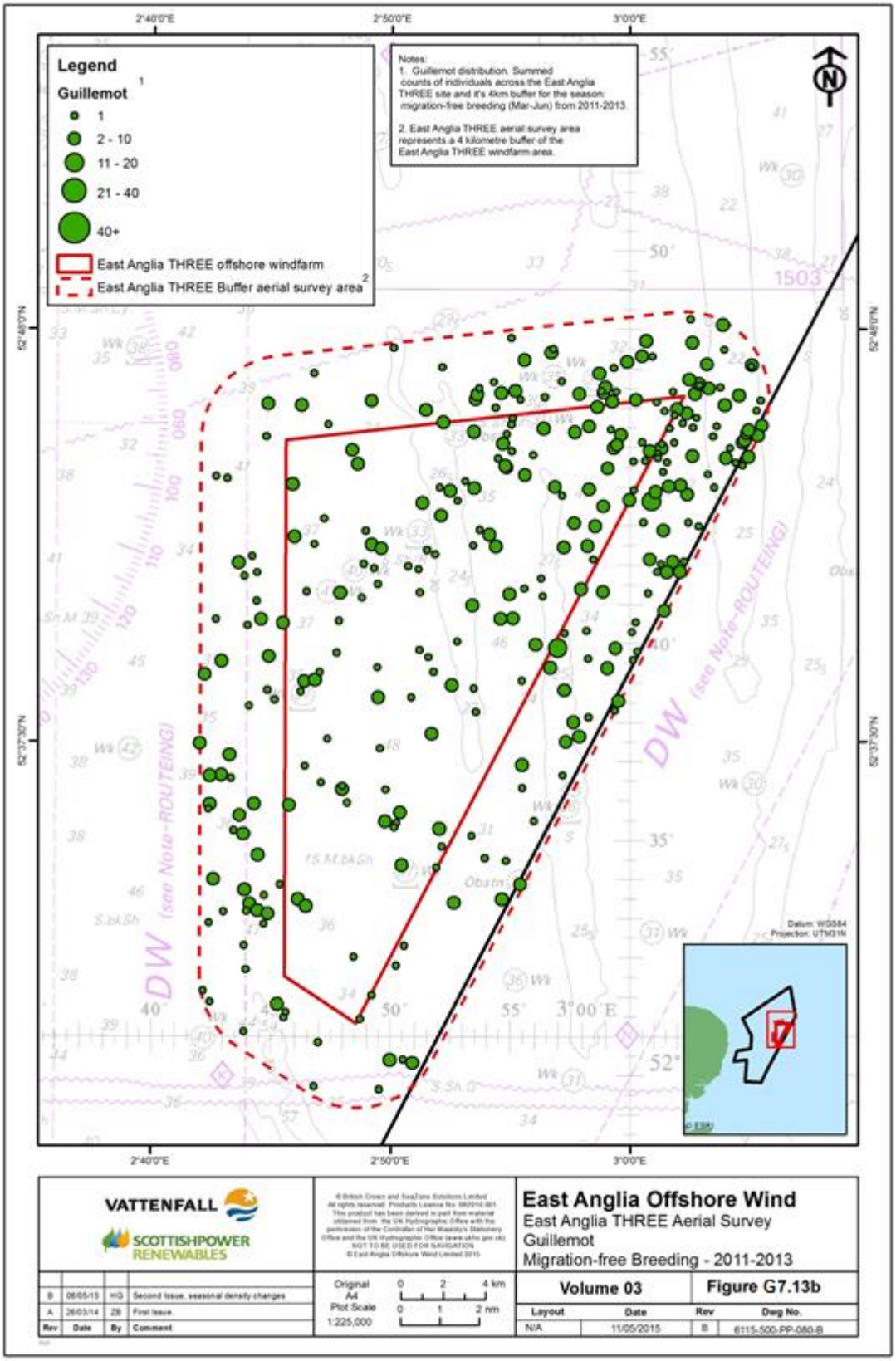

Legend
Great black-backed gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Great black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - autumn (Aug-Nov) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Obstn
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Great black-backed gull
Migration - Autumn - 2011-2013
Volume 03
Figure G7.11c
Layout
Date
Rev
Dwg No.
N/A
06/05/2015
B
6115-500-PP-075-B
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

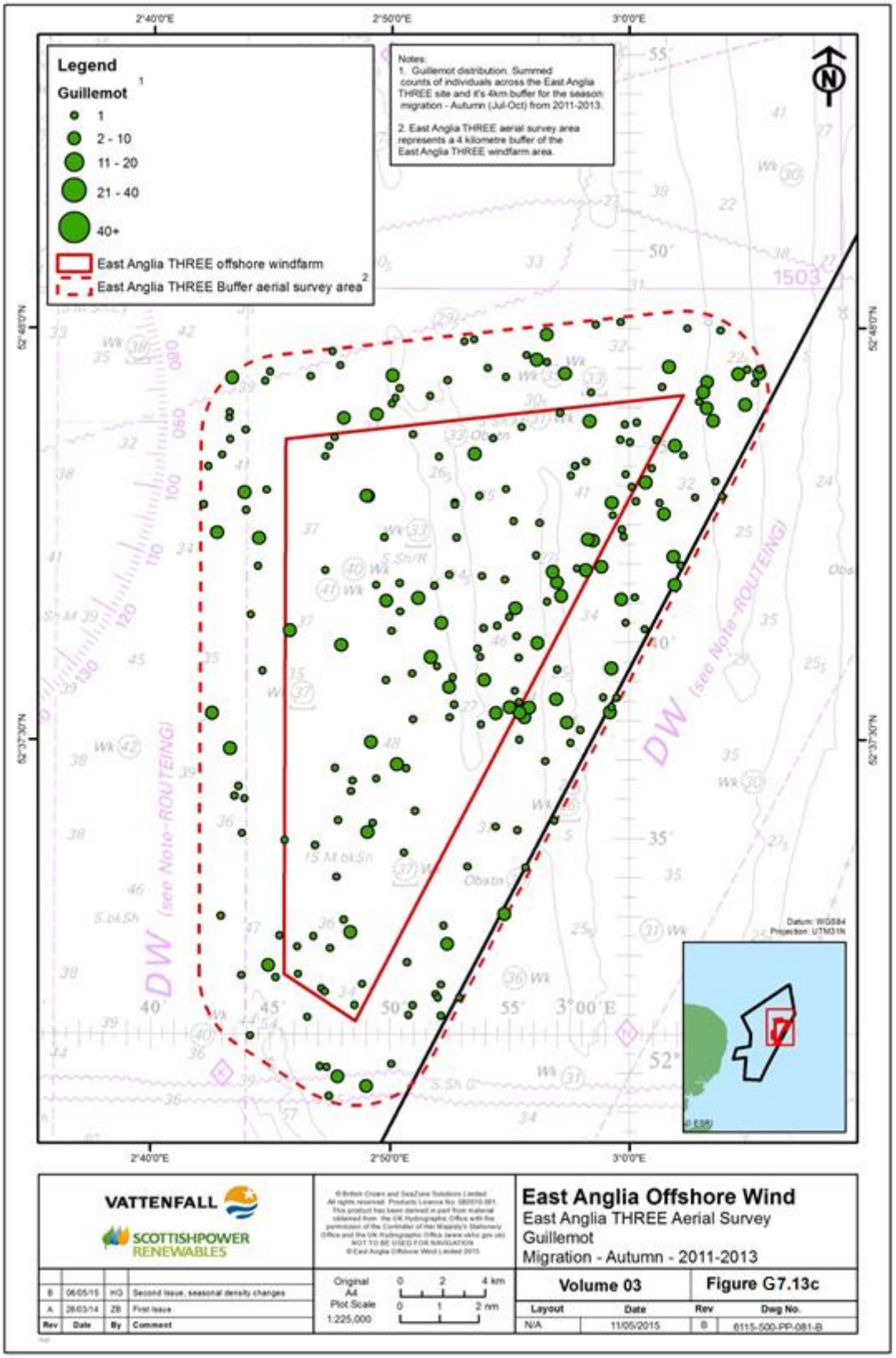

Legend
Great black-backed gull 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Great black-backed gull distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: winter (Dec) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Great black-backed gull
Winter - 2011-2013
Volume 03
Figure G 7.11d
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue.
Rev Date By Comment
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-076-B

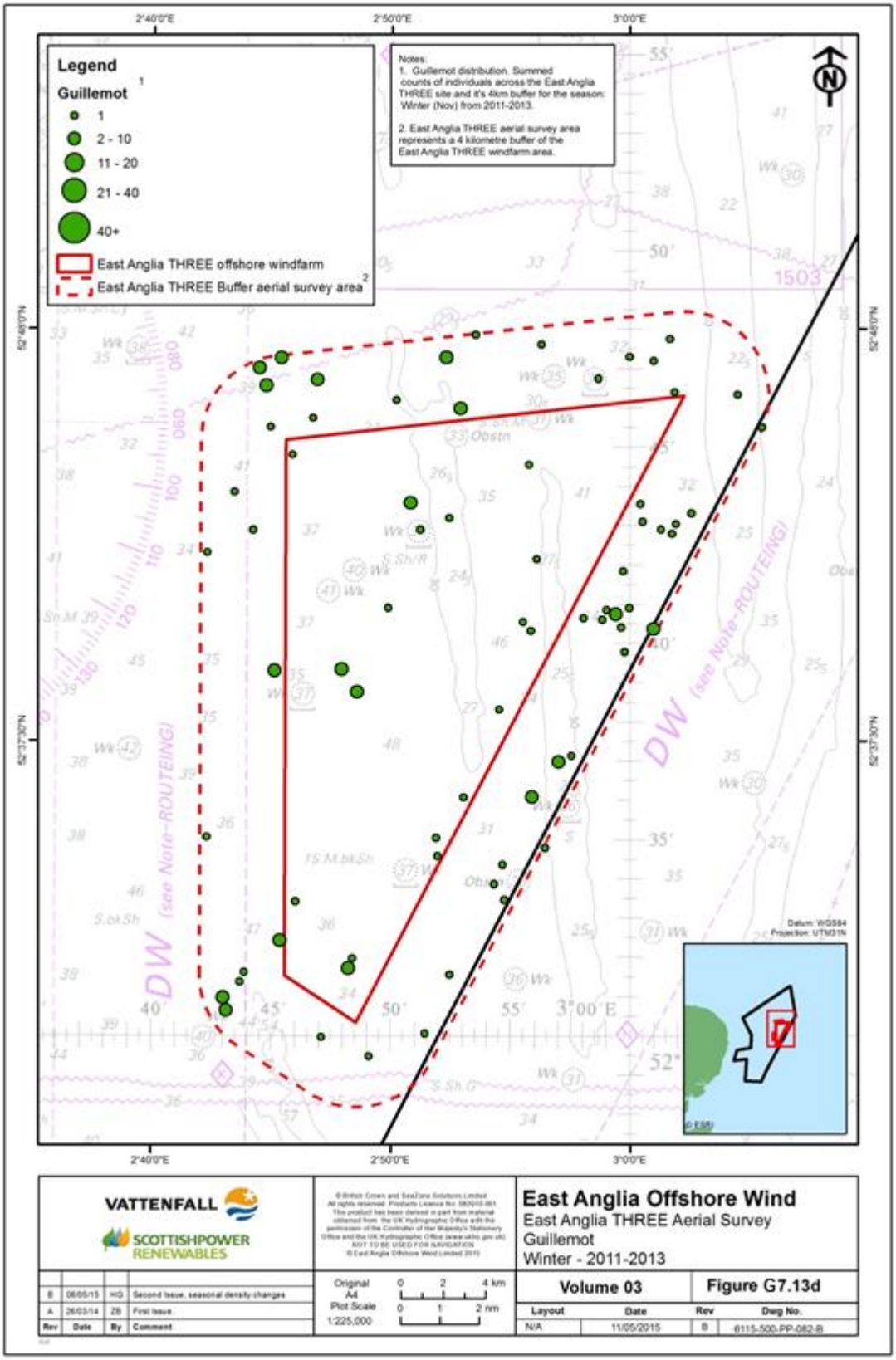

Legend
Commic Tern 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Commic tern distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - spring (Apr-May) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Commic tern
Migration - Spring - 2011-2013
Volume 03
Figure G7.12a
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-077-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment

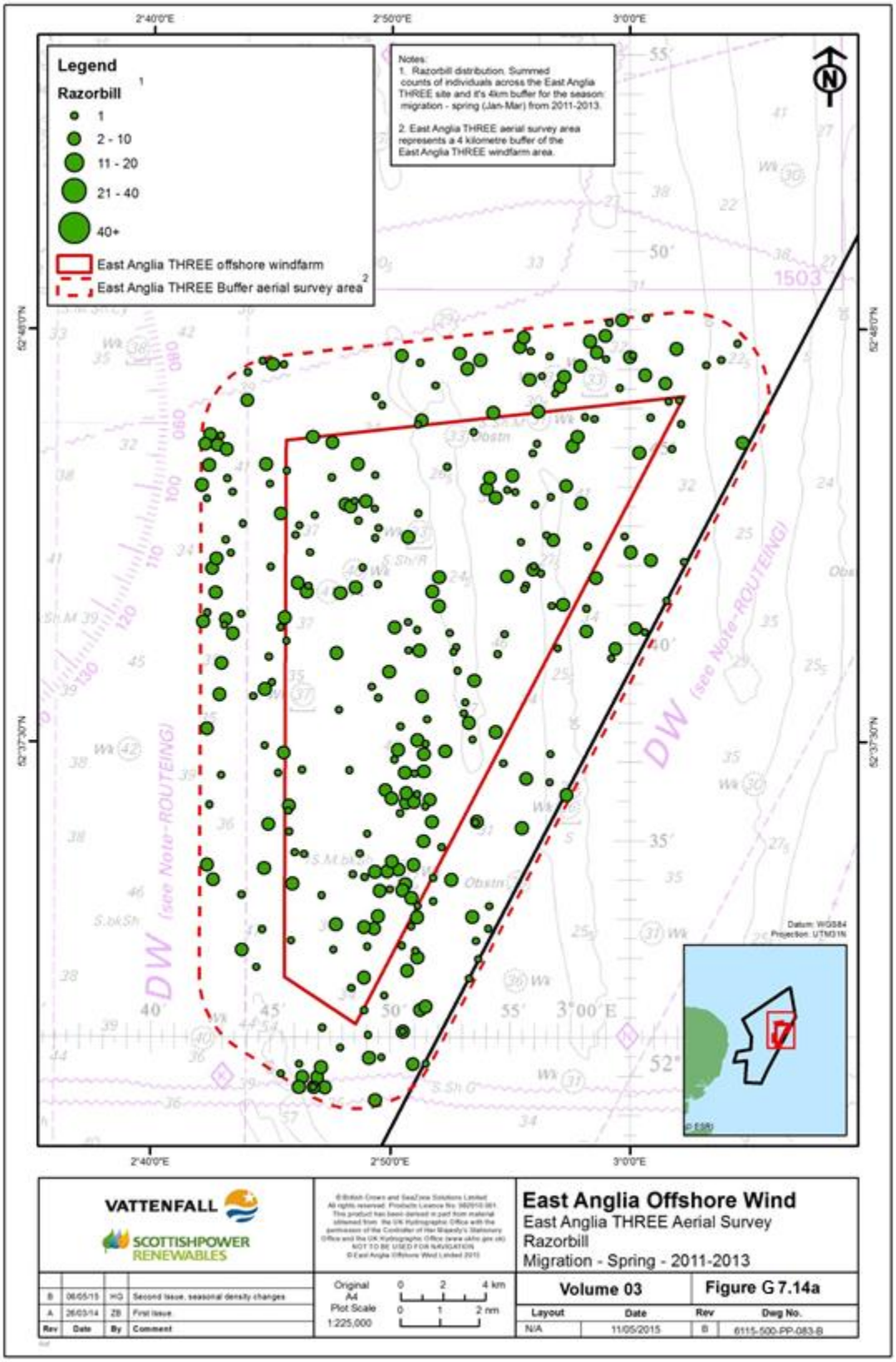

Legend
Commic Tern 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Commic tern distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - autumn (Jul-Sep) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Commic tern
Migration - Autumn - 2011-2013
Volume 03
Figure G7.12b
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment
Layout N/A
Date 06/05/2015
Rev B
Dwg No. 6115-500-PP-078-B


Legend
Guillemot 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Guillemot distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - spring (Dec-Feb) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Guillemot
Migration - Spring - 2011-2013
Volume 03
Figure G7.13a
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-FP-079-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment


Legend
Guillemot 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Guillemot distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (Mar-Jun) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°48'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Guillemot
Migration-free Breeding - 2011-2013
Volume 03
Figure G7.13b
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-080-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue.
Rev Date By Comment


Legend
Guillemot 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Guillemot distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - Autumn (Jul-Oct) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Guillemot
Migration - Autumn - 2011-2013
Volume 03
Figure G7.13c
Layout
Date
Rev
Dwg No.
N/A
11/05/2015
B
6115-500-PP-081-B
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment


Legend
Guillemot 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Guillemot distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: Winter (Nov) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°40'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Guillemot
Winter - 2011-2013
Volume 03
Figure G7.13d
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Rev Date By Comment
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-082-B


Legend
Razorbill 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Razorbill distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - spring (Jan-Mar) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°46'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Razorbill
Migration - Spring - 2011-2013
Volume 03
Figure G 7.14a
Original A4 Plot Scale 1:225,000
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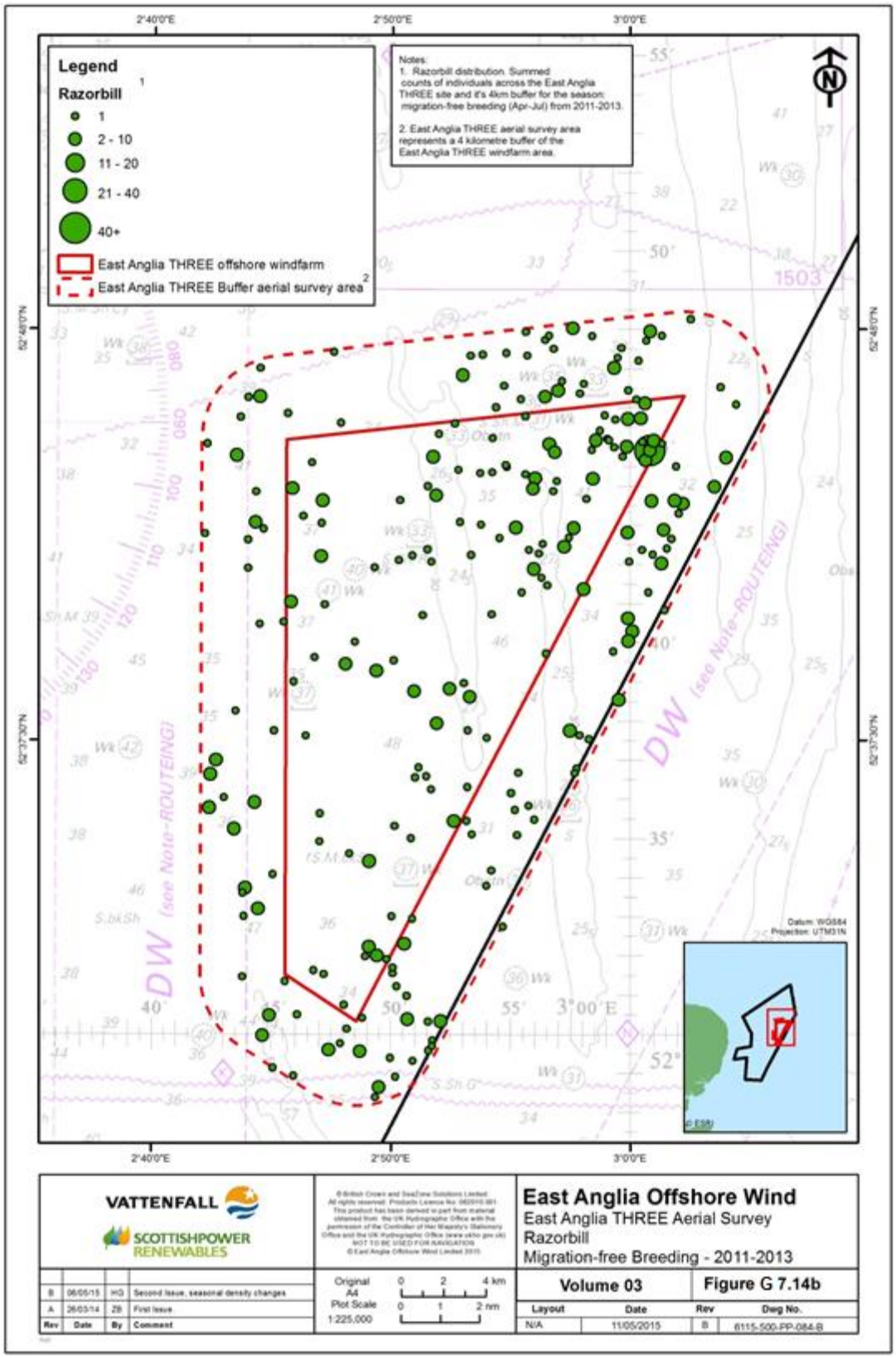
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-083-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment


Legend
Razorbill 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Razorbill distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (Apr-Jul) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
52°
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Razorbill
Migration-free Breeding - 2011-2013
Rev | Date | By | Comment
B | 06/05/15 | HG | Second issue, seasonal density changes
A | 26/03/14 | ZB | First issue
Original A4 Plot Scale 1:225,000
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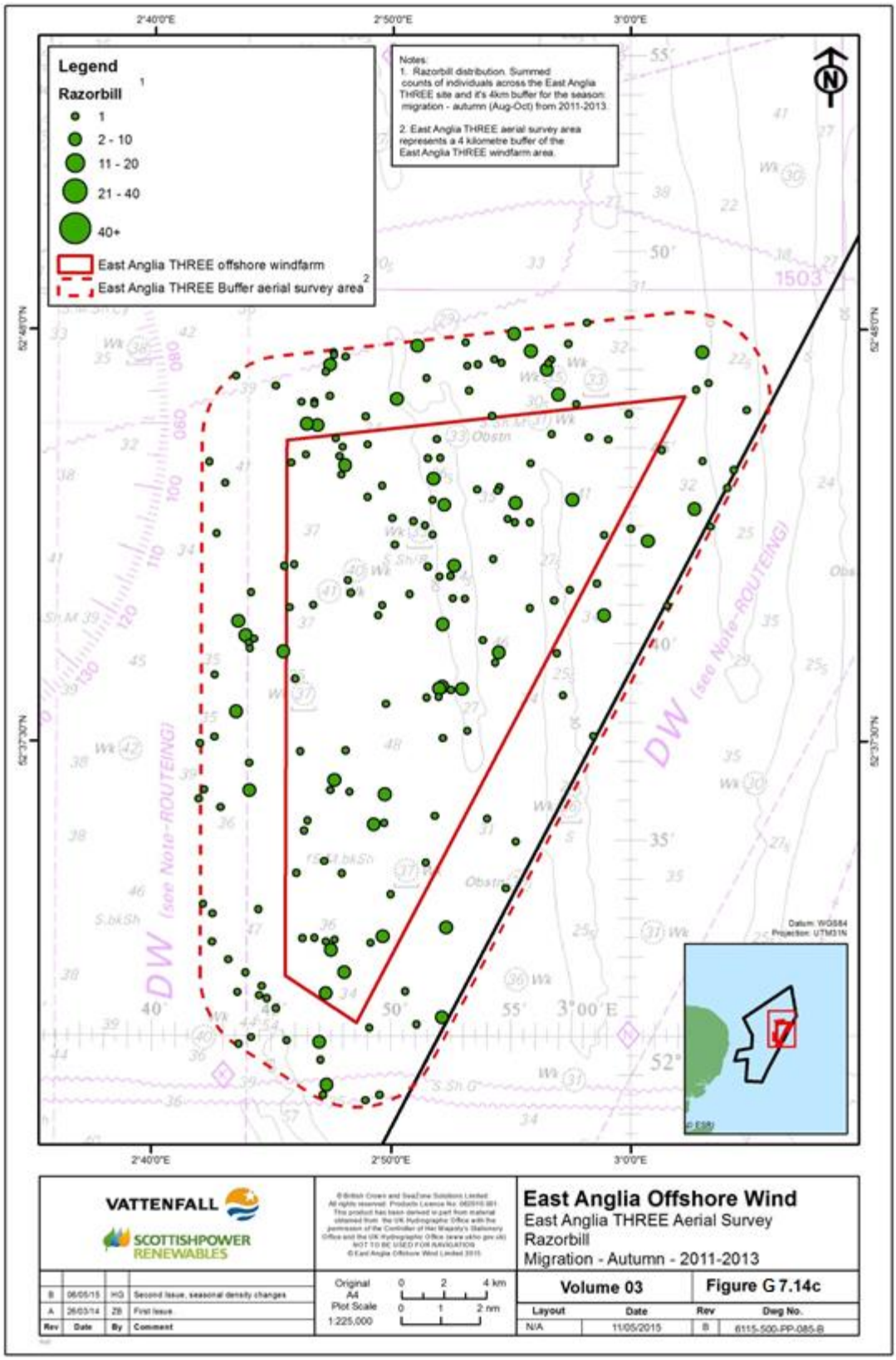
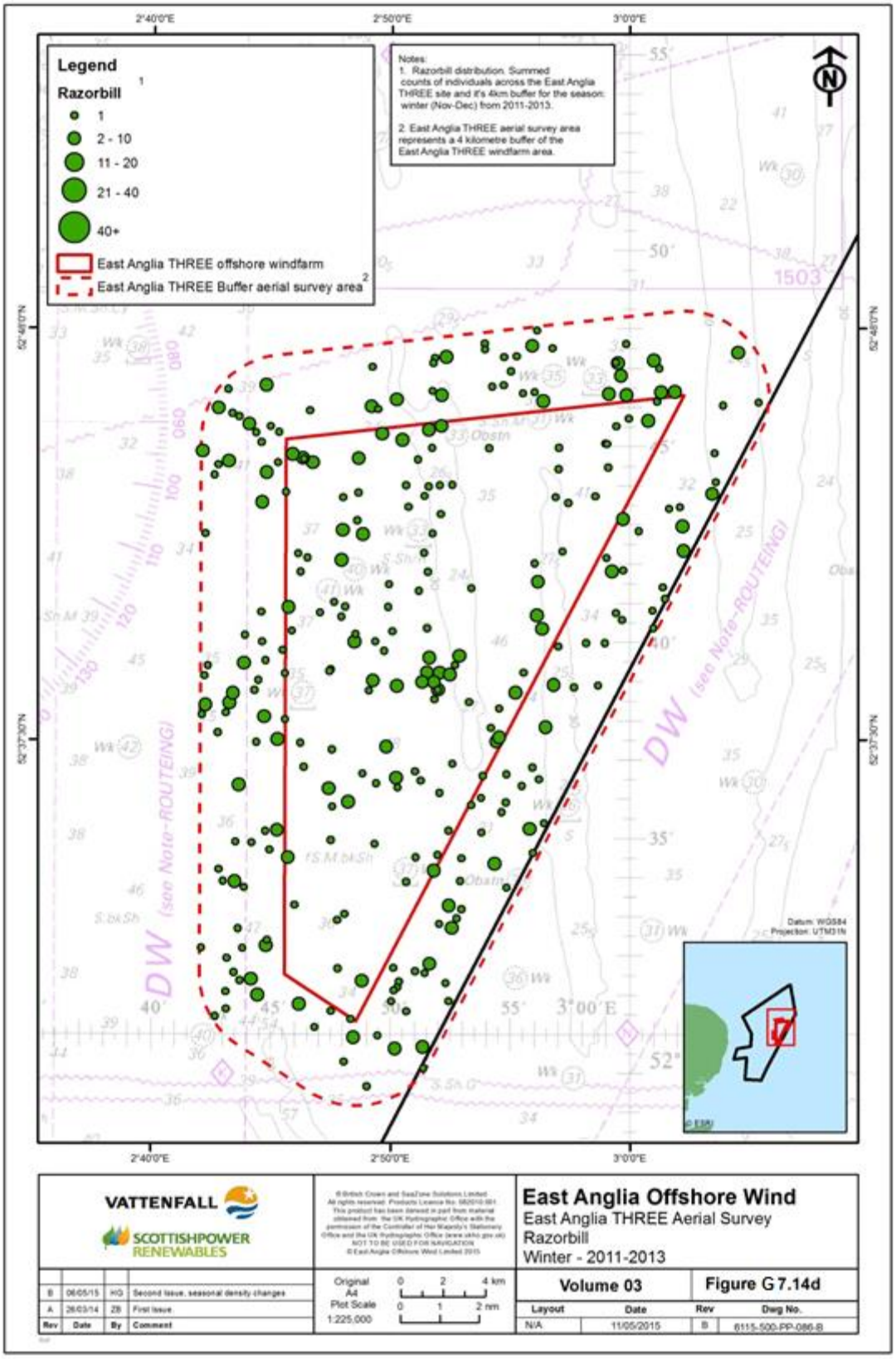
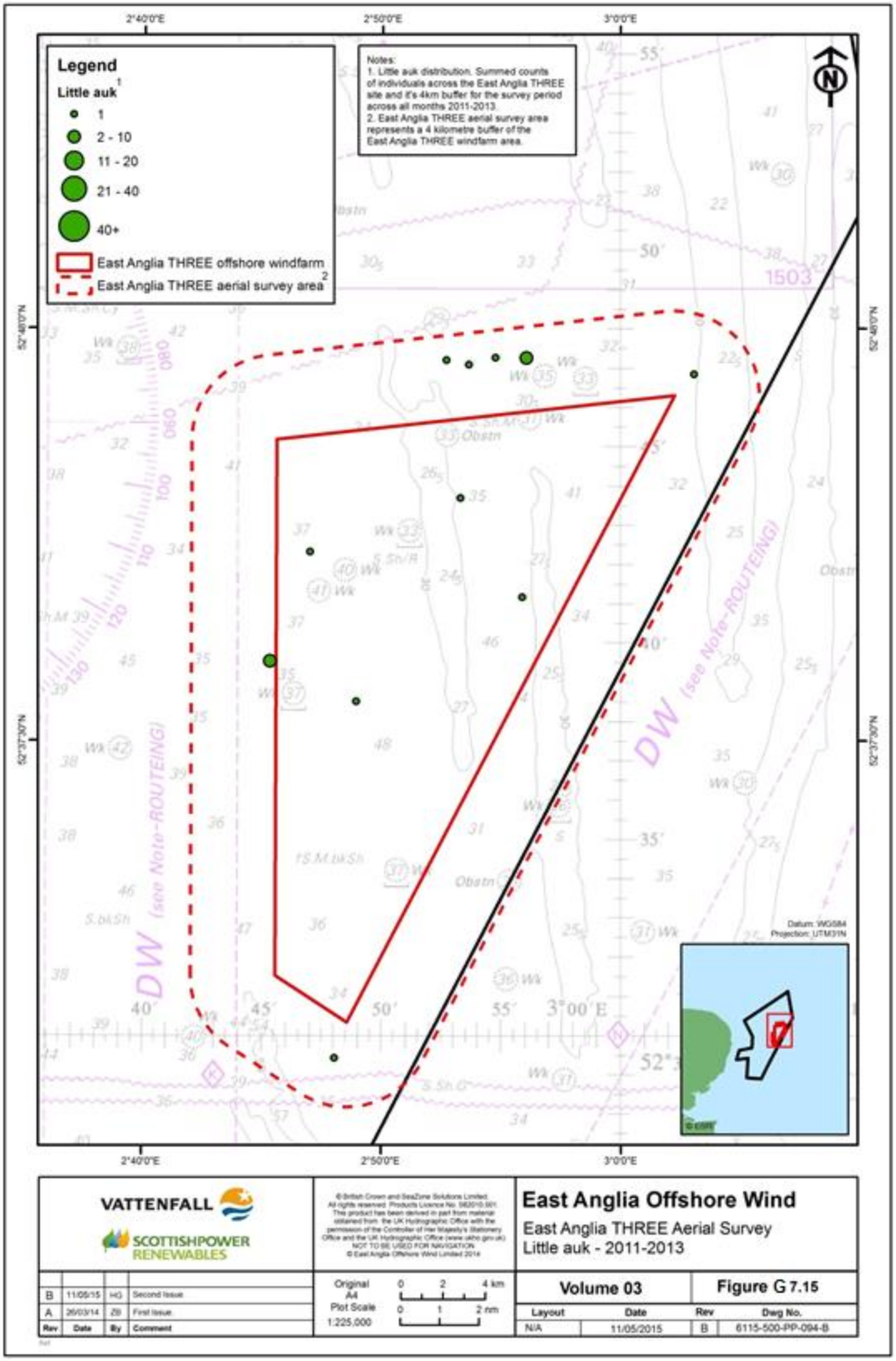
0 1 2 nm
Volume 03
Figure G 7.14b
Layout | Date | Rev | Dwg No.
N/A | 11/05/2015 | B | 6115-500-PP-084-B


Legend
Razorbill 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Razorbill distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - autumn (Aug-Oct) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Razorbill
Migration - Autumn - 2011-2013
Volume 03
Figure G 7.14c
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-085-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment


Legend
Razorbill 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Razorbill distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: winter (Nov-Dec) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°40'0"N
52°30'0"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Razorbill
Winter - 2011-2013
Volume 03
Figure G 7.14d
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-086-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment


Legend
Little auk 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE aerial survey area 2
Notes:
1. Little auk distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the survey period across all months 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°40'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Little auk - 2011-2013
Volume 03
Figure G 7.15
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-094-B
Original A4
Plot Scale 1:225,000
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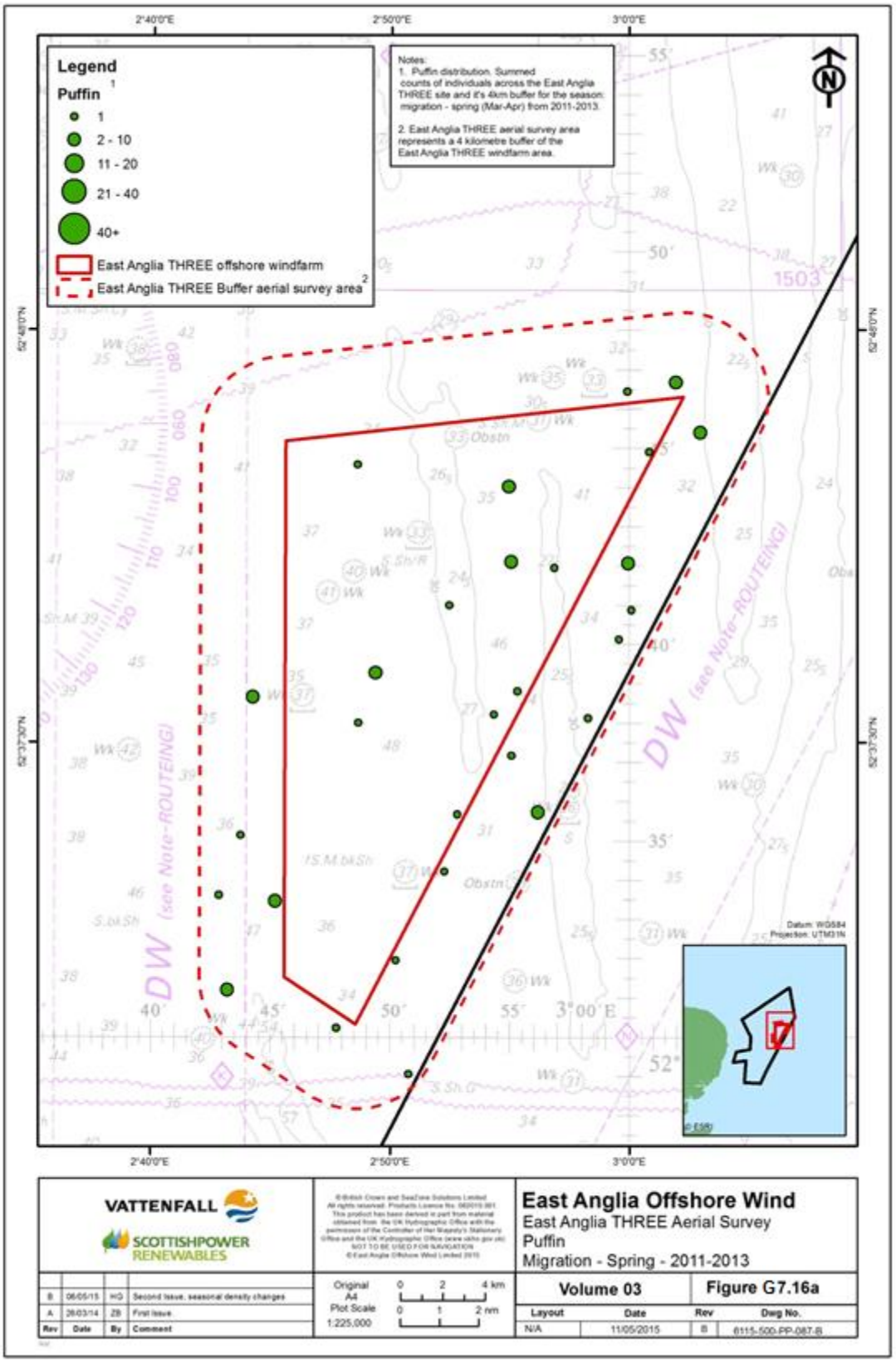
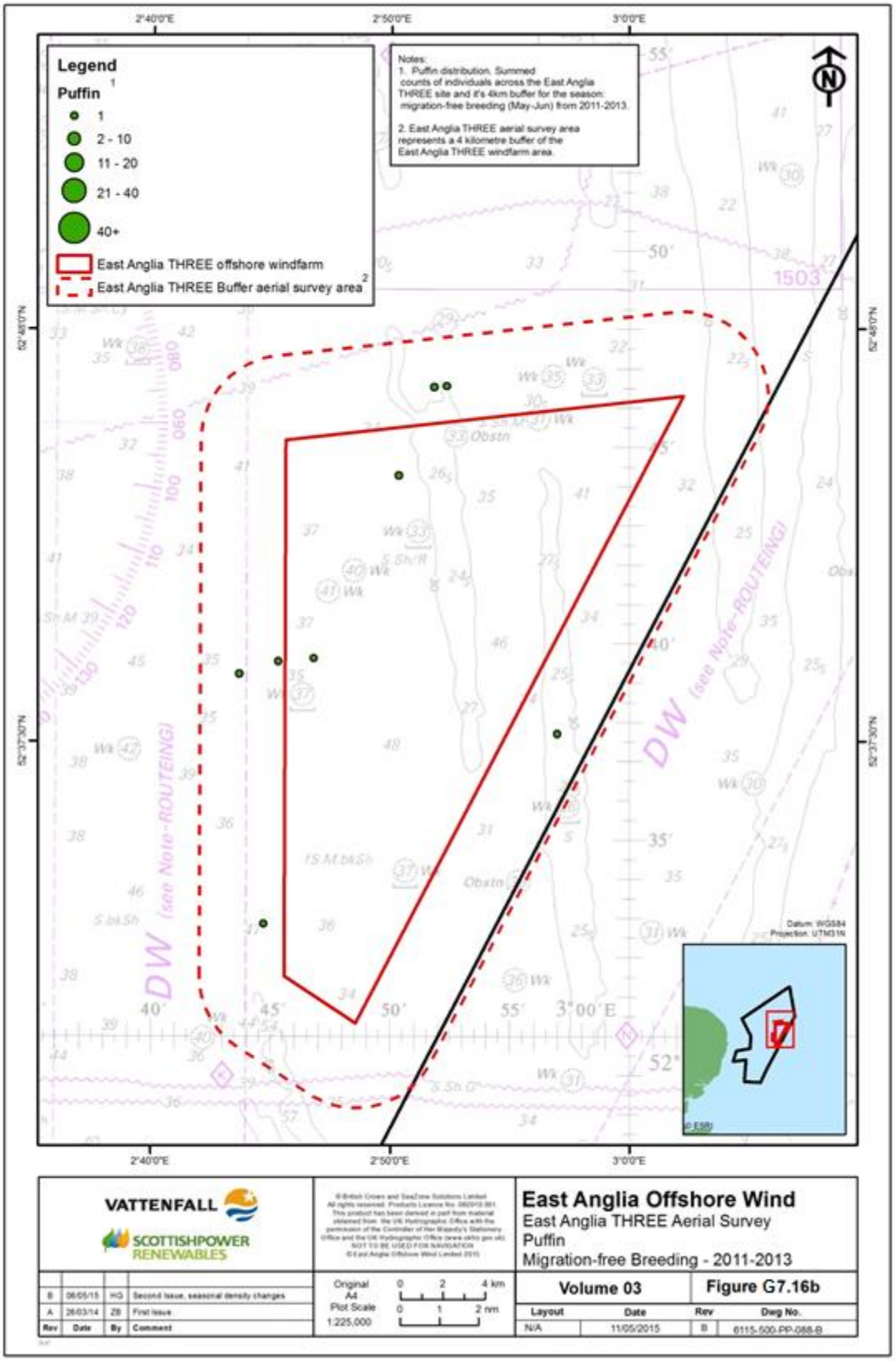
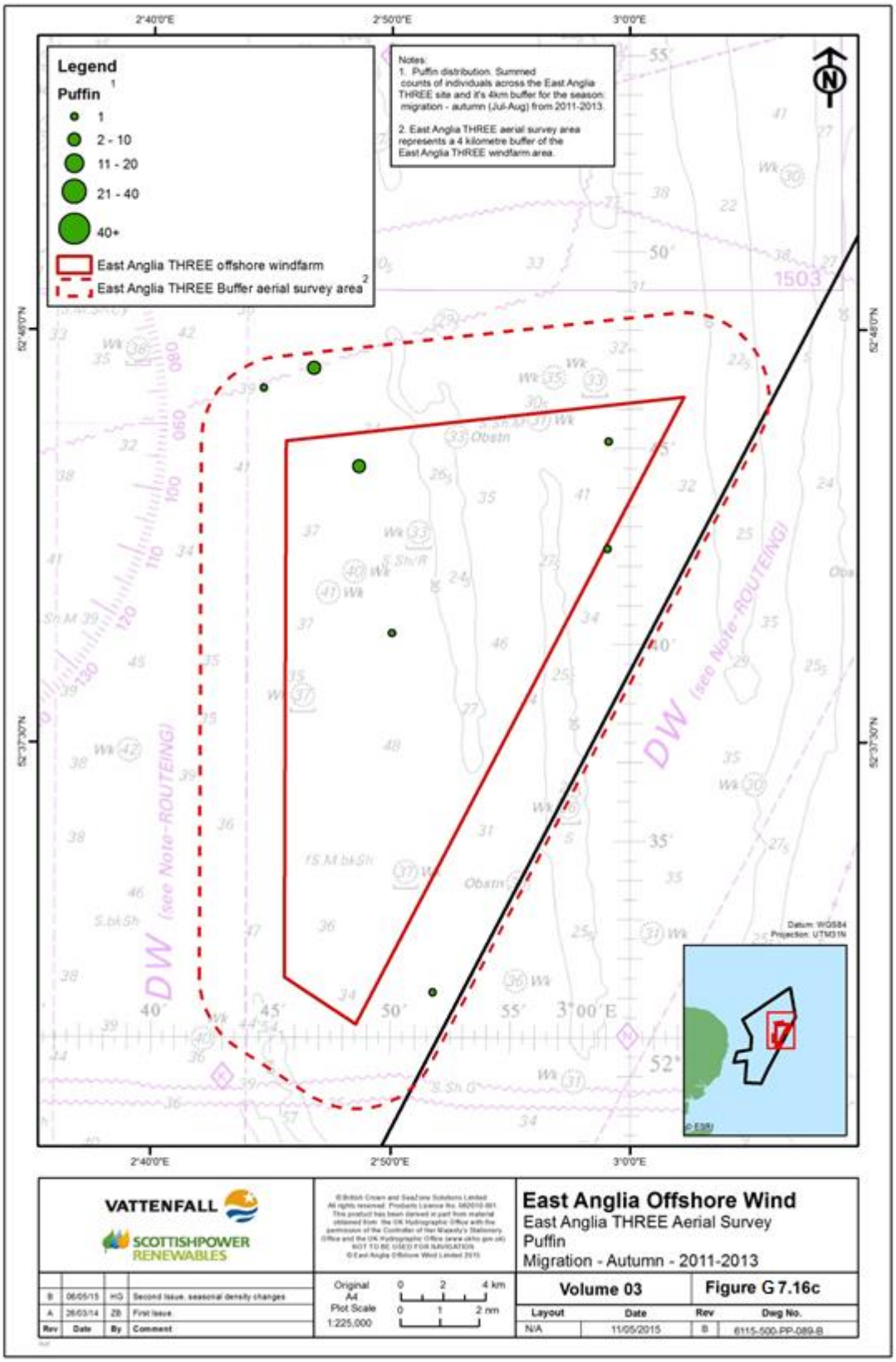
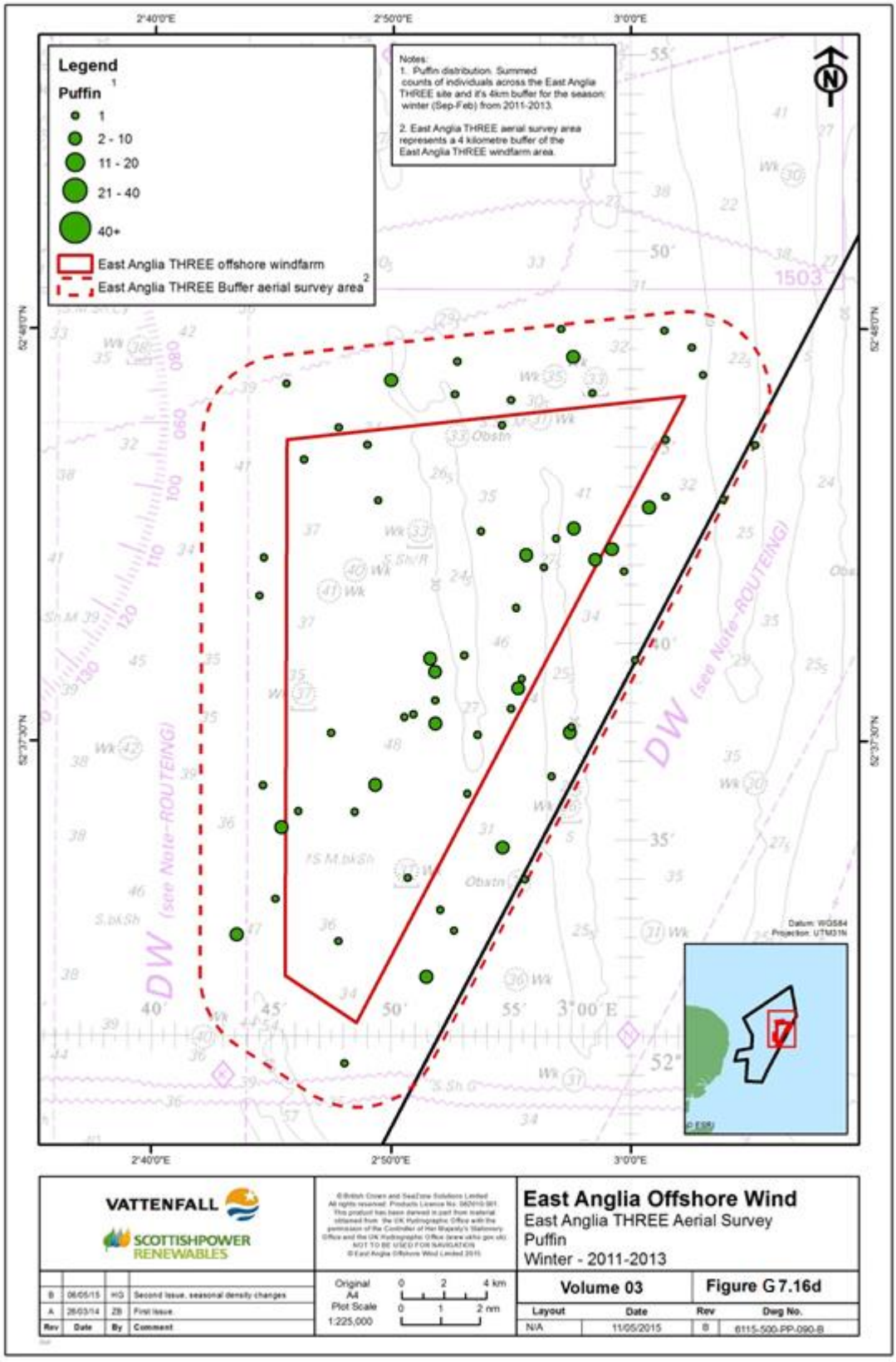
0 1 2 nm
B 11/05/15 HG Second Issue
A 26/03/14 ZB First Issue
Rev Date By Comment


Legend
Puffin 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Puffin distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - spring (Mar-Apr) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°46'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Puffin
Migration - Spring - 2011-2013
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Volume 03
Figure G7.16a
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-087-B


Legend
Puffin 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Puffin distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration-free breeding (May-Jun) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
3°00'E
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Puffin
Migration-free Breeding - 2011-2013
Volume 03
Figure G7.16b
Original A4
Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-088-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment


Legend
Puffin 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Puffin distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: migration - autumn (Jul-Aug) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°49'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Puffin
Migration - Autumn - 2011-2013
Volume 03
Figure G 7.16c
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-089-B
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment


Legend
Puffin 1
1
2 - 10
11 - 20
21 - 40
40+
East Anglia THREE offshore windfarm
East Anglia THREE Buffer aerial survey area 2
Notes:
1. Puffin distribution. Summed counts of individuals across the East Anglia THREE site and it's 4km buffer for the season: winter (Sep-Feb) from 2011-2013.
2. East Anglia THREE aerial survey area represents a 4 kilometre buffer of the East Anglia THREE windfarm area.
2°40'0"E
2°50'0"E
3°0'0"E
52°45'0"N
52°37'30"N
DW (see Note-ROUTEING)
Datum: WGS84
Projection: UTM31N
VATTENFALL
SCOTTISHPOWER RENEWABLES
East Anglia Offshore Wind
East Anglia THREE Aerial Survey
Puffin
Winter - 2011-2013
Volume 03
Figure G 7.16d
Original A4 Plot Scale 1:225,000
0 2 4 km
0 1 2 nm
B 06/05/15 HG Second issue, seasonal density changes
A 26/03/14 ZB First issue
Rev Date By Comment
Layout N/A
Date 11/05/2015
Rev B
Dwg No. 6115-500-PP-090-B

ANNEX H: MONTHLY AGE CLASS PROPORTIONS FOR GANNET, KITTIWAKE AND LARGE GULLS

Annex H provides information on the methodology APEM uses to age gannets, kittiwakes and large gulls from digital still imagery. The proportion of adult individuals per species per month is presented in Table H8.6.

High resolution digital aerial imagery is able to identify most birds to species level given a suitable resolution (expressed as Xcm ground sample distance). The only regular exception for surveys in the North Sea is differentiating between common and Arctic tern. High resolution digital aerial imagery is also able to differentiate between the different plumages shown by seabird species as they progress from immature to full adult plumage.

For each of these species example images have been provided taken from the surveys undertaken by APEM for the East Anglia THREE windfarm. It should be noted that the actual image quality is superior to these compressed and cropped examples included in this document.

Gannet

APEM can identify 100% of gannets encountered during our aerial digital surveys at both 2cm and 3cm GSD resolution.

Separation of adults from sub-adults, both in flight and sitting on the water surface, is relatively straightforward.

For gannets in flight APEM can identify all age groups, possibly with the exception of fifth year birds as seeing the blackish central tail feathers maybe difficult even with 2cm resolution. No fifth year gannets were recorded in the surveys of East Anglia THREE. Juvenile or first year (top left, Plate H8.1) can be separated from second year (top right, Plate H8.1) by the amount of white that is visible. The juvenile fully brown plumage (top left, Plate H8.1) can be compared in the example below to the second year bird (top right, Plate H8.1) which shows white head and white forewing patches. First year birds can show slightly more white around the neck and forewing than juveniles, but this can vary considerably in gannets. Adult gannets (bottom right, Plate H8.1) are obvious with yellow heads clearly visible. It is also possible to separate third year (bottom left, Plate H8.1) and fourth year gannet, based on the reduced amount of black in the upperparts of fourth year birds.

Plate H8.1. Flying gannets of different ages captured in digital still imagery (GSD 2cm)

Ageing gannets sitting on the water is slightly more difficult than in flight when birds have their wings outstretched. For swimming birds APEM can positively identify the following age groups: adults (top left, Plate H8.2), fourth years, third years, second years (top right, Plate H8.2), first years and juveniles. Separating third and fourth year is slightly less certain than the other age groups but varying amounts of black on the upperparts is used for separation. Any fifth year birds sitting on the water are likely to be grouped with adults as few black primaries and any black on the tail feathers is unlikely to be visible.

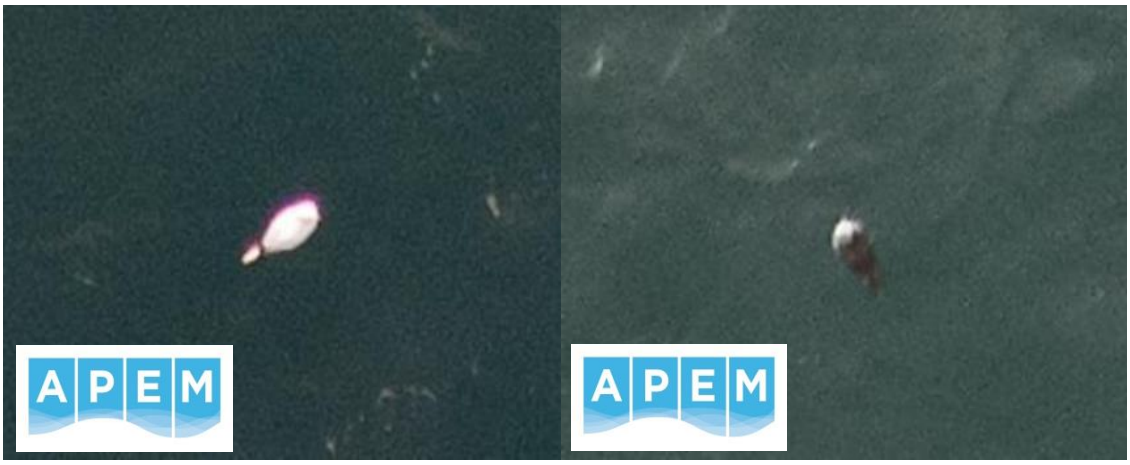


Plate H8.2. Sitting gannets of different ages captured in digital still imagery (GSD 2cm)

Age categories of gannets used in the data tables produced by APEM of its analysed high resolution aerial images are provided in Table H8.1.

Table H8.1. Gannet age class

Age of gannet	APEM age category – sitting and flying birds
Adult	Adult
Fifth year	
Fourth year	Fourth year
Third year	Third year
Second year	Second year
First year	First year
Juvenile	Juvenile

Kittiwake

Kittiwakes are the easiest small gull to identify in flight with very distinctive shape and wing tips.

In flight APEM can readily identify both adults (below left, Plate H8.3) and first years (below right, Plate H8.3) and with good image quality and higher resolution (i.e. 2cm GSD) separation between juveniles and first years is possible (the juvenile's black neck collar can be seen from above).

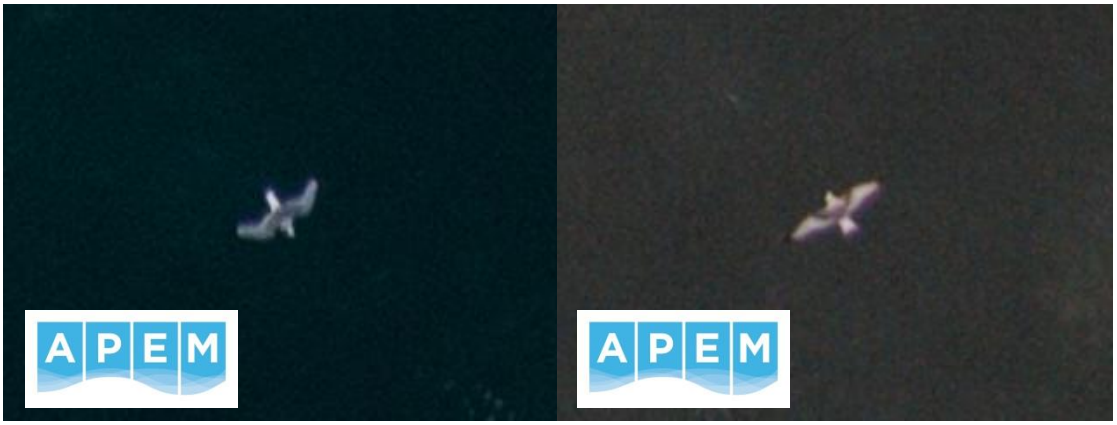


Plate H8.3. Flying kittiwakes of different ages captured in digital still imagery (GSD 2cm)

Sitting adults viewed from above (below left, Plate H8.4) are distinctive, showing a light grey back with white either side and usually the black wing tips are not visible. Separation of sitting adults from immature birds is difficult at any resolution, and only realistically possible with good quality 2cm GSD imagery. First years (below right, Plate H8.4) tend to show black around the back of the neck or darker looking upperparts, though these features are not always visible.

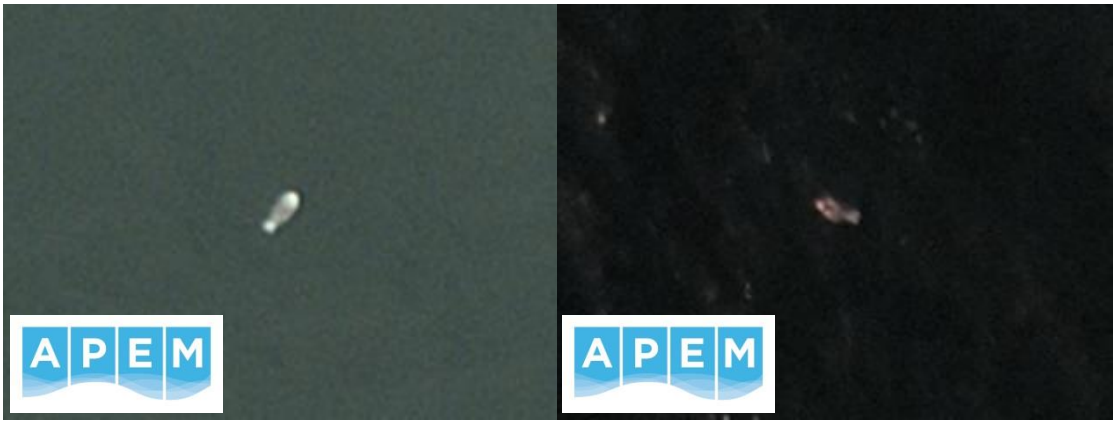


Plate H8.4. Sitting kittiwakes of different ages captured in digital still imagery (GSD 2cm)

Age categories of kittiwakes used in the data tables produced by APEM of its analysed high resolution aerial images are provided in Table H8.2.

Table H8.2. Kittiwake age class

Age of kittiwake	APEM age category – sitting birds	APEM age category – flying birds
Adult	Adult	Adult
Second year		Second year
First year	First year	First year
Juvenile	Juvenile	Juvenile

Lesser black-backed gull

As well as the visible plumage features, APEM's accurate in house measuring tool is one the best techniques to separate sitting and flying lesser black-backed gulls from the larger great black-backed gulls.

In flight, identification of all age groups is straightforward as seen in the example images below. The adult bird (below right, Plate H8.5) has grey uniform upperparts and black wing tips with white mirrors visible and the immature birds (first year, below left, Plate H8.5) have dark brown upperparts, white rump, black tail band and dark wing tips without mirrors. All age classes can be identified in flight.

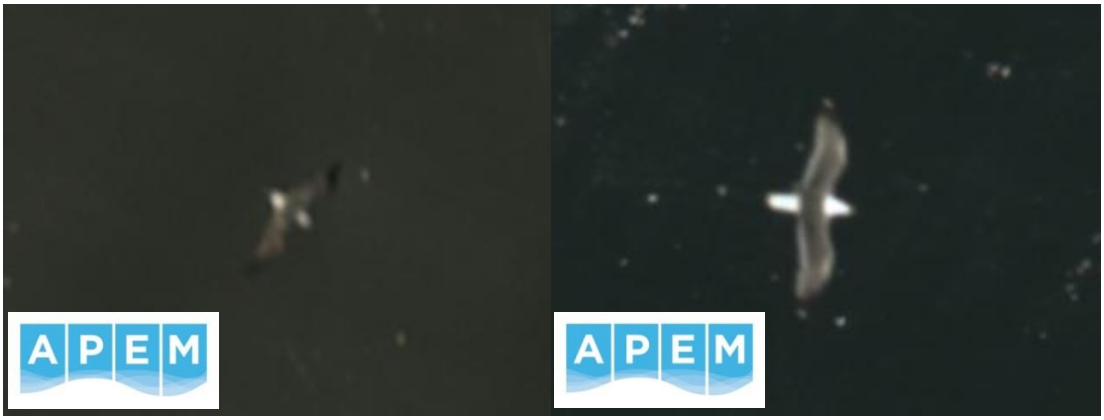


Plate H8.5. Flying lesser black-backed gulls of different ages captured in digital still imagery (GSD 2cm)

Sitting juvenile lesser black-backed gulls can often be difficult to separate from juvenile herring gulls but are usually darker in appearance. APEM can positively identify juveniles, first years, second years and adults but attempting to separate third years from adults can be difficult.

Age categories of lesser black-backed gulls used in the data tables produced by APEM of its analysed high resolution aerial images are provided in Table H8.3.

Table H8.3. Lesser black-backed gull age class

Age of lesser black-backed gull	APEM age category – sitting birds	APEM age category – flying birds
Adult	Adult	Adult
Third year		Third year
Second year	Second year	Second year
First year	First year	First year
Juvenile	Juvenile	Juvenile

Herring gull

For herring gulls in flight, APEM can identify all the age groups. Adults from above display broad uniform light grey wings (below right, Plate H8.6) and immature birds show larger black wing tips without white mirrors with varying amounts of brown juvenile plumage (below left, Plate H8.6).

Plate H8.6. Flying herring gulls of different ages captured in digital still imagery (GSD 2cm)

Like the other gulls, sitting birds offer greater identification challenges, though the adults grey upperparts are distinctive (below left, Plate H8.7). Sitting herring gulls consistently measure around 45cm body lengths, which is a valuable aid in separating juvenile birds from juvenile great black-backed gulls. APEM can readily identify juveniles (below right, Plate H8.7) which display a uniformly brown back and mottled brown head. The only potential pitfall is separating sitting third year birds from adults so these are likely to be recorded as adults.

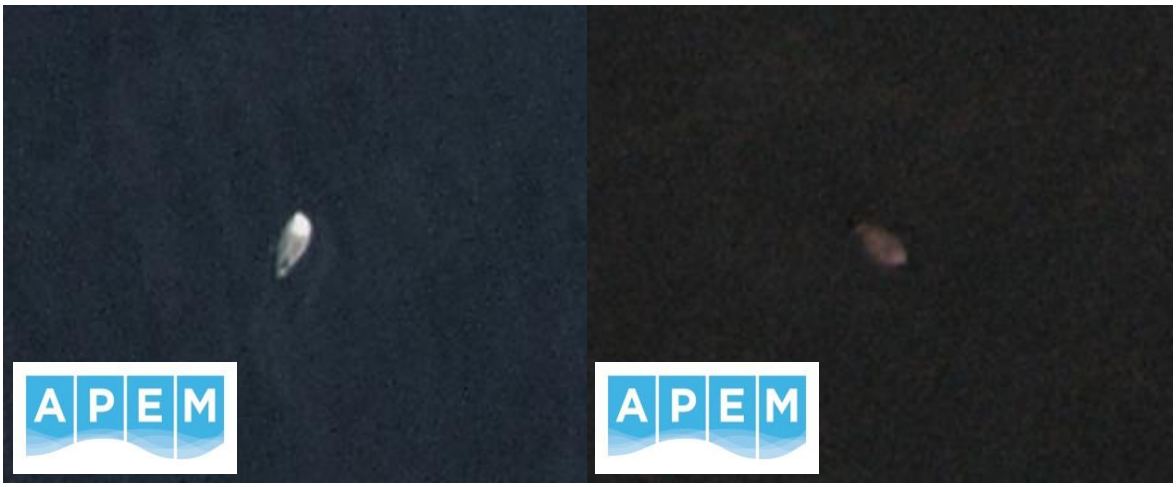


Plate H8.7. Sitting herring gulls of different ages captured in digital still imagery (GSD 2cm)

Age categories of herring gulls used in the data tables produced by APEM of its analysed high resolution aerial images are provided in Table H8.4.

Table H8.4. Herring gull age class

Age of herring gull	APEM age category – sitting birds	APEM age category – flying birds
Adult	Adult	Adult
Third year		Third year
Second year	Second year	Second year
First year	First year	First year
Juvenile	Juvenile	Juvenile

Great black-backed gull

The easiest large gull to identify and separated from lesser black-backed gull on size.

In flight the following ages can be readily identified: juvenile, first year, second year, third year and adults. The adults are very distinctive (below left, Plate H8.8), with black upperparts and small white mirrors. First and second year birds (below right, Plate 8.8) are easily classified by light brown upperparts becoming darker towards the wing tips, white head and pale tail with dark tail band.

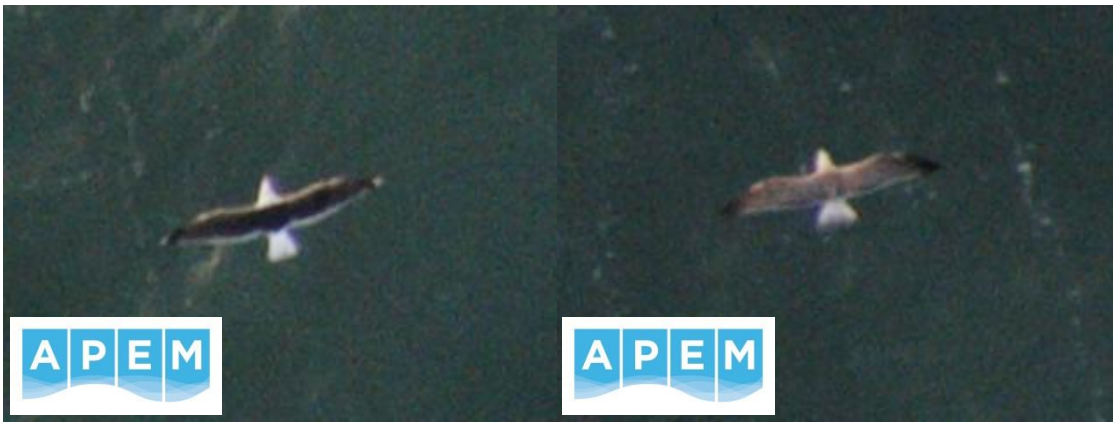


Plate H8.8. Flying great black-backed gulls of different ages captured in digital still imagery (GSD 2cm)

Sitting birds on the water tend to show varying amounts of brown from juveniles (bottom right, Plate H8.9) to the very dark black backed adults (below left, Plate H8.9). The only age that there may be difficulty in identifying is sitting third years as plumage-wise they will be very similar to adults.

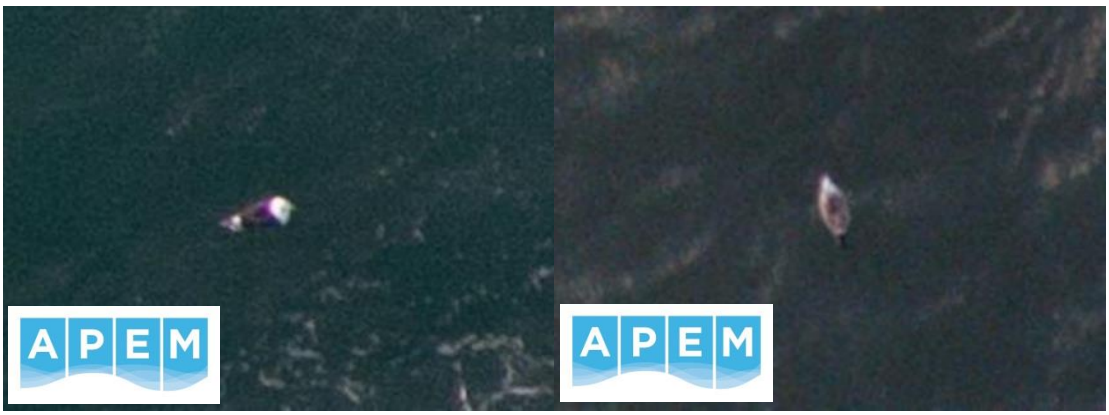


Plate H8.9. Sitting great black-backed gulls of different ages captured in digital still imagery (GSD 2cm)

Age categories of great black-backed gulls used in the data tables produced by APEM of its analysed high resolution aerial images are provided in Table H8.5.

Table H8.5. Great black-backed gull age class

Age of great black-backed gull	APEM age category – sitting birds	APEM age category – flying birds
Adult	Adult	Adult
Third year		Third year
Second year	Second year	Second year
First year	First year	First year
Juvenile	Juvenile	Juvenile

Table H8.6. The proportion (%) of adults recorded in the East Anglia THREE site plus 4km buffer per month for gannet, lesser black-backed gull, herring gull, great black-backed gull and kittiwake.

Month	Gannet			Lesser black-backed gull			Herring gull			Great black-backed gull			Kittiwake		
	Juvenile & Sub-adults	Adults	Proportion of adults (%)	Juvenile & Sub-adults	Adults	Proportion of adults (%)	Juvenile & Sub-adults	Adults	Proportion of adults (%)	Juvenile & Sub-adults	Adults	Proportion of adults (%)	Juvenile & Sub-adults	Adults	Proportion of adults (%)
January	0	14	100.00	2	10	83.33	1	52	98.11	16	111	87.40	9	181	95.26
February	0	3	100.00	2	1	33.33	0	18	100.00	7	56	88.88	7	121	94.53
March	0	4	100.00	0	2	100.00	1	6	85.71	0	1	100.00	1	27	96.42
April	0	61	100.00	2	11	84.61	1	8	88.88	1	9	90.00	6	46	88.46
May	0	1	100.00	0	21	100.00	0	3	100.00	0	9	100.00	8	25	75.75
June	2	9	81.81	1	12	92.30	0	2	100.00	0	0	0.00	2	45	95.74
July	1	1	50.00	0	8	100.00	0	2	100.00	2	3	60.00	0	0	0.00
August	3	5	62.50	0	31	100.00	0	49	100.00	0	35	100.00	0	17	100.00
September	16	27	62.79	2	14	87.50	0	11	100.00	1	6	85.71	0	10	100.00
October	2	16	88.88	1	9	90.00	0	12	100.00	0	9	100.00	0	14	100.00
November	1	156	99.36	1	7	87.50	1	14	93.33	3	31	91.17	26	97	78.86
December	0	86	100.00	2	16	88.88	10	123	92.48	19	97	83.62	38	517	93.15

Appendix 13.2 ends here