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East Anglia THREE

Appendix 12.2

Baseline Marine Mammal Technical Report

Environmental Statement
Volume 3
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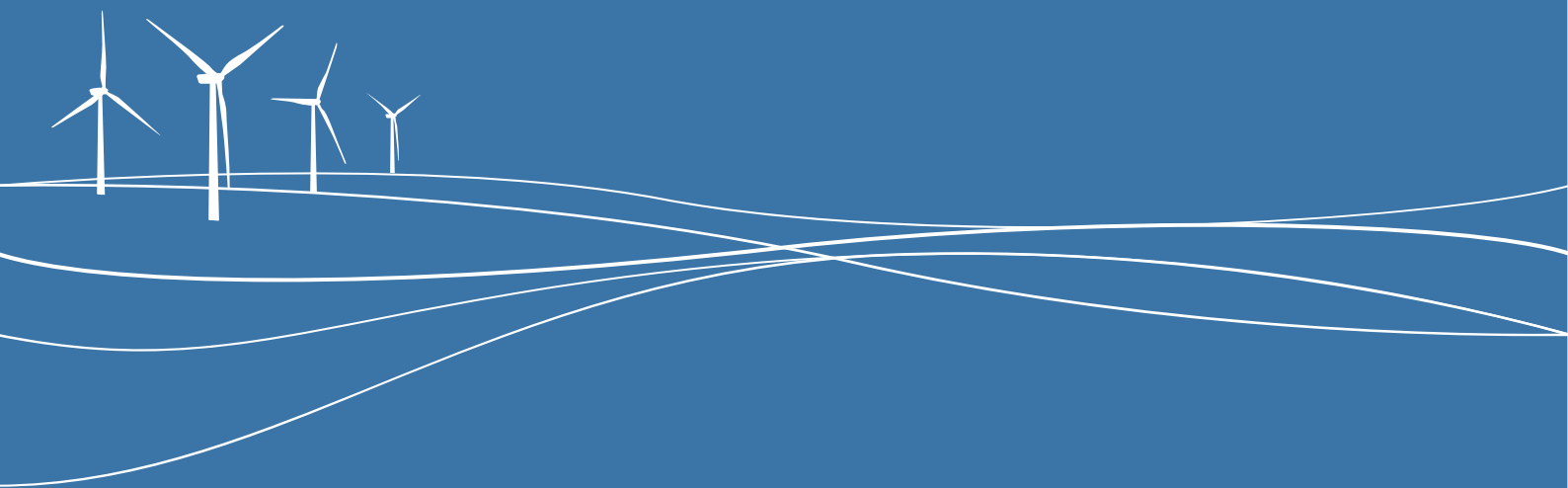

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12.2 BASELINE MARINE MAMMAL TECHNICAL REPORT

1. This appendix contains a report written by APEM Limited providing an account of the marine mammal surveys which were conducted for the East Anglia THREE site and surrounding area

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EAST ANGLIA THREE OFFSHORE WIND: BASELINE MARINE MAMMAL TECHNICAL REPORT

DATE: April 2015

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APEM REMOTE SENSING

East Anglia
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12.2 BASELINE MARINE MAMMAL TECHNICAL REPORT

12.2.1 Executive Summary

2. This report presents marine mammal sighting records within the East Anglia THREE site and buffer to provide baseline data for marine mammals potentially in the vicinity of the proposed windfarm. The East Anglia THREE site and a surrounding 4km buffer area were surveyed using aerial survey methods each month for a total of 24 consecutive months between September 2011 and August 2013 inclusive. The assessment was carried out using high resolution digital stills derived from aerial surveys conducted by APEM Ltd.

3. Abundance estimates, with confidence limits and precision (coefficient of variation) of the outputs were calculated for the East Anglia THREE site and the East Anglia THREE site plus buffer. Aerial survey imagery can capture marine mammals both at the surface and submerged individuals near the surface. Consequently, an initial estimate of abundance was calculated based on a count of all individuals recorded during the survey (i.e. both surfacing and submerged individuals). When data was available for specific species another estimate was derived by applying a correction factor for marine mammal availability (i.e. the probability of the animals being at the surface given that they are present in the water column). The correction factor was applied to surface sightings only to account for individuals that were likely to be below the surface and could not be detected in the imagery.

4. For 61% of the total marine mammal counts within the East Anglia THREE site, and 56% of the total counts when considering the East Anglia THREE site plus buffer, it was not possible to identify the marine mammals to species level. When just considering individuals at the surface it was not possible to identify the marine mammals to species level for 43% of the counts for the East Anglia THREE site and for 41% of the counts for the East Anglia THREE site plus buffer. In these cases different groupings were used based on the highest level of identification that could be obtained. For these groupings a correction factor could not be applied due to the uncertainty of the species present (correction factors are species-specific) and counts of individuals at the surface and those which were submerged but visible were used to derive abundance estimates.

5. Harbour porpoise was by far the most common species recorded within the East Anglia THREE site and East Anglia THREE site plus buffer. The density of harbour porpoise within the East Anglia THREE site was 0.10 individuals km^{-2} across the two survey years, and when corrected for availability this was 0.14 individuals km^{-2}. To account for all potential harbour porpoise sightings, however, a further grouping was

created which incorporated all individuals positively identified as harbour porpoise and any unidentified dolphin or porpoise. Under the assumption that any unidentified dolphin or porpoise were all harbour porpoise this grouping was considered to represent a more conservative abundance estimate (i.e. worst case scenario) for harbour porpoise. The density of individuals within the East Anglia THREE site for the combined unidentified dolphin or porpoise and harbour porpoise group was 0.24 individuals km^{-2} across the survey period, and when corrected for availability this was 0.22 individuals km^{-2}.

6. For the dolphins which could be identified to species level only, four white-beaked dolphin (all in the East Anglia THREE site) were recorded during the survey. No whales were recorded.

7. In addition, harbour and grey seals could not be identified to species level and were grouped as phocids and only two individuals were recorded across the survey period.

8. In summary, harbour porpoise were recorded in the largest numbers and the other marine mammal species which have the potential to occur in the East Anglia THREE site and the East Anglia THREE site plus buffer may be considered rare in comparison.

12.2.2 Introduction

12.2.2.1 Background

9. The proposed East Anglia THREE project would comprise offshore wind turbines, offshore converter station, inter-array cables and offshore and onshore export cables taking power to an onshore converter station. The East Anglia THREE site location within the East Anglia Zone is shown in *Figure 2.1*.

10. 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 mammals. EAOW Ltd 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 marine mammals. To facilitate this, surveys have been undertaken as outlined in the scoping report 'East Anglia THREE Offshore Windfarm Environmental Impact Assessment Scoping Report, Royal HaskoningDHV (RHDHV) November 2012' and further clarified during subsequent consultation.

12.2.2.2 Aims of the Report

11. The aim of this report is to inform the marine mammal EIA and Habitats Regulations Assessment (HRA).

12. It presents information on marine mammal abundance and distribution for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer during 24 months of surveillance (September 2011 to August 2013 inclusive).

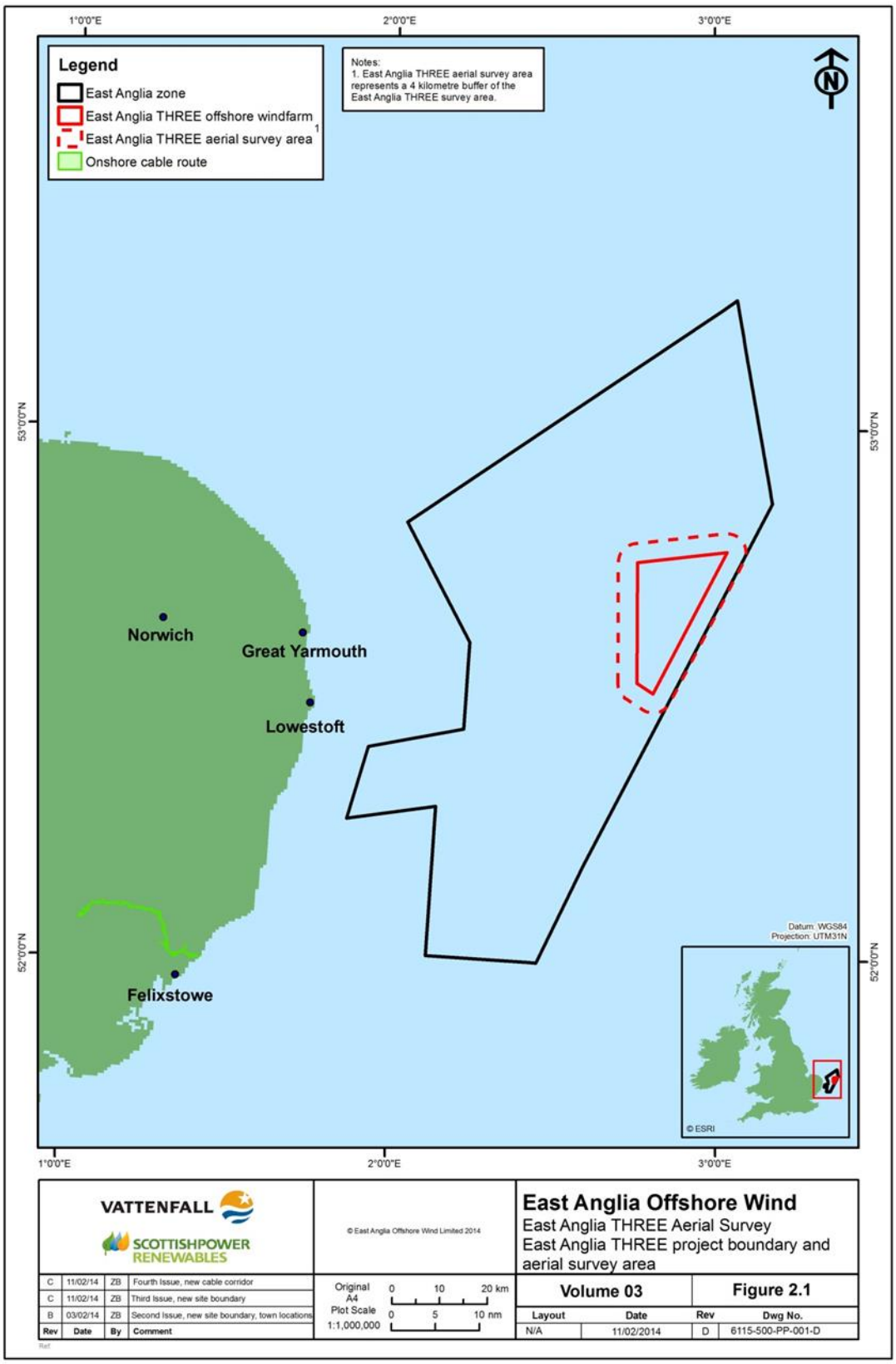

Figure 12.1 Location of the East Anglia THREE site within the East Anglia Zone.

12.2.3 Data Sources

12.2.3.1 Digital Aerial Survey Data

13. The survey area was the East Anglia THREE site and a 4km buffer around it.

14. To assess the temporal and spatial variation in marine mammal abundance and distribution within the survey area, data were collected from monthly aerial surveys across the windfarm site and its 4km buffer between September 2011 and August 2013 inclusive.

12.2.4 Survey and Analysis Methods

12.2.4.1 Approach to Surveys

15. Round Three offshore windfarm sites tend to be larger, further offshore and in deeper waters than those in earlier development rounds. Proposed projects such as East Anglia THREE are therefore situated in challenging environments, requiring a survey methodology that is flexible and reliable. High Resolution digital stills photography from an aerial survey platform provides an ideal option.

16. Through the Evidence Plan process and the Marine Mammal Expert Technical Group (MMETG) it was agreed with Natural England that sufficient data have been collected to inform the baseline (MMETG meeting of October 2013) and that the methods and duration of the baseline surveys were sufficient (MMETG meeting of November 2013). Further information on the meetings of the MMETG can be found in *Appendix 12.1* of the Environmental Statement.

17. 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 marine mammals, such as harbour porpoise *Phocoena phocoena*, that can influence the numbers recorded and affect their apparent distribution) or attraction (i.e. some marine mammal species, such as bottlenose dolphin *Tursiops truncatus* may be attracted to boats and ride the bow wave formed by the vessel). The aerial survey approach also provides very accurate positioning data, and can be interpreted to provide information on swimming direction and the distance between animals in a pod. 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 provide a permanent record for future interpretation.

18. A major advantage of collecting many digital still images is the resulting statistical power. Each image is a representative sample of marine mammal 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.

19. It is also necessary to understand certain restrictions and limitations associated with aerial survey for marine mammals. For example, it is often difficult to identify individuals to species level from the imagery and higher level groupings are frequently used for classification, which influences the information available for individual species that can be taken forward for further assessment (see *Section 4.3*). In addition, although submerged individuals near the surface can be observed, water clarity could introduce bias in the results with more individuals likely to be recorded during calm weather with greater water clarity than e.g. following a storm when water is potentially more turbid. In addition, marine mammals spend a large proportion of time underwater and individuals present which are too deep to be captured by the imagery will not be recorded, requiring the application of a correction factor as indicated in *Section 4.3*.

20. 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 abundance 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 unless the level of survey effort is increased.

12.2.4.2 High Resolution Digital Stills Methodology

21. APEM Ltd has undertaken monthly aerial surveys from September 2011 to August 2013 (inclusive) in order to collect data to inform EIA and Appropriate Assessment for East Anglia THREE. Dates of the surveys are provided in *Appendix 1*.

22. Aerial surveys have been undertaken using either Vulcanair 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.

23. Surveys of the East Anglia THREE site and its 4km buffer comprised of High Resolution still images taken on a fixed grid system over an area of 770km^2 with a resolution of 500m between nodes and a 2cm ground sampling distance to represent a high intensity sampling regime. All images captured within the grid were analysed.

In addition, information such as count (number of individual marine mammals), position (longitude and latitude of individuals), and date and time of image collection are recorded.

24. Survey data were analysed to show the distribution of marine mammal observations and density within the East Anglia THREE site and within the East Anglia THREE site plus its 4km buffer. This was conducted using dot density maps and did not include a Density Surface Model (DSM).

12.2.4.3 Data Analysis

25. For each monthly aerial survey of the East Anglia THREE site and its 4km buffer, georeferenced locations of marine mammals contained within each individual digital still image were used to generate raw counts. Marine mammal locations contained within the boundaries of the East Anglia THREE site and its 4km buffer were then extracted using ArcGIS, providing raw count data.

26. Raw counts were divided by the number of images taken to give mean number of marine mammals per image (*i*), and this was conducted separately for the East Anglia THREE site and the East Anglia THREE site plus buffer. Abundance estimates (*N*) for each survey month were then generated by multiplying the mean number of marine mammals per image by the total number of images required to cover the entire study area (*A*):

$$N = i\,A$$

27. 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 abundance estimate (Efron & Tibshirani 1993).

28. It should be noted that in some instances an image had sufficient clarity to identify an individual to species level, whereas for other individuals the clarity may not have been sufficient to identify to species levels and it was necessary instead to categorise the individual at a lower identification level e.g. unidentified patterned dolphin species (see *Table 12.2.1* for the different levels of identification of individuals).

29. Consequently, sightings were assigned to a specific species where possible, or to one of the following categories:

- Unidentified cetacean species;

- Phocid species (seals);
- Unidentified dolphin or porpoise;
- Unidentified dolphin; and
- Unidentified patterned dolphin.

30. For 61% of the marine mammal counts within the East Anglia THREE site, and 56% of the counts when considering the East Anglia THREE site and its 4km buffer, it was not possible to identify the marine mammals to species level when analysing aerial images. When just considering individuals at the surface it was not possible to identify the marine mammals to species level for 43% of the counts for the East Anglia THREE site and 41% of counts for the East Anglia THREE site plus buffer. Individuals which could not be identified to species level were identified to a group level instead (*Table 12.2.1*).

31. The analysed images were Quality Assured (QA) internally and 10% of images were re-analysed by a Quality Assurance Analyst to check they have been accurately processed. All identifications were then reviewed by the QA Analyst or Manager. Up to 100% of marine mammal images from each survey were sent for external QA to SMRU Marine Ltd. and identification data was updated as required.

32. Surveys to date suggest that harbour porpoise is the most abundant marine mammal within the East Anglia THREE site and East Anglia THREE site plus buffer. It is consequently assumed that a large number of the unidentified individuals are likely to be harbour porpoise and a worst case scenario (i.e. maximum density estimate) for harbour porpoise has therefore been obtained by adding the number of harbour porpoise recorded to the number of unidentified individuals.

33. Consequently, for harbour porpoise two estimates were obtained as follows:

- Count of individuals identified as harbour porpoise; and
- Count of individuals identified as harbour porpoise + the count of unidentified dolphin or porpoise species.

Table 12.2.1 Marine mammals identification levels according to species and species groups used within baseline report.

<table>
<tr><th>Identification level 1</th><th>Identification level 2</th><th>Identification level 3</th><th>Identification level 4</th><th>Identification level 5</th></tr>
<tr><td rowspan="7">Unidentified cetacean species</td><td rowspan="7">Unidentified dolphin / porpoise</td><td colspan="3">Harbour porpoise Phocoena phocoena</td></tr>
<tr><td rowspan="6">Unidentified dolphin species</td><td colspan="2">Risso’s dolphin Grampus griseus</td></tr>
<tr><td colspan="2">Bottlenose dolphin Tursiops truncatus</td></tr>
<tr><td rowspan="4">Unidentified patterned dolphin species</td><td>White-beaked dolphin Lagenorhynchus albirostris</td></tr>
<tr><td>Atlantic white-sided dolphin Lagenorhynchus acutus</td></tr>
<tr><td>Common dolphin Delphinus delphis</td></tr>
<tr><td>Striped dolphin Stenella coeruleoalba</td></tr>
<tr><td rowspan="2">Phocid species</td><td colspan="4">Grey seal Halichoerus grypus</td></tr>
<tr><td colspan="4">Harbour seal Phoca vitulina</td></tr>
</table>

34. To provide the best possible estimates of absolute density, count estimates for species were generated from the aerial imagery in the following two ways:

a. Counts were made of just the individuals that were surfacing and an availability correction factor was applied to account for individuals expected to be below the water surface. The availability correction factors applied were based on availability data provided in the latest Joint Cetacean Protocol Phase II report (Paxton et al. 2011) (*Table 12.2.2*).

b. Counts and abundance estimates were based on all individuals captured in images during the survey (i.e. both surfacing and submerged individuals). Due to the complexity and variation in factors such as turbidity, visibility and weather no correction factors are available for application to counts of individuals below the water surface, so with this approach no correction factors were used.

Table 12.2.2 Marine mammal correction factors

Species	Correction factor
Harbour porpoise	0.32
White-beaked dolphin	0.11

35. Correction factors are specific to individual species and cannot be applied to groups e.g. the 'Unidentified dolphin / porpoise' group on its own. It should be noted, however, that for the group 'Harbour porpoise and unidentified dolphin / porpoise species', as explained above, it is assumed that all individuals are harbour porpoise and as such a correction factor was applied to that group as a whole.

36. Measures of precision of the model estimates (i.e. how different sample counts are from one another) were calculated using a negative binomial estimator, suitable for a pseudo-Poisson overdispersed distribution (Elliott 1977). This produced a CV (coefficient of variation) which is a standardised measure of scatter based on the relationship of the standard error to the mean.

37. All analysis and data manipulation were conducted in the R programming language (R Development Core Team 2010) and non-parametric 95% confidence intervals were generated using the 'boot' library of functions (Canty & Ripley 2010).

12.2.4.3.1 Distribution

38. Data for each month for each grid section of the East Anglia THREE site and its 4km buffer were combined to provide a total distribution across the year for each species or group. Individual maps were then produced in ArcMap 9.2 to indicate the distribution of individuals for each survey year. Maps are only provided here for species / groups for which more than four individuals were recorded.

12.2.5 Marine Mammal Baseline

12.2.5.1 Introduction

39. Aspects of the construction and operation of windfarms, in particular generation of underwater noise can have potential impacts on marine mammals. Consequently, it is important for proposed developments in the area to consider marine mammal abundance and distribution throughout the year.

12.2.5.2 Marine Mammal Species and Group Accounts

40. Species accounts are provided for harbour porpoise and white-beaked dolphin as these were the only species that could be positively identified from the aerial imagery, while group accounts are provided for unidentified dolphin or porpoise, unidentified dolphin or porpoise and harbour porpoise, unidentified patterned dolphin, unidentified dolphin and phocids.

41. Data are first presented for harbour porpoise as it was the most commonly encountered species, followed by unidentified dolphin or harbour porpoise, and then the combined information for harbour porpoise with unidentified dolphin or

harbour porpoise which represents a worst-case scenario for the numbers of harbour porpoise (based on an assumption that any unidentified dolphin / harbour porpoise were harbour porpoise). Data for the remaining groups are then provided in order of decreasing abundance.

42. Abundance estimates and densities for all marine mammal sightings above and below the surface are provided in *Appendix 3*.

43. Numbers of individuals identified on the surface and those identified while submerged are provided in graphical form in *Appendix 5* for harbour porpoise, and combined harbour porpoise with unidentified dolphin or porpoise.

12.2.5.2.1 Harbour Porpoise

12.2.5.2.1.1 Abundance estimates

Surface only (corrected sightings)

East Anglia THREE site

44. Peak numbers of individuals were recorded in October 2011 with an estimate of relative abundance of 453 individuals (CL 150-803). No individuals were recorded between November 2011 and August 2012, or June 2013 to August 2013 (*Figure 5.1*, *Table A2.1*). The mean abundance estimate across the survey period was 41 individuals.

East Anglia THREE site plus buffer

45. The peak estimate of relative abundance was in October 2011 with 1,503 individuals (CL 903-2,106), (*Figure 5.1, Table A2.1*). No individuals were recorded between January and May 2012 and July 2012 to August 2012. The mean abundance estimate across the survey period was 122 individuals.

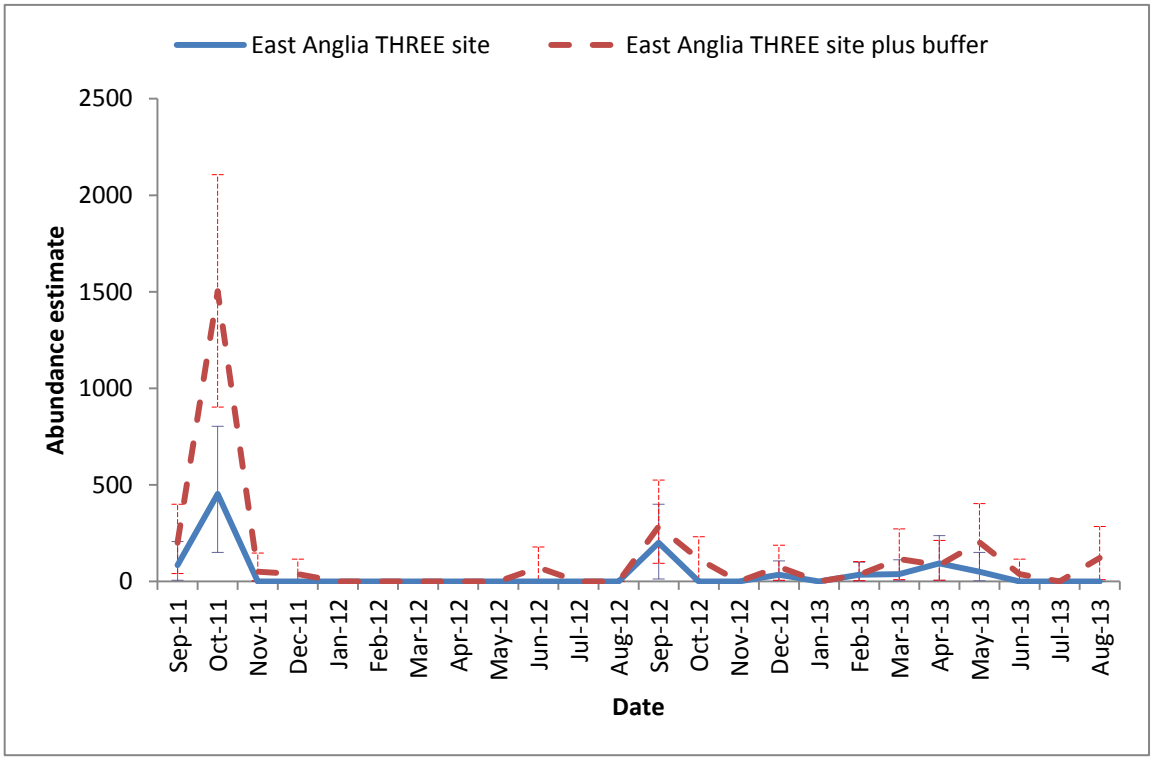

Figure 12.2 Harbour porpoise monthly abundance estimates using corrected surface counts with confidence limits for the East Anglia THREE site and East Anglia THREE site plus buffer.

12.2.5.2.1.2 Density estimates

Surface only (corrected, sightings)

East Anglia THREE site

46. Peak density was 1.49 individuals km^{-2} in October 2011, the lowest density when individuals were recorded was 0.113 individuals km^{-2} in December 2012 and February 2013 (*Figure 5.2, Table A2.1*). Mean density across the survey period was 0.14 individuals km^{-2} (*Table 12.2.3*).

East Anglia THREE site plus buffer

47. Peak density was 2.21 individuals km^{-2} in October 2011, the lowest density when individuals were recorded was 0.05 individuals km^{-2} in February 2013 (*Figure 5.2*). Mean estimated density was 0.18 individuals km^{-2} (*Table 12.2.3*).

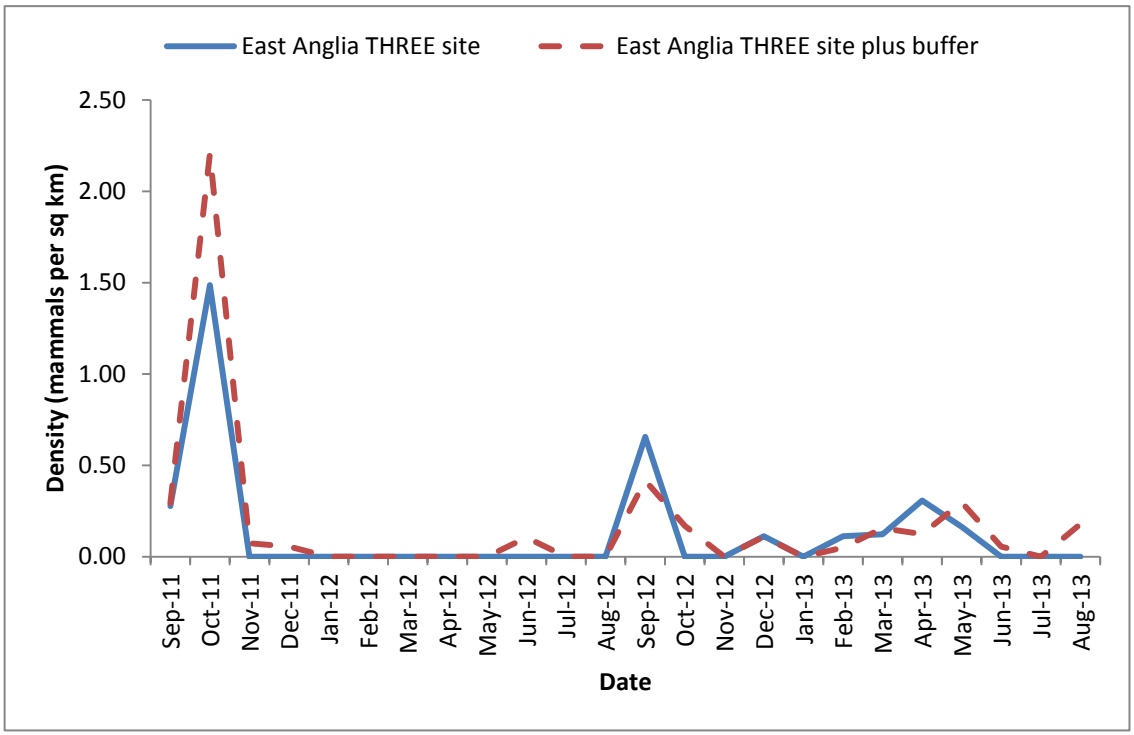

Figure 12.2 Harbour porpoise density estimates using corrected surface counts for the East Anglia THREE site and East Anglia THREE site plus buffer.

Table 12.2.3 Harbour porpoise mean densities across both survey years and for the total survey period. Densities are based on corrected counts (with the correction factor applied to counts of surfacing individuals only).

East Anglia THREE site		
	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.147	0.135
September 2012 to August 2013	0.123	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.228	0.179
September 2012 to August 2013	0.130	

All sightings (above and below surface)

48. These data are provided in *Appendices 3* and *4*.

12.2.5.2.1.3 Distribution

49. When all sightings were collated across both survey years 1 and 2 there was a relatively even spread of individuals across the survey area (East Anglia THREE site and buffer), usually with just one individual recorded at a given location across the year (*Figure A6.1* and *A6.2*).

12.2.5.2.1.4 Summary of harbour porpoise data

50. For nine of the months no individuals were recorded within the East Anglia THREE site but individuals were recorded in the East Anglia THREE site plus buffer (*Table A2.1*). Peak abundances were recorded in autumn (*Table A2.1*).

51. The highest density was in October 2011 for both the East Anglia THREE site and for the East Anglia THREE site plus buffer. For the East Anglia THREE site there were smaller peaks in density in September 2012 and April 2013, and for the East Anglia THREE site plus buffer three were smaller peaks in density in September 2012 and May 2013.

12.2.5.2.2 Unidentified dolphin or porpoise

52. This group was used to classify individuals which could not be identified to species level but based on the aerial image could be either a dolphin or porpoise. The dolphin and porpoise species which could be present in the area, and hence have the potential to be encompassed by this group, are indicated in *Table 12.2.1*.

12.2.5.2.2.1 Abundance estimates

East Anglia THREE site

53. The peak estimate of relative abundance was in January 2013 with 139 individuals (CL 63-239). No individuals were recorded in July 2012 or February2013 (*Figure 5.3, Table A2.2*). The mean abundance estimate across the survey period was 42.4 individuals.

East Anglia THREE site plus buffer

54. Abundance estimates when individuals were recorded ranged from 12 (CL 1-37) individuals in October 2012, to 242 (CL 127-382) individuals in April 2012. No individuals were recorded in July 2012. The mean abundance estimate across the survey period was 104.3 individuals (*Figure 5.3, Table A2.2*).

12.2.5.2.2.2 Density estimates

East Anglia THREE site

55. Peak density was 0.460 individuals km^{-2} in January 2013, and the lowest density when individuals were recorded was 0.04 individuals km^{-2} in June, October and December 2012 and July and August 2013 (*Figure 5.4, Table A2.2*). Mean density was 0.14 individuals km^{-2} (*Table 12.2.4*).

East Anglia THREE site plus buffer

56. Peak density was 0.360 individuals km^{-2} in April 2012, the lowest density when individuals were recorded was 0.02 individuals km^{-2} in October 2012 and August 2013 (*Figure 5.4, Table A2.2*). Mean density was 0.15 individuals km^{-2} (*Table 12.2.4*).

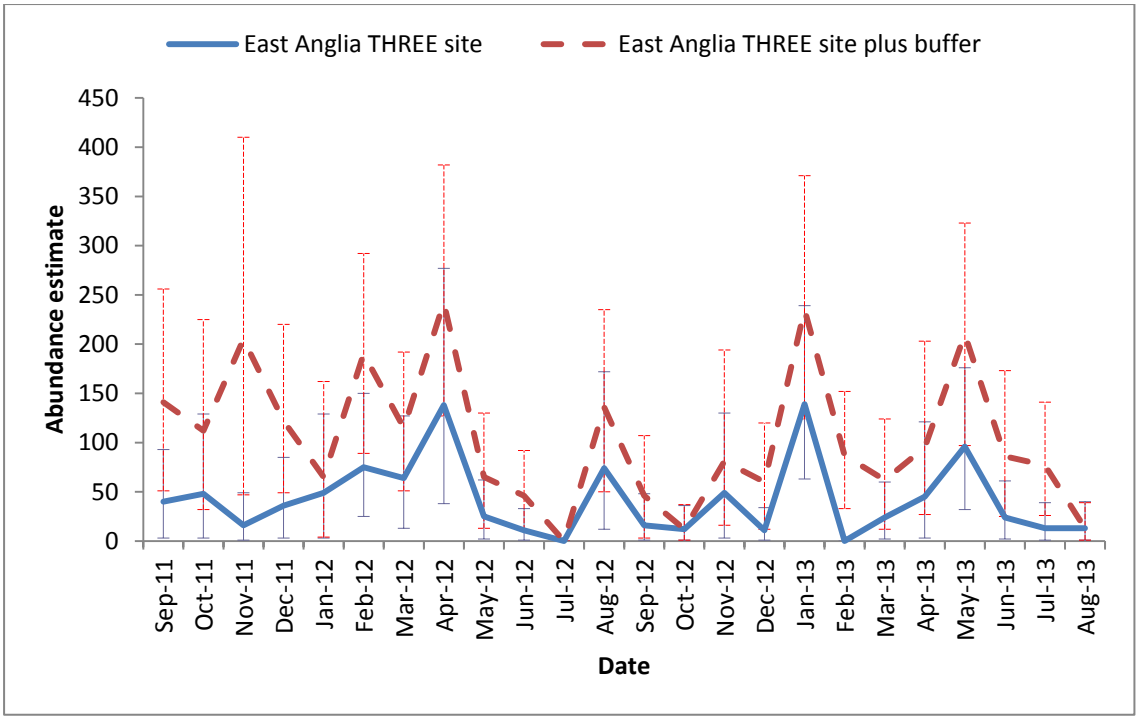

Figure 12.3 Unidentified dolphin or porpoise monthly abundance estimates with confidence limits for the East Anglia THREE site and East Anglia THREE site plus buffer.

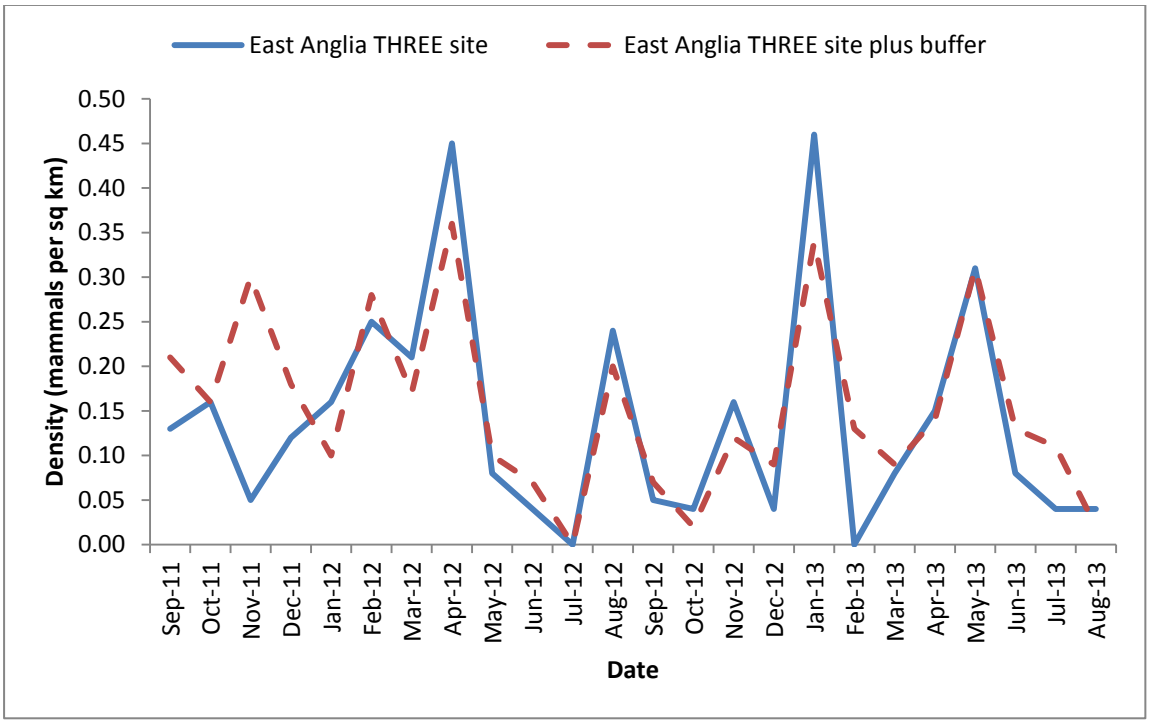

Figure 12.4 Unidentified dolphin or porpoise density estimates for the East Anglia THREE site and East Anglia THREE site plus buffer.

Table 12.2.4 Unidentified dolphin or porpoise mean densities across both survey years and for the total survey period.

East Anglia THREE site	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.158	0.139
September 2012 to August 2013	0.121	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.178	0.154
September 2012 to August 2013	0.131	

12.2.5.2.2.3 Distribution

57. The distribution of unidentified dolphin or porpoise across the survey area was relatively even during both survey years (*Figure A6.3 and A6.4*). During the first survey year, when a record was made for a given point on the survey grid it was usually based on the presence of one individual across the year, with a small number of points with two individuals recorded and just four points at which three or four

individuals were recorded. During the second survey year all records were based on the presence of one or two individuals only (*Figure A6.3 and A6.4*).

12.2.5.2.2.4 Summary of unidentified dolphin or porpoise data

58. At least one individual was recorded each month apart from July 2012 and February 2013 within the East Anglia THREE site, and for all months within the East Anglia THREE site plus buffer apart from July 2012. Peaks in abundance tended to occur throughout the year (*Figure 5.4, Table A2.2*).

59. Densities were very similar within the East Anglia THREE site and the East Anglia THREE site plus buffer.

12.2.5.2.3 Harbour porpoise and unidentified dolphin or porpoise

60. This group is a combination of the previous two categories (the counts for harbour porpoise which had been identified to the level of species and the counts for dolphin or porpoise where it was not possible to identify individuals to a higher level of resolution). The reason for grouping these together is that when combined, by assuming all individuals are harbour porpoise, the counts represent a worst case scenario for harbour porpoise densities which can be considered in future assessments.

61. As it is assumed that all individuals are porpoise when these two categories are combined, a harbour porpoise correction factor can be applied to surface only sightings across the whole group to generate a corrected abundance estimate.

12.2.5.2.3.1 Abundance estimates

Surface only (corrected sightings)

East Anglia THREE site

62. The peak estimate of relative abundance was 453 (CL 150-803) individuals in October 2011 (*Figure 5.5, Table A2.3*). No individuals were recorded at the water surface for nine of the months surveyed. The mean abundance estimate across the survey period was 68.9. individuals km^{-2}.

East Anglia THREE site plus buffer

63. Peak abundance estimate was in October 2011 with 1,553 (CL 953-2,206) individuals. There were just three months when no individuals were recorded and the mean abundance estimate was 200.3 individuals km^{-2} (*Figure 5.5, Table A2.3*).

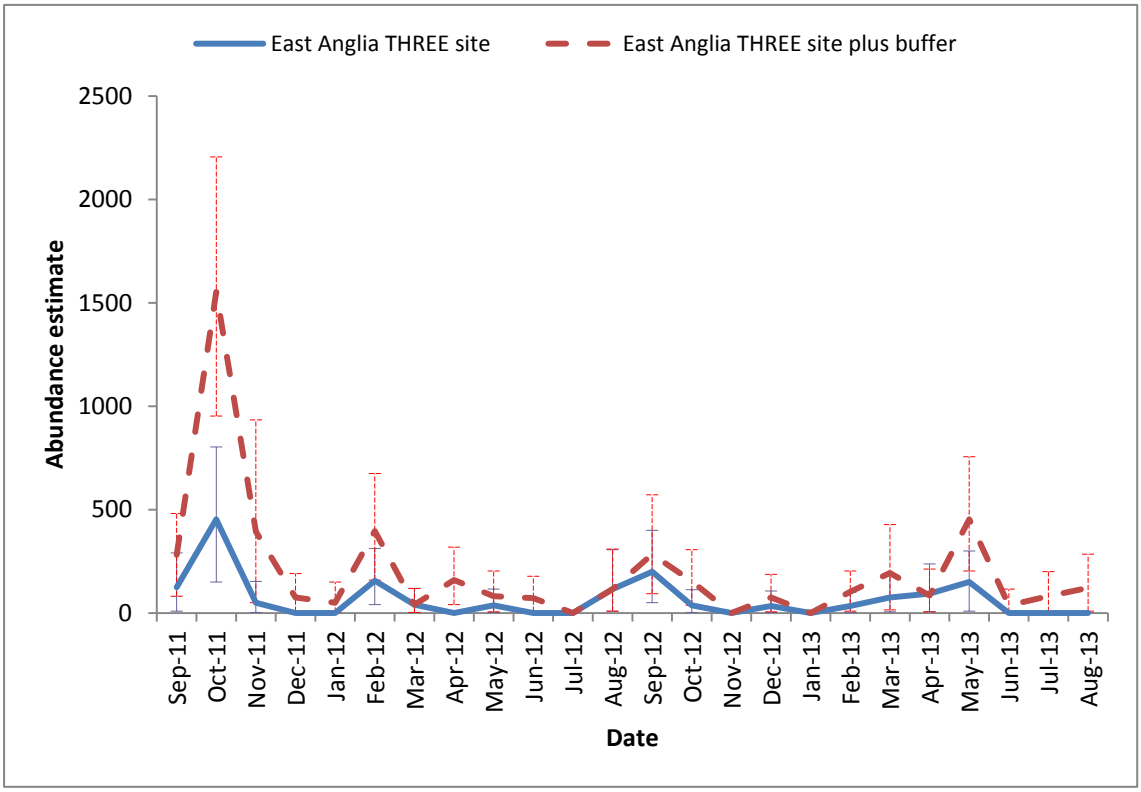

Figure 12.5 Harbour porpoise and unidentified dolphin or porpoise monthly abundance estimates using corrected surface counts with confidence limits for the East Anglia THREE site and East Anglia THREE site plus buffer.

12.2.5.2.3.2 Density estimates

Surface only (corrected sightings)

East Anglia THREE site

64. Peak density was 1.49 individuals km^{-2} in October 2011, the lowest density when individuals were recorded was 0.11 individuals km^{-2} in December 2012 and February 2013 (*Figure 5.6, Table A2.3*). Mean density across the survey period was 0.23 individuals km^{-2} (*Table 12.2.5*).

East Anglia THREE site plus buffer

65. Peak density was 2.28 individuals km^{-2} in October 2011, the lowest density when individuals were recorded was 0.055 individuals km^{-2} in June 2013 (*Figure 5.6, Table A2.3*). Mean density across the survey period was 0.29 individuals km^{-2} (*Table 12.2.5*).

All sightings (above and below surface)

66. These data are provided in *Appendices 3* and *4*.

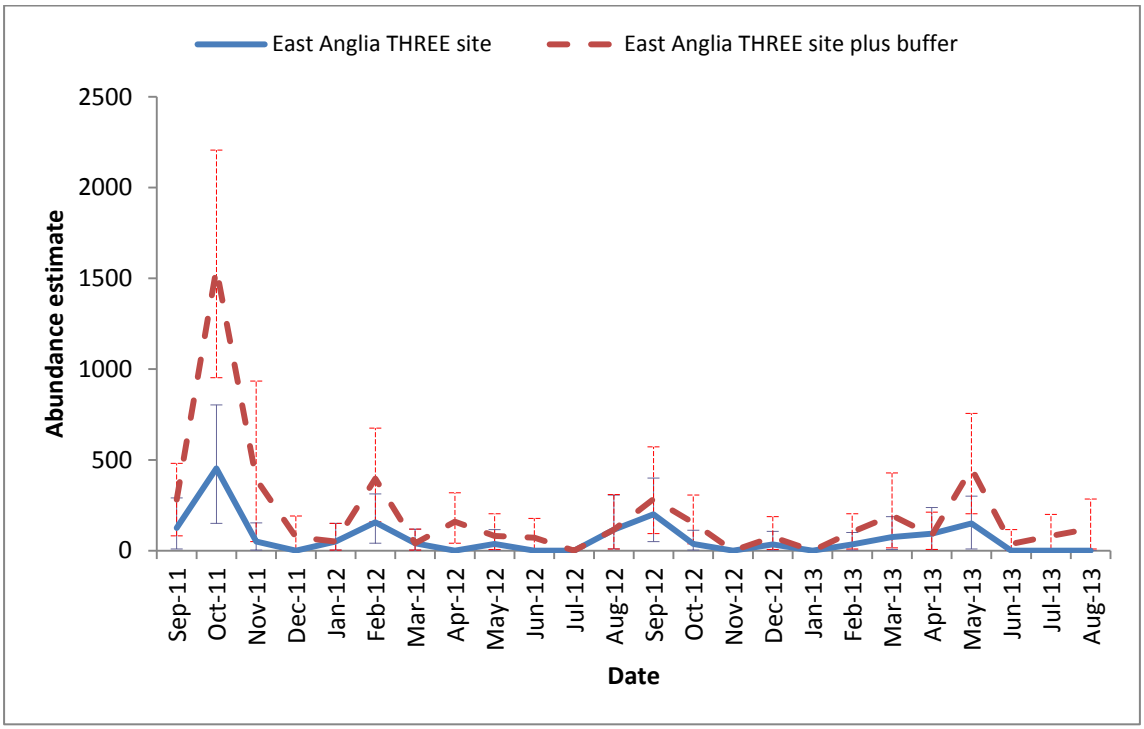

Figure 12.6 Harbour porpoise and unidentified dolphin or porpoise density estimates using corrected surface counts for the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

Table 12.2.5 Harbour porpoise and unidentified dolphin or porpoise mean densities across both survey years and for the total survey period. Densities are based on corrected counts (with the correction factor applied to counts of surfacing individuals only).

East Anglia THREE site		
	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.281	0.226
September 2012 to August 2013	0.171	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.394	0.294
September 2012 to August 2013	0.194	

12.2.5.2.3.3 Distribution

67. The map for this grouping combines the data in the maps for harbour porpoise (*Figure A6.1* and *A6.2*) and for unidentified dolphin or porpoise (*Figure A6.3* and *A6.4*). As such, as described previously, it indicates a relatively even distribution of

sightings of individuals across the East Anglia THREE site and the East Anglia THREE site plus buffer (*Figure A6.5* and *A6.6*). During the first survey year there were a small number of grid points at which more than one individual was recorded across the year, and during the second survey year no more than two individuals were recorded at each grid point (*Figure A6.5* and *A6.6*).

12.2.5.2.3.4 Summary of harbour porpoise and unidentified dolphin or porpoise data

68. At least one individual (at surface or submerged) was recorded each month within the East Anglia THREE site and East Anglia THREE site plus buffer (*Table A4.2*). No individuals were recorded at the surface for nine of the months within the East Anglia THREE site and for three of the months for the East Anglia THREE site plus buffer (*Figure 5.6, Table A2.3*). Peak abundances in terms of total count were recorded in September and October 2011, September 2012 and January 2013, with smaller peaks in April 2012 and April and May 2013 (*Table A4.2*).

69. Densities were similar for the East Anglia THREE site and the East Anglia THREE site plus buffer.

70. The harbour porpoise data indicated a peak in abundance in October 2011 with smaller peaks in September 2012 and April 2013, whereas with the harbour porpoise and unidentified dolphin or porpoise data there were more regular peaks in abundance estimates throughout the year although the peak in October 2011 remained considerably greater than for the other months. The proportion of harbour porpoise and unidentified dolphin or porpoise which were submerged was greater than for harbour porpoise (*Figure A3.1-A3.4*).

12.2.5.2.4 Unidentified dolphin species

71. This group consisted of individuals which had the characteristics of a dolphin and not a porpoise, but the dolphin species could not be identified. *Table 12.2.1* indicates the dolphin species potentially present in the area.

72. There were seven unidentified dolphin recorded in the East Anglia THREE site and the East Anglia THREE site plus buffer during the surveys.

12.2.5.2.4.1 Abundance estimates

East Anglia THREE site

73. The peak estimate of relative abundance was in April and May 2012 with 25 individuals and CL 2-63 and 2-62, respectively. No individuals were recorded between September 2011 to February 2012, and August 2012 to August 2013 (*Figure 5.7, Table A2.4*). The mean abundance estimate across the survey period was 3.5 individuals.

East Anglia THREE site plus buffer

74. No extra individuals were recorded within the buffer so the results were very similar to those for the East Anglia THREE site, however, the estimate for May 2012 was 26 (CL 2-65) individuals (*Figure 5.7, Table A2.4*). Mean abundance remained 3.5 individuals.

12.2.5.2.4.2 Density estimates

East Anglia THREE site

75. Peak density was 0.08 individuals km^{-2} in April and May 2012, the lowest density when individuals were recorded was 0.03 individuals km^{-2} in July 2012 (*Figure 5.8, Table A2.4*). Mean density across the survey period was 0.011 individuals km^{-2} (*Table 12.2.6*).

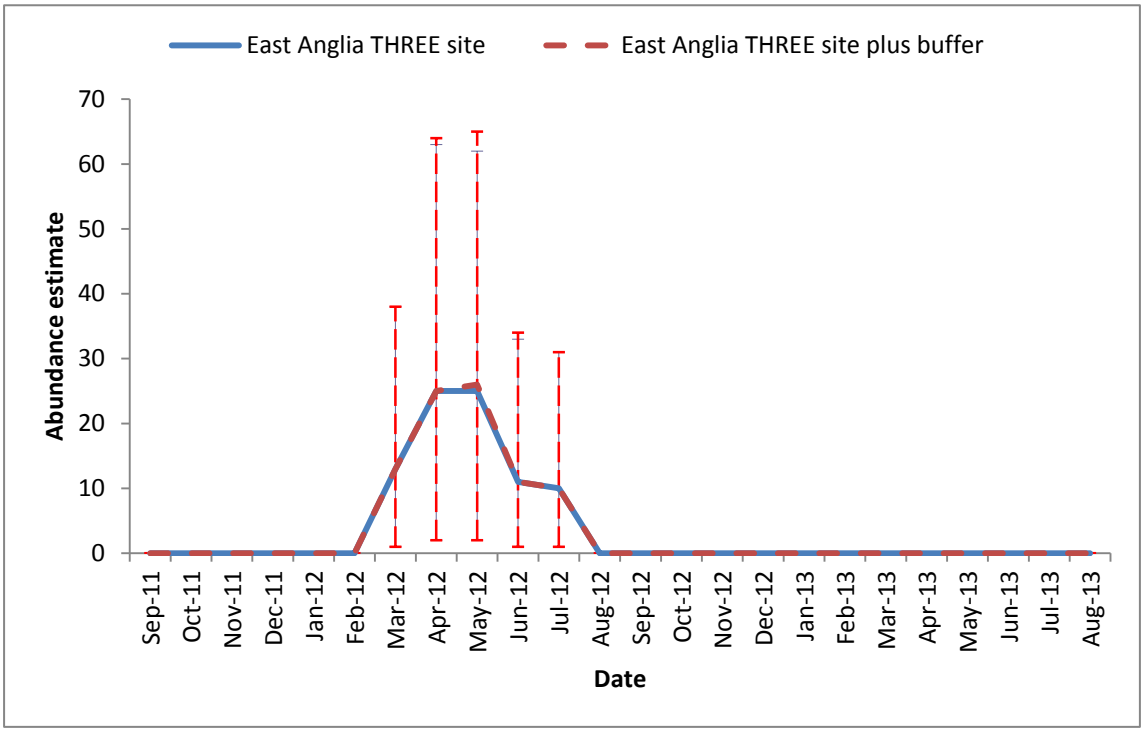

Figure 12.7 Total unidentified dolphin species monthly abundance estimates and confidence limits for the East Anglia THREE site and East Anglia THREE site plus buffer.

East Anglia THREE site plus buffer

76. With the buffer included, the peak density estimate was 0.040 individuals km^{-2} in April and May 2012, the lowest density when individuals were recorded was 0.010 individuals km^{-2} in July 2012 (*Figure 5.8, Table A2.4*). Mean density across the survey period was 0.0054 individuals km^{-2} (*Table 12.2.6*).

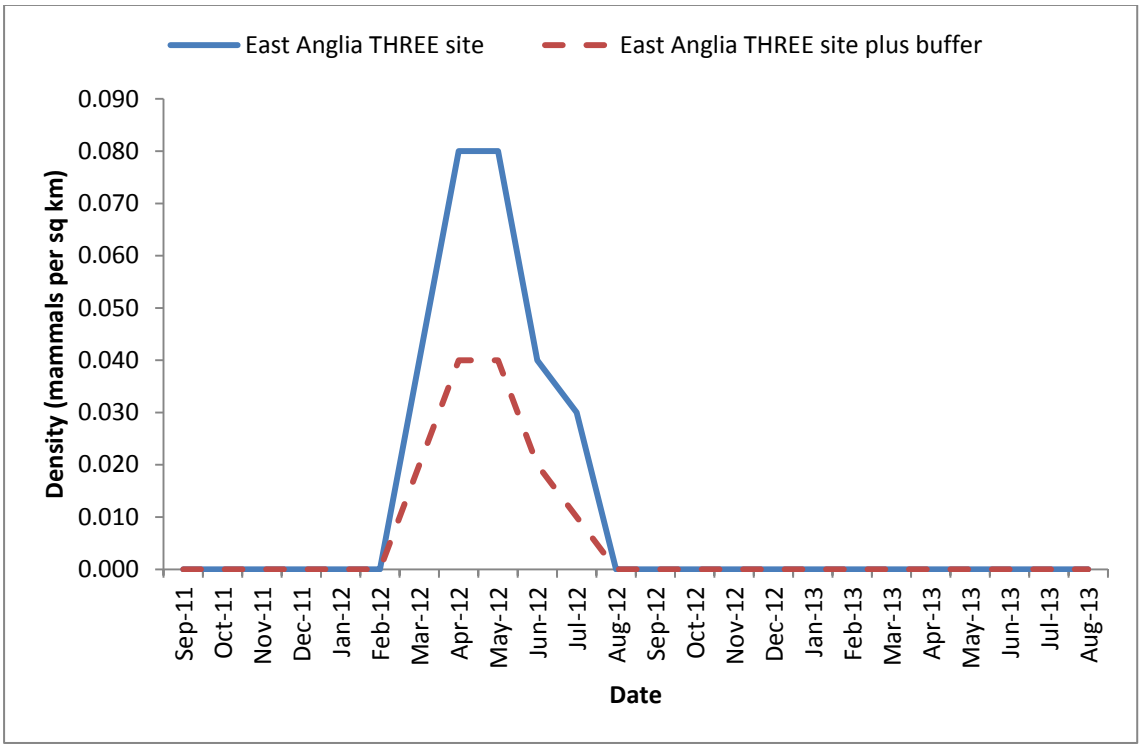

Figure 12.8 Total unidentified dolphin species density estimates for the East Anglia THREE site and East Anglia THREE site plus buffer.

Table 12.2.6 Unidentified dolphin species mean densities across both survey years and for the total survey period. Densities are based on total counts which includes surfacing and submerged (but visible) individuals.

East Anglia THREE site		
	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.023	0.011
September 2012 to August 2013	0	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.011	0.0054
September 2012 to August 2013	0	

12.2.5.2.4.3 Distribution

77. Unidentified dolphin species were only recorded during the first survey year and seven individuals were recorded in the East Anglia THREE site with none recorded in the buffer (*Figure A6.7*).

12.2.5.2.4.4 Summary of unidentified dolphin data

78. A total of seven individuals were recorded during the survey period, all within the East Anglia THREE site and all between March and July 2012 (*Table A2.4*).

79. As all of the individuals were recorded within the East Anglia THREE site, densities for the East Anglia THREE site were about double those for the East Anglia THREE site plus buffer.

12.2.5.2.5 White-beaked dolphin

12.2.5.2.5.1 Abundance estimates

Surface only (corrected sightings)

East Anglia THREE site

80. The abundance estimate for January 2012 for the East Anglia THREE site was 291 individuals (CL 18-882) (*Figure 5.9, Table A2.5*).

East Anglia THREE site plus buffer

81. As indicated above, no additional individuals were recorded when the 4km buffer area was included (*Figure 5.9, Table A2.5*).

12.2.5.2.5.2 Density estimates

Surface only (corrected sightings)

East Anglia THREE site

82. The density estimate for January 2012 was 0.95 individuals km^{-2} (*Figure 5.10, Table A2.5*). Mean density was 0.040 individuals km^{-2} (*Table 12.2.7*).

East Anglia THREE site plus buffer

83. The density estimate for January 2012 was 0.43 individuals km^{-2} (*Figure 5.10, Table A2.5*). Mean density was 0.018 individuals km^{-2} (*Table 12.2.7*).

All sightings (above and below surface)

84. These data are provided in *Appendices 3* and *4*.

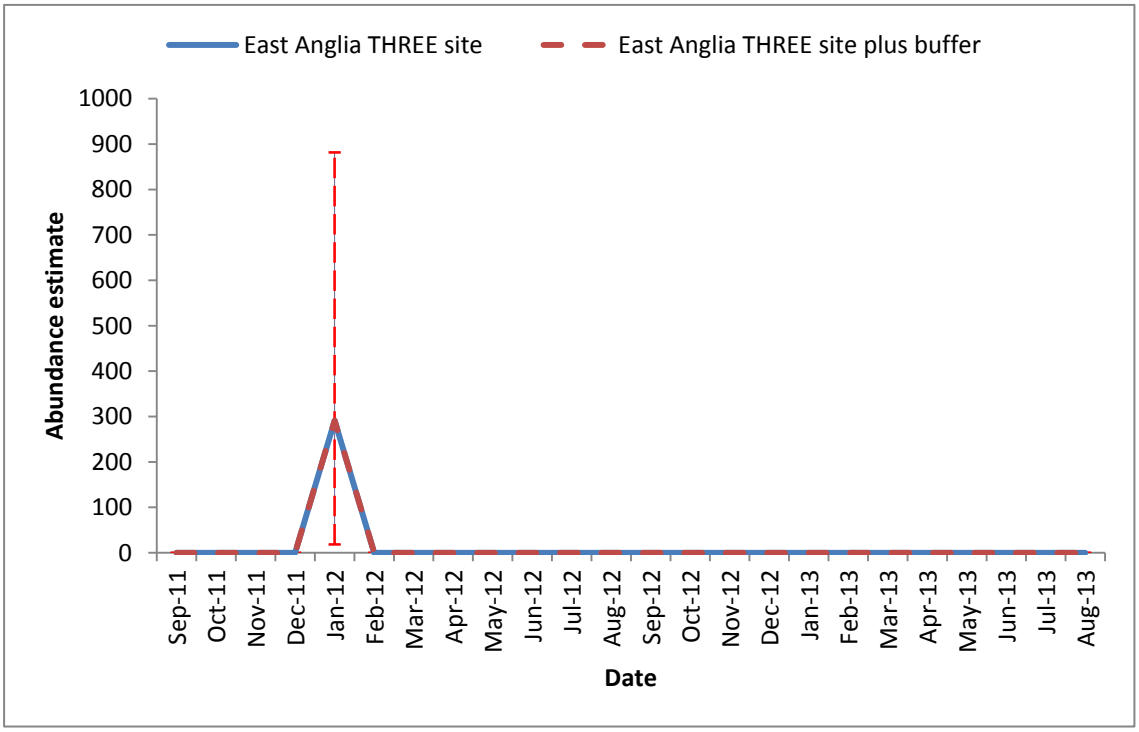

Figure 12.9 White-beaked dolphin monthly abundance estimates using corrected surface counts with confidence limits for the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

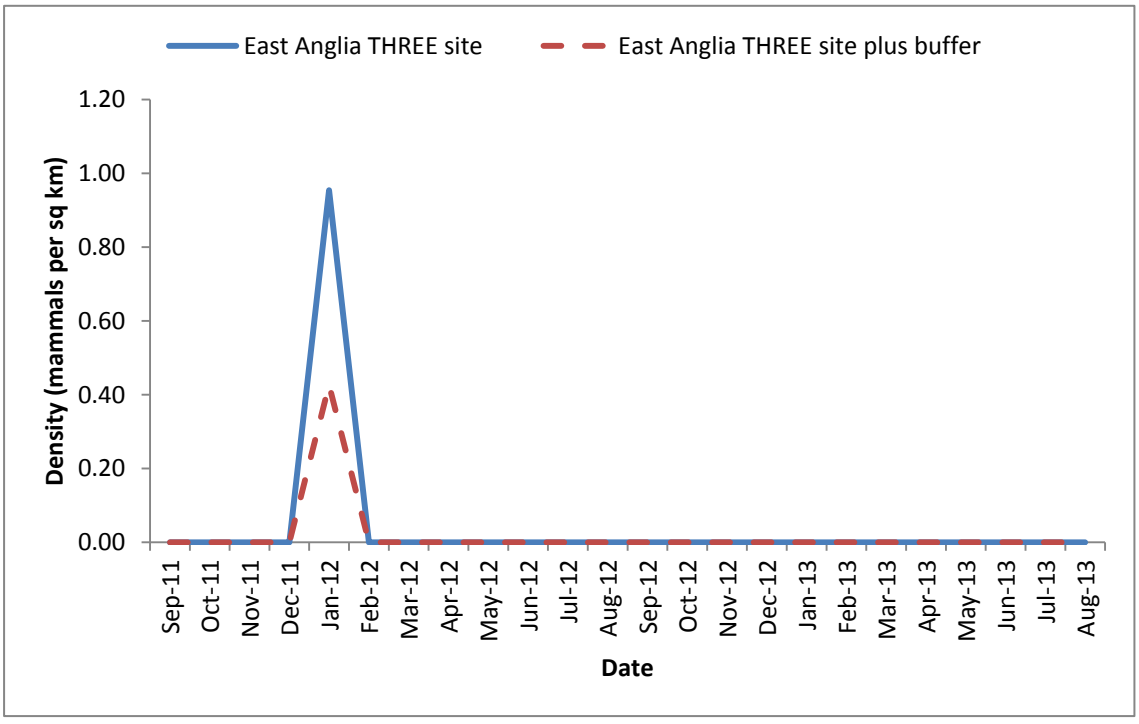

Figure 12.10 White-beaked dolphin density estimates using corrected surface counts for the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

Table 12.2.7 White-beaked dolphin mean densities across both survey years and for the total survey period. Densities are based on corrected counts (with the correction factor applied to counts of surfacing individuals only).

East Anglia THREE site		
	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.080	0.040
September 2012 to August 2013	0	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.036	0.018
September 2012 to August 2013	0	

12.2.5.2.5.3 Number of surfacing or submerged (but visible) individuals

85. Four individuals were recorded in total, all in January, with two individuals recorded at the surface, and two were submerged but visible.

12.2.5.2.5.4 Distribution

86. All individuals were recorded within the East Anglia THREE site.

12.2.5.2.5.5 Summary of data

87. All four individuals recorded were in January 2012. As no individuals were recorded within the buffer, densities were greater for the East Anglia THREE site than for the East Anglia THREE site plus buffer.

12.2.5.2.6 Phocids

88. This category includes both harbour (common) seal and grey seal which are the only seal species that breed in the UK and are commonly observed in UK waters. Other species have been observed in UK waters, but are not known to be resident. It was not possible to differentiate harbour and grey seal from the aerial images.

12.2.5.2.6.1 Abundance estimates

East Anglia THREE site

89. Two phocids were recorded in the East Anglia THREE site in July 2012 resulting in an abundance estimate of 21 (CL 2-63) individuals (*Figure 5.11, Table A2.6*). The mean abundance estimate across the survey period was 0.88 individuals.

East Anglia THREE site plus buffer

90. No further individuals were recorded in the East Anglia THREE site plus buffer.

12.2.5.2.6.2 Density estimates

East Anglia THREE site

91. The density estimate for July 2012 was 0.070 individuals km^{-2} (*Table A2.6, Figure 5.12*). Mean density was 0.0029 individuals km^{-2}.

East Anglia THREE site plus buffer

92. The density estimate for July 2012 was 0.030 individuals km^{-2} (*Table A2.6, Figure 5.12*). Mean density was 0.0013 individuals km^{-2}.

12.2.5.2.6.3 Number of surfacing or submerged (but visible) individuals

93. The two individuals recorded were submerged.

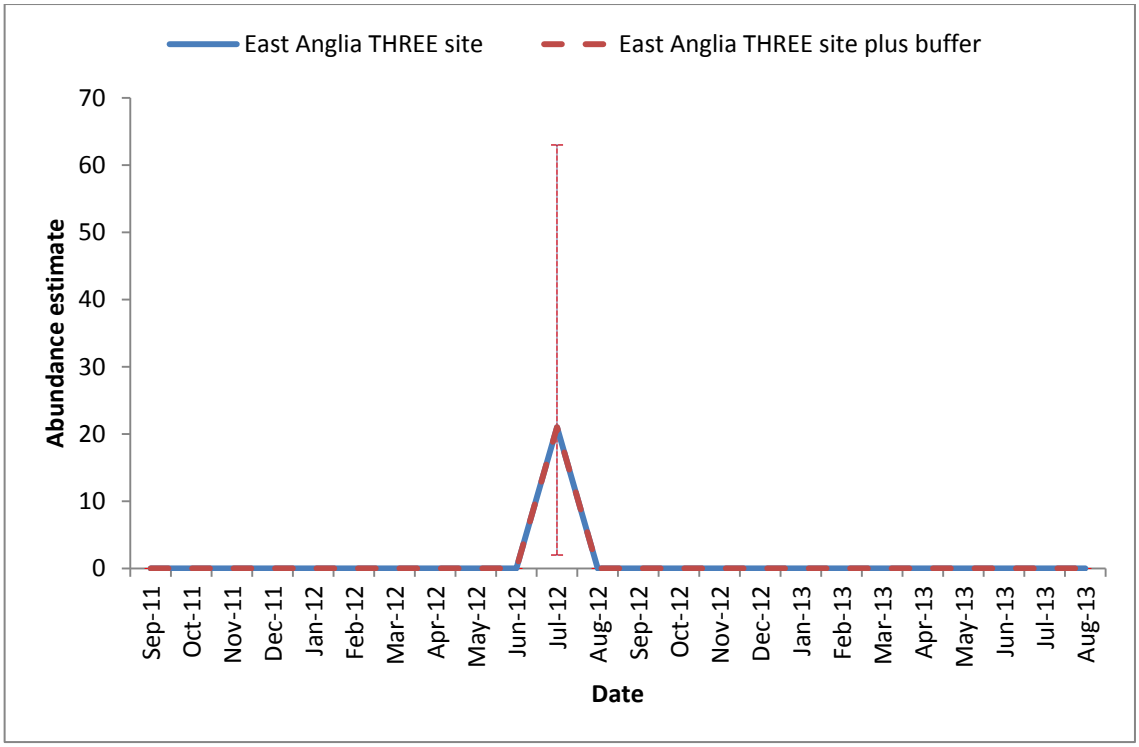

Figure 12.11 Total phocid species monthly abundance estimates using corrected surface counts with confidence limits for the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

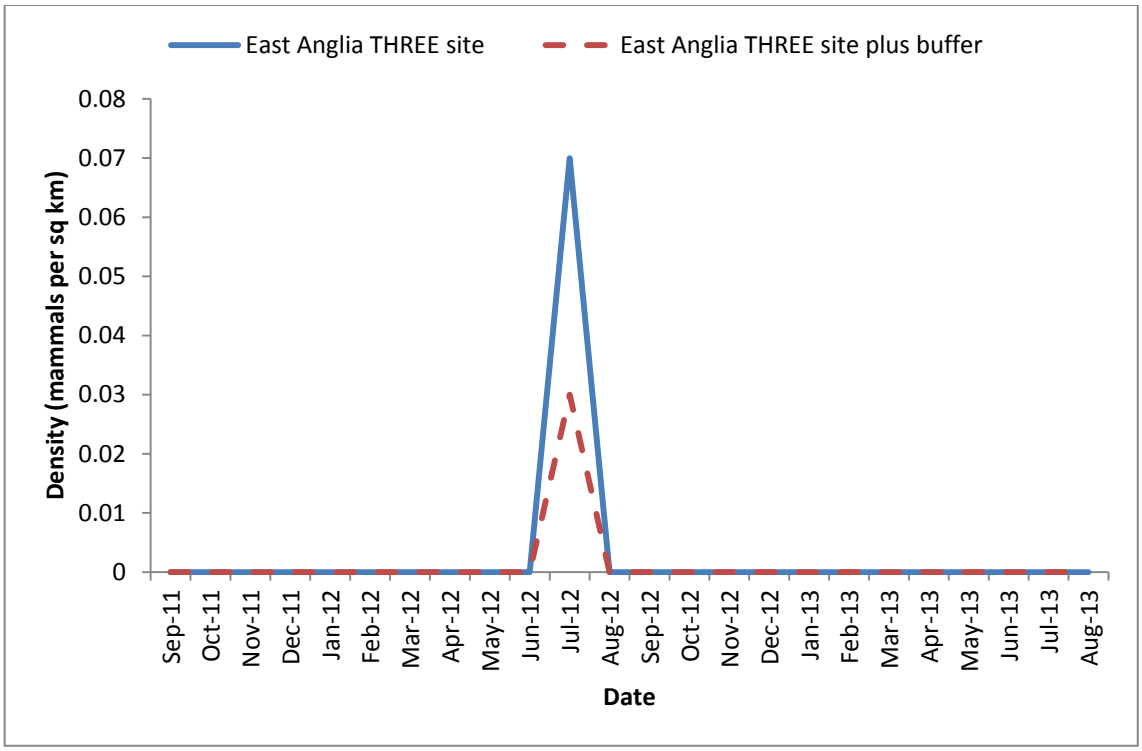

Figure 12.12 Total Phocid species density estimates for the East Anglia THREE site and East Anglia THREE site plus buffer.

12.2.5.2.6.4 Distribution

94. Both individuals were within the East Anglia THREE site.

12.2.5.2.6.5 Summary of data

95. Two individuals were recorded in July 2012 and both were in the East Anglia THREE site.

12.2.5.3 Unidentified patterned dolphin species

96. This group encompassed individuals which were known to be a patterned dolphin but could not be identified to species level. As indicated in *Table 12.2.1* species classed as patterned dolphin were white-beaked dolphin, Atlantic white-sided dolphin, common dolphin and striped dolphin.

12.2.5.3.1 Abundance estimates

East Anglia THREE site

97. No unidentified patterned dolphin species were recorded in the East Anglia THREE site.

East Anglia THREE site plus buffer

98. Only one individual was recorded which was in August 2012 resulting in an abundance estimate of 12 (CL 1-37) (*Figure 5.13, Table A2.7*). Mean abundance estimate was 0.50 individuals.

12.2.5.3.1.1 Density estimates

East Anglia THREE site

99. As indicated above, no unidentified patterned dolphin species were recorded in the East Anglia THREE site.

East Anglia THREE site plus buffer

100. The density estimate for August 2012 was 0.02 individuals km^{-2} (*Table A2.7*). Mean density was 0.00083 individuals km^{-2}.

12.2.5.3.1.2 Number of surfacing or submerged (but visible) individuals

The single individual recorded was at the water surface.

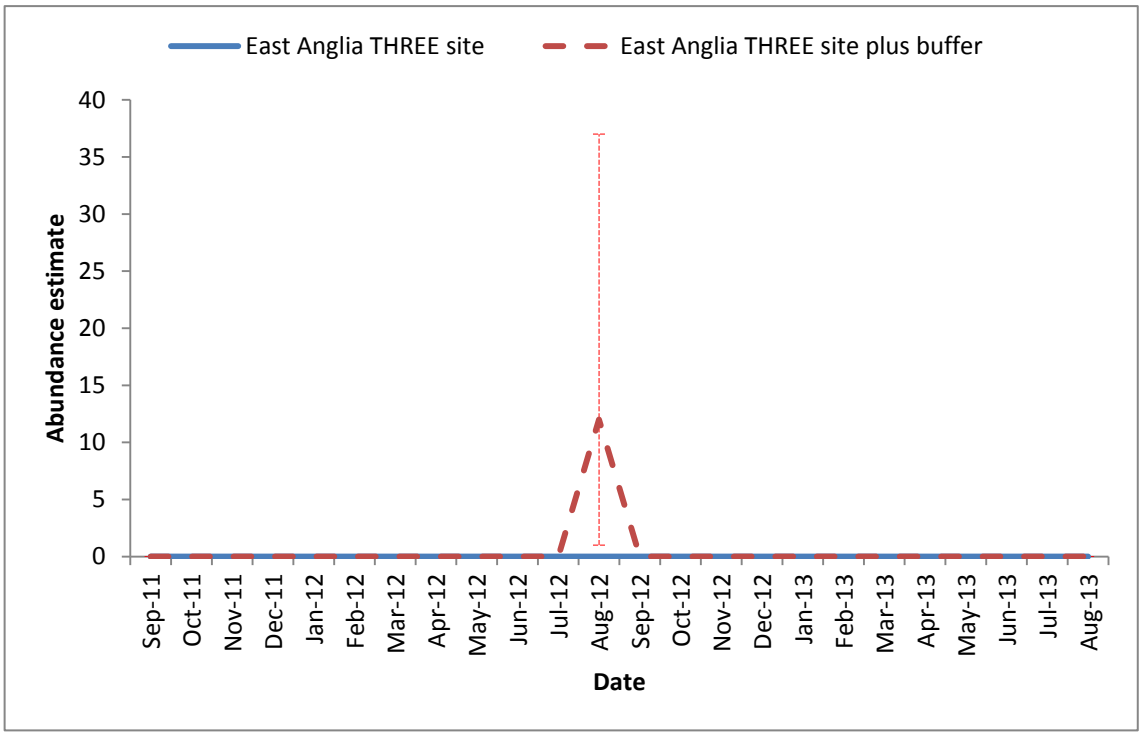

Figure 12.13 Total unidentified patterned dolphin species monthly abundance estimates with confidence limits and precision for the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

12.2.5.3.1.3 Distribution

101. The only individual recorded was within the buffer.

12.2.5.3.1.4 Summary of data

102. Only one individual was recorded in August 2012 and as it was within the buffer density estimates were only available for the East Anglia THREE site plus buffer.

12.2.6 Summary of Main Findings

103. This survey indicates the species of principal interest in the East Anglia THREE site is harbour porpoise. This is consistent with expectations based on the previous surveys of the East Anglia ONE site.

104. Phocids and cetacean species other than harbour porpoise were recorded in very low numbers.

12.2.7 References

Canty A. & Ripley B. (2010). *Boot: Bootstrap R (S-Plus) Functions.* R package version 1. 2-43.

Efron, B. & Tibshirani, R.J. (1993). *An Introduction to the Bootstrap*. Chapman & Hall, London.

Elliott, J.M. (1977). *Some methods for the statistical analysis of samples of benthic invertebrates.* Freshwater Biological Association, Scientific Publication no. 25.

Paxton C. G.M, Mackenzie M., Burt M. L., Rexstad E. & Thomas L. 2011. Phase II Data Analysis of Joint Cetacean Protocol Data Resource Report to Joint Nature Conservation Committee Contract number C11-0207-0421

APPENDIX 1: SURVEY DATES

Table A1.1 East Anglia THREE aerial survey dates

East Anglia THREE	
Survey Month	Survey date
September 2011	15th and 16th
October 2011	1st and 2nd
November 2011	23rd and 24th
December 2011	10th and 11th
January 2012	8th, 9th and 10th
February 2012	1st
March 2012	13th
April 2012	2nd
May 2012	6th
June 2012	4th
July 2012	2nd
August 2012	2nd
September 2012	1st and 2nd
October 2012	3rd
November 2012	7th and 8th
December 2012	11th
January 2013	22nd and 23rd
February 2013	7th and 8th
March 2013	12th
April 2013	13th
May 2013	1st and 2nd
June 2013	2nd and 3rd
July 2013	1st and 2nd
August 2013	3rd

APPENDIX 2: MARINE MAMMAL CORRECTED SURFACE COUNTS, ABUNDANCE ESTIMATES AND DENSITY

Table A2.1 Harbour porpoise monthly counts, estimates, confidence limits and precision (using corrected surface counts) for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	6	84	6	206	n/a	0.277
October 2011	28	453	150	803	n/a	1.487
November 2011	0	0	0	0	n/a	0.000
December 2011	0	0	0	0	n/a	0.000
January 2012	0	0	0	0	n/a	0.000
February 2012	0	0	0	0	n/a	0.000
March 2012	0	0	0	0	n/a	0.000
April 2012	0	0	0	0	n/a	0.000
May 2012	0	0	0	0	n/a	0.000
June 2012	0	0	0	0	n/a	0.000
July 2012	0	0	0	0	n/a	0.000
August 2012	0	0	0	0	n/a	0.000
September 2012	13	200	13	400	n/a	0.656
October 2012	0	0	0	0	n/a	0.000
November 2012	0	0	0	0	n/a	0.000
December 2012	3	34	3	106	n/a	0.113
January 2013	0	0	0	0	n/a	0.000
February 2013	3	34	3	100	n/a	0.113
March 2013	3	38	3	113	n/a	0.123
April 2013	6	94	6	238	n/a	0.308
May 2013	3	50	3	150	n/a	0.164
June 2013	0	0	0	0	n/a	0.000
July 2013	0	0	0	0	n/a	0.000
August 2013	0	0	0	0	n/a	0.000

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	16	200	41	400	n/a	0.293
October 2011	94	1503	903	2106	n/a	2.205
November 2011	3	50	3	147	n/a	0.073
December 2011	3	38	3	116	n/a	0.055
January 2012	0	0	0	0	n/a	0.000
February 2012	0	0	0	0	n/a	0.000
March 2012	0	0	0	0	n/a	0.000
April 2012	0	0	0	0	n/a	0.000
May 2012	0	0	0	0	n/a	0.000
June 2012	6	72	6	178	n/a	0.105
July 2012	0	0	0	0	n/a	0.000
August 2012	0	0	0	0	n/a	0.000
September 2012	19	284	94	525	n/a	0.417
October 2012	9	116	9	231	n/a	0.170
November 2012	0	0	0	0	n/a	0.000
December 2012	6	75	6	188	n/a	0.110
January 2013	0	0	0	0	n/a	0.000
February 2013	3	34	3	103	n/a	0.050
March 2013	9	116	9	272	n/a	0.156
April 2013	6	84	6	213	n/a	0.124
May 2013	13	203	50	403	n/a	0.298
June 2013	3	38	3	116	n/a	0.055
July 2013	0	0	0	0	n/a	0.000
August 2013	9	122	9	284	n/a	0.179

Table A2.2 Unidentified dolphin or porpoise monthly counts, estimates, confidence limits and precision for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	3	40	3	93	0.58	0.130
October 2011	3	48	3	129	0.58	0.160
November 2011	1	16	1	49	>1	0.050
December 2011	3	36	3	85	0.58	0.120
January 2012	3	49	3	129	0.58	0.160
February 2012	6	75	25	150	0.41	0.250
March 2012	5	64	13	127	0.45	0.210
April 2012	11	138	38	277	0.30	0.450
May 2012	2	25	2	62	0.71	0.080
June 2012	1	11	1	33	>1	0.040
July 2012	0	0	0	0	0.00	0.000
August 2012	6	74	12	172	0.41	0.240
September 2012	1	16	1	48	>1	0.050
October 2012	1	12	1	36	>1	0.040
November 2012	3	49	3	130	0.58	0.160
December 2012	1	11	1	34	>1	0.040
January 2013	11	139	63	239	0.30	0.460
February 2013	0	0	0	0	0.00	0.000
March 2013	2	24	2	60	0.71	0.080
April 2013	3	45	3	121	0.58	0.150
May 2013	6	96	32	176	0.41	0.310
June 2013	2	24	2	61	0.71	0.080
July 2013	1	13	1	39	>1	0.040
August 2013	1	13	1	40	NA	0.040

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	11	141	51	256	0.30	0.210
October 2011	7	112	32	225	0.38	0.160
November 2011	13	205	47	410	0.28	0.300
December 2011	10	122	49	220	0.32	0.180
January 2012	4	65	4	162	0.50	0.100
February 2012	15	190	89	292	0.26	0.280
March 2012	9	115	51	192	0.33	0.170
April 2012	19	242	127	382	0.23	0.360
May 2012	5	65	13	130	0.45	0.100
June 2012	4	46	11	92	0.50	0.070
July 2012	0	0	0	0	0.00	0.000
August 2012	11	136	50	235	0.30	0.200
September 2012	3	46	3	107	0.58	0.070
October 2012	1	12	1	37	>1	0.020
November 2012	5	81	16	194	0.45	0.120
December 2012	5	60	12	120	0.45	0.090
January 2013	19	235	124	371	0.23	0.340
February 2013	8	87	33	152	0.35	0.130
March 2013	5	62	12	124	0.45	0.090
April 2013	7	95	27	203	0.38	0.140
May 2013	13	210	97	323	0.28	0.310
June 2013	7	86	25	173	0.38	0.130
July 2013	6	77	26	141	0.41	0.110
August 2013	1	13	1	39	>1	0.020

Table A2.3 Harbour porpoise and unidentified dolphin or porpoise monthly counts, estimates, confidence limits and precision (using corrected surface counts) for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	9	125	9	291	n/a	0.406
October 2011	28	453	150	803	n/a	1.487
November 2011	3	50	3	153	n/a	0.164
December 2011	0	0	0	0	n/a	0.000
January 2012	3	50	3	150	n/a	0.164
February 2012	13	156	41	313	n/a	0.513
March 2012	3	41	3	119	n/a	0.133
April 2012	0	0	0	0	n/a	0.000
May 2012	3	38	3	116	n/a	0.123
June 2012	0	0	0	0	n/a	0.000
July 2012	0	0	0	0	n/a	0.000
August 2012	9	116	9	306	n/a	0.379
September 2012	13	200	50	400	n/a	0.656
October 2012	3	38	3	113	n/a	0.123
November 2012	0	0	0	0	n/a	0.000
December 2012	3	34	3	106	n/a	0.113
January 2013	0	0	0	0	n/a	0.000
February 2013	3	34	3	100	n/a	0.113
March 2013	6	75	6	188	n/a	0.246
April 2013	6	94	6	238	n/a	0.308
May 2013	9	150	9	300	n/a	0.492
June 2013	0	0	0	0	n/a	0.000
July 2013	0	0	0	0	n/a	0.000
August 2013	0	0	0	0	n/a	0.000

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	22	281	81	481	n/a	0.413
October 2011	97	1553	953	2206	n/a	2.279
November 2011	25	394	50	934	n/a	0.578
December 2011	6	75	6	191	n/a	0.110
January 2012	3	50	3	150	n/a	0.073
February 2012	31	397	159	675	n/a	0.582
March 2012	3	41	3	119	n/a	0.060
April 2012	13	159	41	319	n/a	0.234
May 2012	6	81	6	203	n/a	0.119
June 2012	6	72	6	178	n/a	0.105
July 2012	0	0	0	0	n/a	0.000
August 2012	9	116	9	309	n/a	0.170
September 2012	19	284	94	572	n/a	0.417
October 2012	13	153	38	306	n/a	0.225
November 2012	0	0	0	0	n/a	0.000
December 2012	6	75	6	188	n/a	0.110
January 2013	0	0	0	0	n/a	0.000
February 2013	9	103	9	203	n/a	0.151
March 2013	16	194	16	428	n/a	0.281
April 2013	6	84	6	213	n/a	0.124
May 2013	28	453	203	756	n/a	0.665
June 2013	3	38	3	116	n/a	0.055
July 2013	6	81	6	200	n/a	0.119
August 2013	9	122	9	284	n/a	0.179

Table A2.4 Total unidentified dolphin species monthly counts, estimates, confidence limits and precision for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	0	0.000
October 2011	0	0	0	0	0	0.000
November 2011	0	0	0	0	0	0.000
December 2011	0	0	0	0	0	0.000
January 2012	0	0	0	0	0	0.000
February 2012	0	0	0	0	0	0.000
March 2012	1	13	1	38	>1	0.040
April 2012	2	25	2	63	0.71	0.080
May 2012	2	25	2	62	0.71	0.080
June 2012	1	11	1	33	>1	0.040
July 2012	1	10	1	31	>1	0.030
August 2012	0	0	0	0	0	0.000
September 2012	0	0	0	0	0	0.000
October 2012	0	0	0	0	0	0.000
November 2012	0	0	0	0	0	0.000
December 2012	0	0	0	0	0	0.000
January 2013	0	0	0	0	0	0.000
February 2013	0	0	0	0	0	0.000
March 2013	0	0	0	0	0	0.000
April 2013	0	0	0	0	0	0.000
May 2013	0	0	0	0	0	0.000
June 2013	0	0	0	0	0	0.000
July 2013	0	0	0	0	0	0.000
August 2013	0	0	0	0	0	0.000

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	0	0.000
October 2011	0	0	0	0	0	0.000
November 2011	0	0	0	0	0	0.000
December 2011	0	0	0	0	0	0.000
January 2012	0	0	0	0	0	0.000
February 2012	0	0	0	0	0	0.000
March 2012	1	13	1	38	>1	0.020
April 2012	2	25	2	64	0.71	0.040
May 2012	2	26	2	65	0.71	0.040
June 2012	1	11	1	34	>1	0.020
July 2012	1	10	1	31	>1	0.010
August 2012	0	0	0	0	0	0.000
September 2012	0	0	0	0	0	0.000
October 2012	0	0	0	0	0	0.000
November 2012	0	0	0	0	0	0.000
December 2012	0	0	0	0	0	0.000
January 2013	0	0	0	0	0	0.000
February 2013	0	0	0	0	0	0.000
March 2013	0	0	0	0	0	0.000
April 2013	0	0	0	0	0	0.000
May 2013	0	0	0	0	0	0.000
June 2013	0	0	0	0	0	0.000
July 2013	0	0	0	0	0	0.000
August 2013	0	0	0	0	0	0.000

Table A2.5 White-beaked dolphin monthly counts, estimates, confidence limits and precision (using corrected surface counts) for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	n/a	0.000
October 2011	0	0	0	0	n/a	0.000
November 2011	0	0	0	0	n/a	0.000
December 2011	0	0	0	0	n/a	0.000
January 2012	18	291	18	882	n/a	0.954
February 2012	0	0	0	0	n/a	0.000
March 2012	0	0	0	0	n/a	0.000
April 2012	0	0	0	0	n/a	0.000
May 2012	0	0	0	0	n/a	0.000
June 2012	0	0	0	0	n/a	0.000
July 2012	0	0	0	0	n/a	0.000
August 2012	0	0	0	0	n/a	0.000
September 2012	0	0	0	0	n/a	0.000
October 2012	0	0	0	0	n/a	0.000
November 2012	0	0	0	0	n/a	0.000
December 2012	0	0	0	0	n/a	0.000
January 2013	0	0	0	0	n/a	0.000
February 2013	0	0	0	0	n/a	0.000
March 2013	0	0	0	0	n/a	0.000
April 2013	0	0	0	0	n/a	0.000
May 2013	0	0	0	0	n/a	0.000
June 2013	0	0	0	0	n/a	0.000
July 2013	0	0	0	0	n/a	0.000
August 2013	0	0	0	0	n/a	0.000

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	n/a	0.000
October 2011	0	0	0	0	n/a	0.000
November 2011	0	0	0	0	n/a	0.000
December 2011	0	0	0	0	n/a	0.000
January 2012	18	291	18	882	n/a	0.427
February 2012	0	0	0	0	n/a	0.000
March 2012	0	0	0	0	n/a	0.000
April 2012	0	0	0	0	n/a	0.000
May 2012	0	0	0	0	n/a	0.000
June 2012	0	0	0	0	n/a	0.000
July 2012	0	0	0	0	n/a	0.000
August 2012	0	0	0	0	n/a	0.000
September 2012	0	0	0	0	n/a	0.000
October 2012	0	0	0	0	n/a	0.000
November 2012	0	0	0	0	n/a	0.000
December 2012	0	0	0	0	n/a	0.000
January 2013	0	0	0	0	n/a	0.000
February 2013	0	0	0	0	n/a	0.000
March 2013	0	0	0	0	n/a	0.000
April 2013	0	0	0	0	n/a	0.000
May 2013	0	0	0	0	n/a	0.000
June 2013	0	0	0	0	n/a	0.000
July 2013	0	0	0	0	n/a	0.000
August 2013	0	0	0	0	n/a	0.000

Table A2.6 Total phocid species monthly counts, estimates, confidence limits and precision for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	0	0
October 2011	0	0	0	0	0	0
November 2011	0	0	0	0	0	0
December 2011	0	0	0	0	0	0
January 2012	0	0	0	0	0	0
February 2012	0	0	0	0	0	0
March 2012	0	0	0	0	0	0
April 2012	0	0	0	0	0	0
May 2012	0	0	0	0	0	0
June 2012	0	0	0	0	0	0
July 2012	2	21	2	63	0.71	0.070
August 2012	0	0	0	0	0	0
September 2012	0	0	0	0	0	0
October 2012	0	0	0	0	0	0
November 2012	0	0	0	0	0	0
December 2012	0	0	0	0	0	0
January 2013	0	0	0	0	0	0
February 2013	0	0	0	0	0	0
March 2013	0	0	0	0	0	0
April 2013	0	0	0	0	0	0
May 2013	0	0	0	0	0	0
June 2013	0	0	0	0	0	0
July 2013	0	0	0	0	0	0
August 2013	0	0	0	0	0	0

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	0	0
October 2011	0	0	0	0	0	0
November 2011	0	0	0	0	0	0
December 2011	0	0	0	0	0	0
January 2012	0	0	0	0	0	0
February 2012	0	0	0	0	0	0
March 2012	0	0	0	0	0	0
April 2012	0	0	0	0	0	0
May 2012	0	0	0	0	0	0
June 2012	0	0	0	0	0	0
July 2012	2	21	2	63	0.71	0.030
August 2012	0	0	0	0	0	0
September 2012	0	0	0	0	0	0
October 2012	0	0	0	0	0	0
November 2012	0	0	0	0	0	0
December 2012	0	0	0	0	0	0
January 2013	0	0	0	0	0	0
February 2013	0	0	0	0	0	0
March 2013	0	0	0	0	0	0
April 2013	0	0	0	0	0	0
May 2013	0	0	0	0	0	0
June 2013	0	0	0	0	0	0
July 2013	0	0	0	0	0	0
August 2013	0	0	0	0	0	0

Table A2.7 Total unidentified patterned dolphin species monthly counts, estimates, confidence limits and precision for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	N/A	0.00
October 2011	0	0	0	0	N/A	0.00
November 2011	0	0	0	0	N/A	0.00
December 2011	0	0	0	0	N/A	0.00
January 2012	0	0	0	0	N/A	0.00
February 2012	0	0	0	0	N/A	0.00
March 2012	0	0	0	0	N/A	0.00
April 2012	0	0	0	0	N/A	0.00
May 2012	0	0	0	0	N/A	0.00
June 2012	0	0	0	0	N/A	0.00
July 2012	0	0	0	0	N/A	0.00
August 2012	0	0	0	0	N/A	0.00
September 2012	0	0	0	0	N/A	0.00
October 2012	0	0	0	0	N/A	0.00
November 2012	0	0	0	0	N/A	0.00
December 2012	0	0	0	0	N/A	0.00
January 2013	0	0	0	0	N/A	0.00
February 2013	0	0	0	0	N/A	0.00
March 2013	0	0	0	0	N/A	0.00
April 2013	0	0	0	0	N/A	0.00
May 2013	0	0	0	0	N/A	0.00
June 2013	0	0	0	0	N/A	0.00
July 2013	0	0	0	0	N/A	0.00
August 2013	0	0	0	0	N/A	0.00

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (mammals per sq km)
September 2011	0	0	0	0	N/A	0.00
October 2011	0	0	0	0	N/A	0.00
November 2011	0	0	0	0	N/A	0.00
December 2011	0	0	0	0	N/A	0.00
January 2012	0	0	0	0	N/A	0.00
February 2012	0	0	0	0	N/A	0.00
March 2012	0	0	0	0	N/A	0.00
April 2012	0	0	0	0	N/A	0.00
May 2012	0	0	0	0	N/A	0.00
June 2012	0	0	0	0	N/A	0.00
July 2012	0	0	0	0	N/A	0.00
August 2012	1	12	1	37	>1	0.020
September 2012	0	0	0	0	N/A	0.00
October 2012	0	0	0	0	N/A	0.00
November 2012	0	0	0	0	N/A	0.00
December 2012	0	0	0	0	N/A	0.00
January 2013	0	0	0	0	N/A	0.00
February 2013	0	0	0	0	N/A	0.00
March 2013	0	0	0	0	N/A	0.00
April 2013	0	0	0	0	N/A	0.00
May 2013	0	0	0	0	N/A	0.00
June 2013	0	0	0	0	N/A	0.00
July 2013	0	0	0	0	N/A	0.00
August 2013	0	0	0	0	N/A	0.00

APPENDIX 3: ALL MARINE MAMMAL SIGHTINGS ABOVE AND BELOW THE SURFACE

Harbour Porpoise

Abundance estimates

East Anglia THREE site

1. Peak numbers were recorded in late autumn with estimates of relative abundance of 159 (Confidence Limits (CL) 66-265) and 225 (CL 96-369) individuals recorded in September and October 2011, respectively, and 144 (CL 64-240) individuals recorded in September 2012 (*Figure A3.1, Table A4.1*).

2. No individuals were recorded between December 2011 and August 2012, whereas individuals were recorded each month between December 2012 and May 2013 with abundance estimates ranging from 11 (CL 1-34) to 76 (CL 15-151) individuals, and a mean value of 30.3 individuals across the survey period.

East Anglia THREE site plus buffer

3. Peak estimated abundance was 786 (CL 545-1,042) individuals in October 2011, and individuals were recorded each month between June 2012 to August 2013 (with the exception of no individuals recorded in November 2012) (*Figure A3.1, Table A4.1*). The mean abundance estimate across the survey period was 88.1 individuals.

Density estimates

East Anglia THREE site

4. Peak density was 0.74 individuals km^{-2} in October 2011, and the lowest density when individuals were recorded was 0.040 individuals km^{-2} in December 2012, February 2013 and March 2013 (*Figure A3.2, Table A4.1*).

5. Overall, estimated mean density across the first survey year was greater than during the second survey year (*Table A3.1*), and the mean across the full survey period was 0.10 individuals km^{-2}.

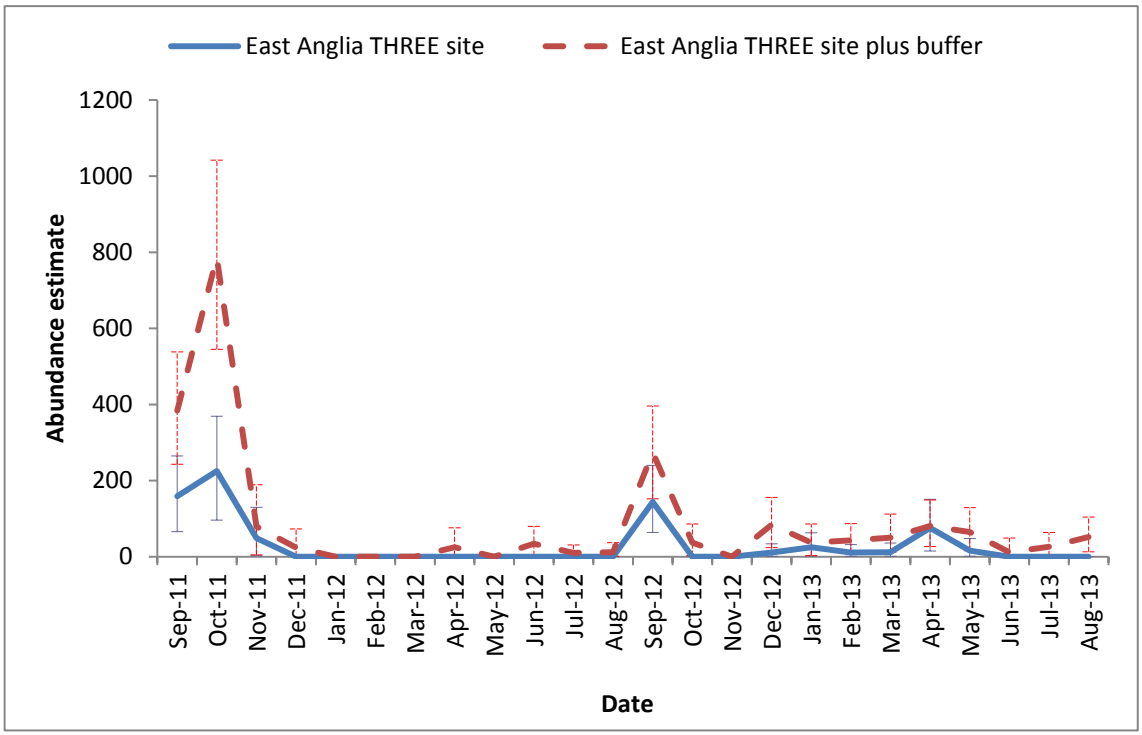

Figure A3.1 Harbour porpoise monthly abundance estimates using all sightings with confidence limits for the East Anglia THREE site and East Anglia THREE site plus buffer.

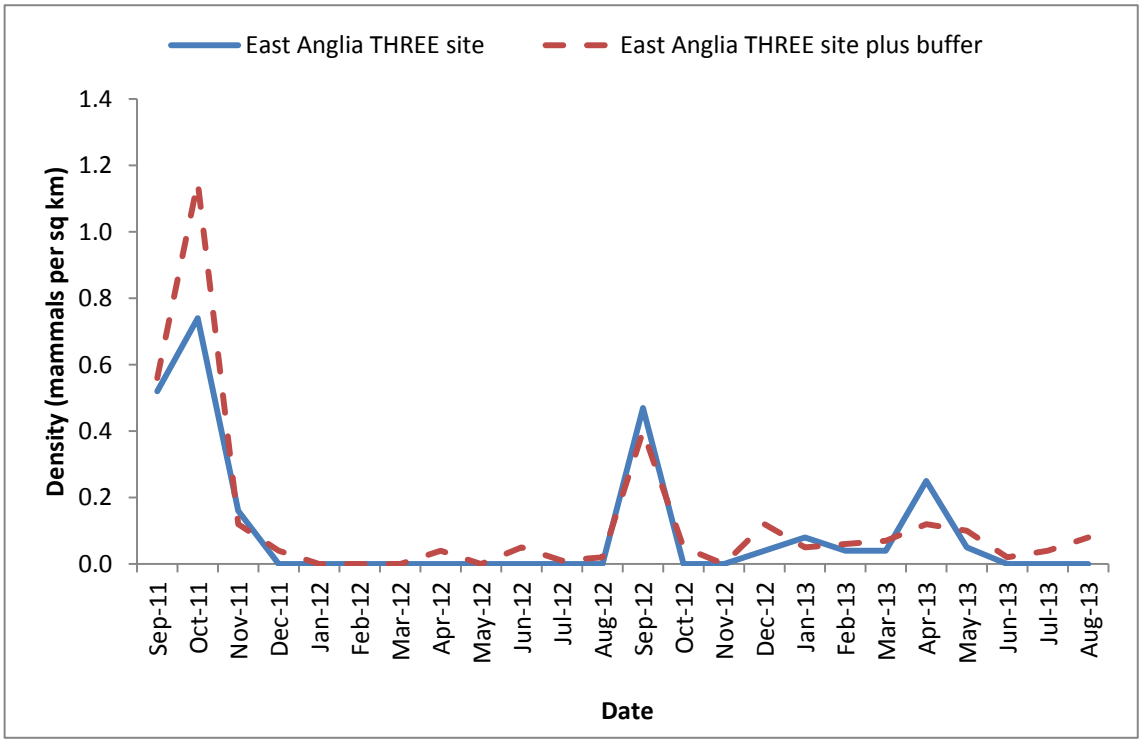

Figure A3.2 Harbour porpoise density estimates using all sightings with confidence limits for the East Anglia THREE site and East Anglia THREE site plus buffer.

East Anglia THREE site plus buffer

6. Peak density was 1.15 individuals km^{-2} in October 2011, the lowest density when individuals were recorded was 0.010 individuals km^{-2} in July 2012 (*Figure A3.2, Table A4.1*). When the buffer area was included, estimated densities recorded were slightly greater with a mean of 0.13 individuals per km^{2} across the full survey period (*Table A3.1*).

Table A3.1 Harbour porpoise mean densities across both survey years and for the total survey period. Densities are based on total counts which includes surfacing and submerged (but visible) individuals.

East Anglia THREE site		
	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.118	0.100
September 2012 to August 2013	0.081	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.166	0.129
September 2012 to August 2013	0.093	

Harbour porpoise and unidentified dolphin or porpoise

Abundance estimates

East Anglia THREE site

7. The count data for this group is effectively the sum of the counts provided individually for harbour porpoise and for unidentified dolphin or porpoise. To put the relative contribution of the two groups to the combined group into perspective, within the East Anglia THREE site a total of 49 individuals were recorded as harbour porpoise, and a total of 76 individuals were recorded as dolphin or porpoise.

8. The peak estimate of relative abundance was in October 2011 with 273 (CL 129-434) individuals. No individuals were recorded in July 2012 (*Figure A3.3, Table A4.2*). The mean abundance estimate across the survey period was 72.8 individuals.

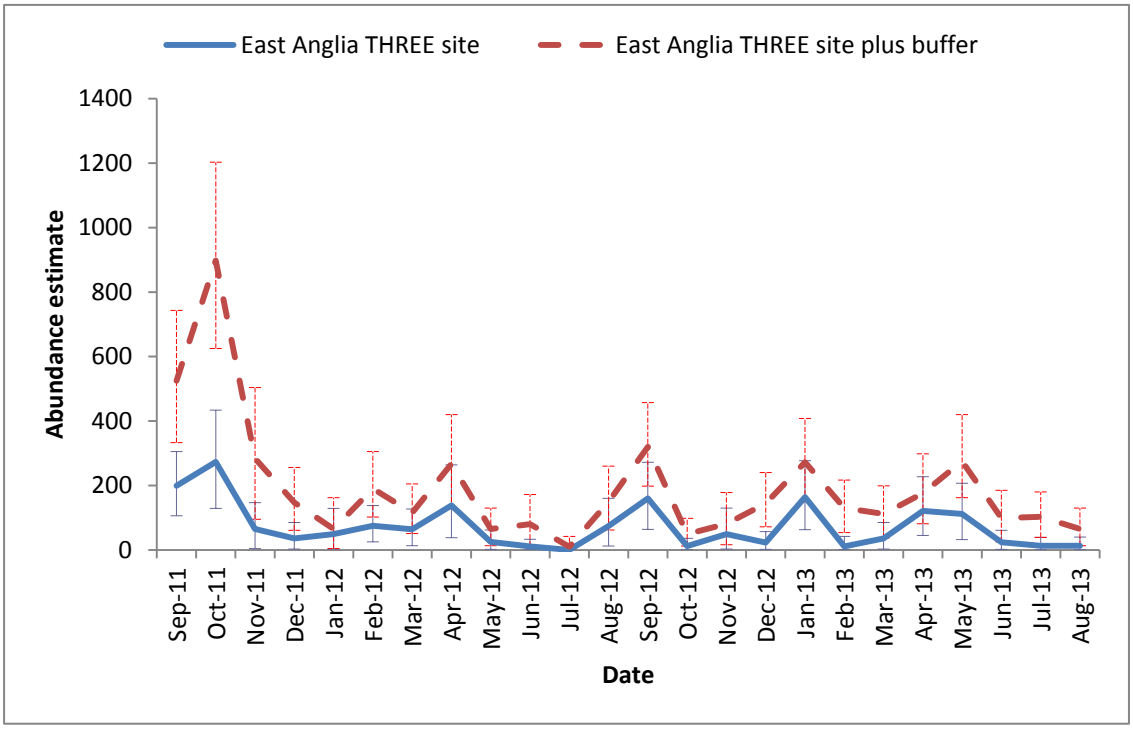

Figure A3.3 Total harbour porpoise and unidentified dolphin or porpoise monthly abundance estimates using all sightings with confidence limits for the East Anglia THREE site and East Anglia THREE site plus buffer.

East Anglia THREE site plus buffer

9. The peak abundance estimate was 898 (CL 625-1,203) individuals for October 2011 (*Figure A3.3, Table A4.2*) and the mean abundance estimate was 193 individuals km^{-2}.

Density estimates

East Anglia THREE site

10. Peak density was 0.90 individuals km^{-2} in October 2011, the lowest density when individuals were recorded was 0.040 individuals km^{-2} in June and October 2012, and February, July and August 2013 (*Figure A3.4, Table A4.2*). The mean density of this group within the East Anglia THREE site was 0.28 individuals km^{-2} during the first survey year (in comparison with the 0.12 individuals km^{-2} recorded for harbour porpoise), and for the second survey year was 0.20 individuals km^{-2} compared with the 0.08 individuals km^{-2} recorded for just harbour porpoise (*Table A3.1*). Mean density across the survey period was 0.24 individuals km^{-2}.

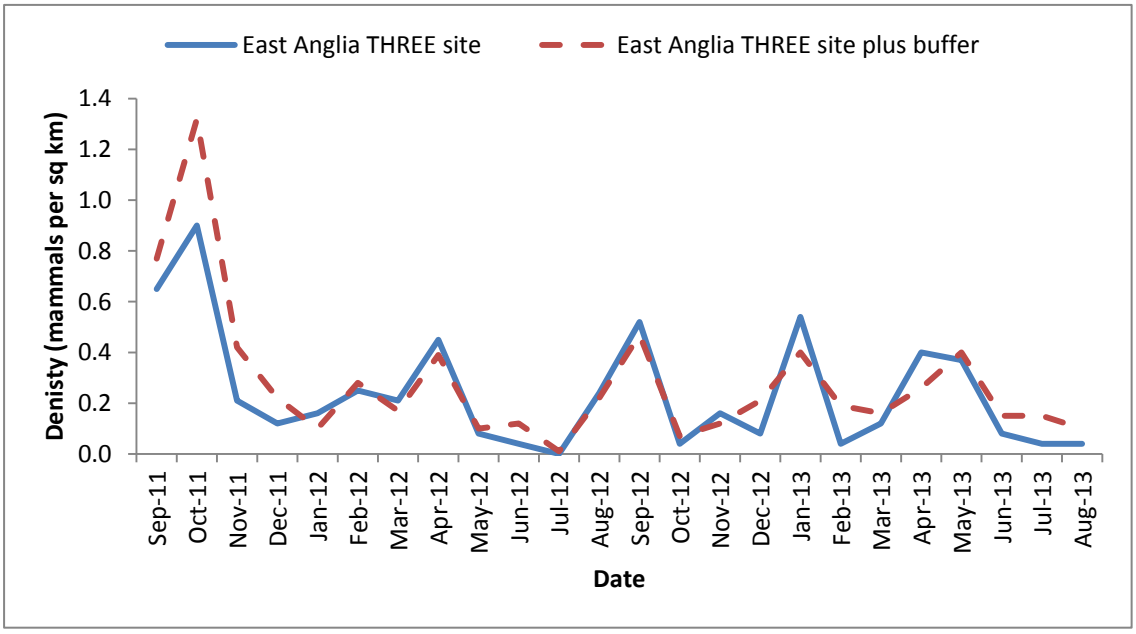

Figure A3.4 Total harbour porpoise and unidentified dolphin or porpoise density estimates using all sightings for the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

East Anglia THREE site plus buffer

11. Peak density was 1.32 individuals km^{-2} in October 2011, the lowest density was 0.01 individuals km^{-2} in July 2012 (*Figure A3.4, Table A4.2*). Mean density across the survey period was 0.28 individuals km^{-2} (*Table A3.2*).

Table A3.2 Harbour porpoise and unidentified dolphin or porpoise mean densities across both survey years and for the total survey period. Densities are based on total counts which includes surfacing and submerged (but visible) individuals.

East Anglia THREE site		
	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.276	0.239
September 2012 to August 2013	0.203	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.343	0.283
September 2012 to August 2013	0.223	

White-beaked dolphin

Abundance estimates

East Anglia THREE site

12. Only four individuals of this species were recorded in the East Anglia THREE site (all in January 2012) resulting in an abundance estimate of 65 (CL 4-194) individuals (*Figure A3.5, Table A4.3*). The mean abundance estimate across the survey period was 2.71 individuals.

East Anglia THREE site plus buffer

13. No additional individuals were recorded when the 4km buffer area was included (*Figure A3.5, Table A4.3*).

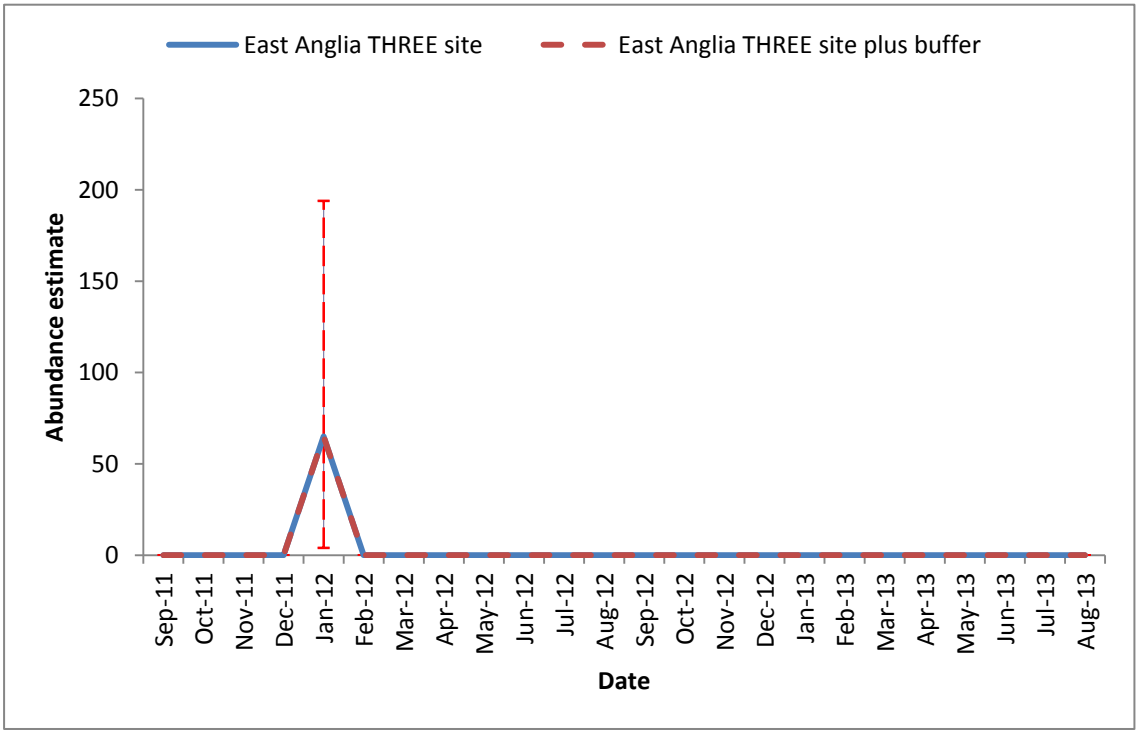

Figure A3.5 White-beaked dolphin monthly abundance estimates using all sightings with confidence limits the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

Density estimates

East Anglia THREE site

14. The density estimate for January 2012 was 0.21 individuals km^{-2} (*Figure A3.6, Table A4.3*). Mean density was 0.0088 individuals km^{-2} (*Table A3.3*).

East Anglia THREE site plus buffer

15. The density estimate for January 2012 was 0.10 individuals km^{-2} (*Figure A3.6, Table A4.3*). Mean density was 0.0042 individuals km^{-2} (*Table A3.3*).

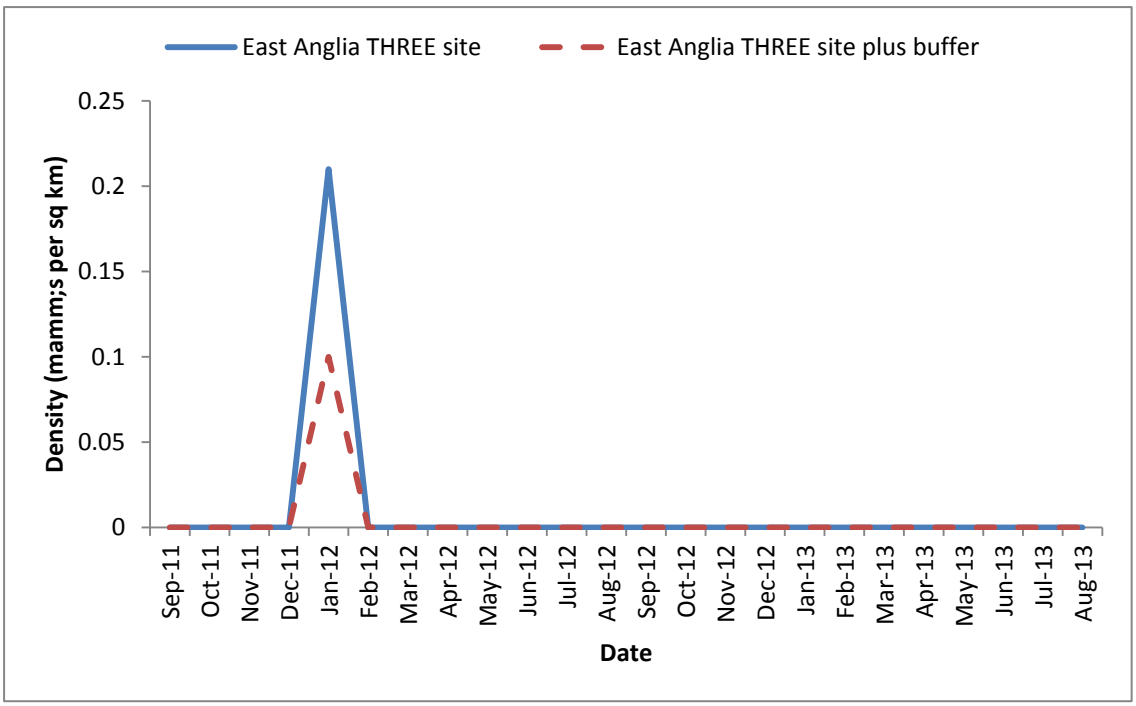

Figure A3.6 White-beaked dolphin density estimates using all sightings for the East Anglia THREE site and East Anglia THREE site plus 4km buffer.

Table A3.3.White-beaked dolphin mean densities across both survey years and for the total survey period. Densities are based on total counts, which includes; surfacing and submerged (but visible) individuals.

East Anglia THREE site		
	Density (individuals km^{-2})	
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.018	0.0088
September 2012 to August 2013	0	
East Anglia THREE site plus 4km buffer		
Survey Year	Survey Year	Total Survey Period
September 2011 to August 2012	0.0083	0.0042
September 2012 to August 2013	0	

APPENDIX 4: MARINE MAMMAL COUNTS (ALL SIGHTINGS), ABUNDANCE ESTIMATES AND DENSITY

Table A4.1 Harbour porpoise monthly counts, estimates, confidence limits and precision (using all sightings) for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (individuals km^{-2})
September 2011	12	159	66	265	0.29	0.520
October 2011	14	225	96	369	0.27	0.740
November 2011	3	49	3	130	0.58	0.160
December 2011	0	0	0	0	0.00	0.000
January 2012	0	0	0	0	0.00	0.000
February 2012	0	0	0	0	0.00	0.000
March 2012	0	0	0	0	0.00	0.000
April 2012	0	0	0	0	0.00	0.000
May 2012	0	0	0	0	0.00	0.000
June 2012	0	0	0	0	0.00	0.000
July 2012	0	0	0	0	0.00	0.000
August 2012	0	0	0	0	0.00	0.000
September 2012	9	144	64	240	0.33	0.470
October 2012	0	0	0	0	0.00	0.000
November 2012	0	0	0	0	0.00	0.000
December 2012	1	11	1	34	NaN	0.040
January 2013	2	25	2	63	0.71	0.080
February 2013	1	11	1	32	>1	0.040
March 2013	1	12	1	36	>1	0.040
April 2013	5	76	15	151	0.45	0.250
May 2013	1	16	1	48	>1	0.050
June 2013	0	0	0	0	0.00	0.000
July 2013	0	0	0	0	0.00	0.000
August 2013	0	0	0	0	0.00	0.000

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (individuals km^{-2})
September 2011	30	384	243	538	0.18	0.560
October 2011	49	786	545	1042	0.14	1.150
November 2011	5	79	5	189	0.45	0.120
December 2011	2	24	2	73	0.71	0.040
January 2012	0	0	0	0	0.00	0.000
February 2012	0	0	0	0	0.00	0.000
March 2012	0	0	0	0	0.00	0.000
April 2012	2	25	2	76	0.71	0.040
May 2012	0	0	0	0	0.00	0.000
June 2012	3	34	3	80	0.58	0.050
July 2012	1	10	1	31	>1	0.010
August 2012	1	12	1	37	>1	0.020
September 2012	18	274	152	396	0.23	0.400
October 2012	3	37	3	86	0.58	0.050
November 2012	0	0	0	0	0.00	0.000
December 2012	7	84	24	156	0.38	0.120
January 2013	3	37	3	86	0.58	0.050
February 2013	4	43	11	87	0.50	0.060
March 2013	4	50	12	112	0.50	0.070
April 2013	6	81	27	149	0.41	0.120
May 2013	4	65	16	129	0.50	0.100
June 2013	1	12	1	49	>1	0.020
July 2013	2	26	2	64	0.71	0.040
August 2013	4	52	13	104	0.50	0.080

Table A4.2 Harbour porpoise and unidentified dolphin or porpoise monthly counts, estimates, confidence limits and precision (using all sightings) for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (individuals km^{-2})
September 2011	15	199	106	305	0.26	0.650
October 2011	17	273	129	434	0.24	0.900
November 2011	4	65	4	147	0.50	0.210
December 2011	3	36	3	85	0.58	0.120
January 2012	3	49	3	129	0.58	0.160
February 2012	6	75	25	138	0.41	0.250
March 2012	5	64	13	127	0.45	0.210
April 2012	11	138	38	264	0.30	0.450
May 2012	2	25	2	62	0.71	0.080
June 2012	1	11	1	33	>1	0.040
July 2012	0	0	0	0	0.00	0.000
August 2012	6	74	12	160	0.41	0.240
September 2012	10	160	64	272	0.31	0.520
October 2012	1	12	1	36	>1	0.040
November 2012	3	49	3	130	0.58	0.160
December 2012	2	23	2	57	0.71	0.080
January 2013	13	164	63	277	0.28	0.540
February 2013	1	11	1	42	>1	0.040
March 2013	3	36	3	85	0.58	0.120
April 2013	8	121	45	227	0.35	0.400
May 2013	7	112	32	207	0.38	0.370
June 2013	2	24	2	61	0.71	0.080
July 2013	1	13	1	39	>1	0.040
August 2013	1	13	1	40	NA	0.040

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (individuals km^{-2})
September 2011	41	525	333	743	0.16	0.770
October 2011	56	898	625	1203	0.13	1.320
November 2011	18	284	95	504	0.24	0.420
December 2011	12	147	61	256	0.29	0.220
January 2012	4	65	4	162	0.50	0.100
February 2012	15	190	102	305	0.26	0.280
March 2012	9	115	51	205	0.33	0.170
April 2012	21	267	127	420	0.22	0.390
May 2012	5	65	13	130	0.45	0.100
June 2012	7	80	11	172	0.38	0.120
July 2012	1	10	1	42	>1	0.010
August 2012	12	149	62	260	0.29	0.220
September 2012	21	320	198	457	0.22	0.470
October 2012	4	49	12	98	0.50	0.070
November 2012	5	81	16	178	0.45	0.120
December 2012	12	144	72	240	0.29	0.210
January 2013	22	272	148	408	0.21	0.400
February 2013	12	130	54	217	0.29	0.190
March 2013	9	112	37	199	0.33	0.160
April 2013	13	176	81	298	0.28	0.260
May 2013	17	275	162	420	0.24	0.400
June 2013	8	99	25	185	0.35	0.150
July 2013	8	103	39	180	0.35	0.150
August 2013	5	65	13	130	0.45	0.100

Table A4.3 White-beaked dolphin monthly counts, estimates, confidence limits and precision (using all sightings) for the East Anglia THREE site and the East Anglia THREE site plus 4km buffer.

East Anglia THREE site						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (individuals km^{-2})
September 2011	0	0	0	0	N/A	0.00
October 2011	0	0	0	0	N/A	0.00
November 2011	0	0	0	0	N/A	0.00
December 2011	0	0	0	0	N/A	0.00
January 2012	4	65	4	194	0.5	0.210
February 2012	0	0	0	0	N/A	0.00
March 2012	0	0	0	0	N/A	0.00
April 2012	0	0	0	0	N/A	0.00
May 2012	0	0	0	0	N/A	0.00
June 2012	0	0	0	0	N/A	0.00
July 2012	0	0	0	0	N/A	0.00
August 2012	0	0	0	0	N/A	0.00
September 2012	0	0	0	0	N/A	0.00
October 2012	0	0	0	0	N/A	0.00
November 2012	0	0	0	0	N/A	0.00
December 2012	0	0	0	0	N/A	0.00
January 2013	0	0	0	0	N/A	0.00
February 2013	0	0	0	0	N/A	0.00
March 2013	0	0	0	0	N/A	0.00
April 2013	0	0	0	0	N/A	0.00
May 2013	0	0	0	0	N/A	0.00
June 2013	0	0	0	0	N/A	0.00
July 2013	0	0	0	0	N/A	0.00
August 2013	0	0	0	0	N/A	0.00

East Anglia THREE site plus 4km buffer						
Survey Month	Count	Abundance estimate	Lower confidence Limit	Upper Confidence Limit	Precision	Density (individuals km^{-2})
September 2011	0	0	0	0	N/A	0.00
October 2011	0	0	0	0	N/A	0.00
November 2011	0	0	0	0	N/A	0.00
December 2011	0	0	0	0	N/A	0.00
January 2012	4	65	4	194	0.50	0.10
February 2012	0	0	0	0	N/A	0.00
March 2012	0	0	0	0	N/A	0.00
April 2012	0	0	0	0	N/A	0.00
May 2012	0	0	0	0	N/A	0.00
June 2012	0	0	0	0	N/A	0.00
July 2012	0	0	0	0	N/A	0.00
August 2012	0	0	0	0	N/A	0.00
September 2012	0	0	0	0	N/A	0.00
October 2012	0	0	0	0	N/A	0.00
November 2012	0	0	0	0	N/A	0.00
December 2012	0	0	0	0	N/A	0.00
January 2013	0	0	0	0	N/A	0.00
February 2013	0	0	0	0	N/A	0.00
March 2013	0	0	0	0	N/A	0.00
April 2013	0	0	0	0	N/A	0.00
May 2013	0	0	0	0	N/A	0.00
June 2013	0	0	0	0	N/A	0.00
July 2013	0	0	0	0	N/A	0.00
August 2013	0	0	0	0	N/A	0.00

APPENDIX 5: ALL SIGHTINGS BY SURVEY MONTH

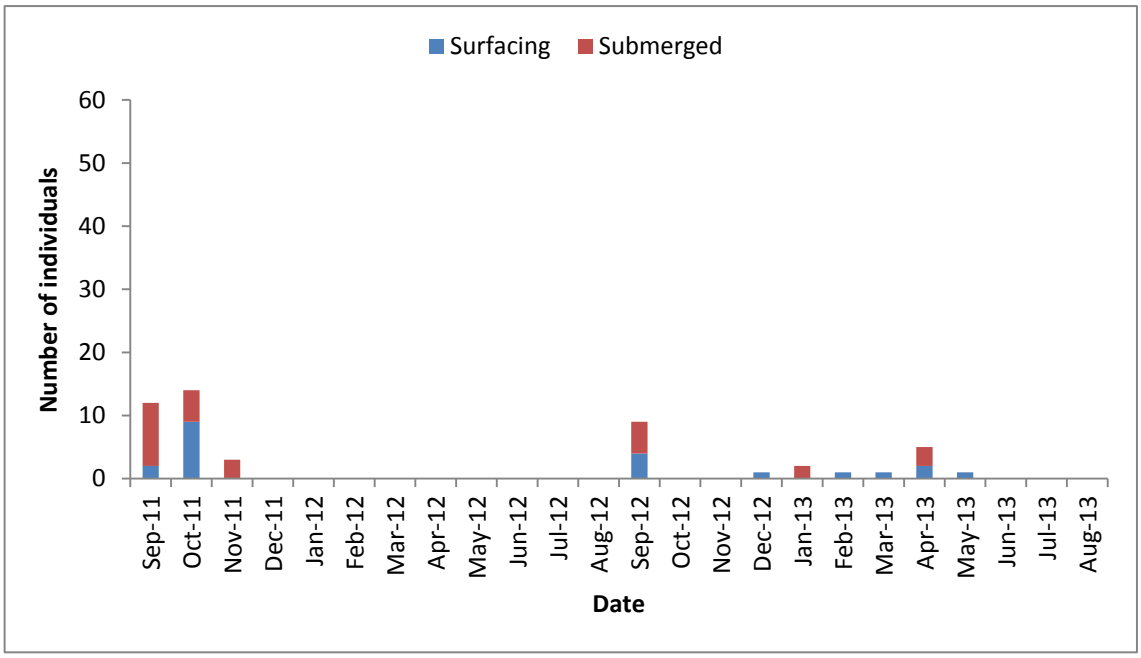

Figure A5.1 East Anglia THREE site. Harbour porpoise: Number of surfacing or submerged (but visible) individuals.

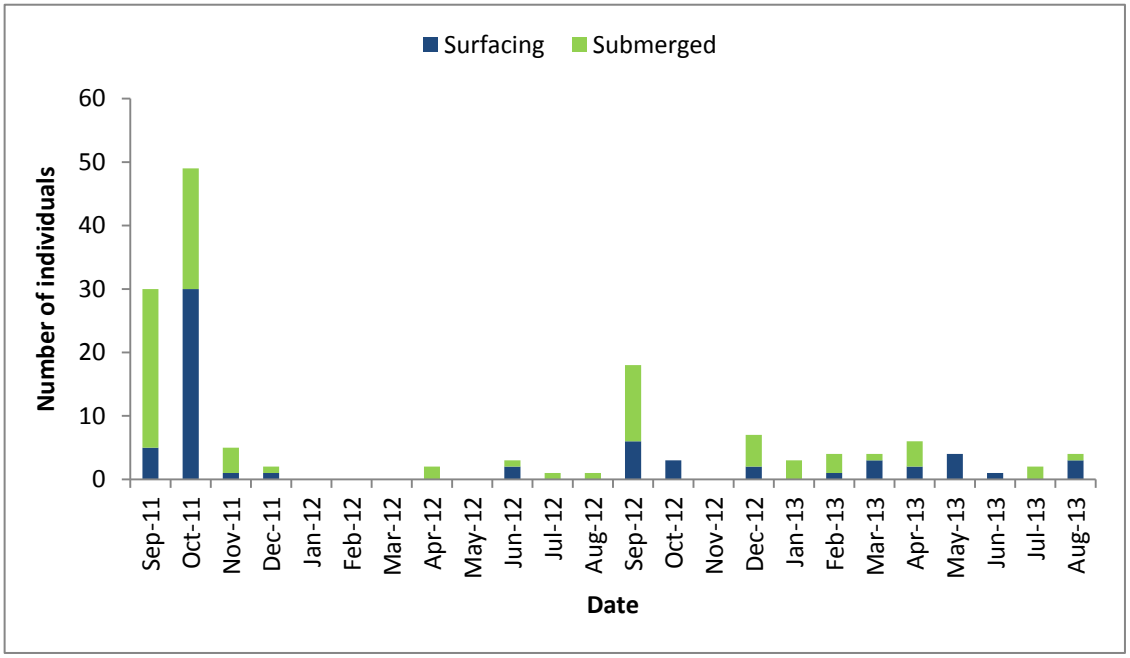

Figure A5.2 East Anglia THREE site plus buffer. Harbour porpoise: Number of surfacing or submerged (but visible) individuals.

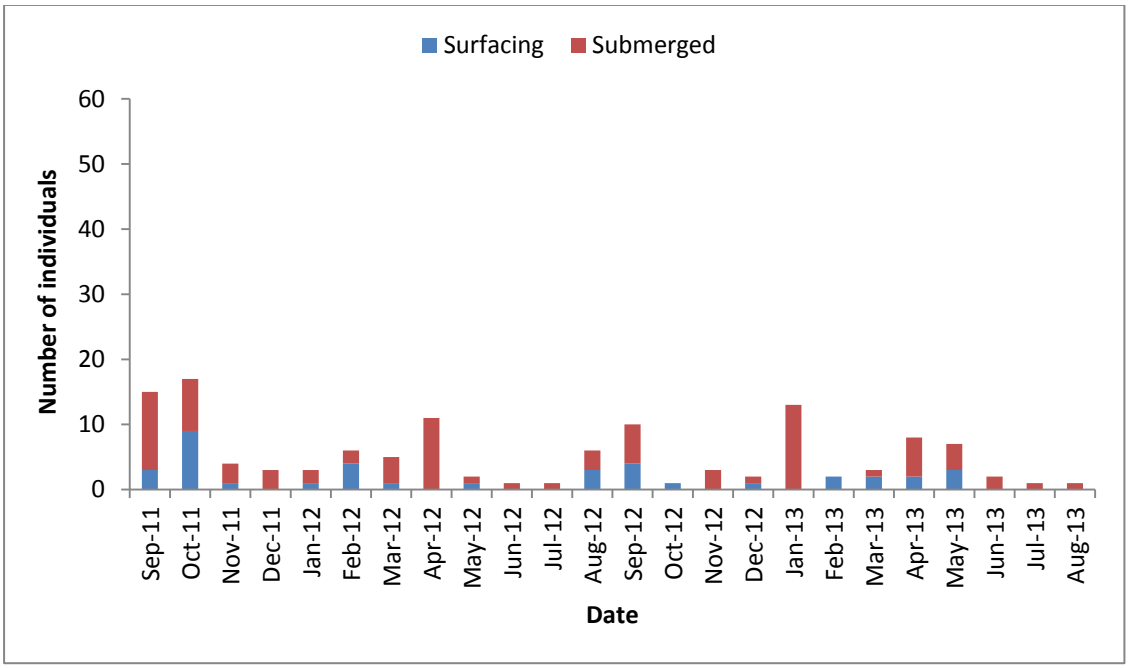

Figure A5.3 East Anglia THREE site. Harbour porpoise and unidentified dolphin or porpoise: Number of surfacing or submerged (but visible) individuals.

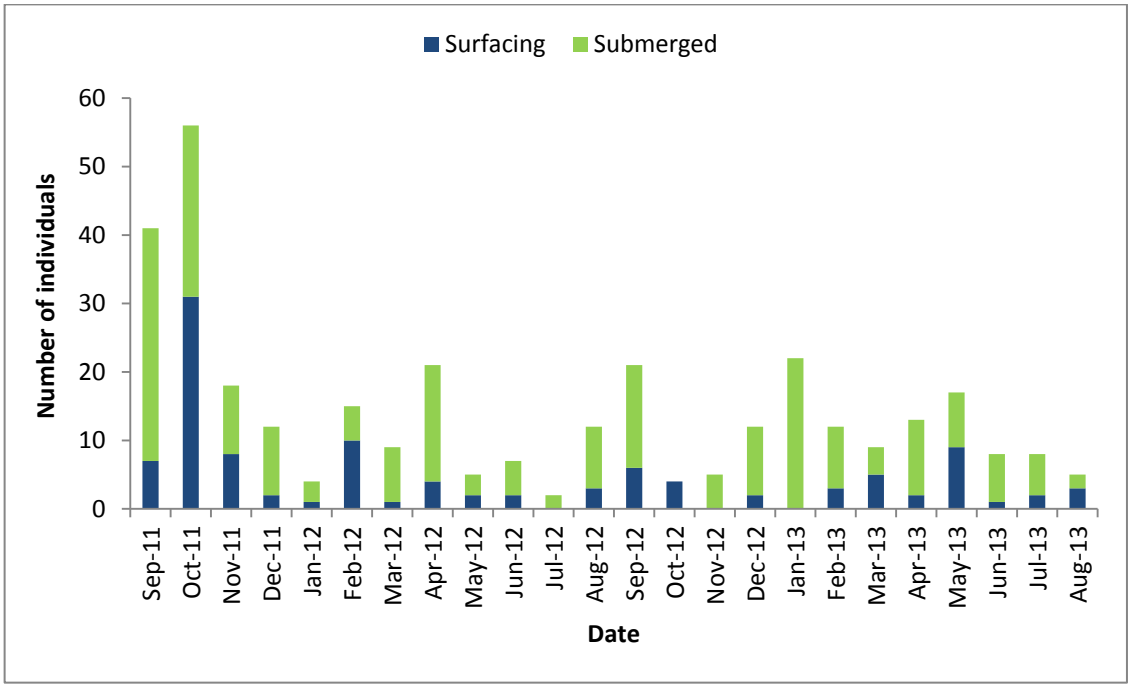

Figure A5.4 East Anglia THREE site plus buffer. Harbour porpoise and unidentified dolphin or porpoise: Number of surfacing or submerged (but visible) individuals.

APPENDIX 6: MAPS OF MARINE MAMMAL DISTRIBUTION

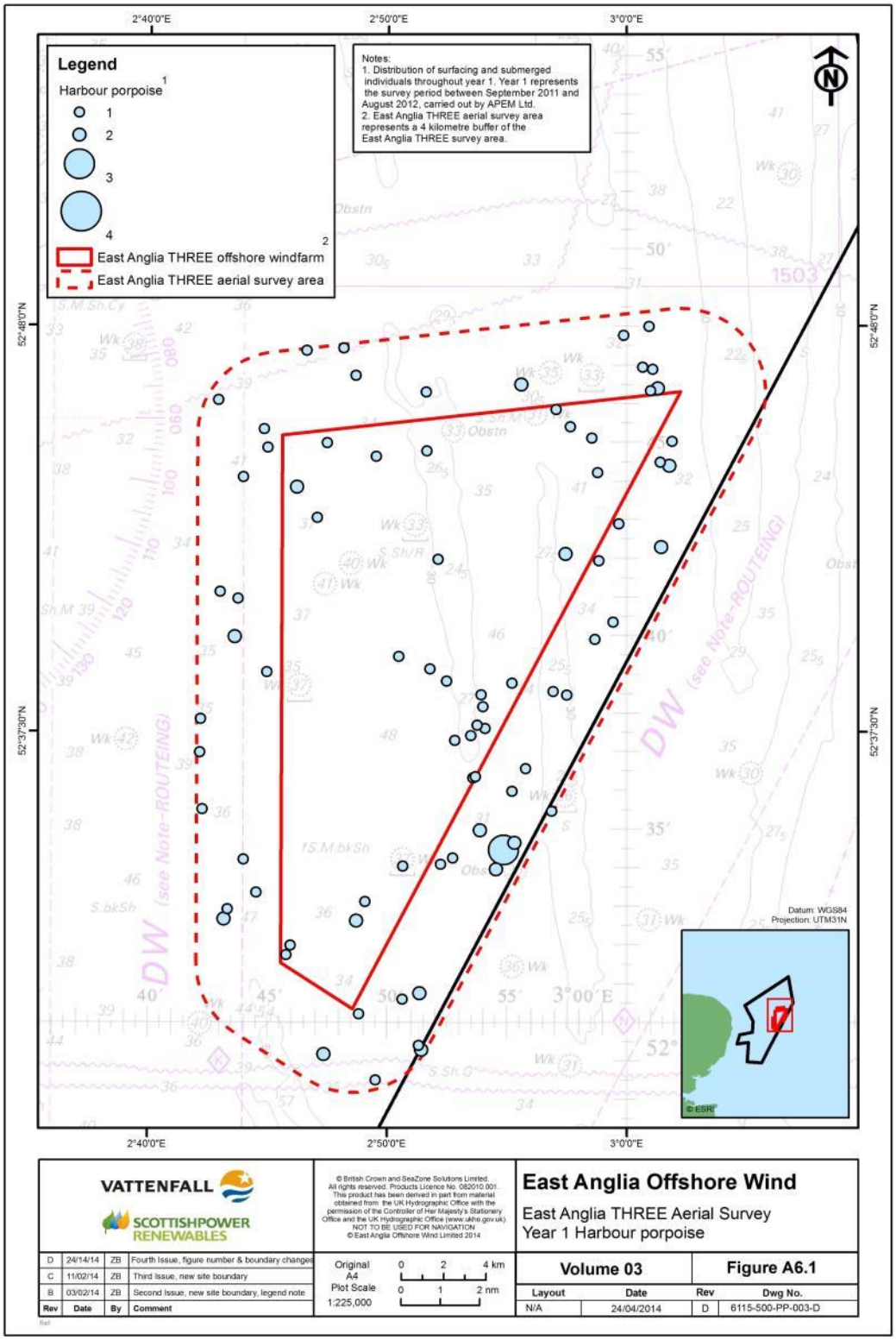

Figure A6.1 Harbour porpoise distribution. Summed counts of surfacing and submerged (but visible) individuals across the East Anglia THREE site and its 4km buffer for Survey Year 1.

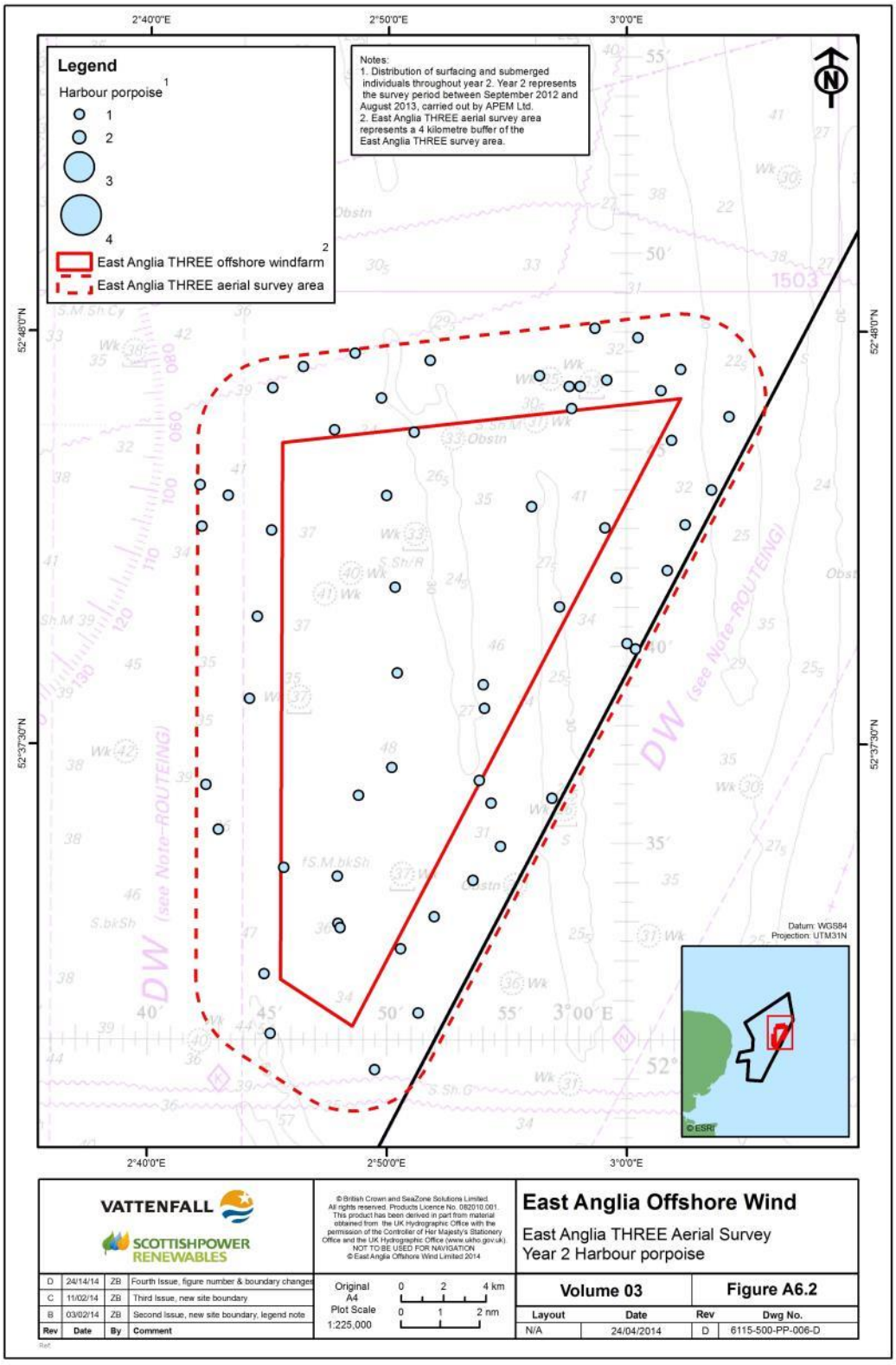

Figure A6.2 Harbour porpoise distribution. Summed counts of surfacing and submerged (but visible) individuals across the East Anglia THREE site and its 4km buffer for Survey Year 2.

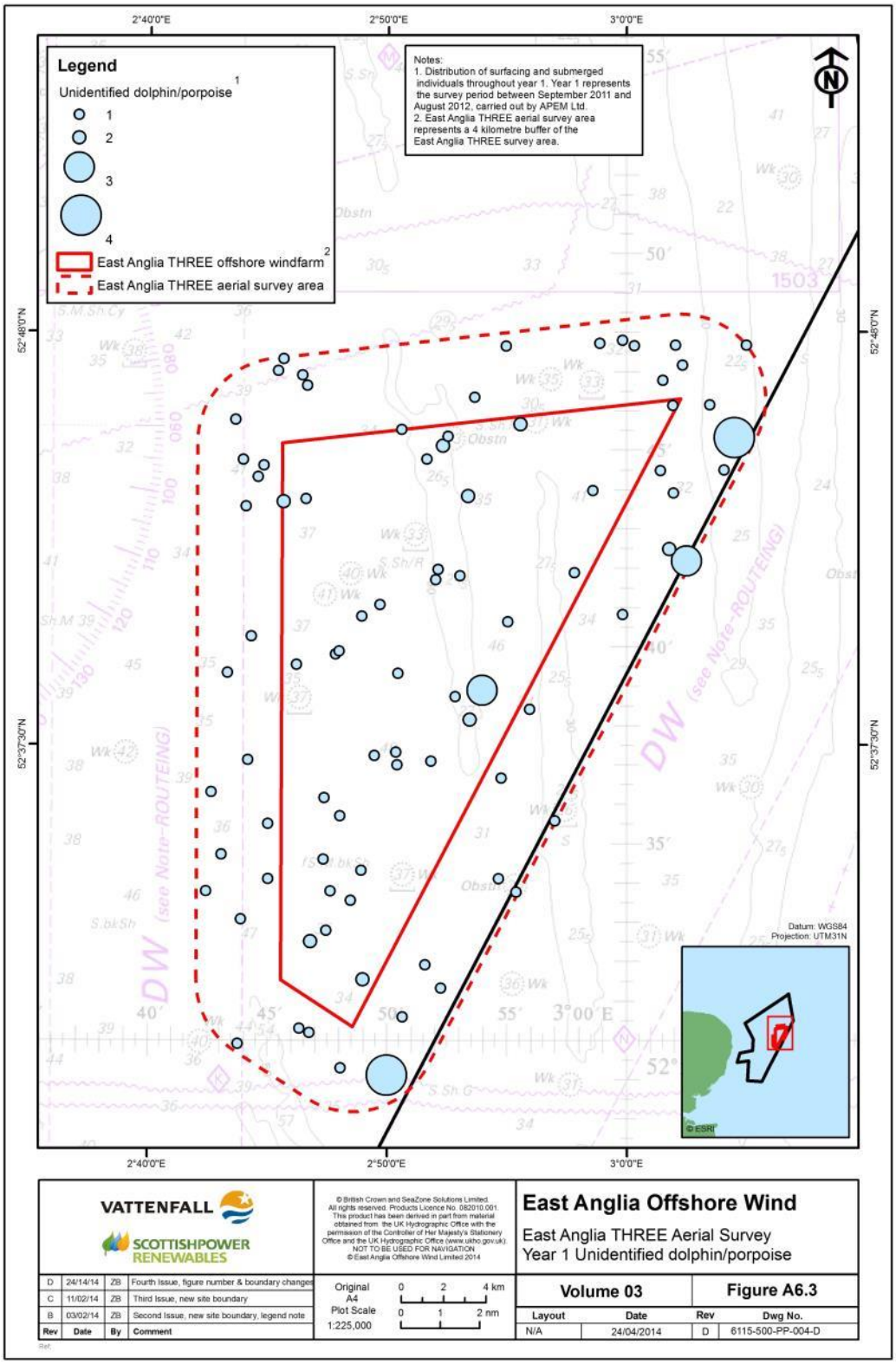

Figure A6.3 Unidentified dolphin or porpoise distribution. Summed counts of surfacing and submerged (but visible) individuals across the East Anglia THREE site and its 4km buffer for Survey Year 1.

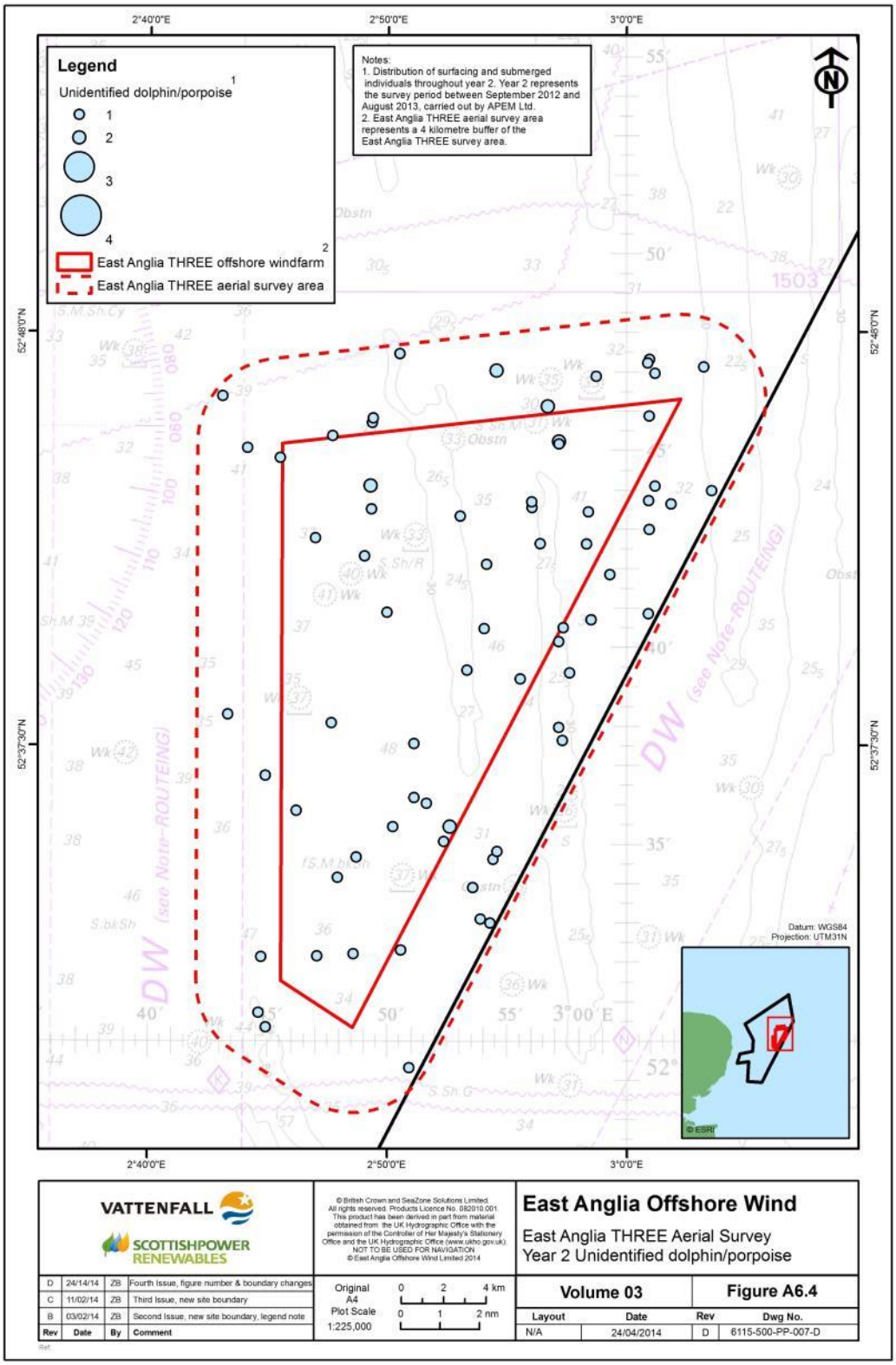

Figure A6.4 Unidentified dolphin or porpoise distribution. Summed counts of surfacing and submerged (but visible) individuals across the East Anglia THREE site and its 4km buffer for Survey Year 2.

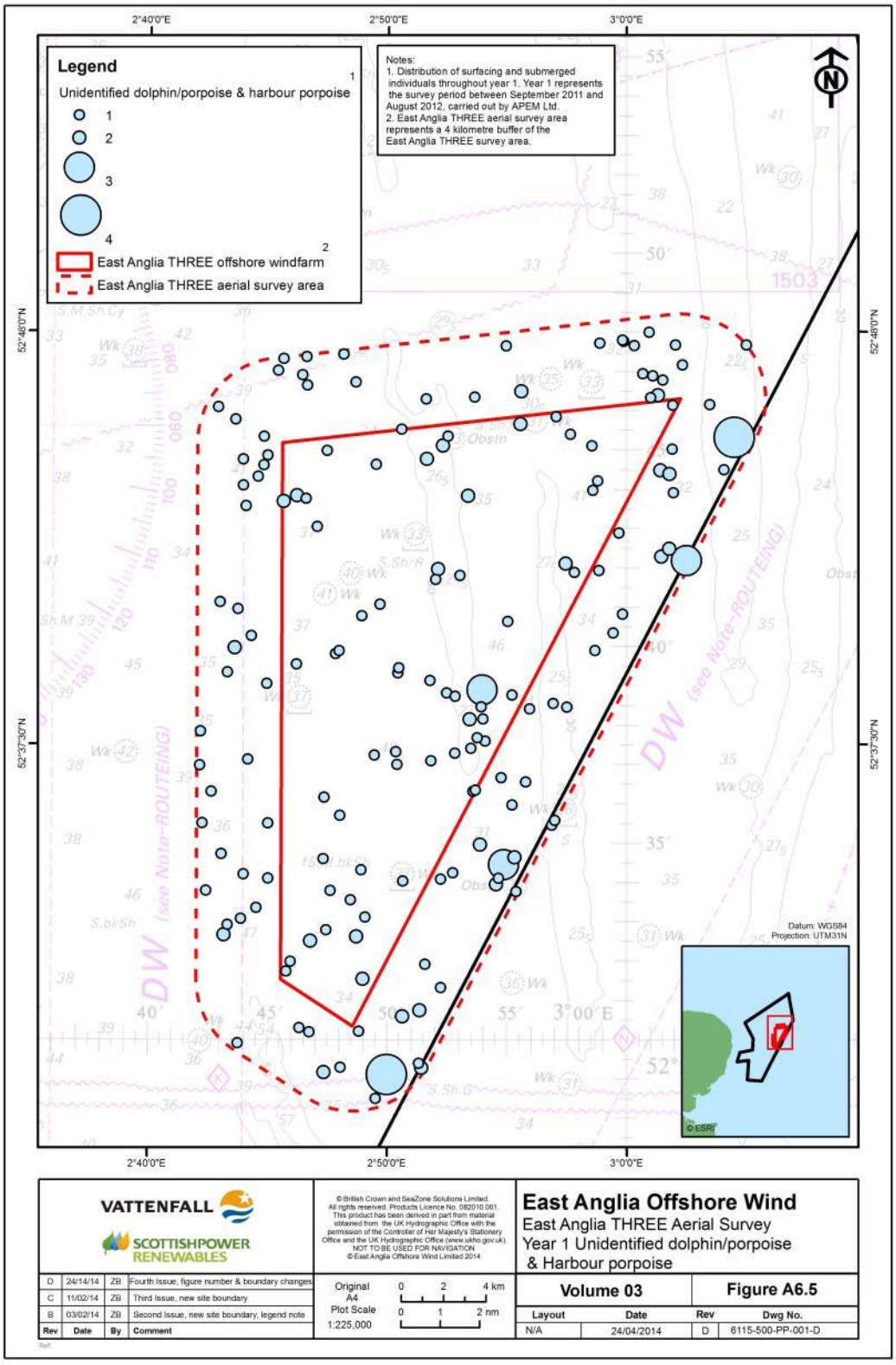

Figure A6.5 Harbour porpoise and unidentified dolphin or porpoise distribution. Summed counts of surfacing and submerged (but visible) individuals across the East Anglia THREE site and its 4km buffer for Survey Year 1.

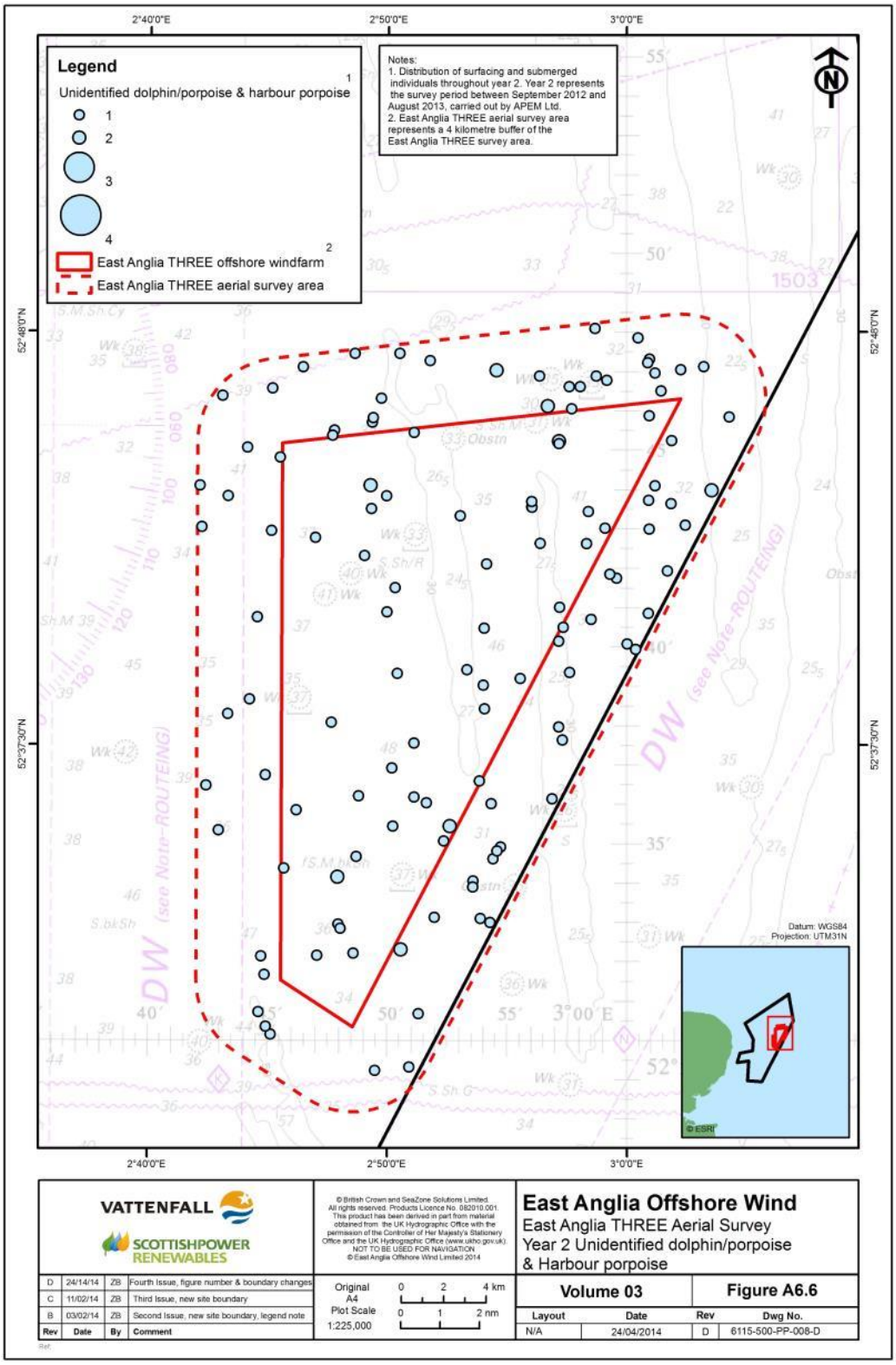

Figure A6.6 Harbour porpoise and unidentified dolphin or porpoise distribution. Summed counts of surfacing and submerged (but visible) individuals across the East Anglia THREE site and its 4km buffer for Survey Year 2.

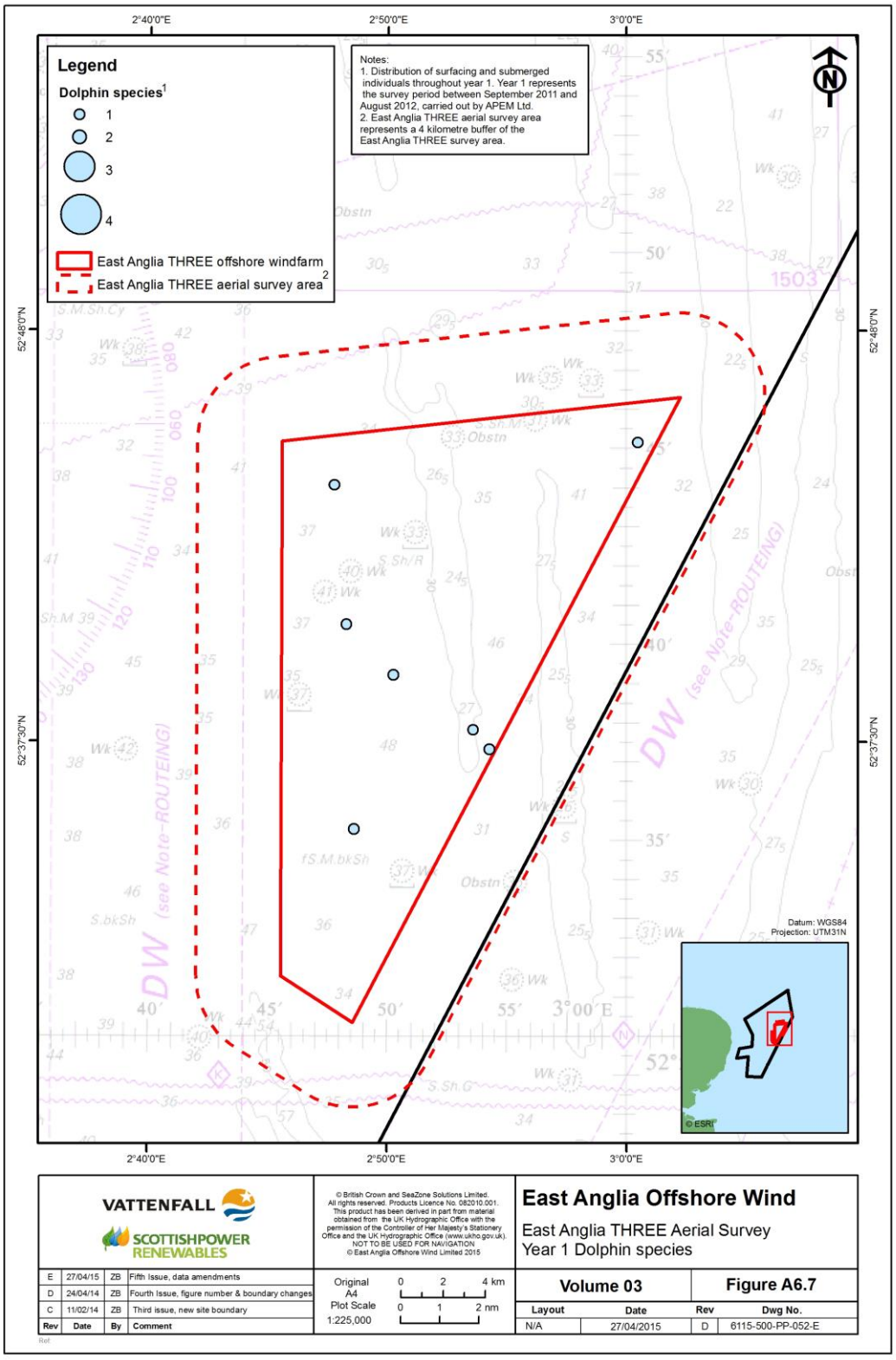

Figure A6.7 Unidentified dolphin species distribution. Summed counts of surfacing and submerged (but visible) individuals across the East Anglia THREE site and its 4km buffer for Survey Year 1.

Appendix 12.2 ends