



Inner Thames Estuary Feasibility Study

*Response to Airports Commission Call for Evidence*

**The Mayor of London's Submission:  
Supporting technical documents**

**23 May 2014**

Title: Ecology Desk Study Part B: Marine and Coastal Baseline (2013)

Author: ABP Marine Environmental Research Ltd

Purpose of paper:

To present the baseline description of the marine ecology of the study area which includes, Thames, Medway, Swale, Crouch and Roach estuaries as well as open coastline.

**Key messages:**

- Produced in 2013 to support the Mayor of London's submissions to the Airports Commission: Outline proposals for long term aviation capacity.



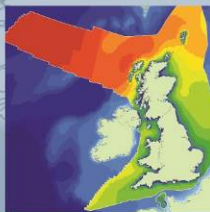
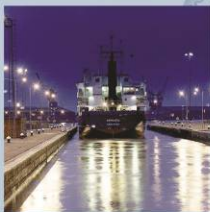
Atkins

## Hub for London Ecology Desk Study Part B: Marine and Coastal Baseline

Report R.2130

August 2013

Creating sustainable solutions for the marine environment



Atkins Global

## Hub for London Ecology Desk Study Part B: Marine and Coastal Baseline




Date: June 2013

Project Ref: R/4155/1

Report No: R.2130

© ABP Marine Environmental Research Ltd

Version	Details of Change	Date
1.0	Draft for Comment	31.05.2013
2.0	2 <sup>nd</sup> Draft for Comment	21.06.2013
3.0	Final	20.08.2013

Document Authorisation		Signature	Date
Project Manager:	N J Frost		20.08.2013
Quality Manager:	C R Scott		20.08.2013
Project Director:	S C Hull		20.08.2013

### ABP Marine Environmental Research Ltd

Quayside Suite, Medina Chambers, Town Quay, Southampton, Hampshire SO14 2AQ

Tel: +44 (0) 23 8071 1840

Web: [www.abpmer.co.uk](http://www.abpmer.co.uk)

Fax: +44 (0) 23 8071 1841

Email: [enquiries@abpmer.co.uk](mailto:enquiries@abpmer.co.uk)

ABPmer is certified by:



**Disclaimer:**

- *Any 'Draft' issue of this report, and any information contained therein, may be subject to updates and clarifications on the basis of any review comments before 'Final' issue. All content should therefore be considered provisional, and should not be disclosed to third parties without seeking prior clarification from ABP Marine Environmental Research Ltd ("ABPmer") of the suitability of the information for the intended disclosure and should not be relied upon by the addressee or any other person.*
- *Unless previously agreed between the addressee and ABPmer, in writing, the 'Final' issue of this report can be relied on by the addressee only. ABPmer accepts no liability for the use by or reliance on this report or any of the results or methods presented in this report by any party that is not the addressee of the report. In the event the addressee discloses the report to any third party, the addressee shall make such third party aware that ABPmer shall not be liable to such third party in relation to the contents of the report and shall indemnify ABPmer in the event that ABPmer suffers any loss or damage as a result of the addressee failing to make such third party so aware.*
- *Sections of this report rely on data supplied by or drawn from third party sources. Unless previously agreed between the addressee and ABPmer, in writing, ABPmer accepts no liability for loss or damage suffered by the addressee or any third party as a result of any reliance on third party data contained in the report or on any conclusions drawn by ABPmer which are based on such third party data.*

# Figures

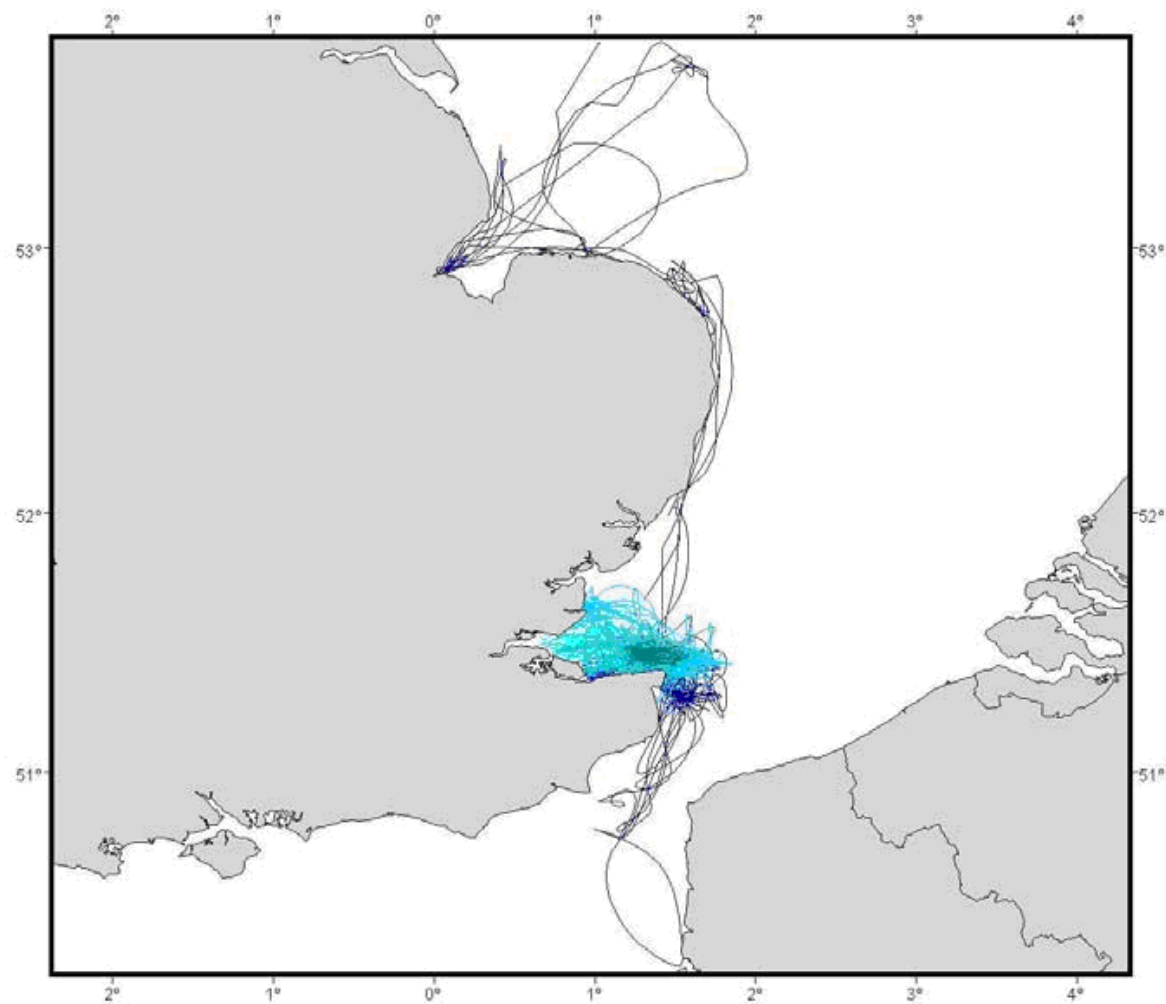
Figures 18 to 36 only in this document  
See separate document for Figures 1 to 17

## Figures

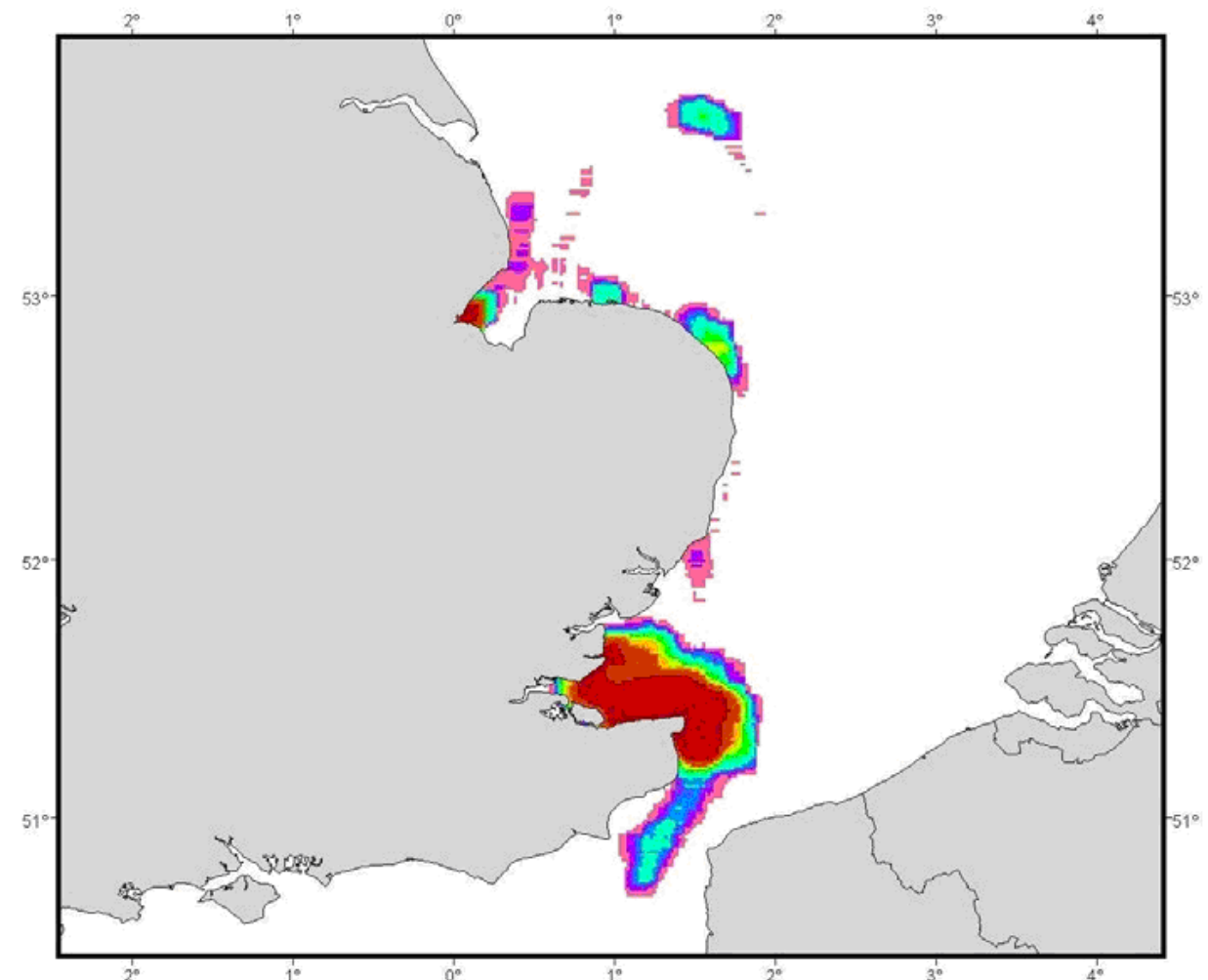
1. Study Area and Possible Airport Locations
2. International Designations
3. National designations
4. Subdivisions of the Study Area Used to Describe the Intertidal and Subtidal Benthic Habitats and Species
5. Intertidal Habitat Map
6. Benthic Invertebrate Assemblages Within the Study Area
7. Subtidal Habitat Map (EUSeaMap and MESH)
8. Subtidal Benthic Assemblage
9. Spawning Grounds for Cod, Dover Sole and Sandeel in the Thames Estuary and Southern North Sea
10. Nursery Grounds for Cod, Herring, Mackerel, Plaice and Whiting in the Thames Estuary and Southern North Sea
11. Nursery Grounds for Dover Sole and Thornback Ray in the Thames Estuary and Southern North Sea
12. Fish Species Abundance – Demersal Gadoids
13. Fish Species Abundance – Demersal Flatfish
14. Fish Species Abundance – Demersal Other
15. Fish Species Abundance – Pelagics
16. Fish Species Abundance - Elasmobranchs
17. Designated Shellfish Waters in the Thames Estuary
18. Seal Movement in the Outer Thames Estuary
19. Regional Distribution of Pinnipeds from 2004 – 2006 Aerial Surveys
20. Common and Grey Seals Recorded on the Sandbanks During August 2010
21. Common Seal Sightings on the Tidal Thames (Teddington - Southend): June '04 - June '07
22. Grey Seal Sightings on the Tidal Thames (Teddington - Southend): June '04 - June '07
23. Regional Distribution of Ceteceans from 2004 – 2006 Aerial Surveys
24. Porpoise Sightings on the Tidal Thames (Teddington - Southend): June '04 - June '07
25. Dolphin Sightings on the Tidal Thames (Teddington - Southend): June '04 - June '07
26. Distribution of Auks Recorded During Aerial Surveys in Summer 2005-2006
27. Distribution of Gulls Recorded During Aerial Surveys in Summer 2005-2006
28. Distribution of Kittiwakes Recorded During Aerial Surveys in Summer 2005-2006
29. Distribution of Terns Recorded During Aerial Surveys in Summer 2005-2006
30. Distribution of Auks Recorded During Aerial Surveys in Winter 04/05 – 07/08
31. Distribution of Gulls Recorded During Aerial Surveys in Winter 04/05 – 07/08
32. Distribution of Kittiwakes Recorded During Aerial Surveys in Winter 04/05 – 07/08
33. a) Size and Location of Flocks of Common Scoters Counted During Aerial Surveys of the Greater Thames (A - D)  
b) Size and Location of Flocks of Common Scoters Counted During Aerial Surveys of the Greater Thames (E - H)  
c) Size and Location of Flocks of Common Scoters Counted During Aerial Surveys of the Greater Thames (I)
34. a) Size and Location of Flocks of All Diver Species Counted During Aerial Surveys of the Greater Thames (A - D)  
b) Size and Location of Flocks of All Diver Species Counted During Aerial Surveys of the Greater Thames (E - H)

- c) Size and Location of Flocks of All Diver Species Counted During Aerial Surveys of the Greater Thames (I - L)
  - d) Size and Location of Flocks of All Diver Species Counted During Aerial Surveys of the Greater Thames (M - P)
  - e) Size and Location of Flocks of All Diver Species Counted During Aerial Surveys of the Greater Thames (Q - S)
35. Size and Location of Flocks of all Grebes Counted During Aerial Surveys of the Greater Thames
36. Mean Distribution of Red-throated Divers in the Outer Thames Estuary





Individual filtered tracks of all harbour seals captured in the Outer Thames.  
(Gallop Wind Farm Limited, 2011)




Density of 'at sea' surface densities per 100 m2 from nine seals tagged in the Outer Thames Estuary.  
(Gallop Wind Farm Limited, 2011)



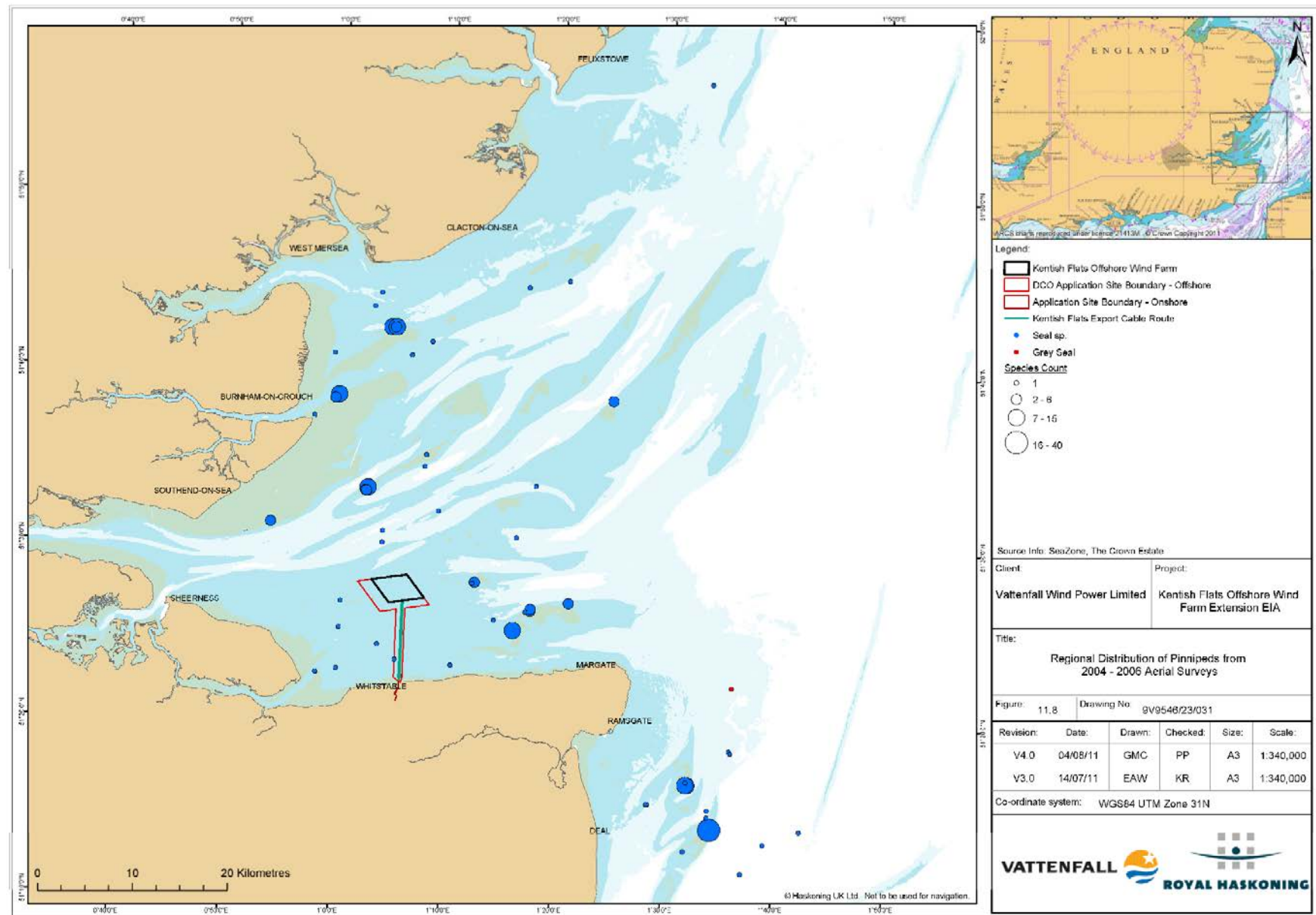
Seal movement in the Thames Estuary (ZSL, 2013)

Date	By	Size	Version
May 13	NMW	A3	1
Projection		WGS 84	
Scale			
QA		FMM	
4155 - Fig18_Seal_Tracks.mxd			
Produced by ABPmer			
© ABPmer, All rights reserved, 2013			

A map of the United Kingdom, including Great Britain and Ireland, colored in light green. A red rectangular box is drawn on the southern coast of England, indicating the specific geographic area covered by the data presented in the table.


Seal Movement in the  
Outer Thames Estuary

Figure 18



Taken from:  
 Kentish Flats Offshore Wind Farm  
 Extension - Environmental Statement  
 Section 11: Marine Mammals  
 Vattenfall, 2011  
 Figure 11.8, Page 28

Date	By	Size	Version
May13	NMW	A4	1
Coordinate System		WGS 1984	
Projection		Transverse Mercator	
Scale		n/a	
QA		FMM	
Fig19_Pinnipeds_04_06.mxd			
Produced by ABPmer			

A map of the British Isles, including Great Britain and Ireland. The landmasses are colored green, and the surrounding waters are light blue. A small red square is located on the southwestern coast of England, indicating the specific geographic area covered by the data presented in the table.

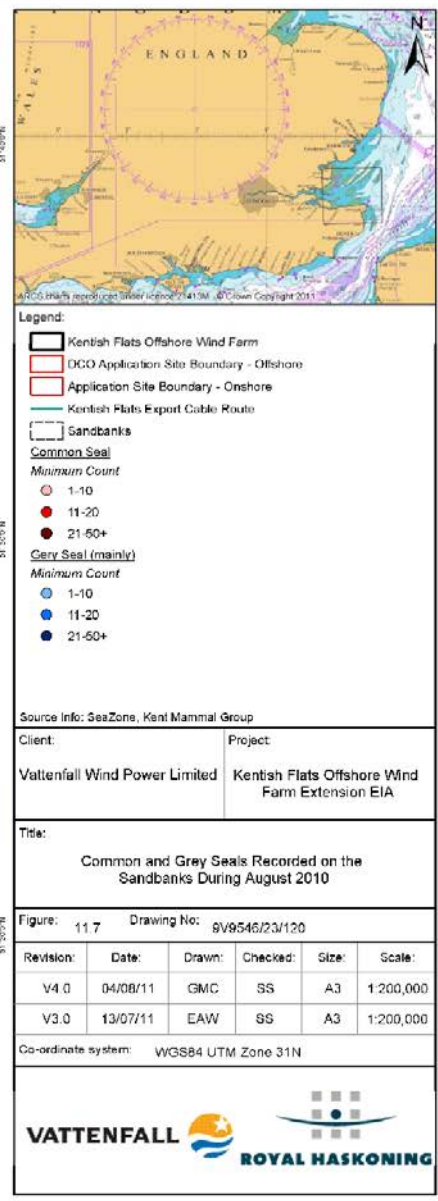
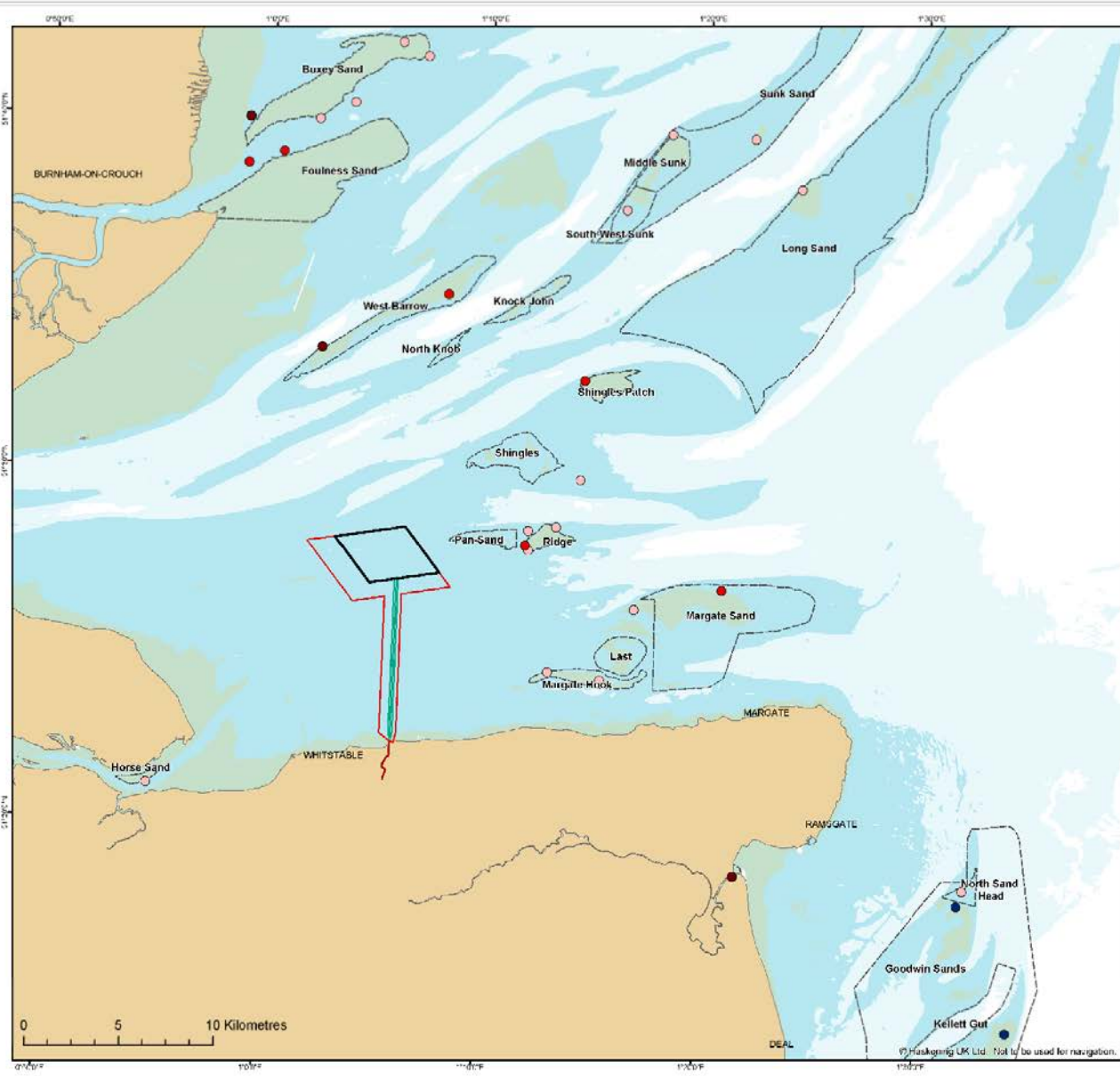
© ABPmer, All rights reserved, 2013



Regional Distribution of  
 Pinnipeds from 2004 - 2006  
 Aerial Surveys

Figure 19





Taken from:  
 Kentish Flats Offshore Wind Farm  
 Extension - Environmental Statement  
 Section 11: Marine Mammals  
 Vattenfall, 2011  
 Figure 11.7, Page 26

Date	By	Size	Version
May 13	NMW	A4	1
Coordinate System		WGS84	
Projection		UTM Zone 31N	
Scale		n/a	
QA		FMM	
Fig20_Seals_Sandbanks.mxd			
Produced by ABPmer			

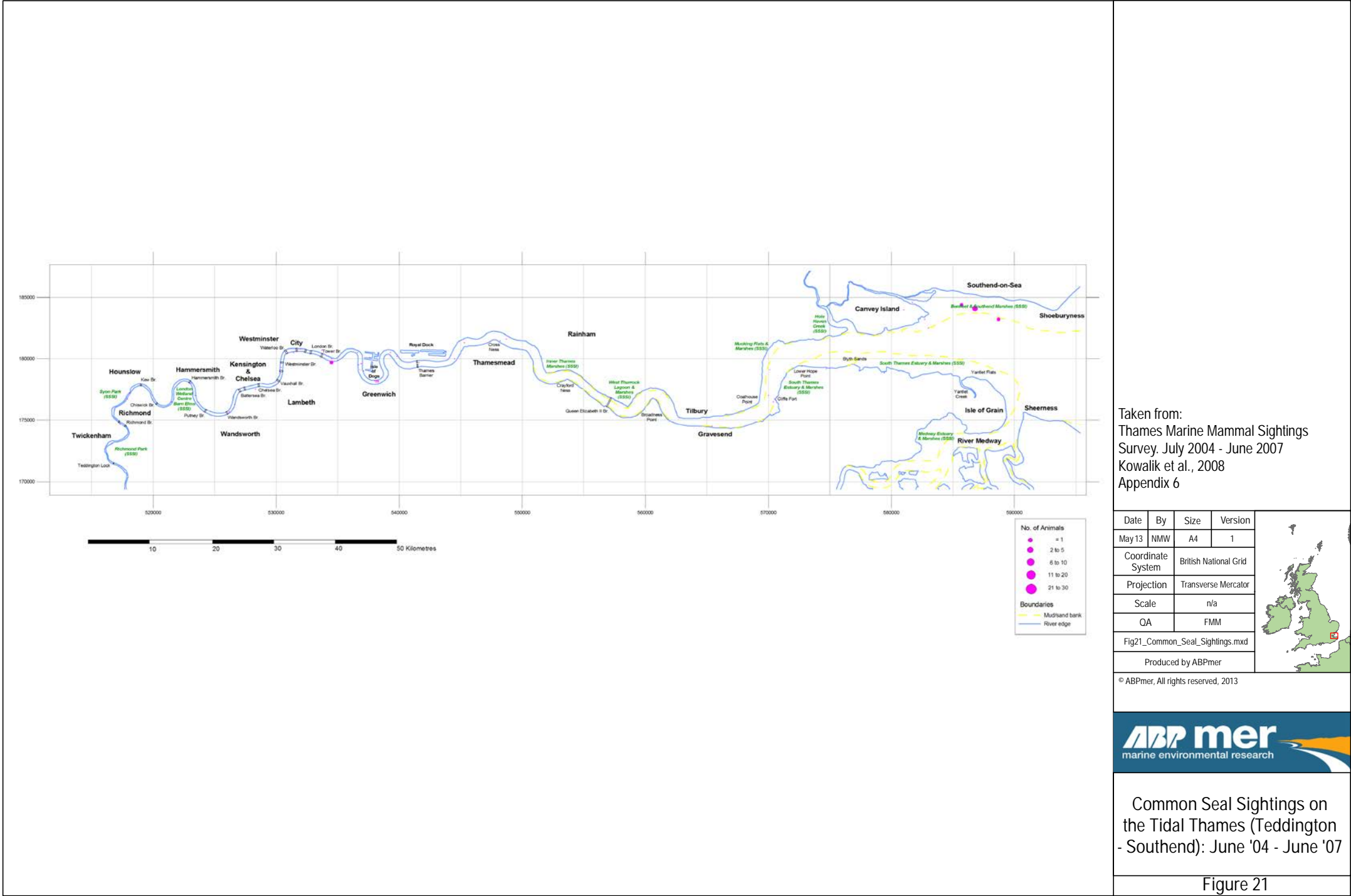


© ABPmer, All rights reserved, 2013




Common and Grey Seals  
 Recorded on the Sandbanks  
 During August 2010

Figure 20



Taken from:  
Thames Marine Mammal Sightings  
Survey, July 2004 - June 2007  
Kowalik et al., 2008  
Appendix 6

Date	By	Size	Version
May 13	NMW	A4	1
Coordinate System	British National Grid		
Projection	Transverse Mercator		
Scale	n/a		
QA	FMM		
Fig21_Common_Seal_Sightings.mxd			
Produced by ABPmer			

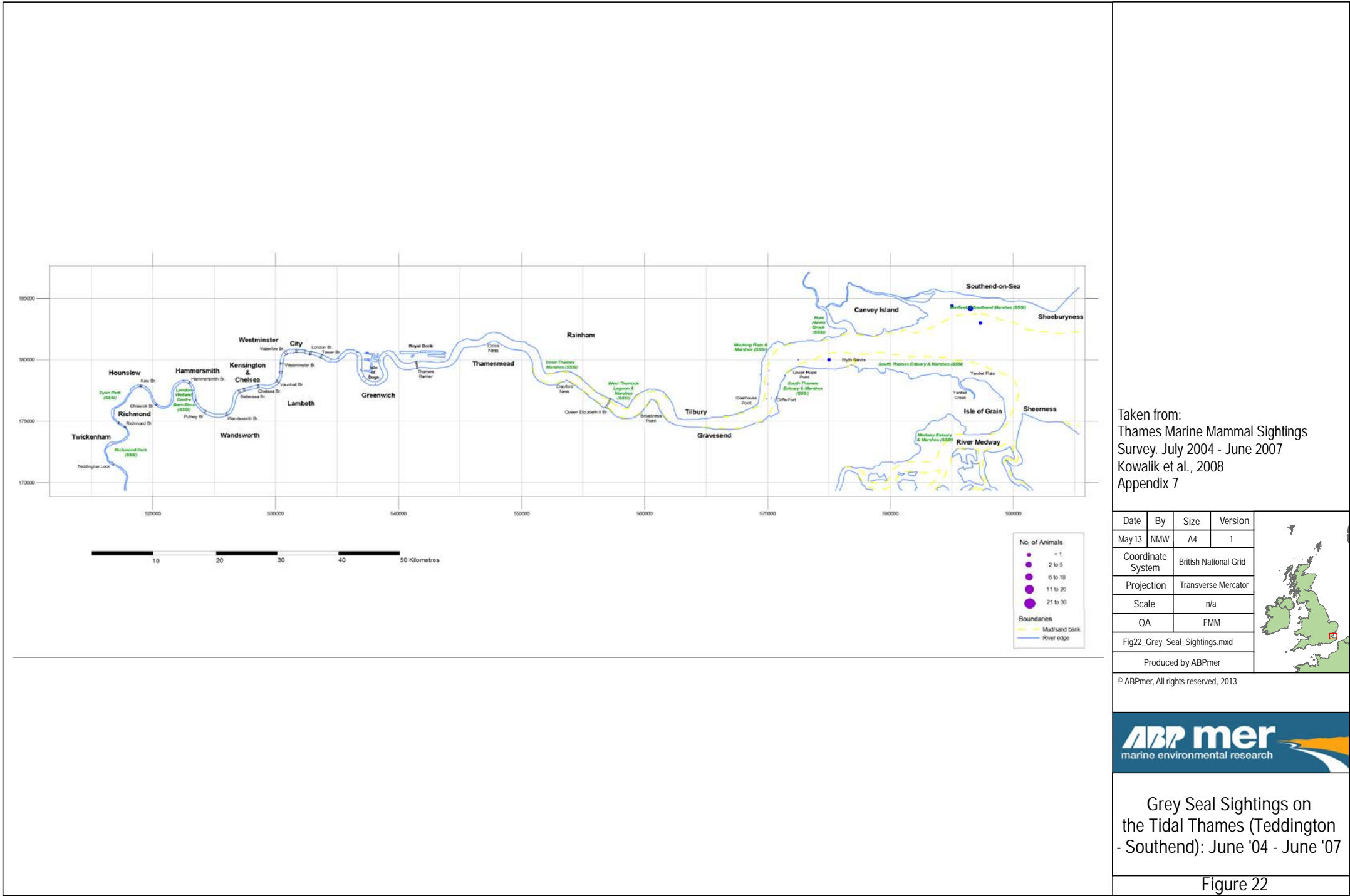
A map of the British Isles, including Great Britain and Ireland, is shown in green. A small red rectangle is located on the southern coast of England, indicating the specific area of interest for the survey.

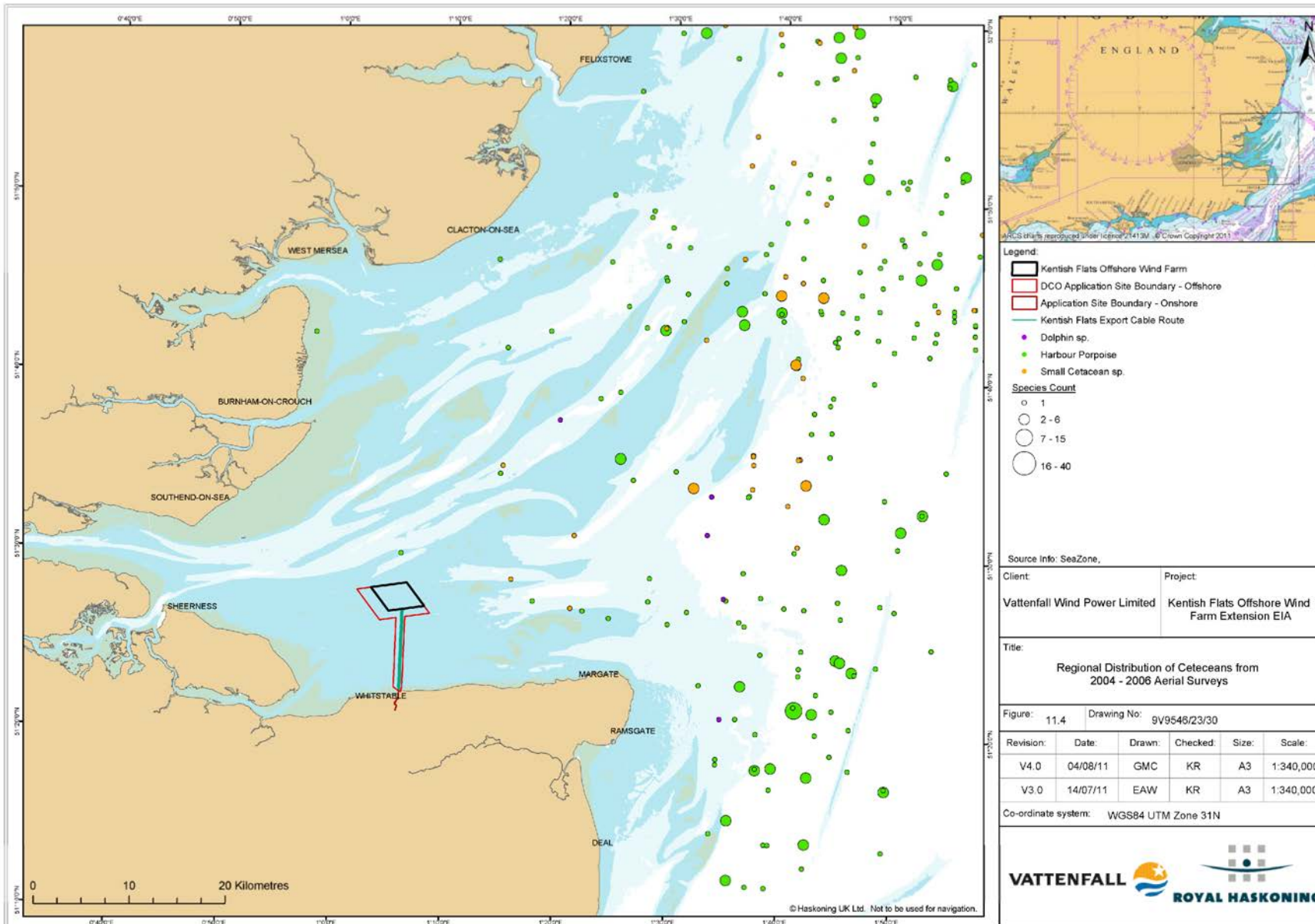
© ABPmer, All rights reserved, 2013



Common Seal Sightings on  
the Tidal Thames (Teddington  
- Southend): June '04 - June '07


Figure 21





Taken from:  
Kentish Flats Offshore Wind Farm  
Extension - Environmental Statement  
Section 11: Marine Mammals  
Vattenfall, 2011  
Figure 11.4, Page 19

Date	By	Size	Version
May13	NMW	A4	1
Coordinate System		WGS84	
Projection		UTM Zone 31N	
Scale		n/a	
QA		FMM	
Fig23_Ceteceans_04_06.mxd			
Produced by ABPmer			

A map of the British Isles, including Great Britain and Ireland. The landmasses are colored green, and the surrounding water is white. A small red square is located on the southeastern coast of England, indicating the specific geographic area covered by the data.

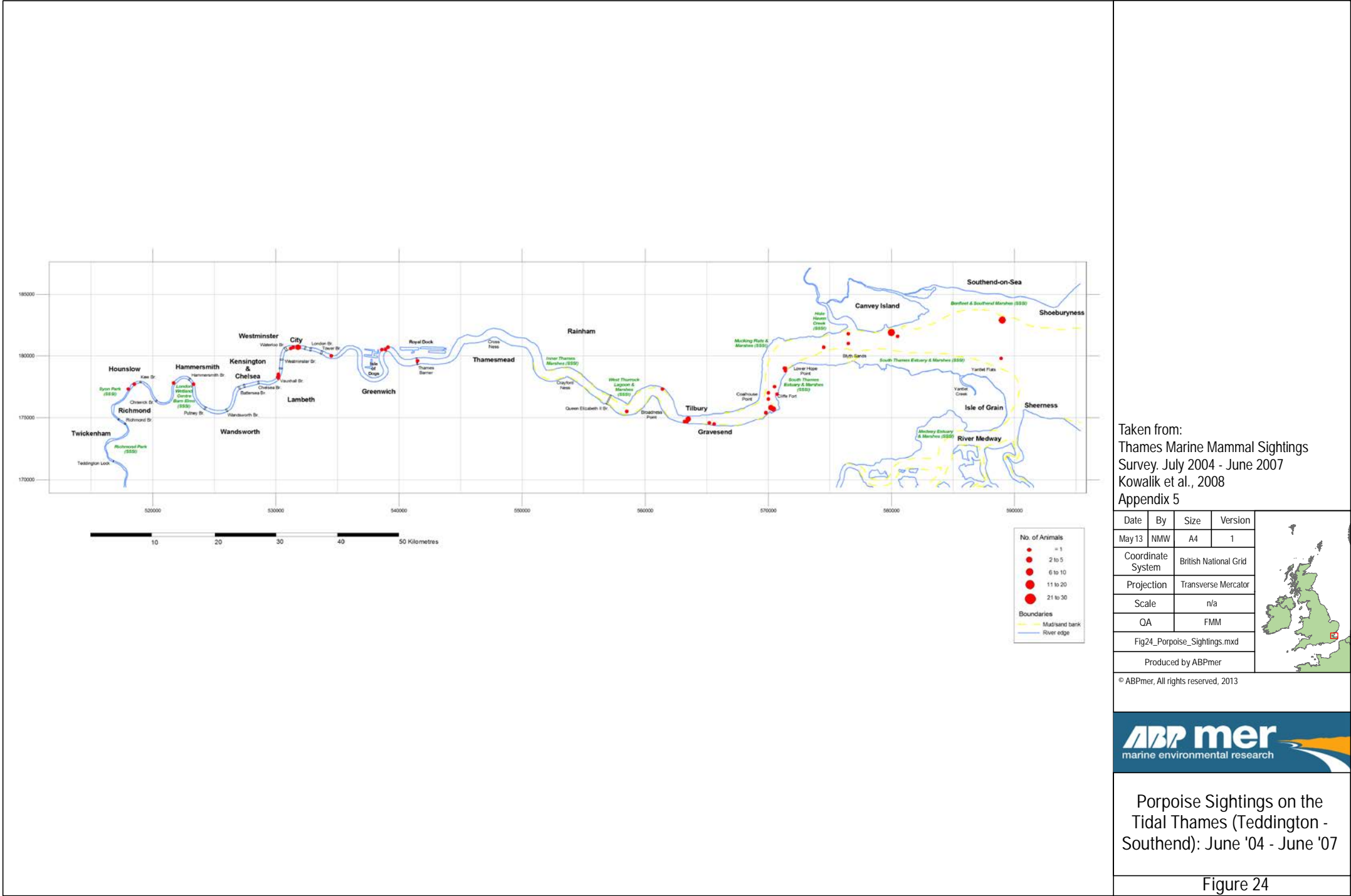
© ABPmer, All rights reserved, 2013



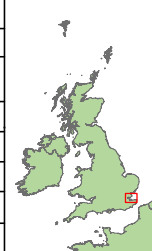
Regional Distribution of  
Cetaceans from 2004 - 2006  
Aerial Surveys

Figure 23





Taken from:  
Thames Marine Mammal Sightings  
Survey, July 2004 - June 2007  
Kowalik et al., 2008  
Appendix 5

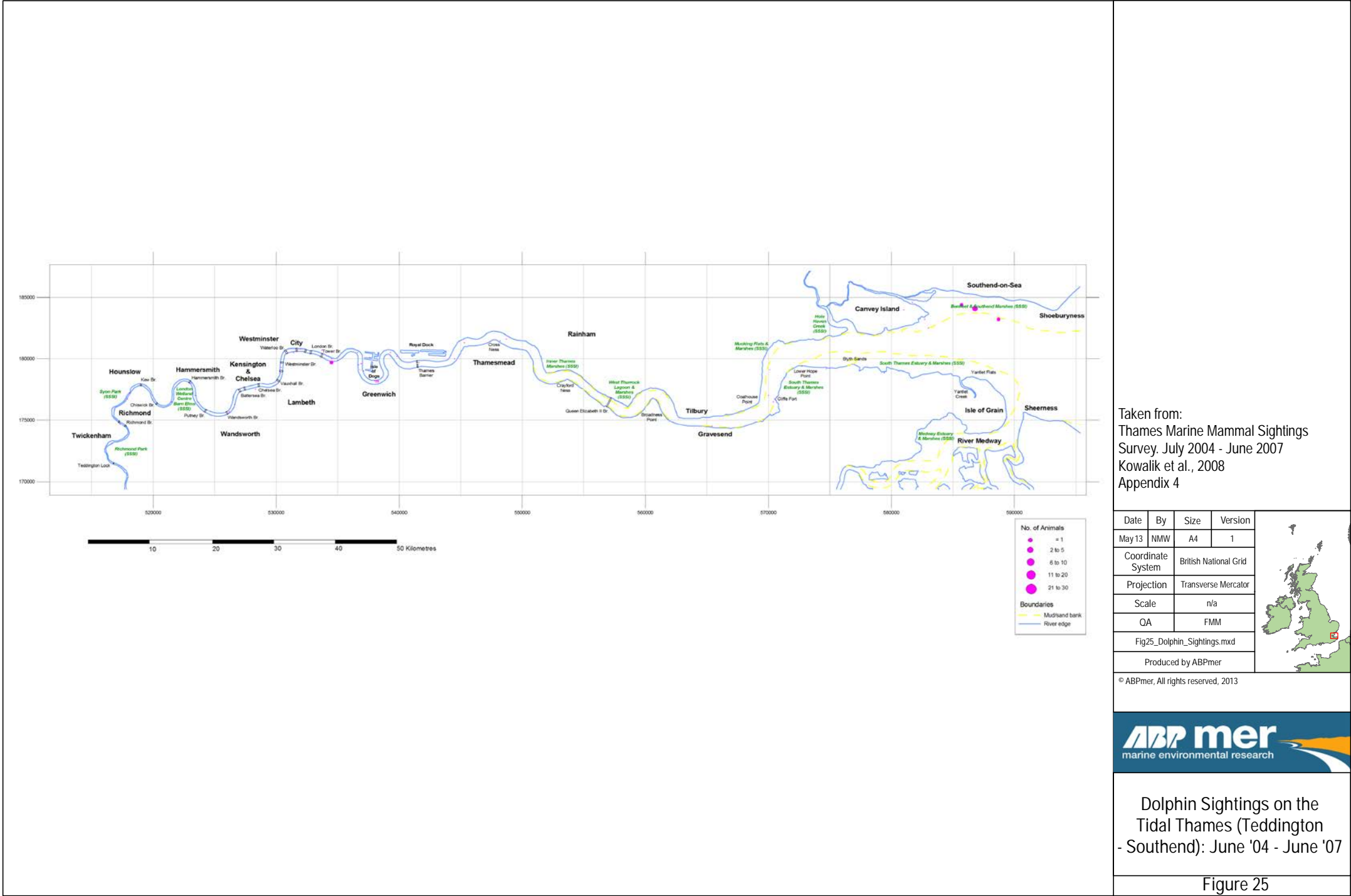
Date	By	Size	Version	
May 13	NMW	A4	1	
Coordinate System		British National Grid		
Projection		Transverse Mercator		
Scale		n/a		
QA		FMM		
Fig24_Porpoise_Sightings.mxd				
Produced by ABPmer				

© ABPmer, All rights reserved, 2013




Porpoise Sightings on the  
Tidal Thames (Teddington -  
Southend): June '04 - June '07

Figure 24



Taken from:  
Thames Marine Mammal Sightings  
Survey, July 2004 - June 2007  
Kowalik et al., 2008  
Appendix 4

Date	By	Size	Version
May 13	NMW	A4	1
Coordinate System	British National Grid		
Projection	Transverse Mercator		
Scale	n/a		
QA	FMM		
Fig25_Dolphin_Sightings.mxd			
Produced by ABPmer			

A map of the United Kingdom, including Great Britain and Ireland, is shown in green. A red rectangular box is located on the southeast coast of England, indicating the specific geographic area covered by the data.

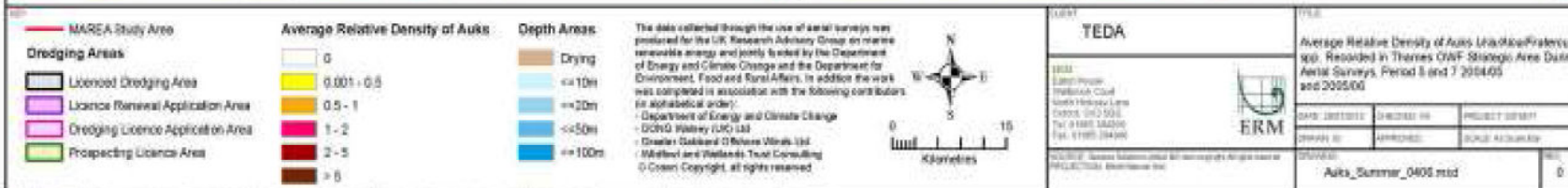
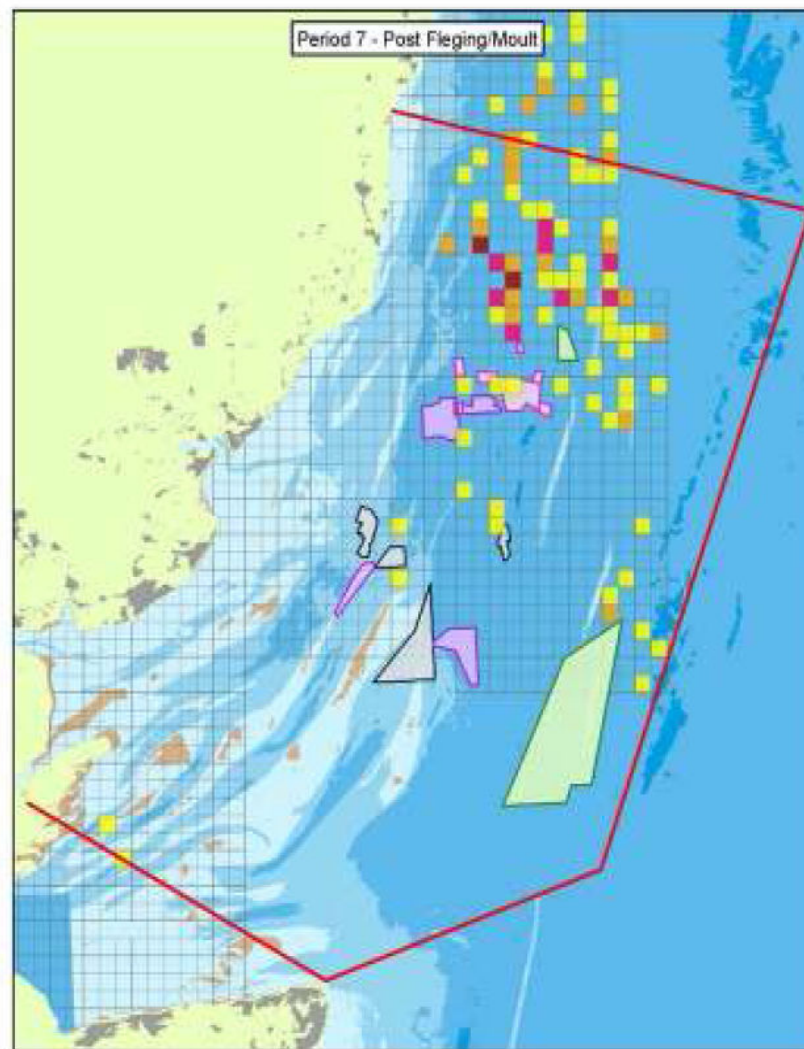
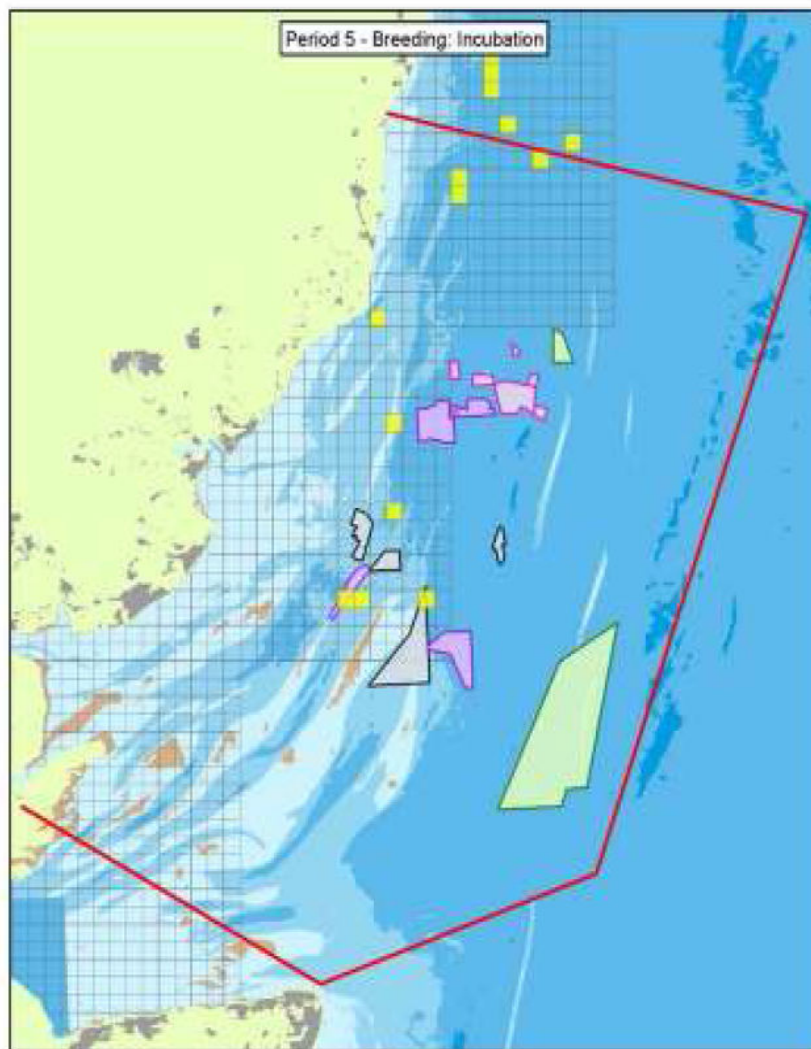
© ABPmer, All rights reserved, 2013



Dolphin Sightings on the  
Tidal Thames (Teddington  
- Southend): June '04 - June '07

Figure 25





Taken from:  
Marine Aggregate Regional Environmental  
Assessment of the Outer Thames Estuary  
TEDA, 2010  
Fig 5.32

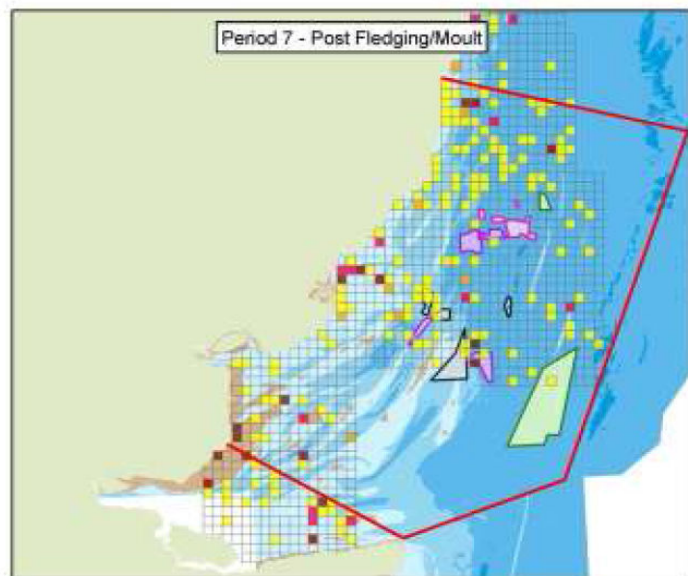
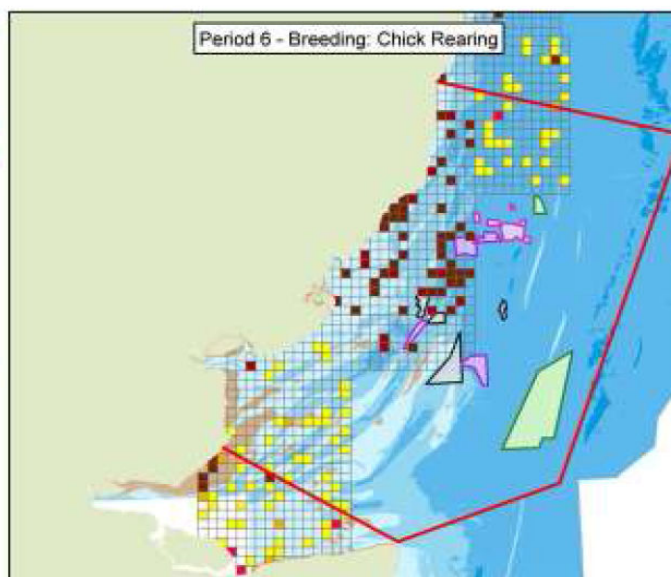
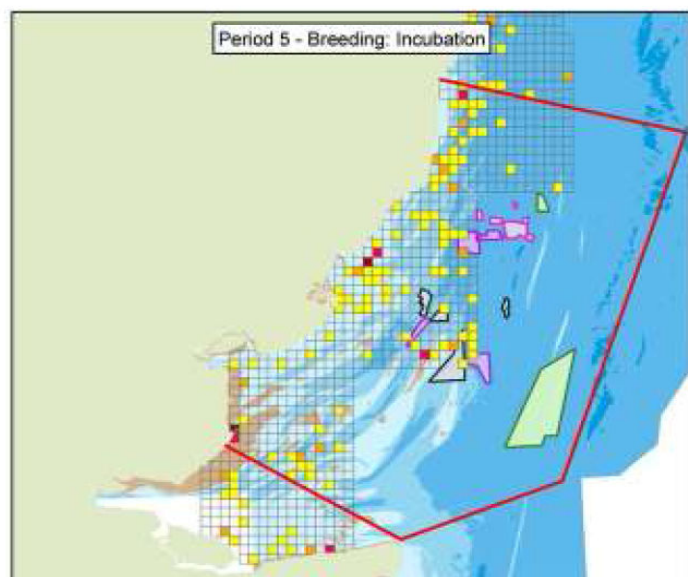
Date	By	Size	Version
May 13	NMW	A4	1
Coordinate System			
Projection			
Scale		n/a	
QA		FMM	
Fig26_Distribution_of_Auks.mxd			
Produced by ABPmer			

© ABPmer, All rights reserved, 2013



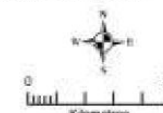
Distribution of Auk Recorded  
During Aerial Surveys in  
Summer 2005-2006

Figure 26



The data collected through the use of aerial surveys was produced for the UK Research Advisory Group on marine renewable energy and jointly funded by the Department of Energy and Climate Change and the Department for Environment, Food and Rural Affairs. In addition the work was completed in association with the following contributors (in alphabetical order):

- Department of Energy and Climate Change
- DONG Walney UK Ltd
- Greater Oubland Offshore Winds Ltd
- Wildowl and Wetlands Trust Consulting
- © Crown Copyright, all rights reserved



**TITLE**

Relative Density of Gulls *Larus* spp.  
Recorded in Thames OMF Strategic Area  
During Aerial Surveys, Periods 5-7

**CLIENT**

TEDA

**DATE:** 05/06/2010 **CHECKED:** NA **PROJECT:** 000007

**DRAWN:** IS **APPROVED:** **SCALE:** As State Bar

**DRAWING:** Gulls\_Summer\_D406.mxd **REV:** 0

**ERM**  
Eaton House  
Waltham Court  
North Victory Lane  
Gilling, OX2 0QS  
Tel: 01865 384900  
Fax: 01865 384940




© Crown Copyright. No Crown Copyright. All rights reserved.  
PRODUCTION: Helen Newman-Butt

Taken from:  
Marine Aggregate Regional Environmental  
Assessment of the Outer Thames Estuary  
TEDA, 2010

Fig 5.30

Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale		n/a	
QA		FMM	
Fig27_Distribution_of_Gulls.mxd			
Produced by ABPmer			



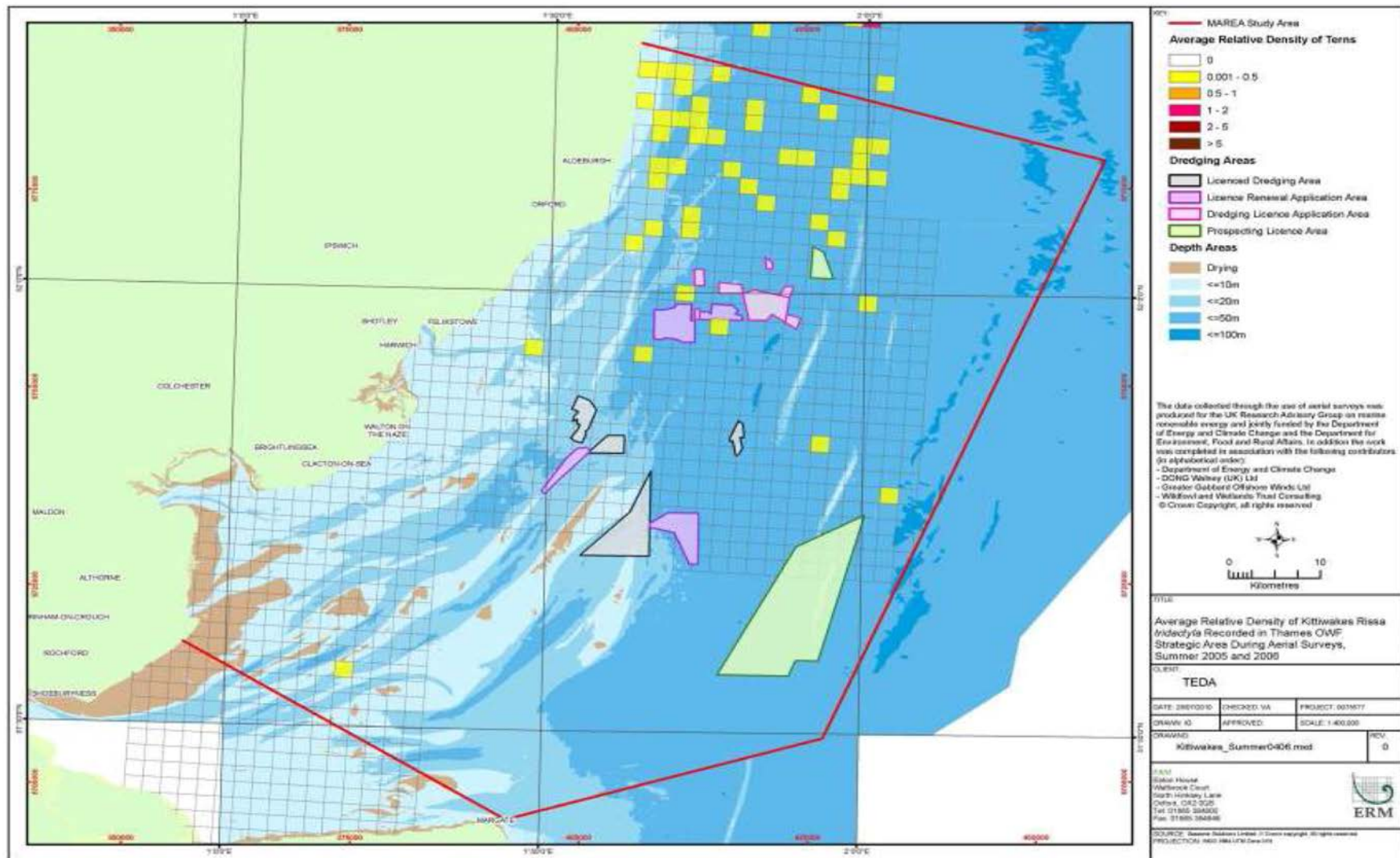
© ABPmer, All rights reserved, 2013



Distribution of Gulls Recorded  
During Aerial Surveys in  
Summer 2005-2006

Figure 27






Taken from:  
Marine Aggregate Regional Environmental  
Assessment of the Outer Thames Estuary  
TEDA, 2010

Fig 5.31

Date	By	Size	Version
May 13	NMW	A4	1
Coordinate System			
Projection			
Scale		n/a	
QA		FMM	
Fig28_Distribution_of_Kittiwakes.mxd			
Produced by ABPmer			

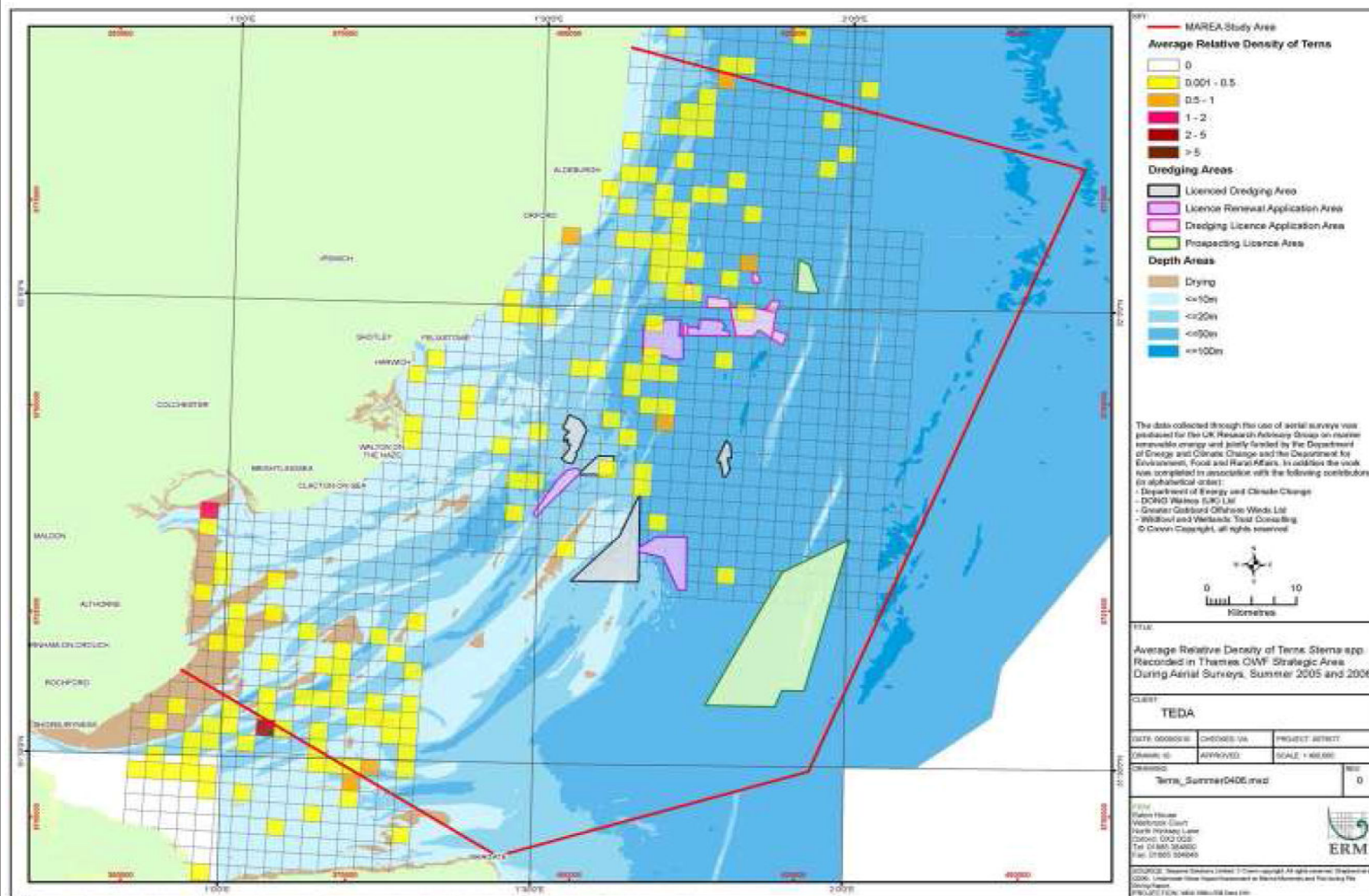


© ABPmer, All rights reserved, 2013




Distribution of Kittiwakes  
Recorded During Aerial  
Surveys in Summer 2006

Figure 28



Taken from:  
Marine Aggregate Regional Environmental  
Assessment of the Outer Thames Estuary  
TEDA, 2010

Fig 5.29

Date	By	Size	Version	
May 13	NMW	A4	1	
Coordinate System				
Projection				
Scale		n/a		
QA		FMM		
Fig29_Distribution_of_Terns.mxd				
Produced by ABPmer				

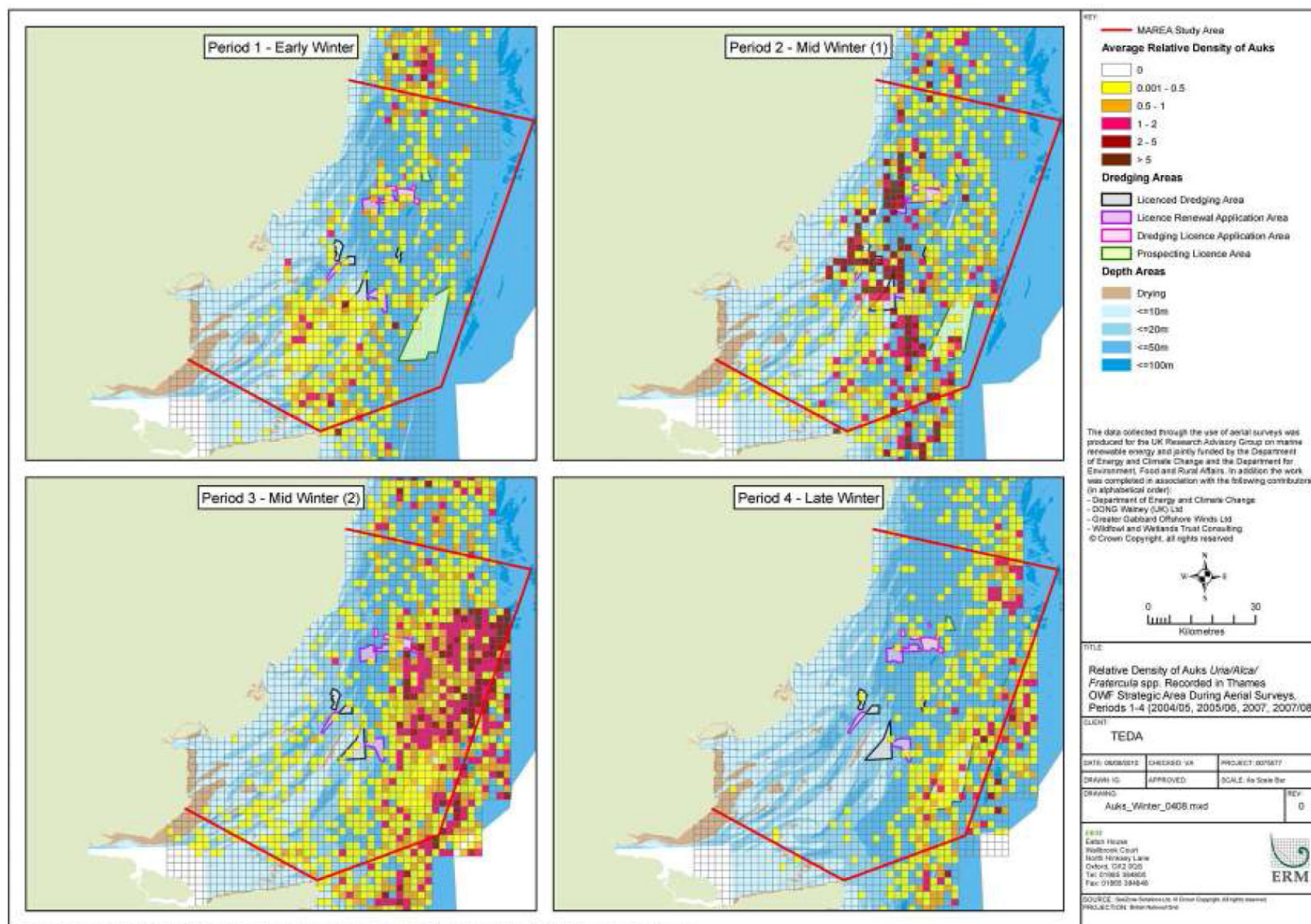
© ABPmer, All rights reserved, 2013



Distribution of Terns Recorded  
During Aerial Surveys in  
Summer 2005-2006

Figure 29





Taken from:  
Marine Aggregate Regional Environmental  
Assessment of the Outer Thames Estuary  
TEDA, 2010

Fig 5.34

Date	By	Size	Version
May 13	NMW	A4	1
Coordinate System			
Projection			
Scale	n/a		
QA	FMM		
Fig30_Distribution_of_Auks.mxd			
Produced by ABPmer			

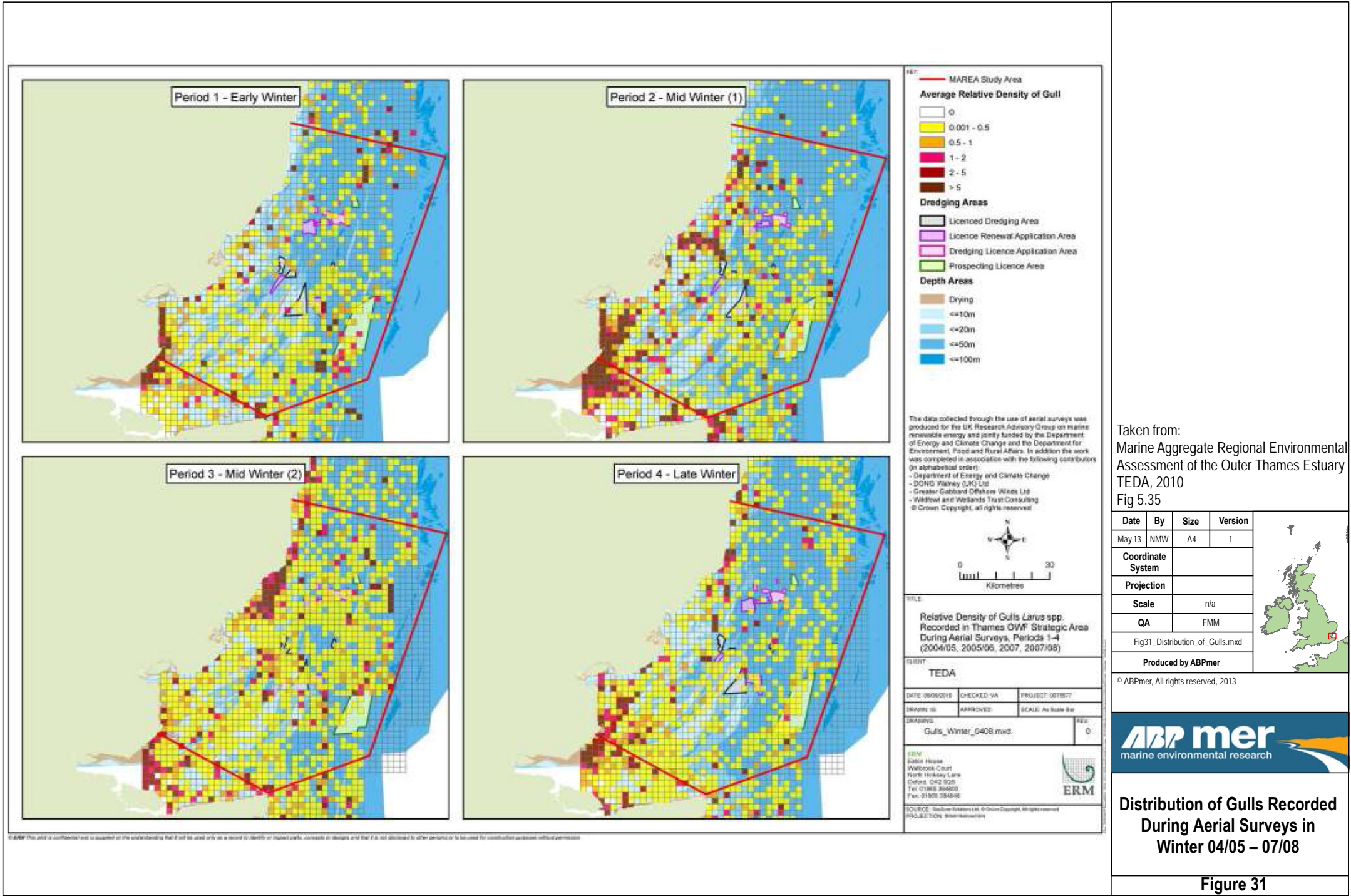
© ABPmer, All rights reserved, 2013



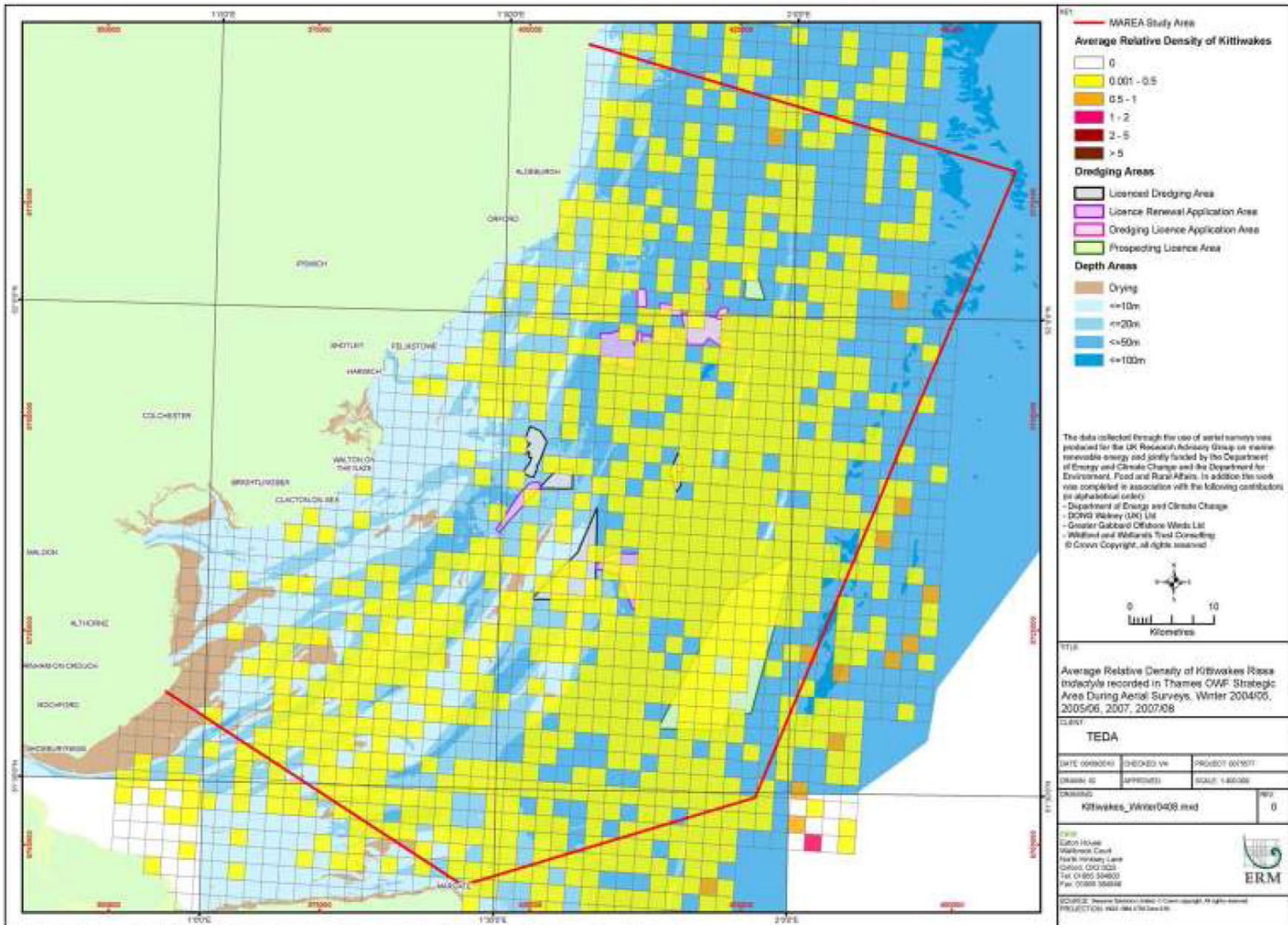
**Distribution of Auks Recorded  
During Aerial Surveys in  
Winter 04/05 – 07/08**

Figure 30










Taken from:  
Marine Aggregate Regional Environmental  
Assessment of the Outer Thames Estuary  
TEDA, 2010

Fig 5.36

Date	By	Size	Version
May 13	NMW	A4	1
Coordinate System			
Projection			
Scale		n/a	
QA		FMM	
Fig32_Distribution_of_Kittiwakes.mxd			
Produced by ABPmer			

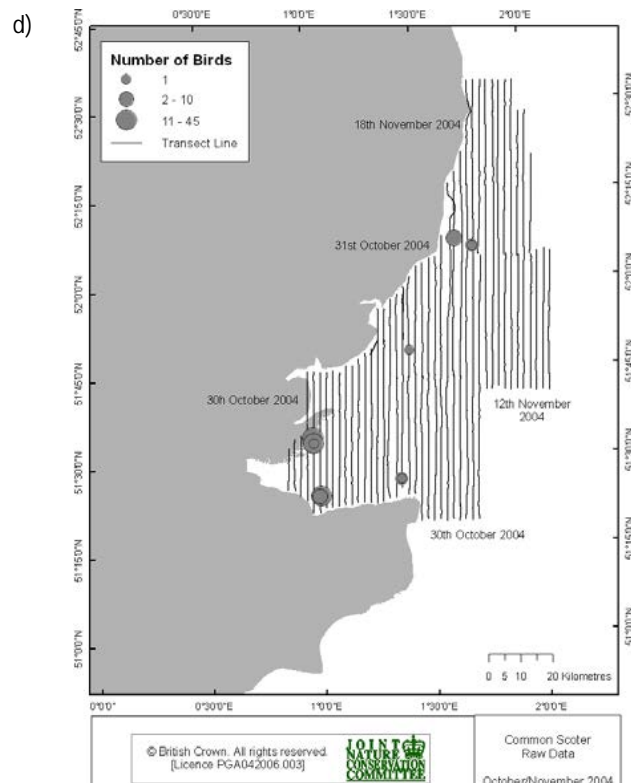
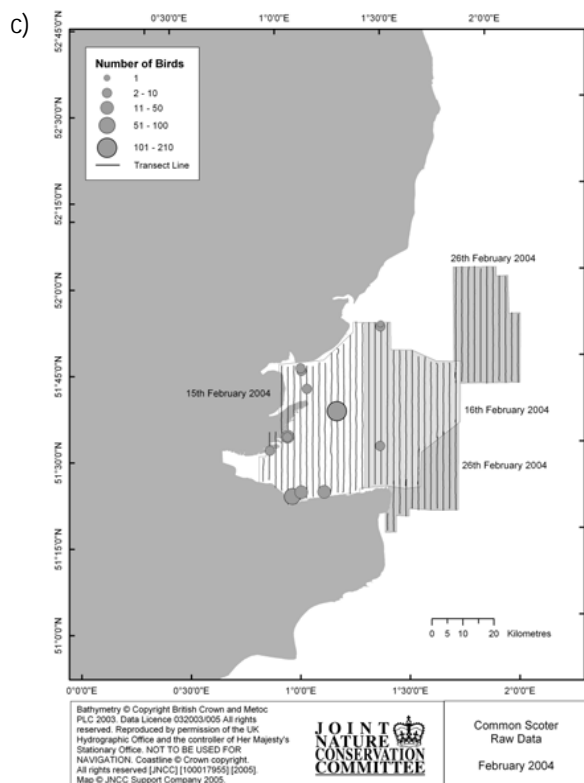
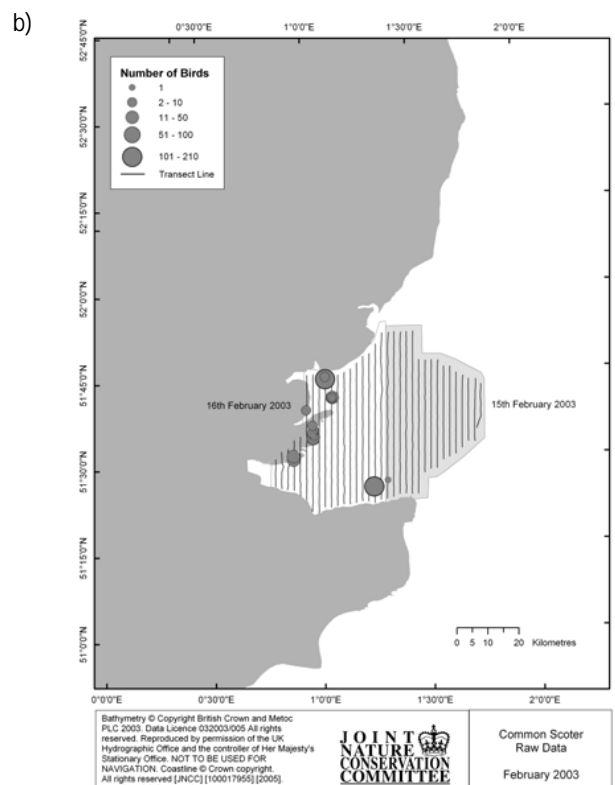
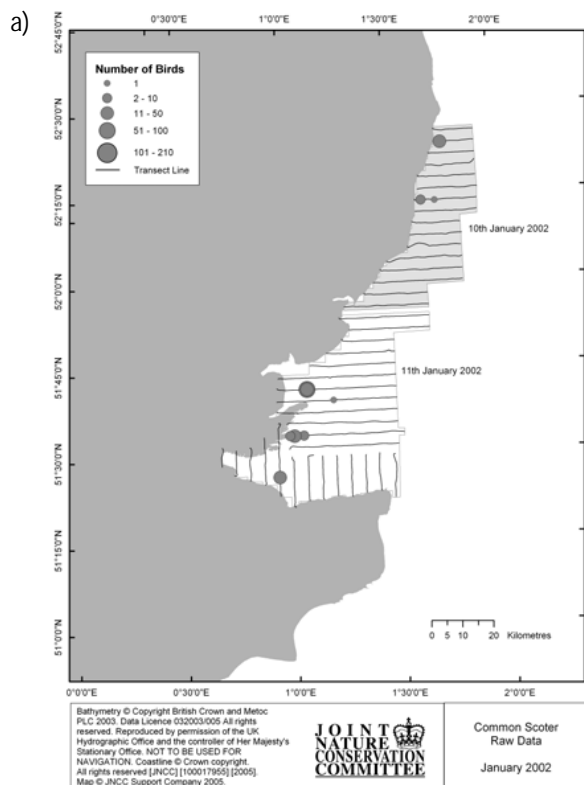


© ABPmer, All rights reserved, 2013



**Distribution of Kittiwakes  
Recorded During Aerial  
Surveys in Winter 04/05 – 07/08**

Figure 32



Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale			
QA		FMM	
Fig33a_Flock_Common_Scoter.mxd			
Produced by ABPmer			

© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.2

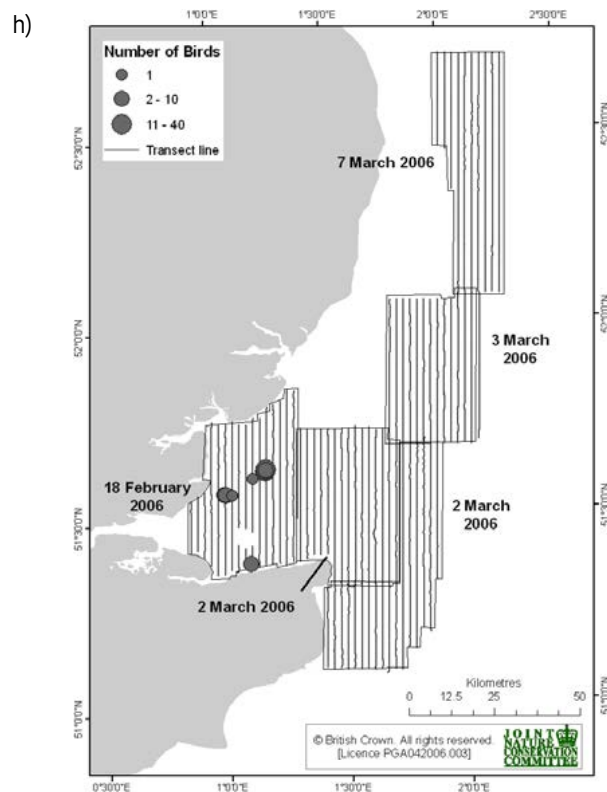
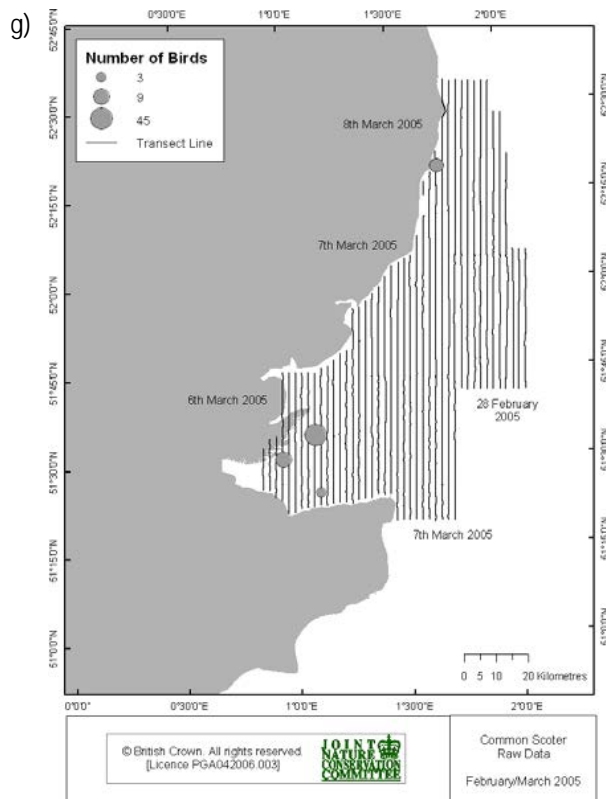
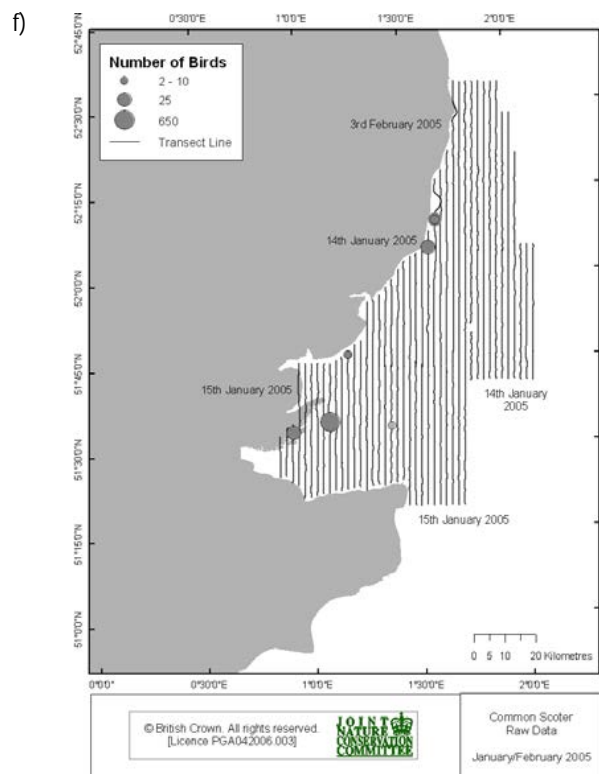
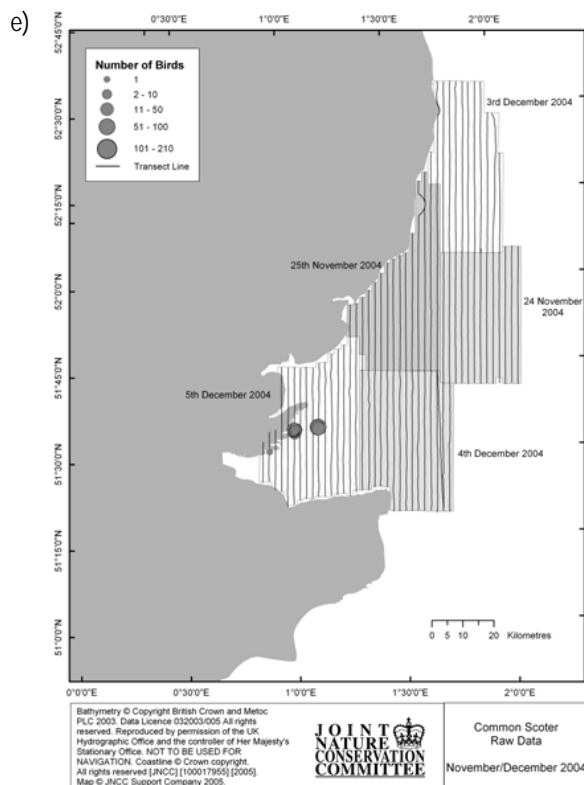
a) January 2002  
b) February 2003  
c) February 2004  
d) October/November 2004



Size and Location of Flocks of Common Scoters Counted During Aerial Surveys of the Greater Thames (A - D)

Figure 33a





Date	By	Size	Version
May13	NMW	A4	1

Coordinate System	Projection	Scale
		QA
		FMM

Fig33b\_Flock\_Common\_Scoter.mxd

Produced by ABPmer

© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.2

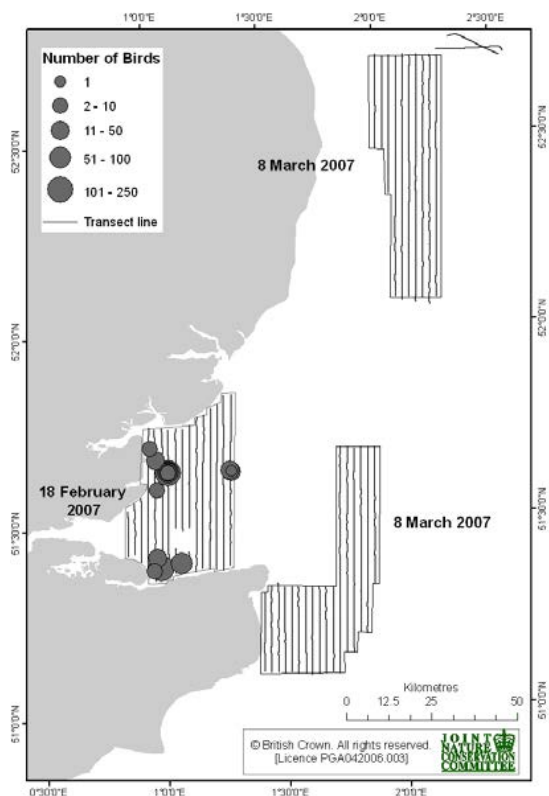
**ABP mer**  
marine environmental research

e) November/December 2004  
f) January/February 2005  
g) February/March 2005  
h) February/March 2006

Size and Location of Flocks of Common Scoters Counted During Aerial Surveys of the Greater Thames (E - H)

Figure 33b

i)

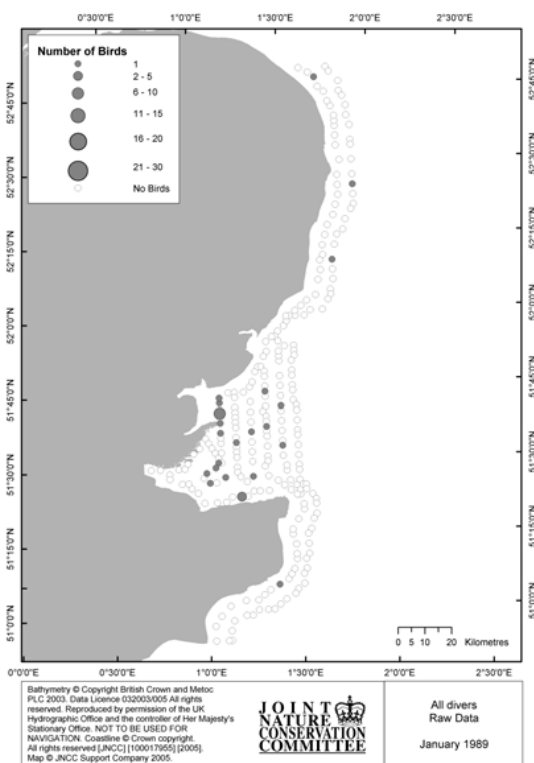


Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale			
QA		FMM	
Fig33c_Flock_Common_Scoter.mxd			
Produced by ABPmer			

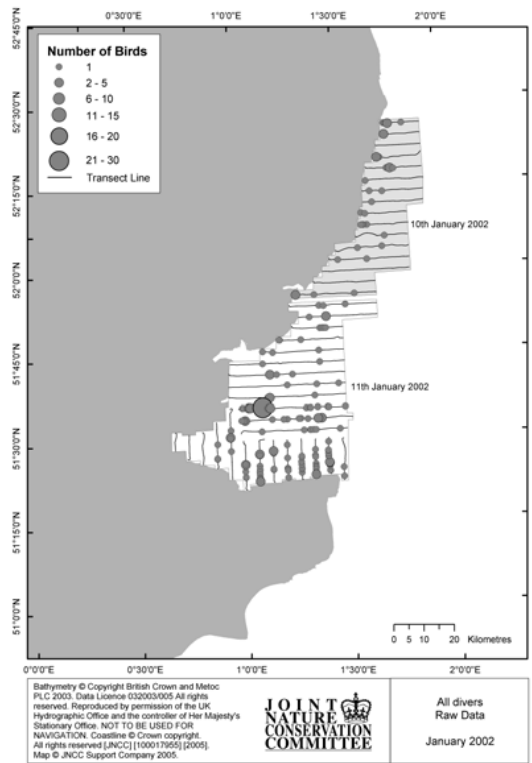
© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.2

i) February/March 2007

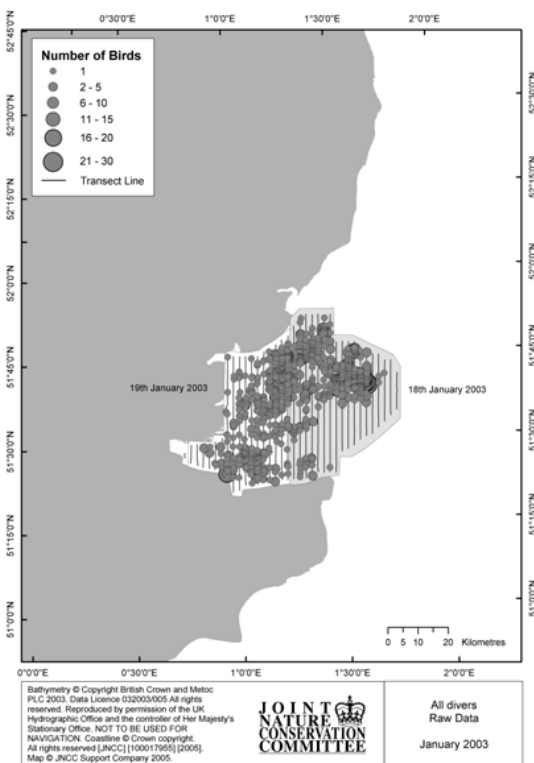
a)



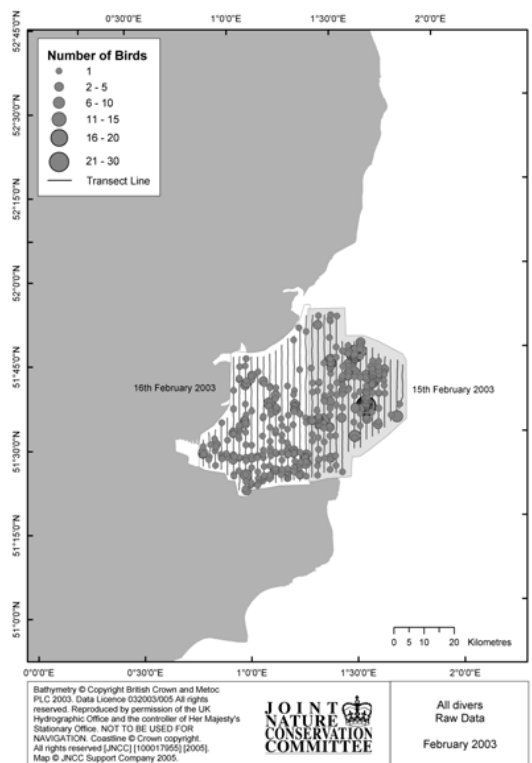
b)



c)



d)



Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale			
QA			FMM
Fig34a_Flock_Diver_Species.mxd			
Produced by ABPmer			

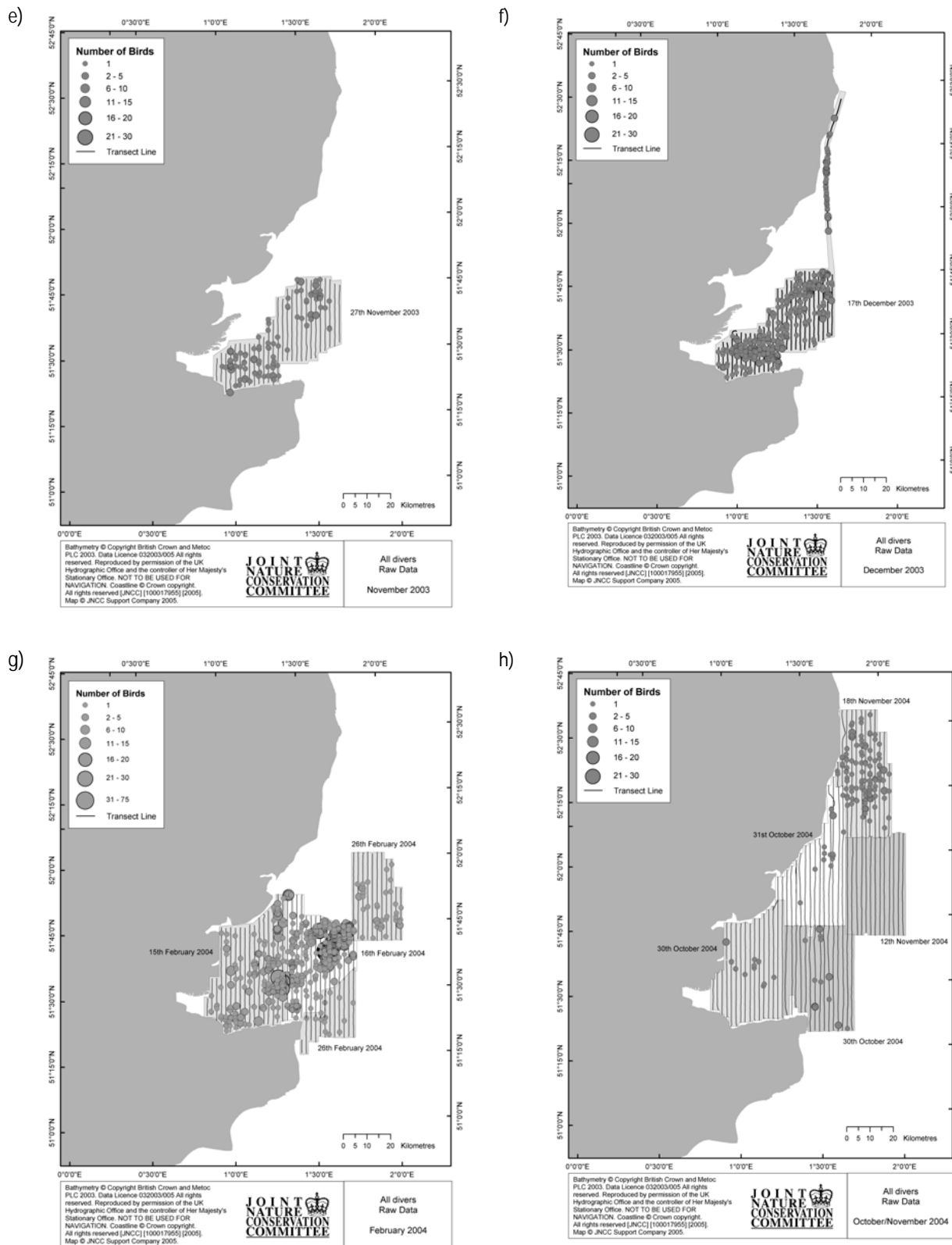
© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.3

a) January 1989  
b) January 2002  
c) January 2003  
d) February 2003



Size and Location of Flocks of All Diver Species Counted During Aerial Surveys of the Greater Thames (A - D)

Figure 34a



Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale			
QA			
FMM			
Fig34b_Flock_Diver_Species.mxd			
Produced by ABPmer			

e) November 2003  
f) December 2003  
g) February 2004  
h) October/November 2004

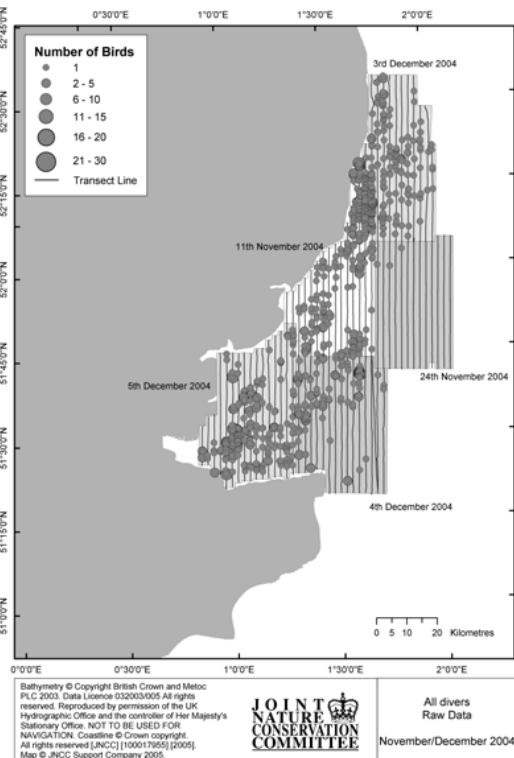
© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.3



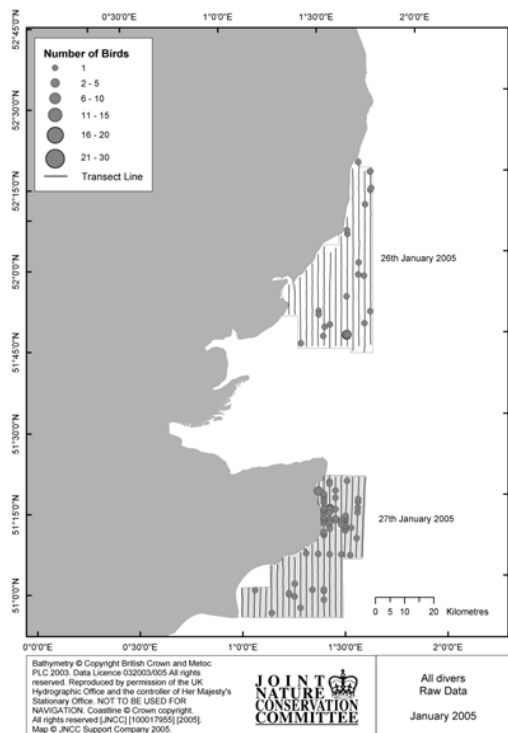
Size and Location of Flocks of All Diver Species Counted During  
Aerial Surveys of the Greater Thames (E - H)

Figure 34b

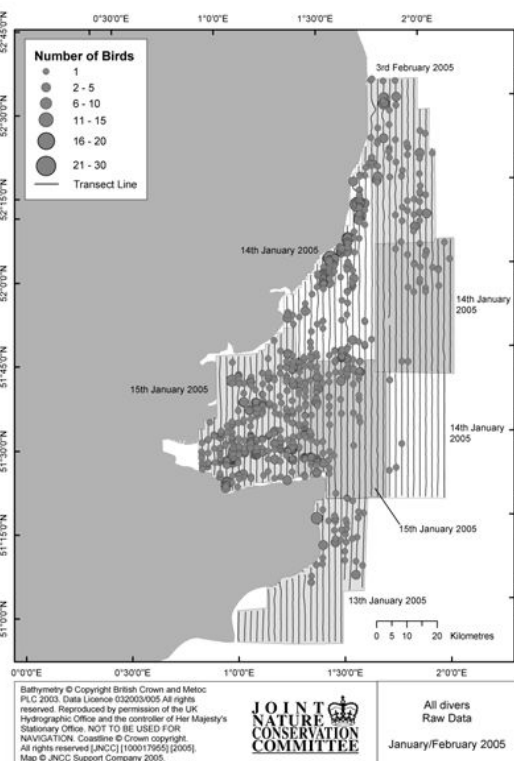
i)



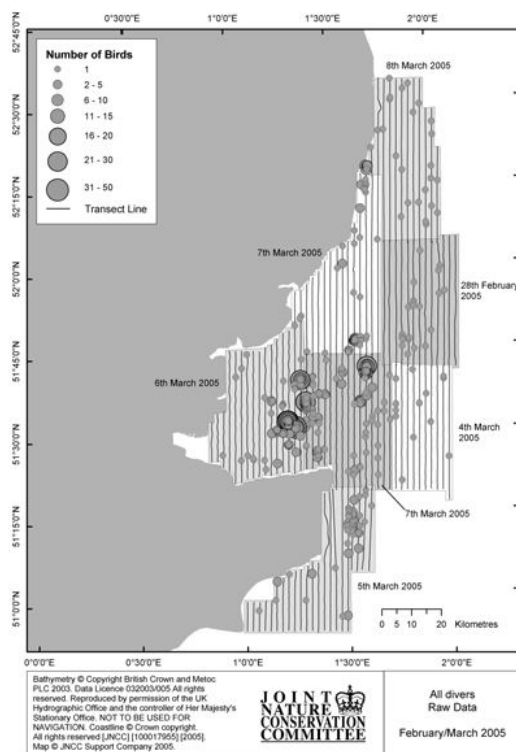
j)



k)



l)



	Date	By	Size	Version
	May13	NMW	A4	1
	Coordinate System			
	Projection			
	Scale			
	QA		FMM	
	Fig34c_Flock_Diver_Species.mxd			
Produced by ABPmer				
© ABPmer, All rights reserved, 2013 Sourced from: JNCC Report No. 374, 2009 Figure 9.3				

i) November/December 2004

j) January 2005

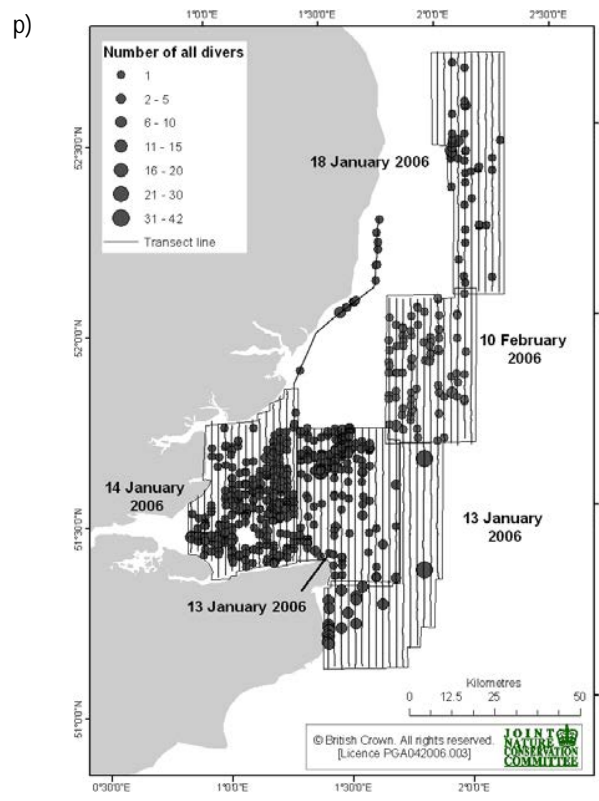
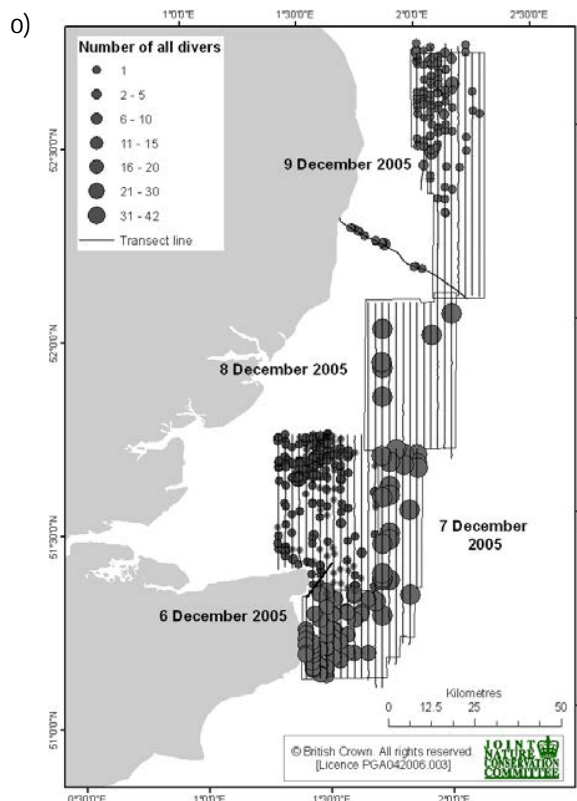
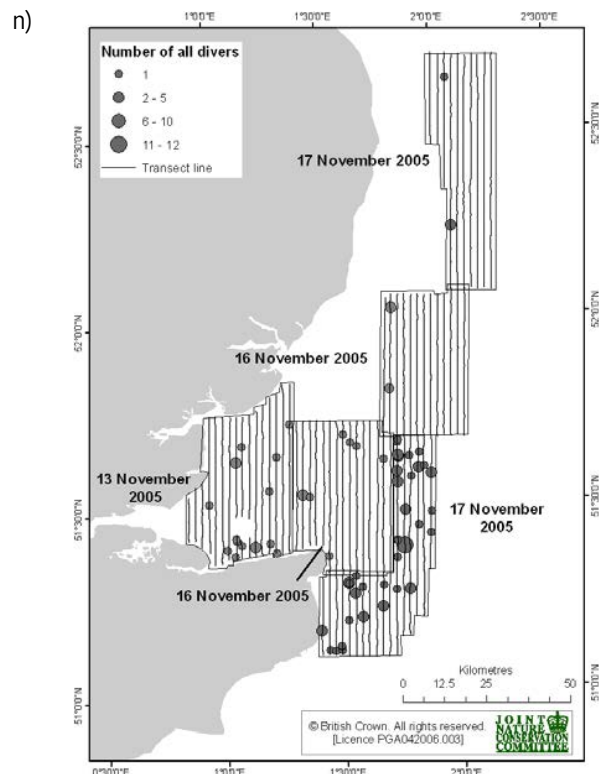
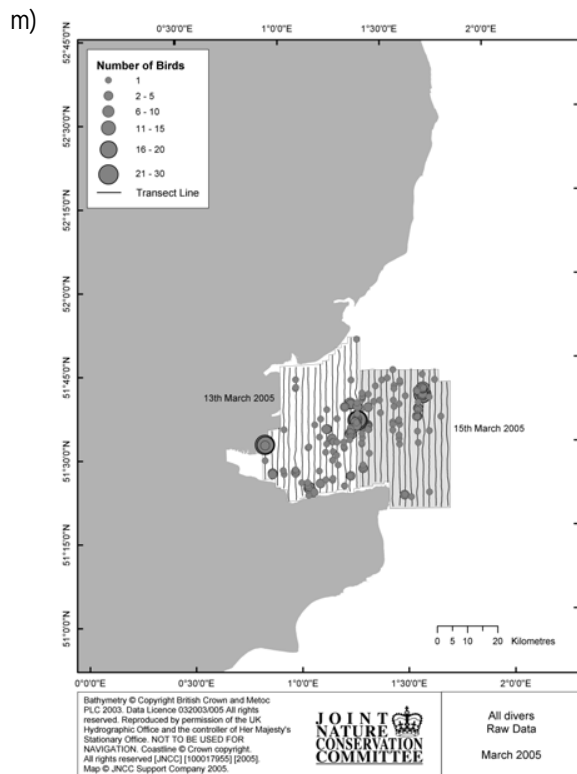
k) January/February 2005

l) February/March 2005

Size and Location of Flocks of All Diver Species Counted During  
Aerial Surveys of the Greater Thames (I - L)

Figure 34c





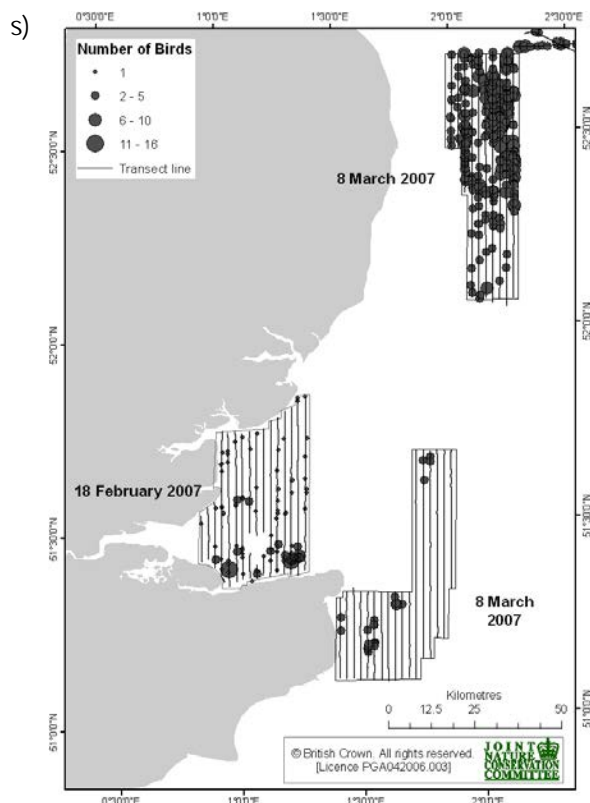
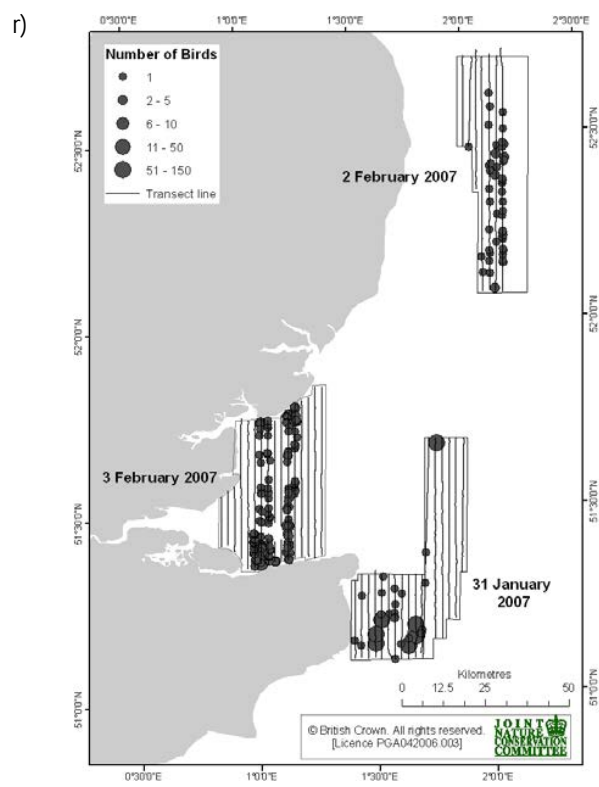
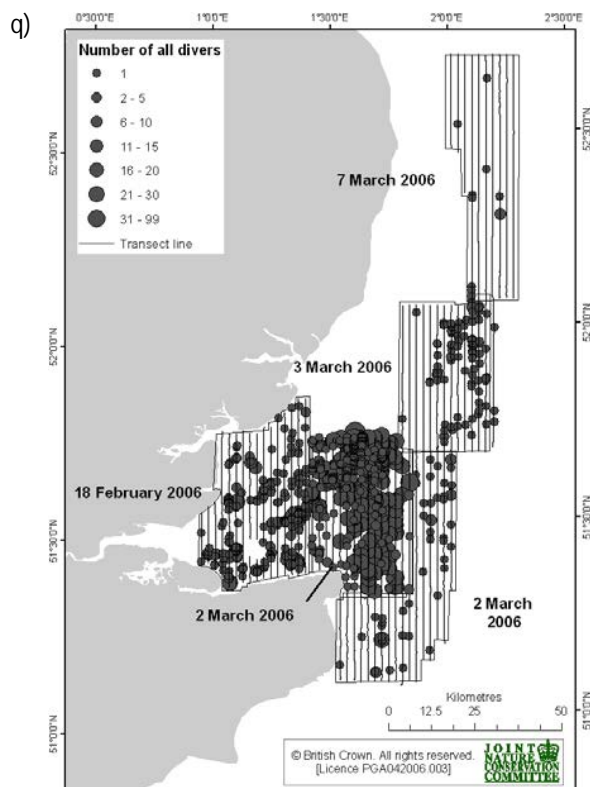
Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale			
QA		FMM	
Fig34d_Flock_Diver_Species.mxd			
Produced by ABPmer			

© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.3



Size and Location of Flocks of All Diver Species Counted During Aerial Surveys of the Greater Thames (M - P)

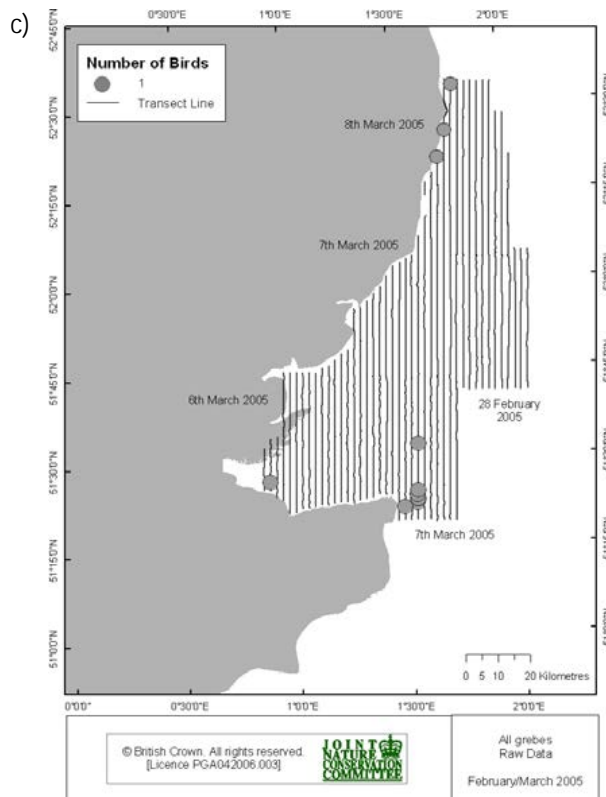
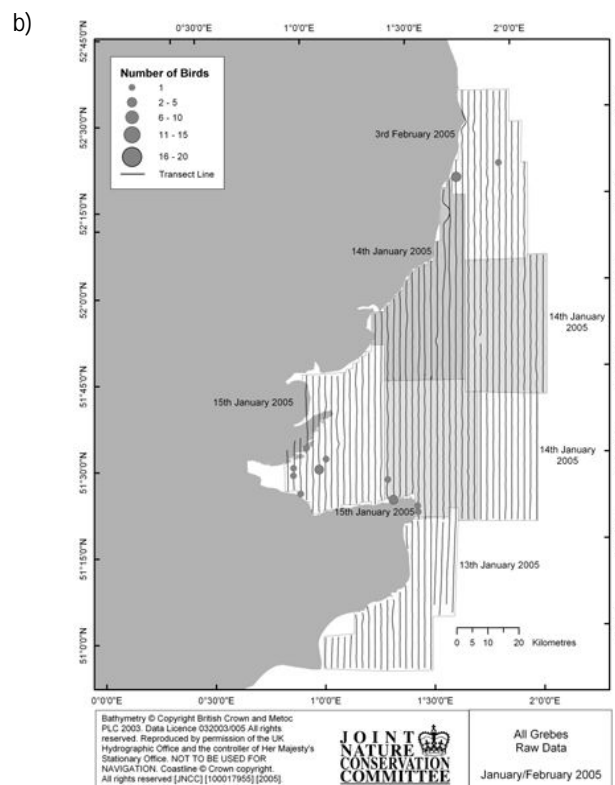
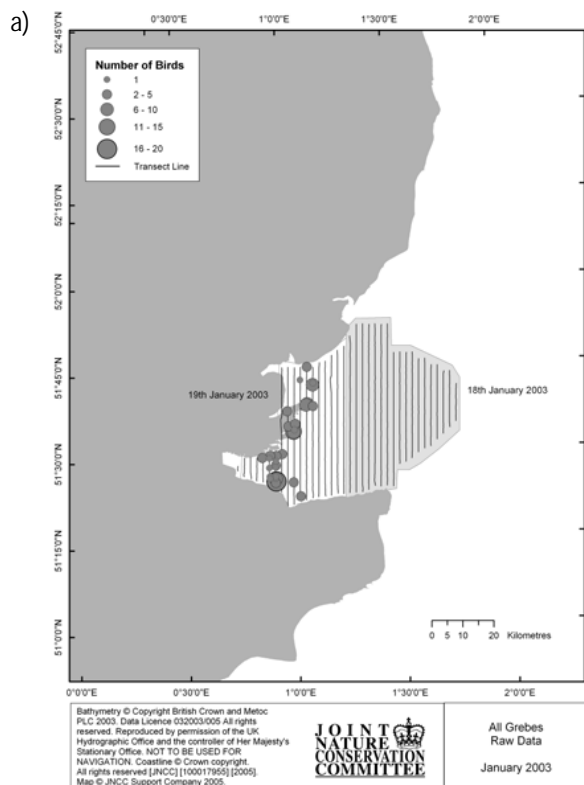
Figure 34d



Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale			
QA			
Fig34e_Flock_Diver_Species.mxd			
Produced by ABPmer			

© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.3

q) February/March 2006  
r) January/February 2007  
s) February/March 2007



Date	By	Size	Version
May13	NMW	A4	1
Coordinate System			
Projection			
Scale			
QA FMM			
Fig35_Flock_Grebes.mxd			
Produced by ABPmer			

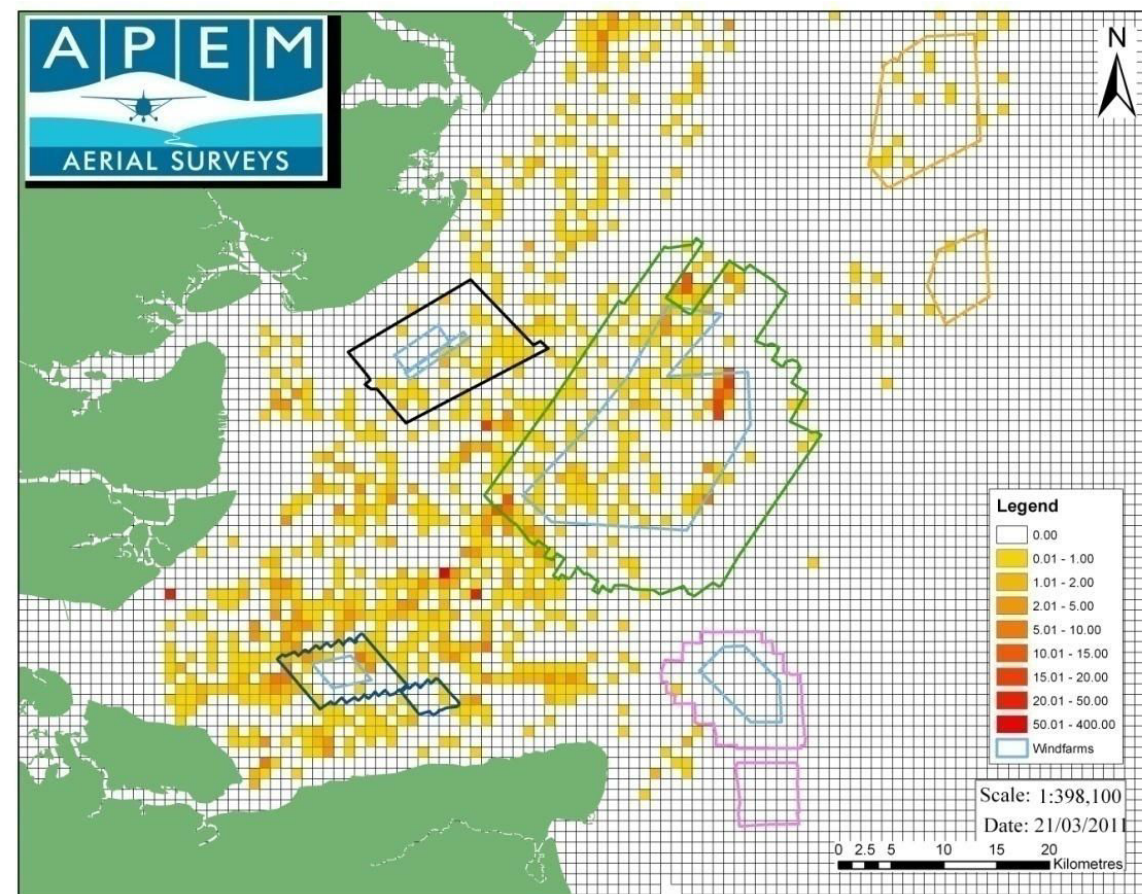
© ABPmer, All rights reserved, 2013  
Sourced from: JNCC Report No. 374, 2009 Figure 9.4

**ABP mer**  
marine environmental research

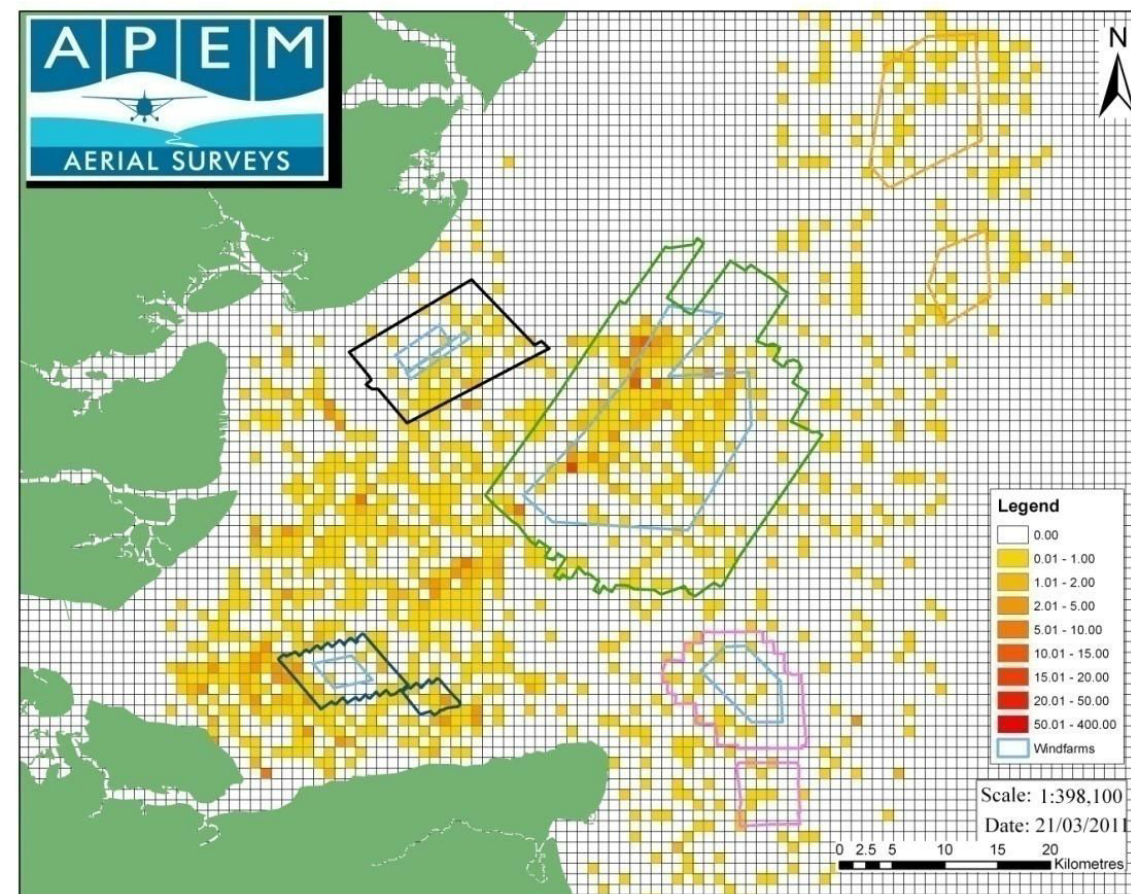
Size and Location of Flocks of all Grebes Counted During Aerial Surveys of the Greater Thames

Figure 35

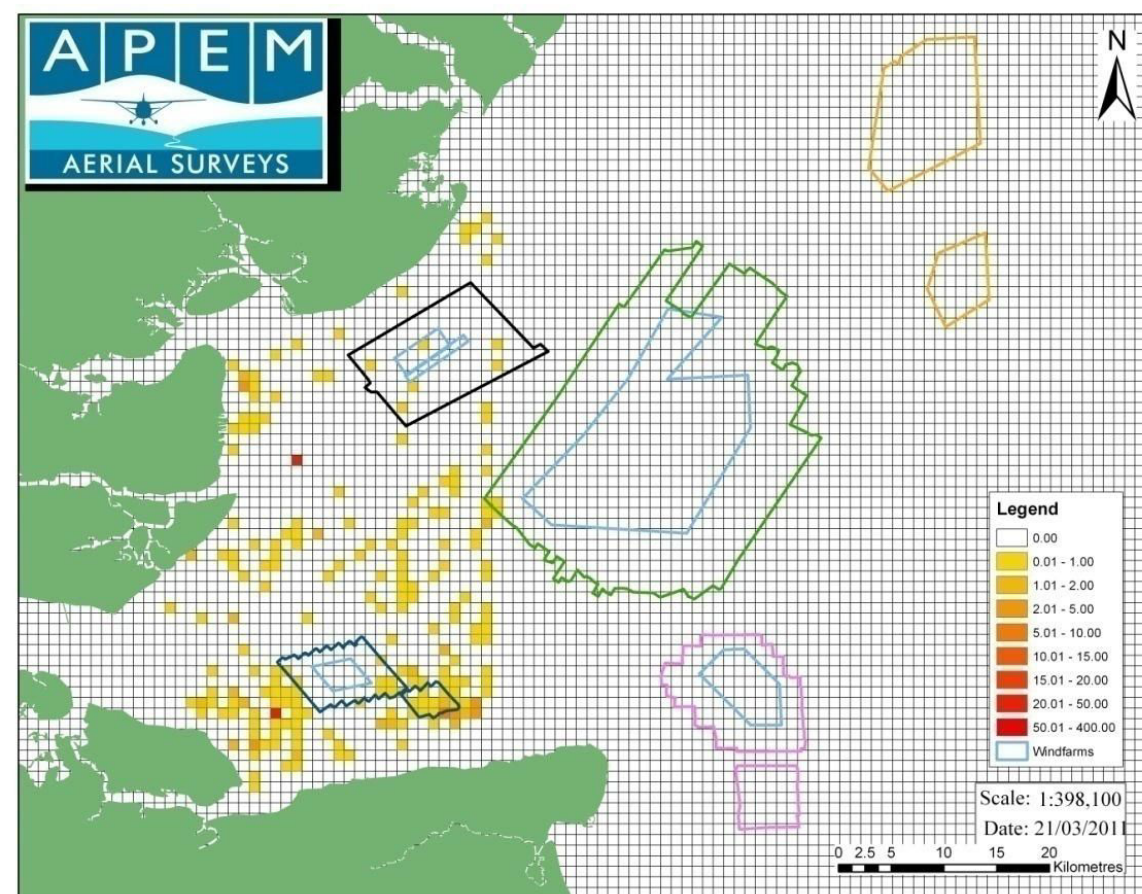




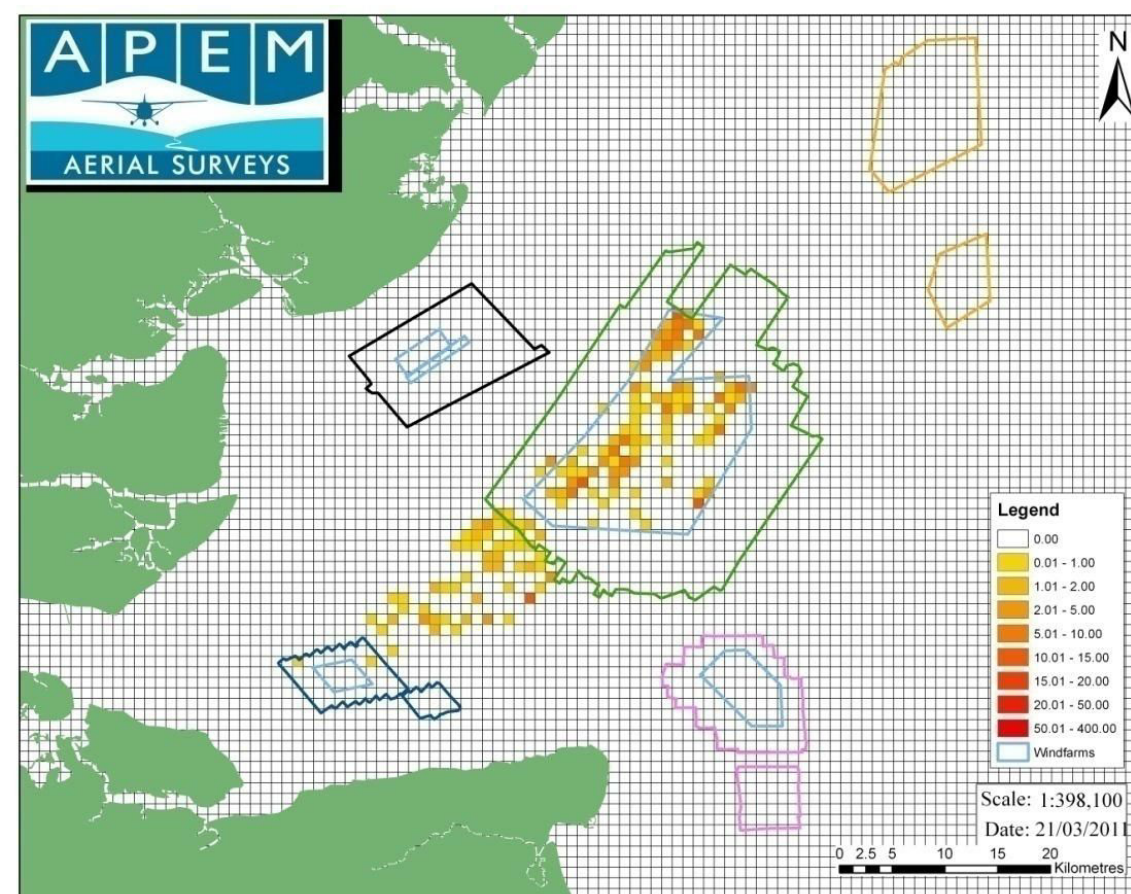
Winter 2004 - 2005



Winter 2005 - 2006




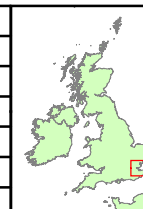
Winter 2006 - 2007



Winter 2009 - 2010

Taken from:  
Red-Throated Divers and Offshore  
Wind Farms in the Outer Thames:  
Historic Data Review  
(APEM, 2011)  
Figures 3-36a, 3-37a, 3-38a, 3-39a

Date	By	Size	Version	
May 13	NMW	A3	1	
Projection				
Scale				
QA		FMM		
4155 - Fig35_Red_Throated_Divers				
Produced by ABPmer				
© ABPmer, All rights reserved, 2013				



Mean Distribution of  
Red-throated Divers in  
the Outer Thames Estuary

Figure 36