

East Anglia THREE

# Chapter 11

## Fish and Shellfish Ecology Figures

**Environmental Statement**

Volume 2

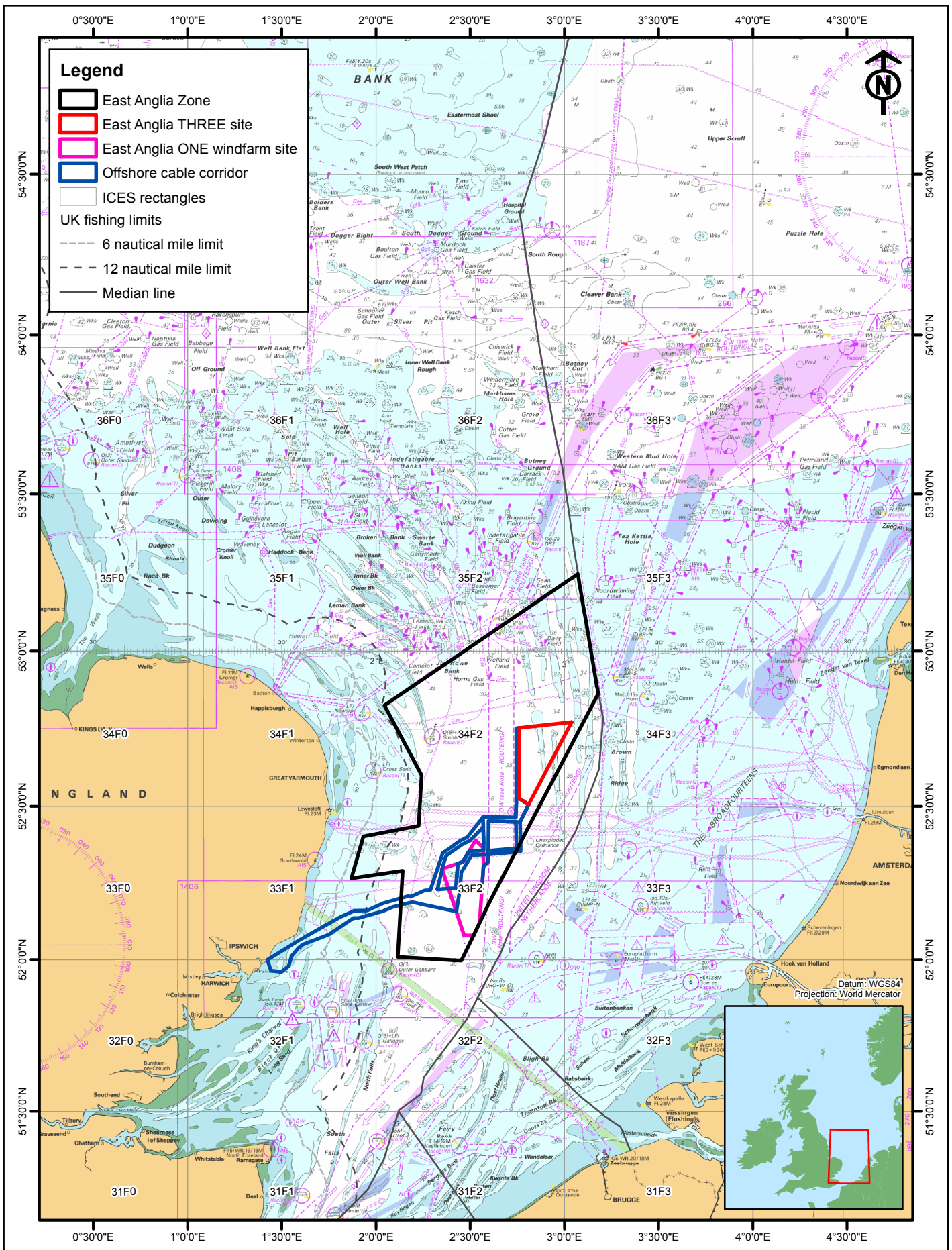
Document Reference – 6.2.11(a)

Author – Brown and May Marine  
East Anglia THREE Limited  
Date – November 2015 Revision  
History – Revision A



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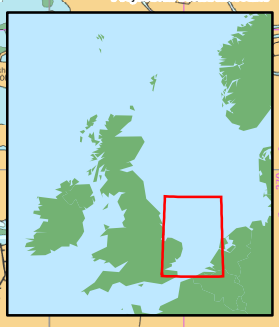


**Legend**

- East Anglia Zone
- East Anglia THREE site
- East Anglia ONE windfarm site
- Offshore cable corridor
- ICES rectangles

**UK fishing limits**

- 6 nautical mile limit
- 12 nautical mile limit
- Median line



<b>VATTENFALL</b>	
<b>SCOTTISHPOWER RENEWABLES</b>	
<b>Rev</b>	<b>Date</b>
<b>By</b>	<b>Comment</b>

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Original A4	0 20 40 km
Plot Scale 1:3,000,000	0 10 20 30 nm

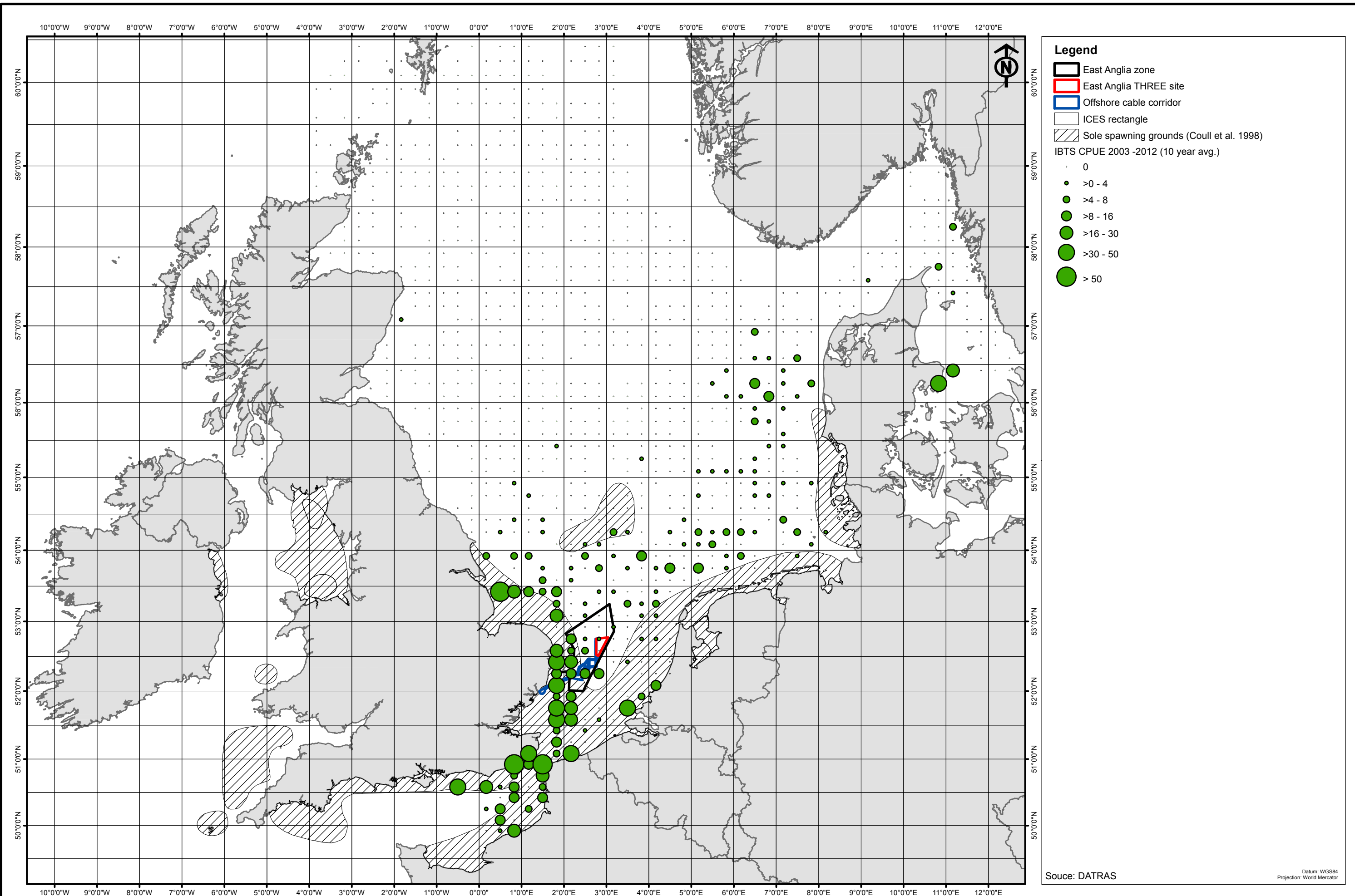
## East Anglia THREE Limited

### Study areas

<b>Volume 2</b>		<b>Figure 11.1</b>	
<b>Layout</b>	<b>Date</b>	<b>Rev</b>	<b>Dwg No.</b>
N/A	13/10/2015	E	EA3-530-PB-551-E

Ref:

Figures 11.2 to 11.9 have been intentionally removed and the data presented as graphs within Appendix 11.2.



**Legend**

- East Anglia zone
- East Anglia THREE site
- Offshore cable corridor
- ICES rectangle
- Sole spawning grounds (Coull et al. 1998)

IBTS CPUE 2003 -2012 (10 year avg.)

- 0
- >0 - 4
- >4 - 8
- >8 - 16
- >16 - 30
- >30 - 50
- >50

Source: DATRAS Datum: WGS84  
Projection: World Mercator



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale 1:9,000,000

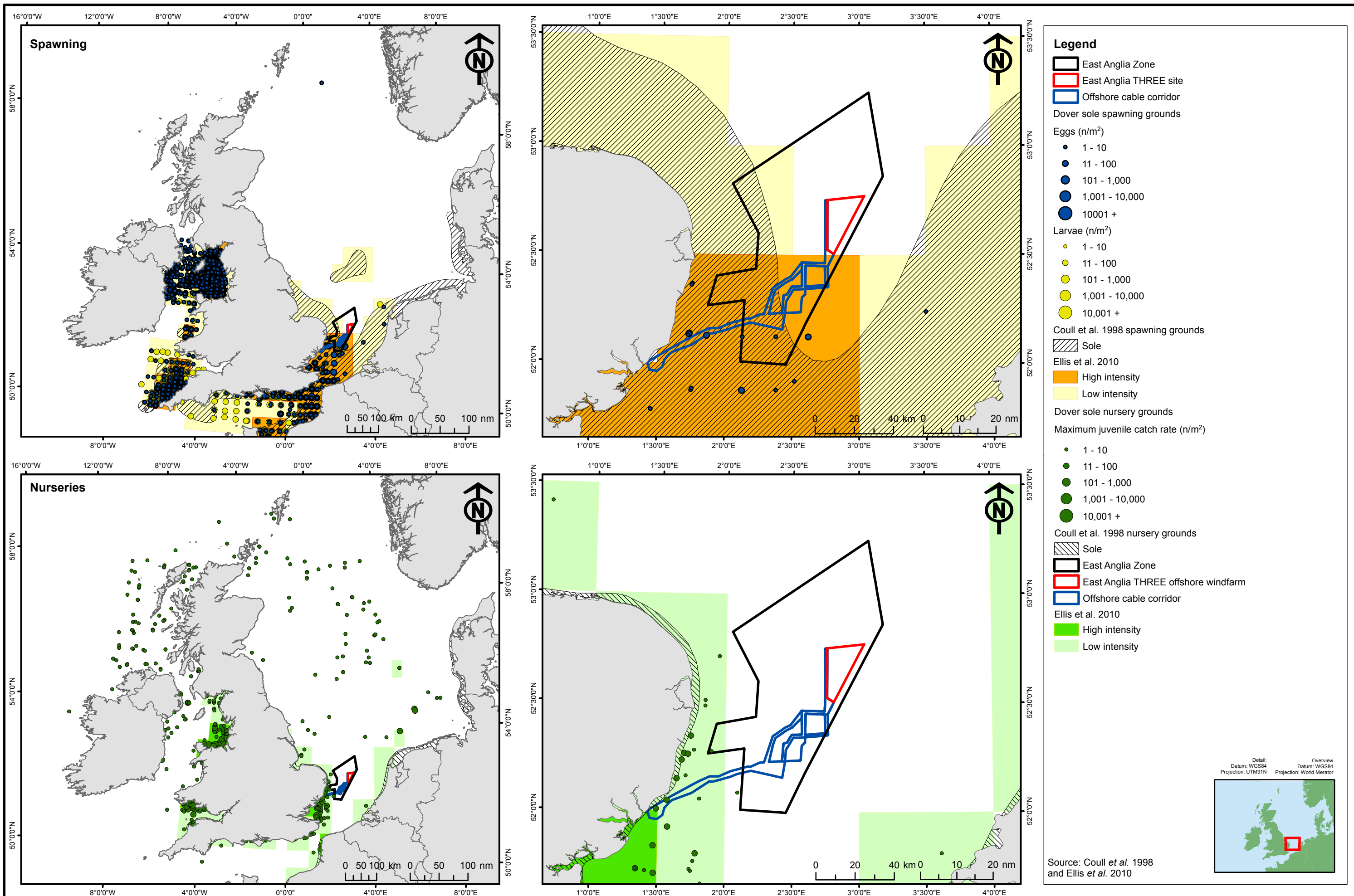
0 50 100 km    0 50 100 nm

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**East Anglia THREE Limited**  
Sole - CPUE 2003 - 2012 (10 year avg.)

Drg No	EA3-530-PB-552-D	<b>Volume</b> <b>2</b>
Rev	D	
Date	14/10/2015	<b>Figure</b> <b>11.10</b>
Layout	N/A	

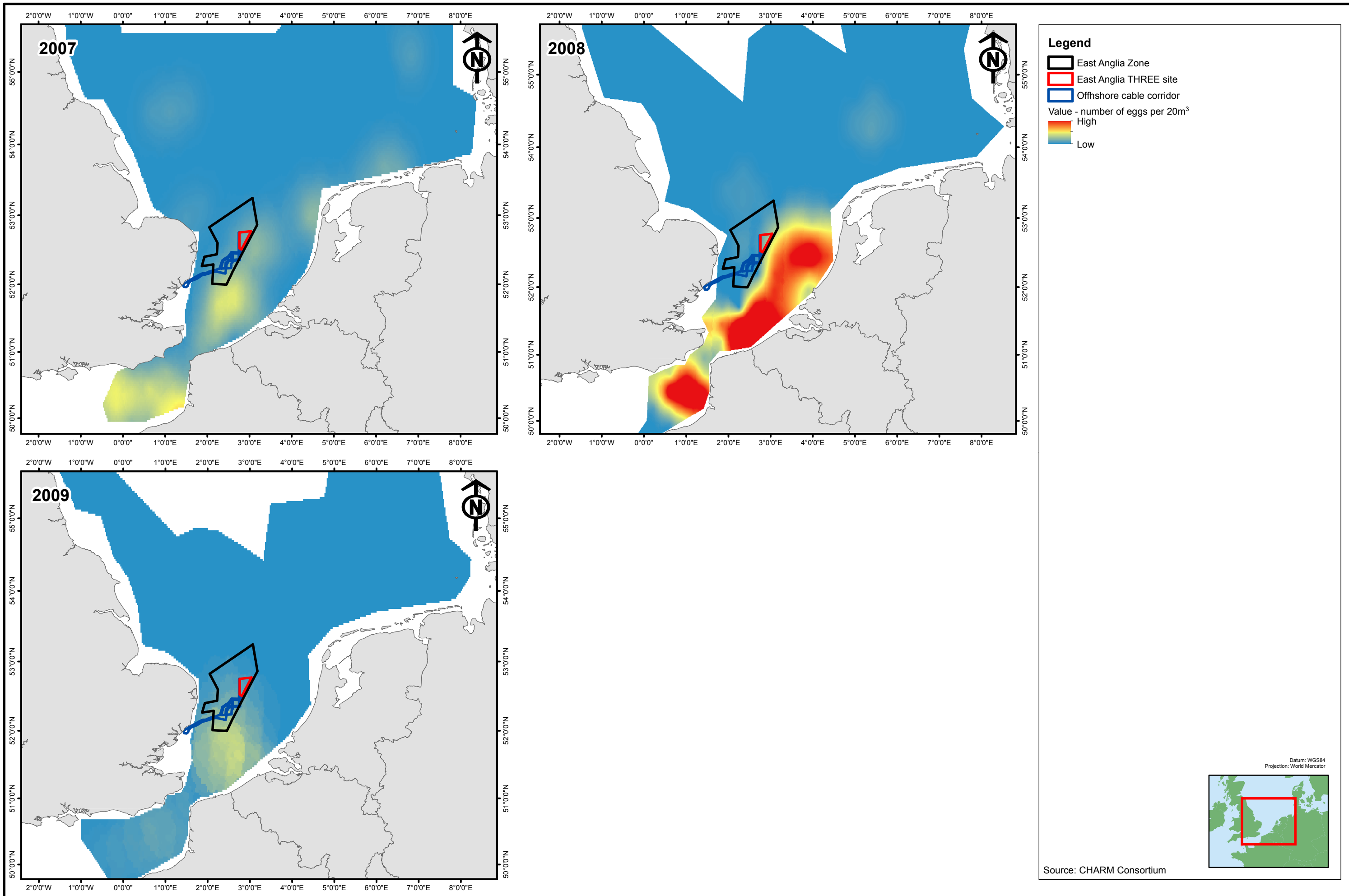




Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale	Overview:	Detail
	1:11,000,000	1:1,750,000

Drg No	EA3-530-PB-553-D	Volume
Rev	D	2
Date	14/10/2015	Figure
Layout	N/A	11.11



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

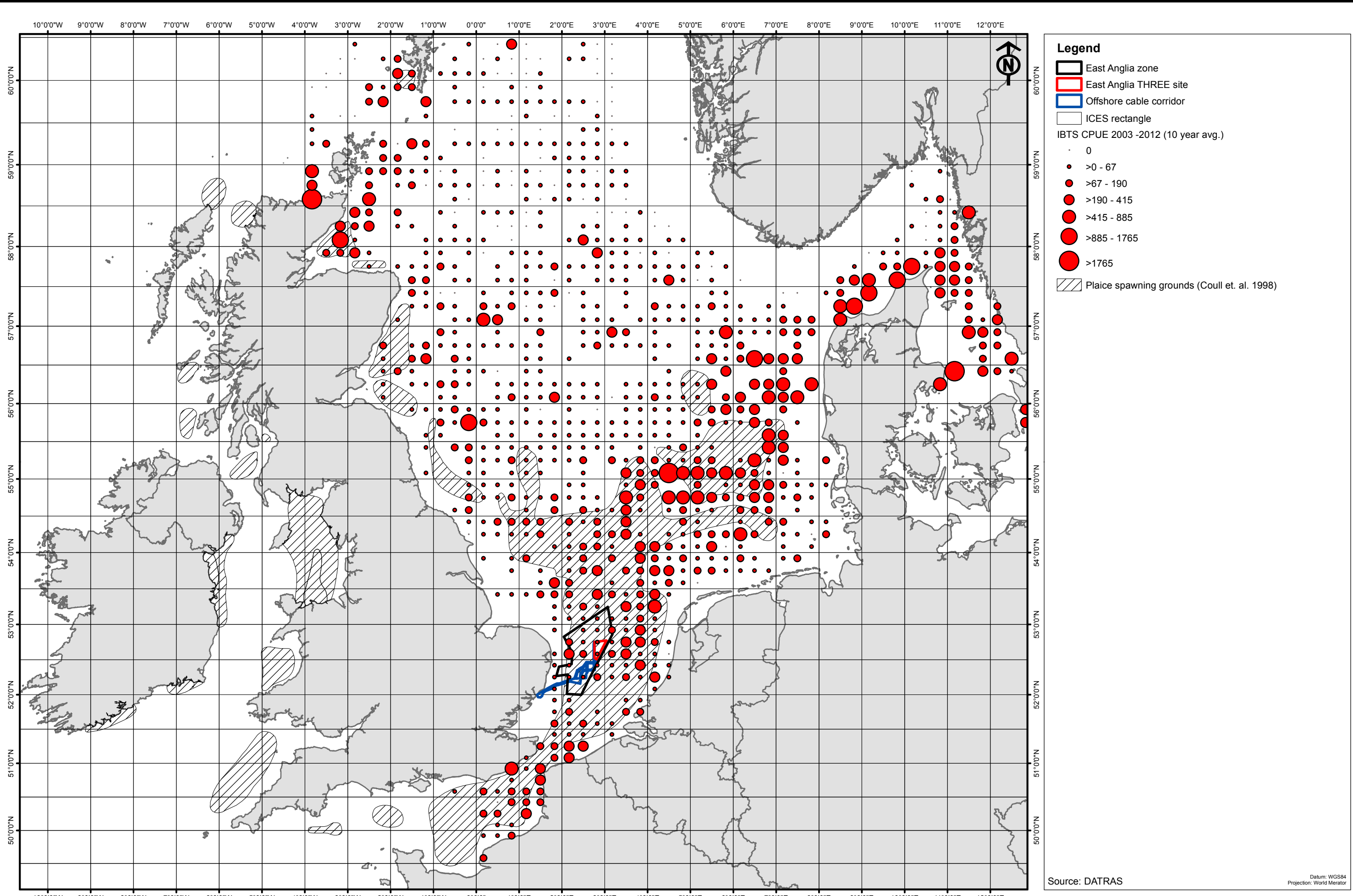
Original A3 Plot Scale 1:9,000,000

0 50 100 km    0 50 100 nm

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**East Anglia THREE Limited**  
Solea solea (Eggs) stage 1  
IBTS annual abundance in January 2007-2009

Drg No	EA3-530-PB-554-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.12</b>
Date	14/10/2015		
Layout	N/A		



**Legend**

- East Anglia zone
- East Anglia THREE site
- Offshore cable corridor
- ICES rectangle

IBTS CPUE 2003 - 2012 (10 year avg.)

- 0
- >0 - 67
- >67 - 190
- >190 - 415
- >415 - 885
- >885 - 1765
- >1765

Plaice spawning grounds (Coull et. al. 1998)

Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

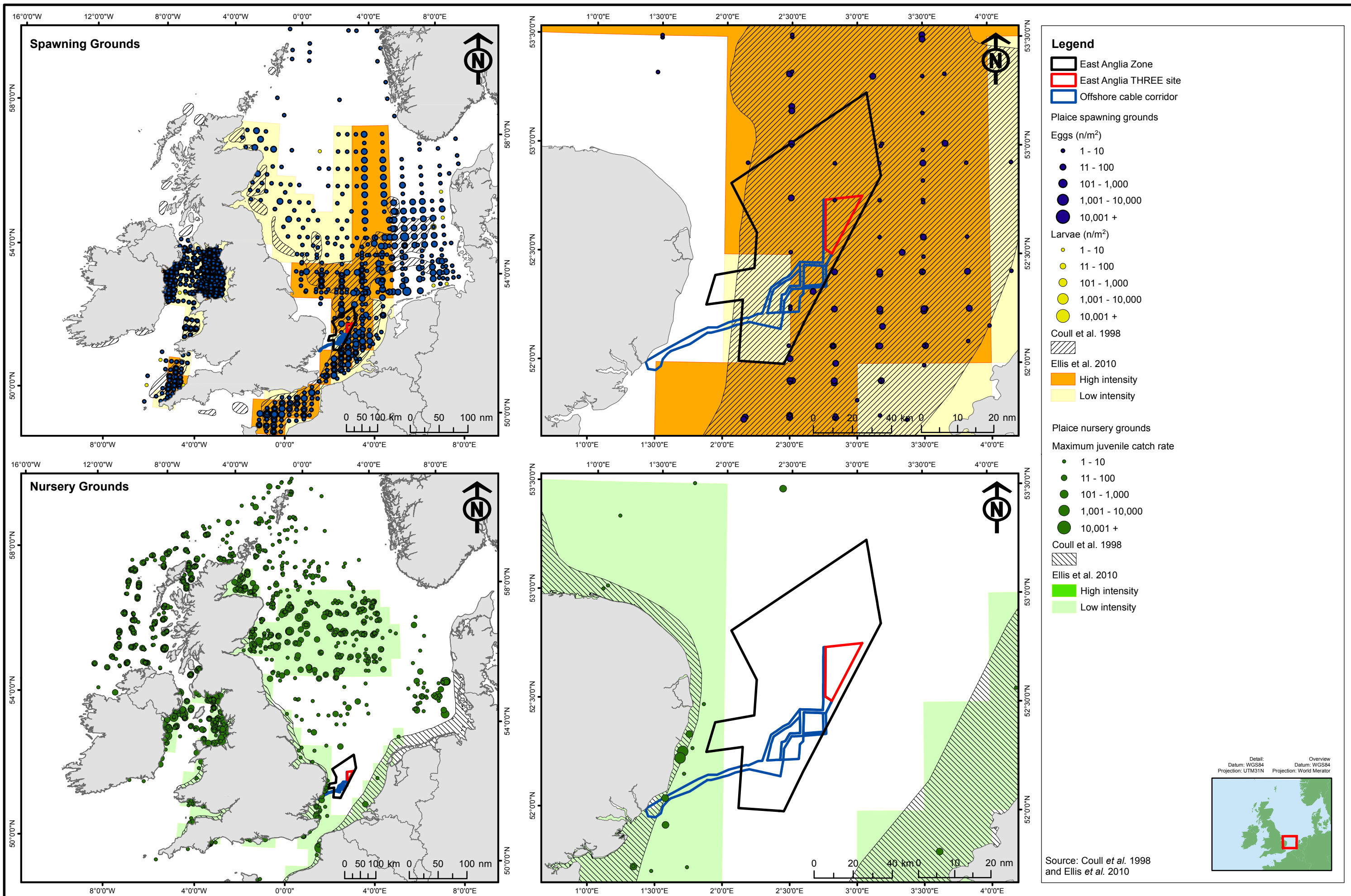
Original A3 Plot Scale 1:9,000,000

0 50 100 km    0 50 100 nm

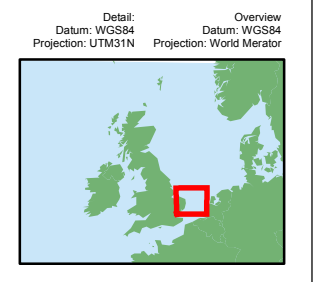
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Drg No	EA3-530-PB-555-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.13</b>
Date	14/10/2015		
Layout	N/A		





- Legend**
- East Anglia Zone
  - East Anglia THREE site
  - Offshore cable corridor
- Plaice spawning grounds
- Eggs (n/m<sup>2</sup>)
- 1 - 10
  - 11 - 100
  - 101 - 1,000
  - 1,001 - 10,000
  - 10,001 +
- Larvae (n/m<sup>2</sup>)
- 1 - 10
  - 11 - 100
  - 101 - 1,000
  - 1,001 - 10,000
  - 10,001 +
- Coull et al. 1998
- 
- Ellis et al. 2010
- High intensity
  - Low intensity
- Plaice nursery grounds
- Maximum juvenile catch rate
- 1 - 10
  - 11 - 100
  - 101 - 1,000
  - 1,001 - 10,000
  - 10,001 +
- Coull et al. 1998
- 
- Ellis et al. 2010
- High intensity
  - Low intensity

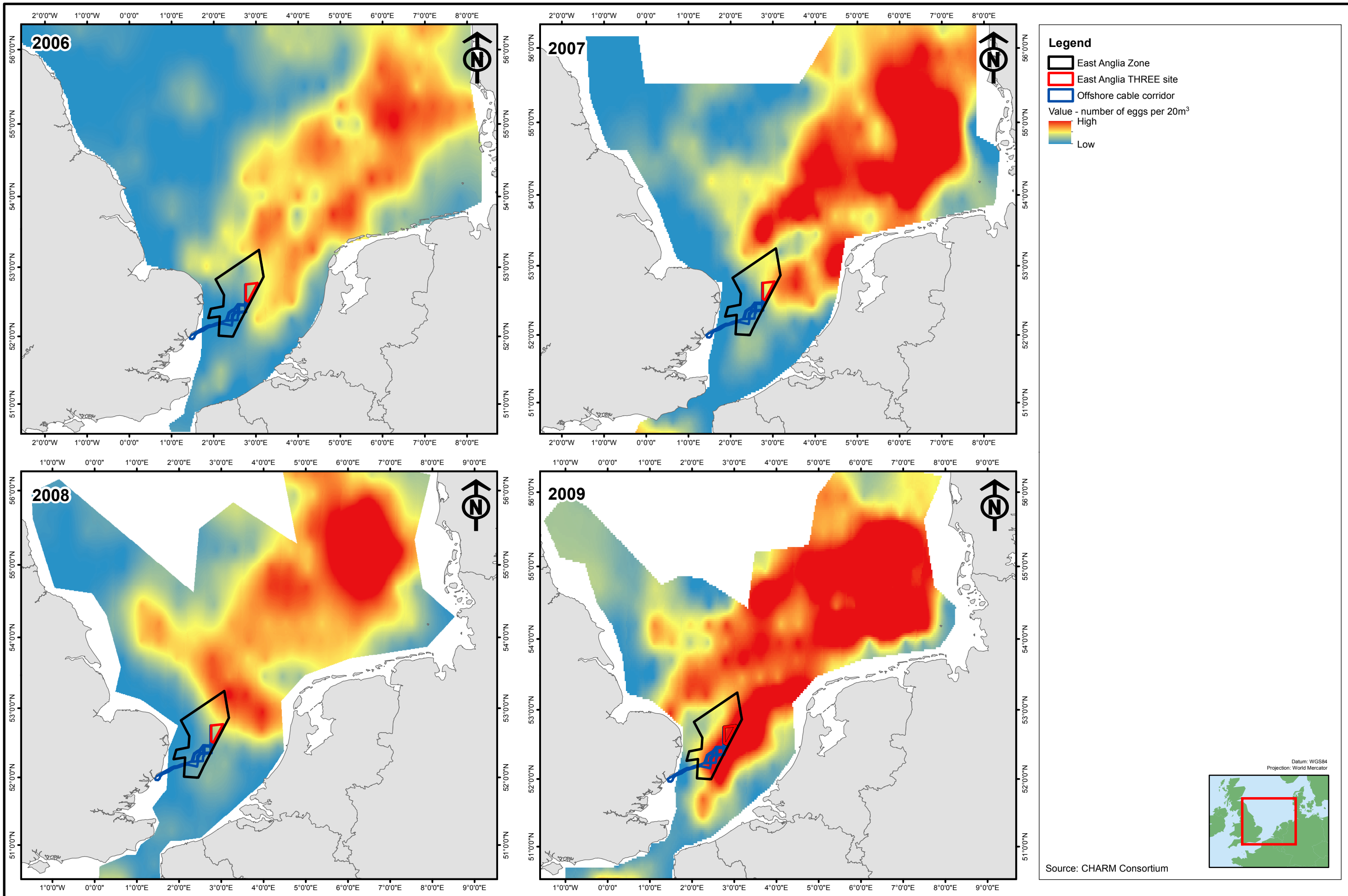


Source: Coull et al. 1998 and Ellis et al. 2010

Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale	Overview:	Detail
	1:11,000,000	1:1,750,000

Drg No	EA3-530-PB-556-D	Volume
Rev	D	2
Date	14/10/2015	Figure
Layout	N/A	11.14

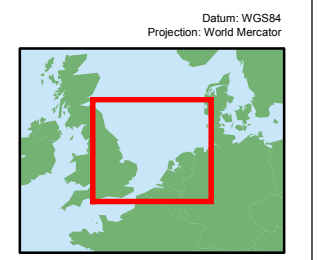


**Legend**

- East Anglia Zone
- East Anglia THREE site
- Offshore cable corridor

Value - number of eggs per 20m<sup>3</sup>

- High
- Low



Source: CHARM Consortium

Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

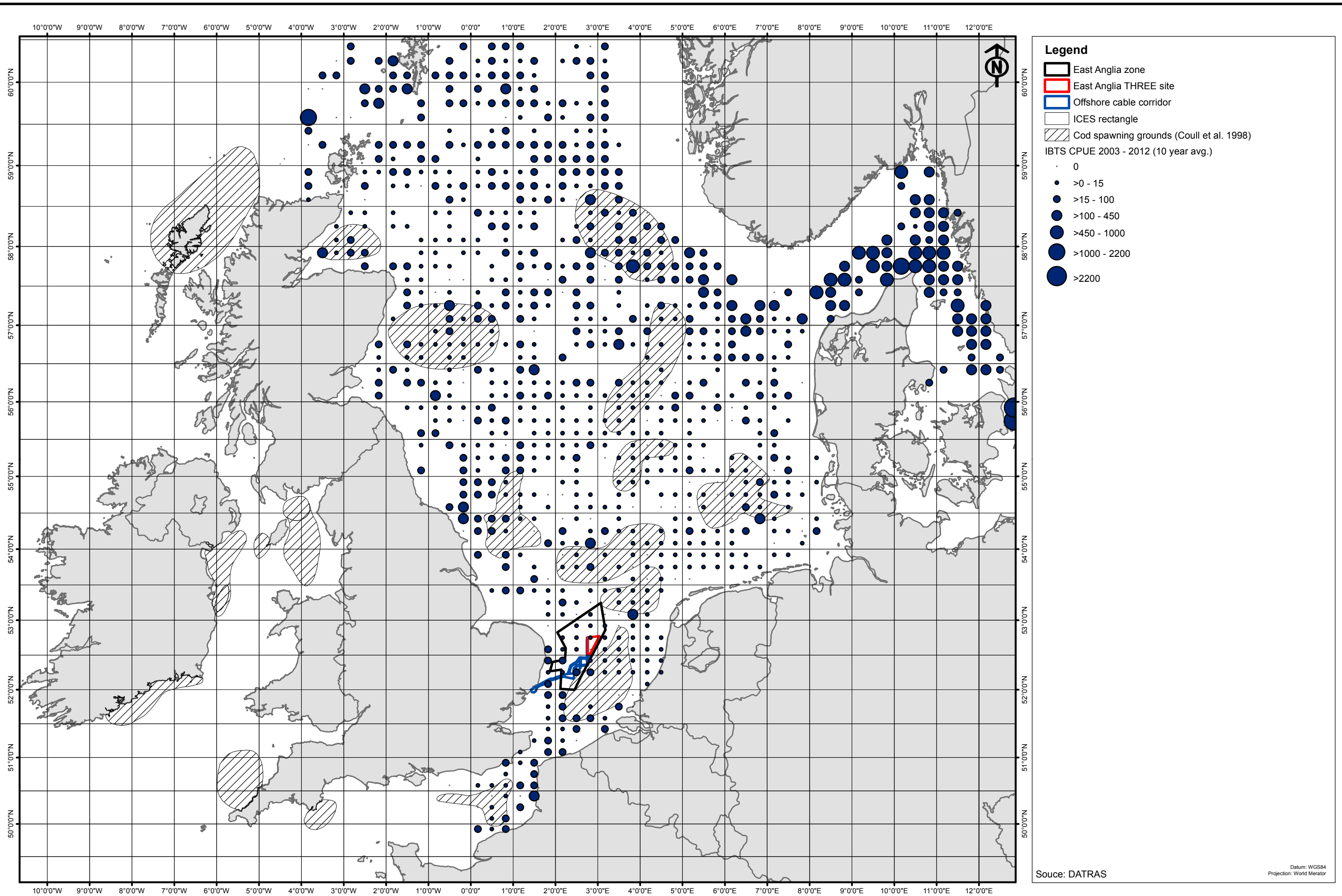
Original A3 Plot Scale 1:9,000,000

0 50 100 km    0 50 100 nm

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Drg No	EA3-530-PB-557-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.15</b>
Date	14/10/2015		
Layout	N/A		





**Legend**

- East Anglia zone
- East Anglia THREE site
- Offshore cable corridor
- ICES rectangle
- Cod spawning grounds (Coull et al. 1998)

IBTS CPUE 2003 - 2012 (10 year avg.)

- 0
- >0 - 15
- >15 - 100
- >100 - 450
- >450 - 1000
- >1000 - 2200
- >2200

Source: DATRAS Datum: WGS84  
Projection: World Merator



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

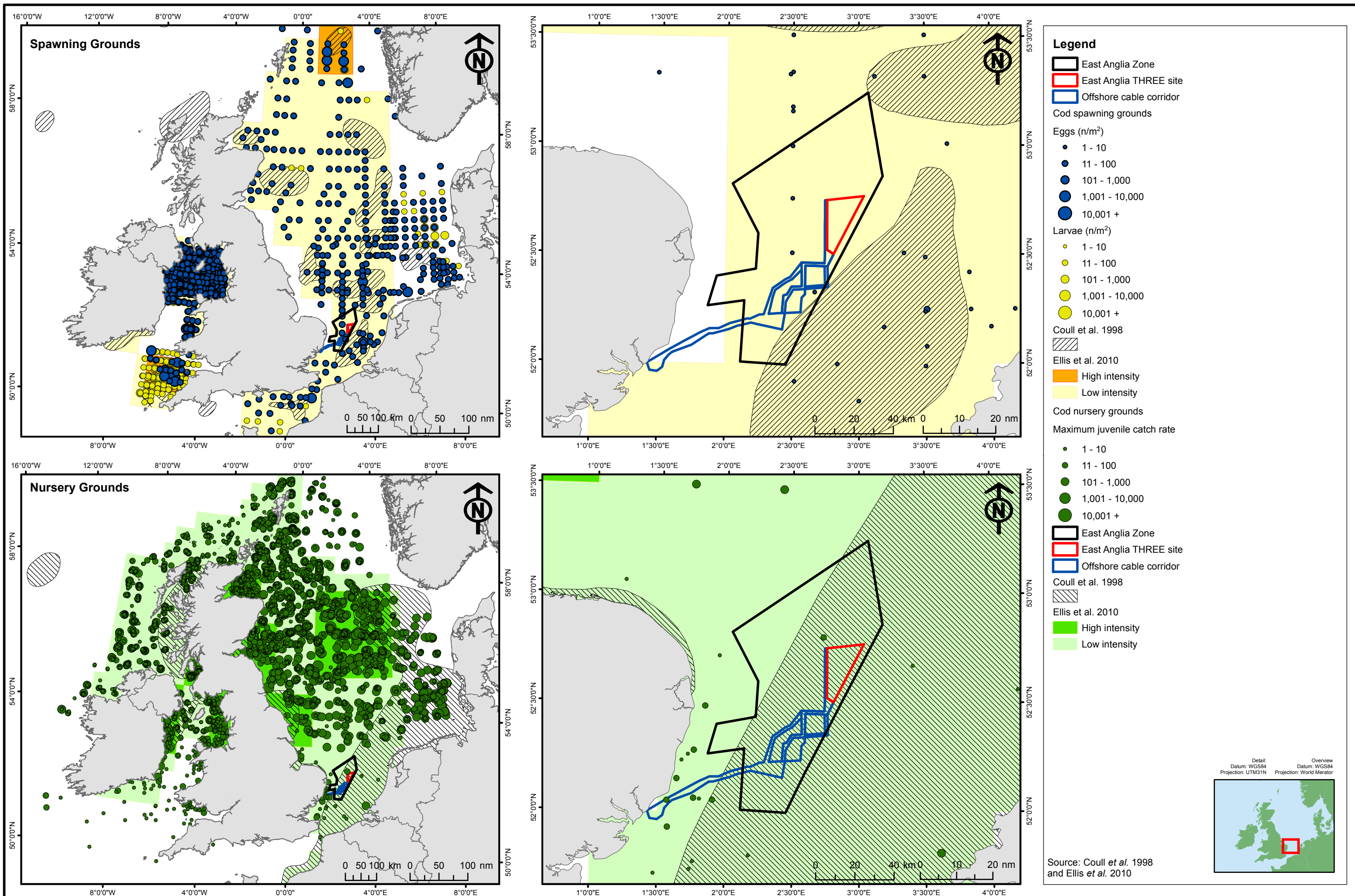
Original A3 Plot Scale 1:9,000,000

0 50 100 km    0 50 100 nm

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Cod - CPUE 2003 - 2012 (10 year avg.)

Drg No	EA3-530-PB-558-D	<b>Volume</b> <b>2</b>
Rev	D	
Date	14/10/2015	<b>Figure</b> <b>11.16</b>
Layout	N/A	



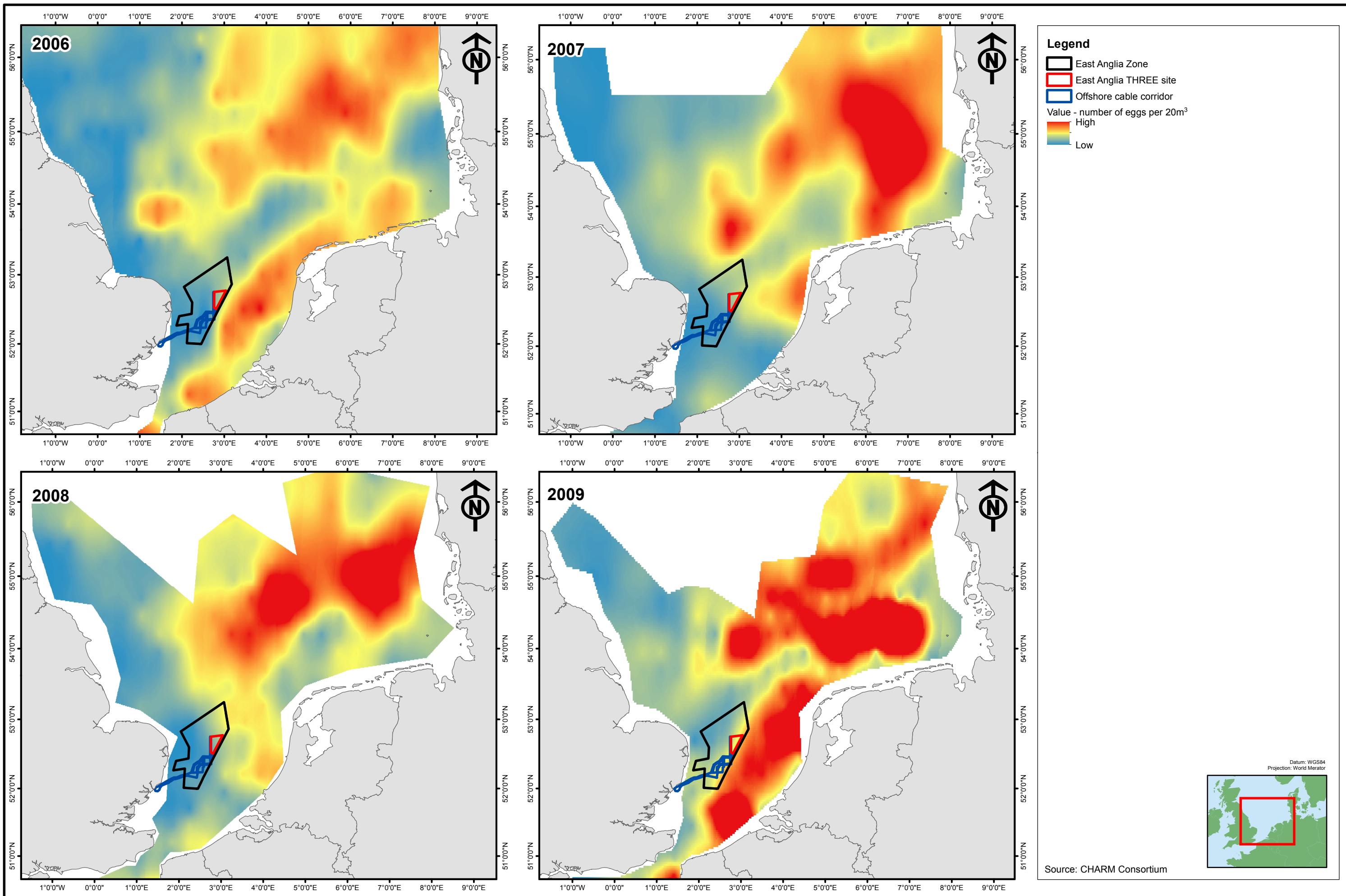
Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale	Overview:	Detail
	1:11,000,000	1:1,750,000

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Drg No	EA3-530-PB-559-D	Volume
Rev	D	2
Date	15/10/2015	Figure
Layout	N/A	11.17





**Legend**

- East Anglia Zone
- East Anglia THREE site
- Offshore cable corridor

Value - number of eggs per 20m<sup>3</sup>

- High
- Low

Datum: WGS84  
Projection: World Merator

Source: CHARM Consortium



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

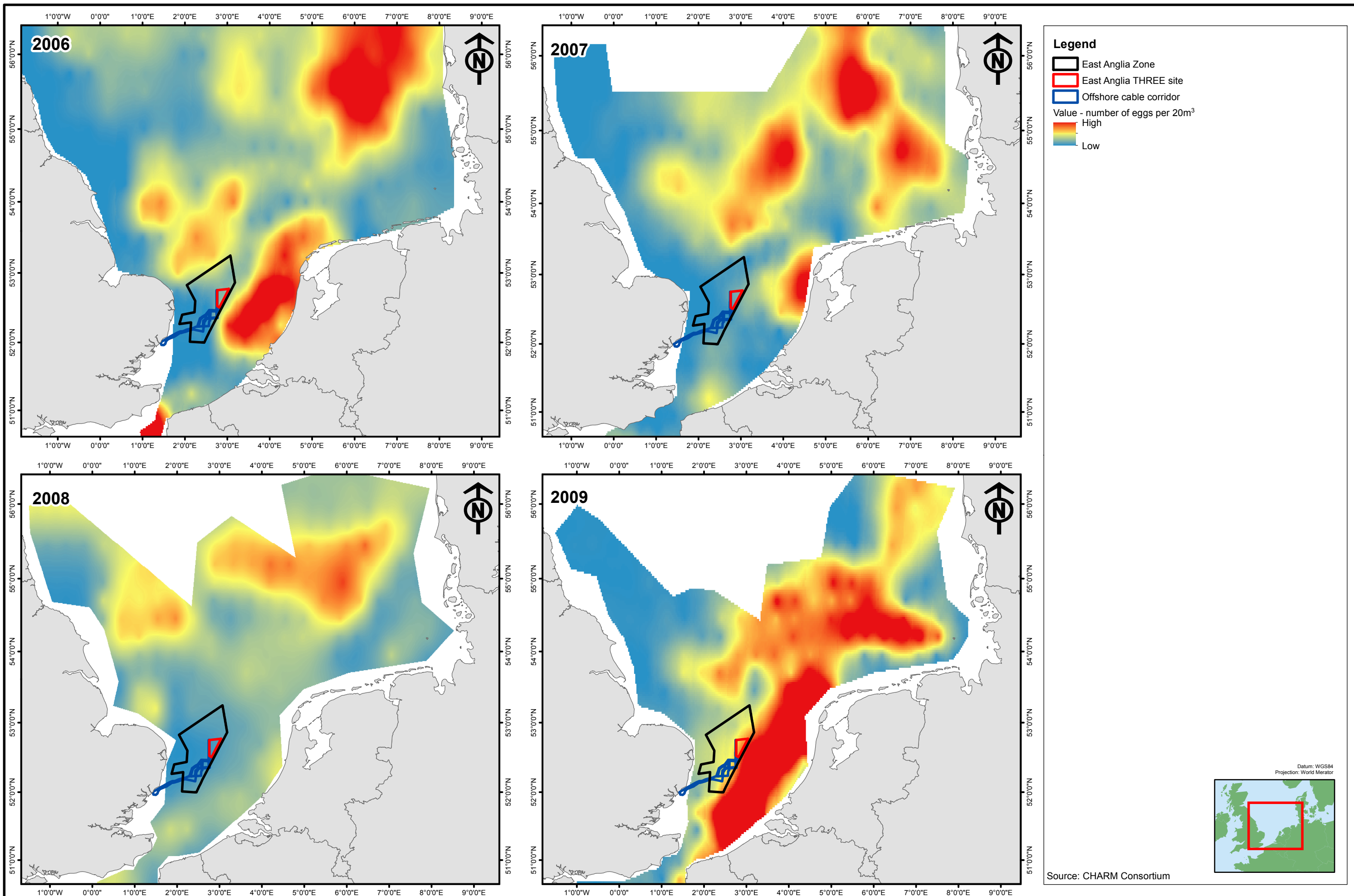
Original A3 Plot Scale 1:9,000,000

0 50 100 km    0 50 100 nm

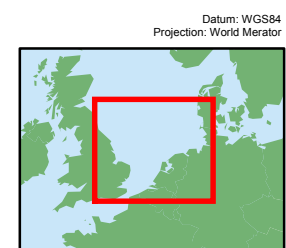
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**East Anglia THREE Limited**  
Cod Eggs Stage 1 - IBTS annual abundance in January 2006 - 2009

Drg No	EA3-530-PB-560-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.18</b>
Date	14/10/2015		
Layout	N/A		



Source: CHARM Consortium

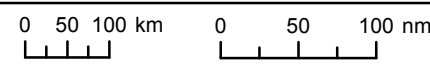


Datum: WGS84  
Projection: World Merator



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

Original A3  
Plot Scale  
1:9,000,000

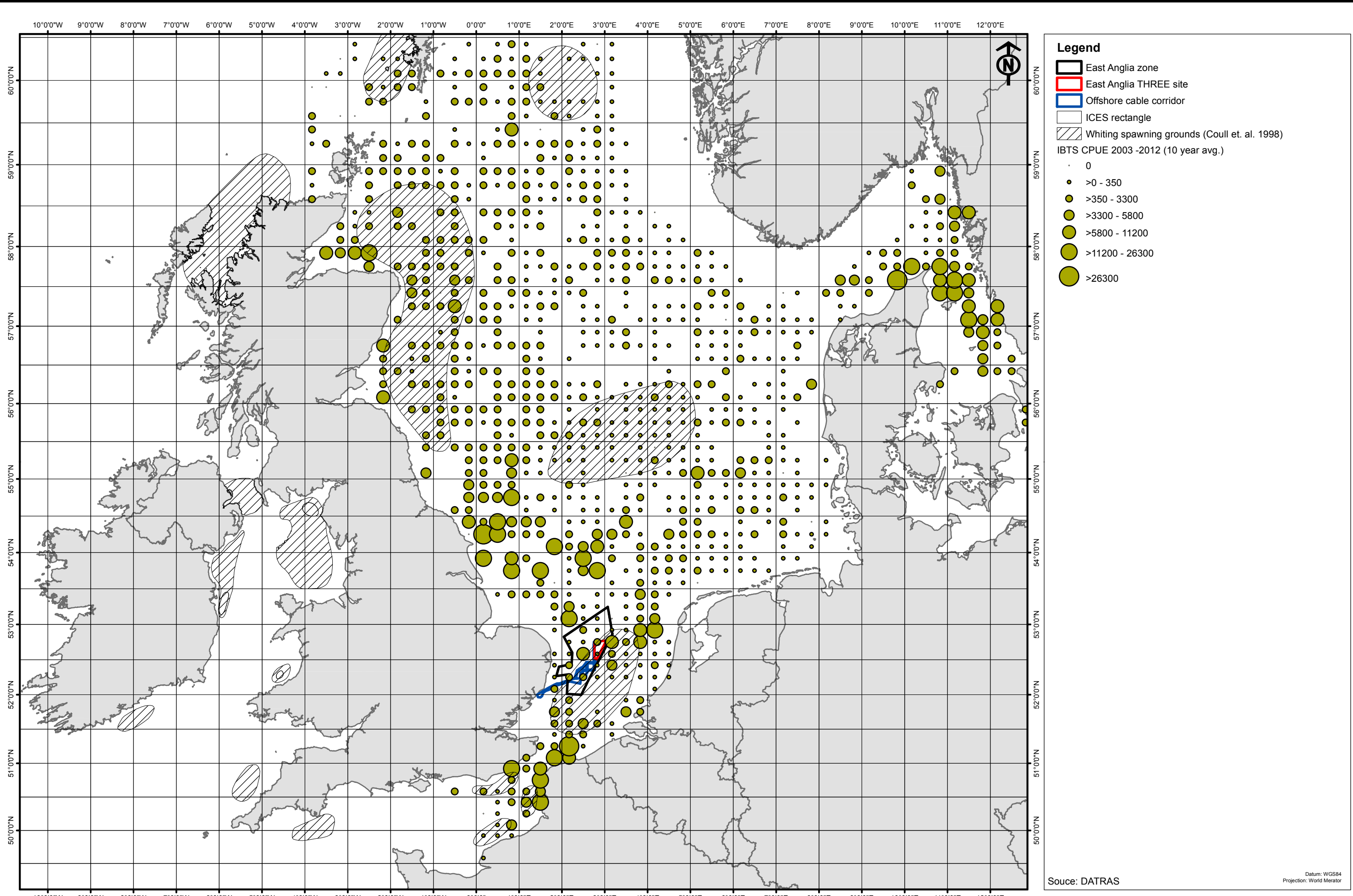


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**East Anglia THREE Limited**  
Cod Eggs Stage 2 - IBTS annual abundance in  
January 2006 - 2009

Drg No	EA3-530-PB-561-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.19</b>
Date	14/10/2015		
Layout	N/A		





**Legend**

- East Anglia zone
- East Anglia THREE site
- Offshore cable corridor
- ICES rectangle
- Whiting spawning grounds (Coull et. al. 1998)

IBTS CPUE 2003 -2012 (10 year avg.)

- 0
- >0 - 350
- >350 - 3300
- >3300 - 5800
- >5800 - 11200
- >11200 - 26300
- >26300

Source: DATRAS Datum: WGS84  
Projection: World Merator



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

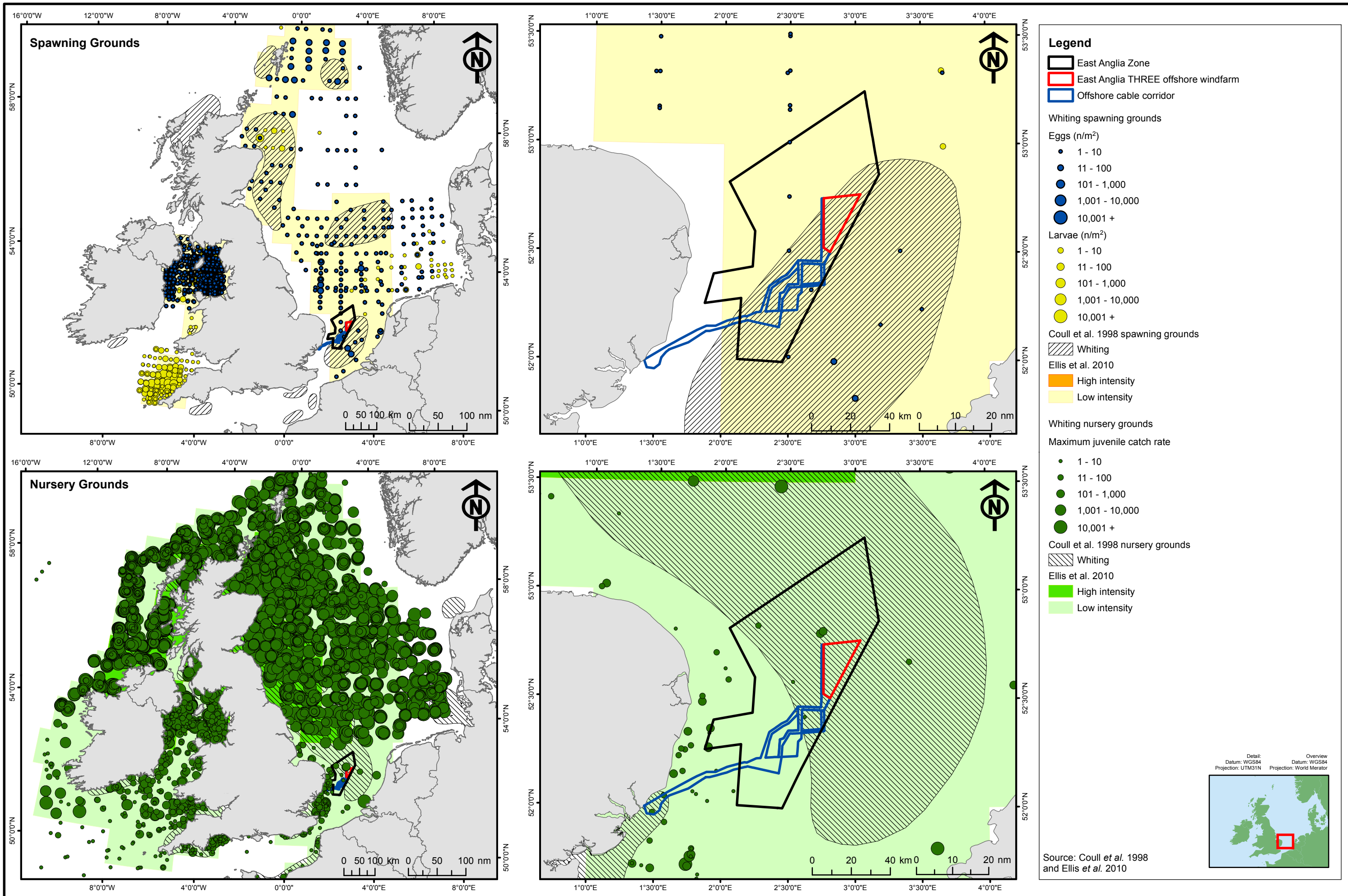
Original A3 Plot Scale 1:9,000,000

0 50 100 km    0 50 100 nm

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**East Anglia THREE Limited**  
Whiting - CPUE 2003 - 2012 (10 year avg.)

Drg No	EA3-530-PB-562-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.20</b>
Date	14/10/2015		
Layout	N/A		



**Legend**

- East Anglia Zone
- East Anglia THREE offshore windfarm
- Offshore cable corridor

**Whiting spawning grounds**

Eggs (n/m<sup>2</sup>)

- 1 - 10
- 11 - 100
- 101 - 1,000
- 1,001 - 10,000
- 10,001 +

Larvae (n/m<sup>2</sup>)

- 1 - 10
- 11 - 100
- 101 - 1,000
- 1,001 - 10,000
- 10,001 +

Coull et al. 1998 spawning grounds

- Whiting

Ellis et al. 2010

- High intensity
- Low intensity

**Whiting nursery grounds**

Maximum juvenile catch rate

- 1 - 10
- 11 - 100
- 101 - 1,000
- 1,001 - 10,000
- 10,001 +

Coull et al. 1998 nursery grounds

- Whiting

Ellis et al. 2010

- High intensity
- Low intensity

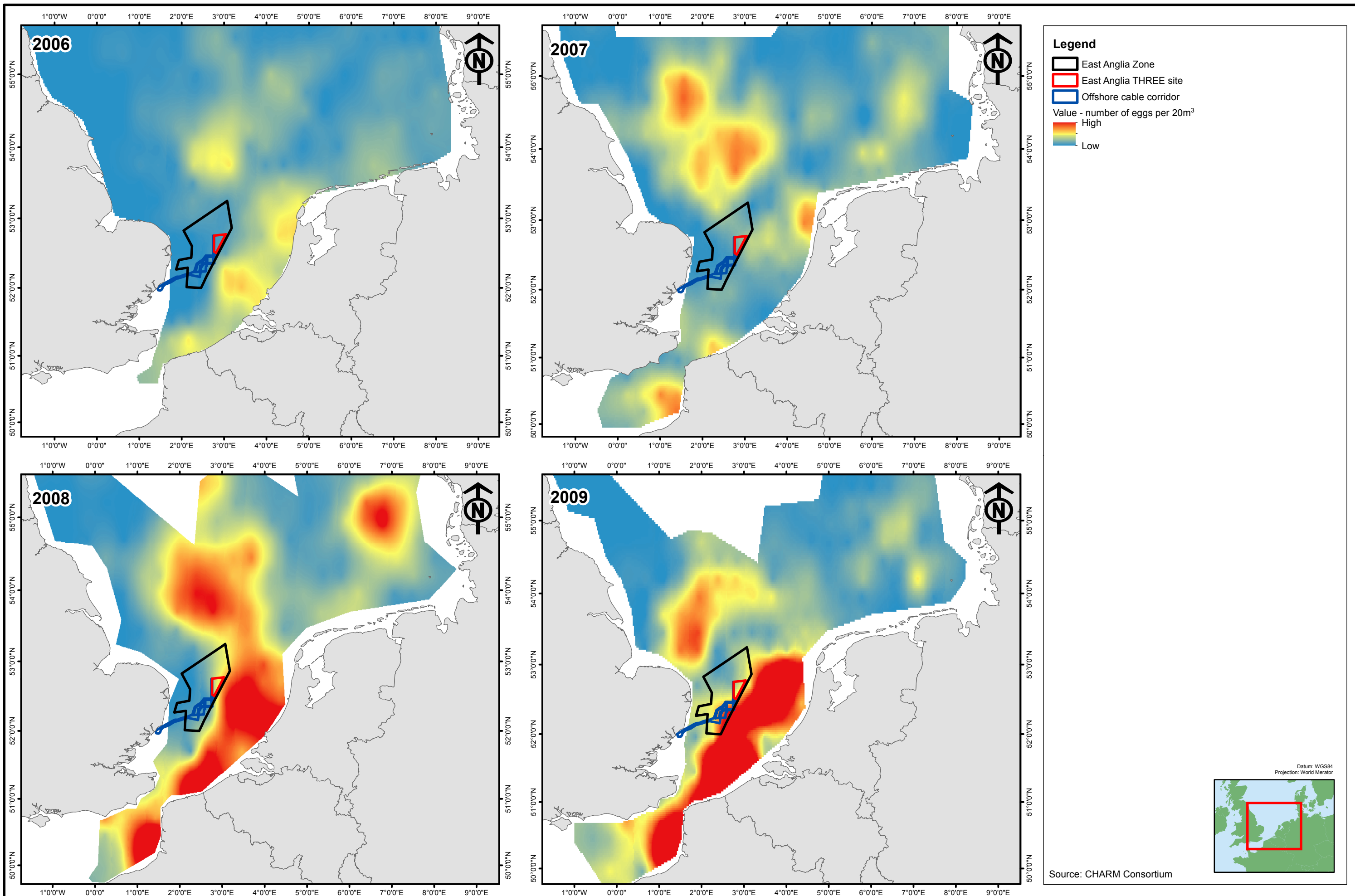
Source: Coull *et al.* 1998 and Ellis *et al.* 2010

Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale	Overview: 1:11,000,000	Detail: 1:1,750,000
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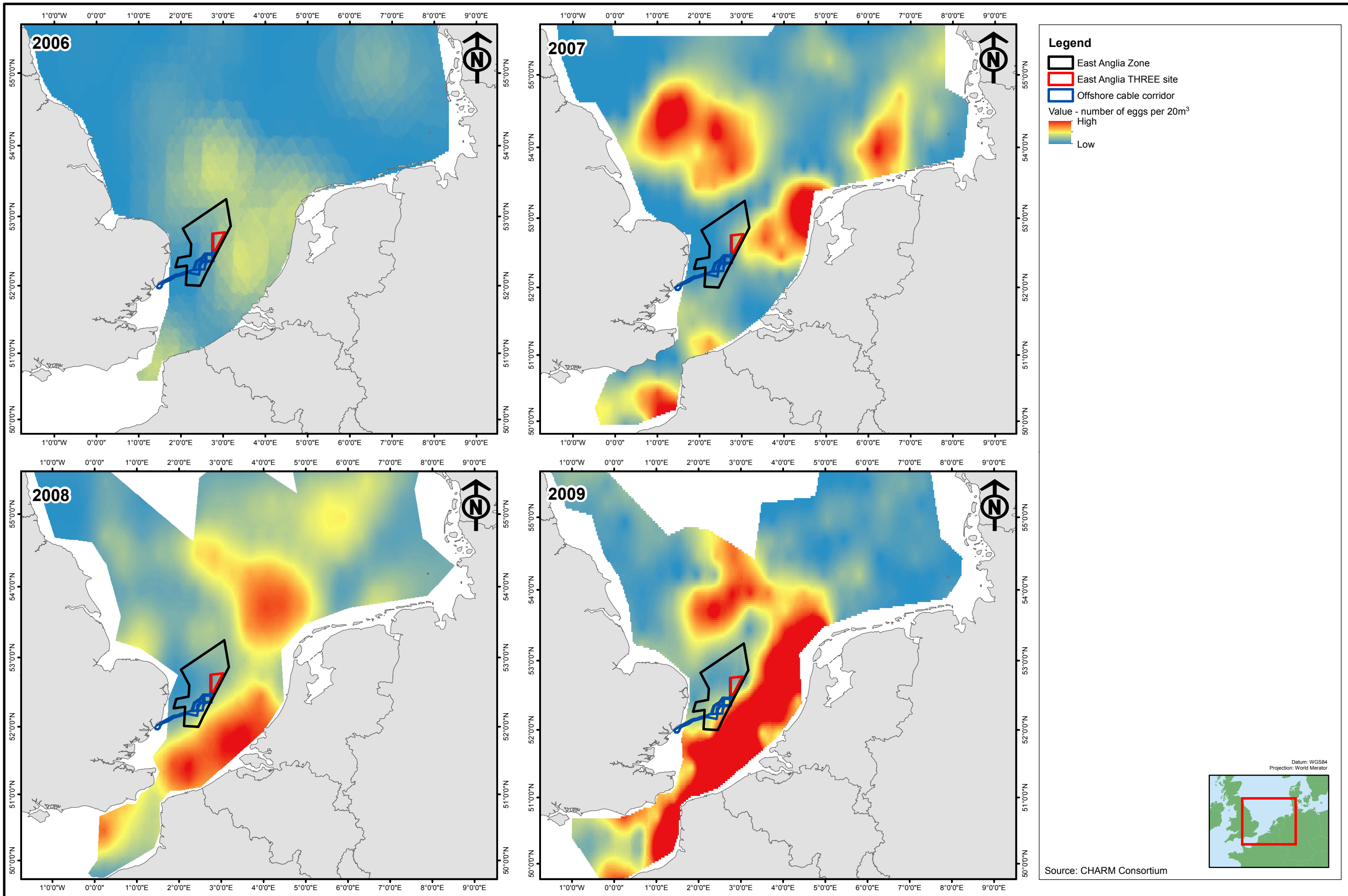
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Rev	D	Date	14/10/2015
Date	14/10/2015	Figure	11.21
Layout	N/A		





Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

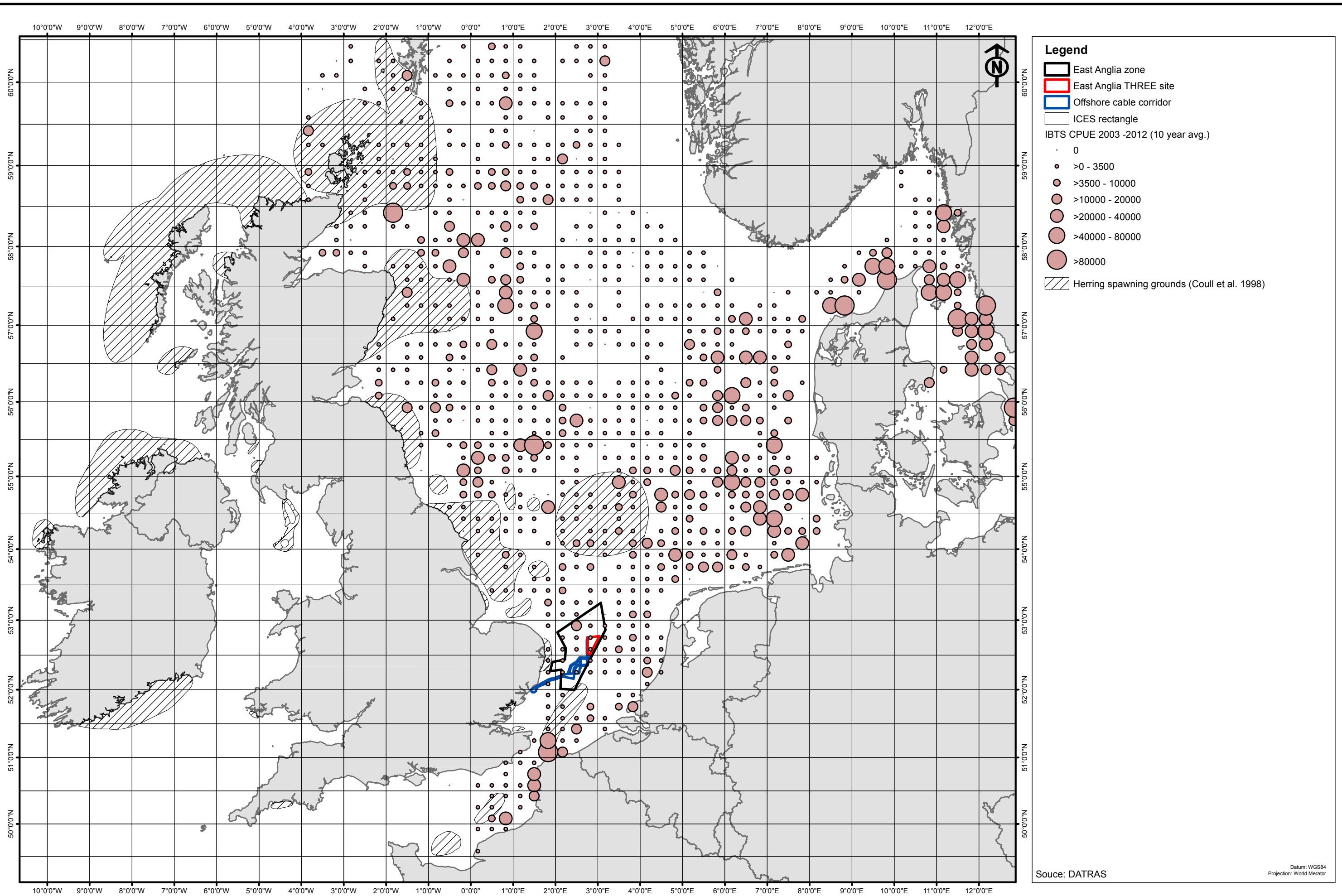
Drg No	EA3-530-PB-564-D	Volume
Rev	D	2
Date	14/10/2015	Figure
Layout	N/A	11.22



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Drg No	EA3-530-PB-565-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.23</b>
Date	14/10/2015		
Layout	N/A		





**Legend**

- East Anglia zone
- East Anglia THREE site
- Offshore cable corridor
- ICES rectangle

IBTS CPUE 2003 -2012 (10 year avg.)

- 0
- >0 - 3500
- >3500 - 10000
- >10000 - 20000
- >20000 - 40000
- >40000 - 80000
- >80000

Herring spawning grounds (Coull et al. 1998)

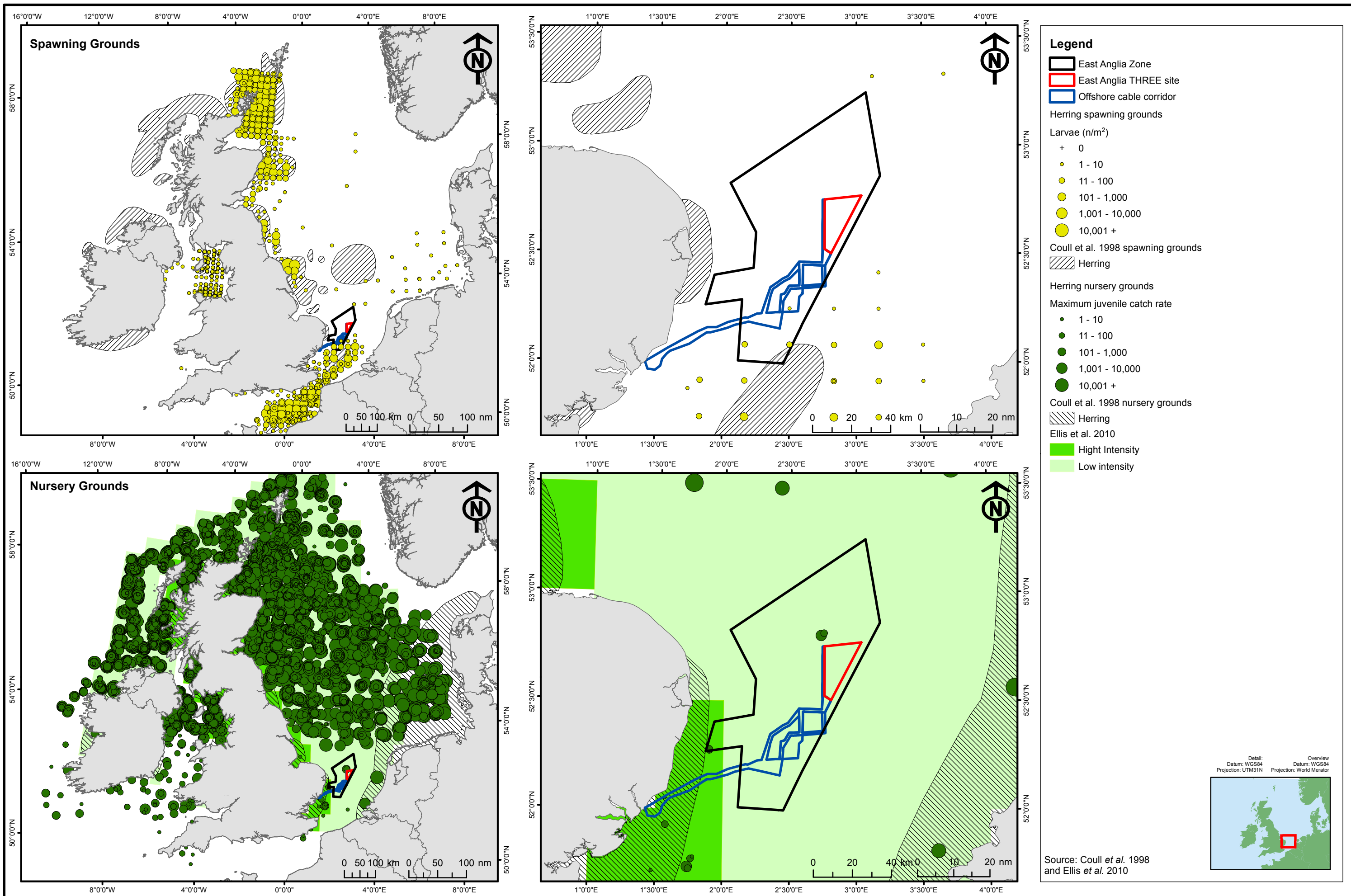
Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale 1:9,000,000

0 50 100 km    0 50 100 nm

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Drg No	EA3-530-PB-566-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.24</b>
Date	14/10/2015		
Layout	N/A		



**Legend**

- East Anglia Zone
- East Anglia THREE site
- Offshore cable corridor

Herring spawning grounds

Larvae (n/m<sup>2</sup>)

- + 0
- 1 - 10
- 11 - 100
- 101 - 1,000
- 1,001 - 10,000
- 10,001 +

Coull et al. 1998 spawning grounds

- Herring

Herring nursery grounds

Maximum juvenile catch rate

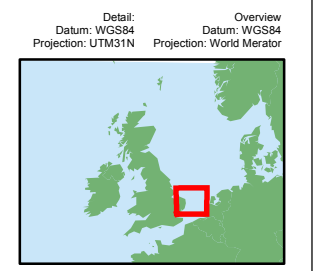
- 1 - 10
- 11 - 100
- 101 - 1,000
- 1,001 - 10,000
- 10,001 +

Coull et al. 1998 nursery grounds

- Herring

Ellis et al. 2010

- Hight Intensity
- Low intensity

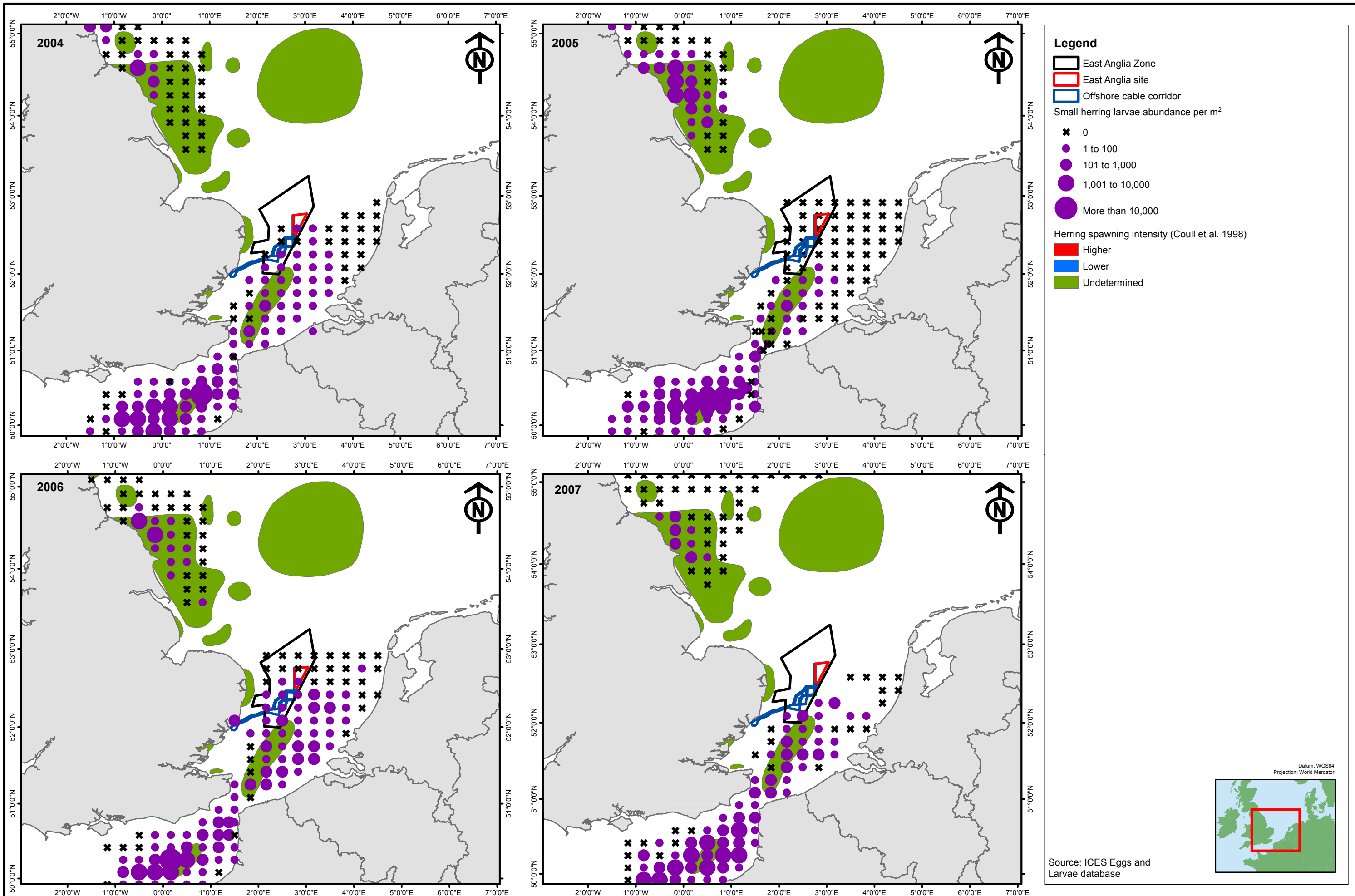


Source: Coull *et al.* 1998 and Ellis *et al.* 2010

Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale	Overview: 1:11,000,000	Detail 1:1,750,000
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Drg No	EA3-530-PB-567-D	<b>Volume 2</b>
Rev	D	
Date	14/10/2015	<b>Figure 11.25</b>
Layout	N/A	



**Legend**

- East Anglia Zone
- East Anglia site
- Offshore cable corridor

Small herring larvae abundance per m<sup>2</sup>

- ✕ 0
- 1 to 100
- 101 to 1,000
- 1,001 to 10,000
- More than 10,000

Herring spawning intensity (Coull et al. 1998)

- Higher
- Lower
- Undetermined

Datum: WGS84  
Projection: World Mercator

Source: ICES Eggs and Larvae database



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	13/05/15	SF	Third Issue. Update IHLS data & update cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale 1:8,000,000

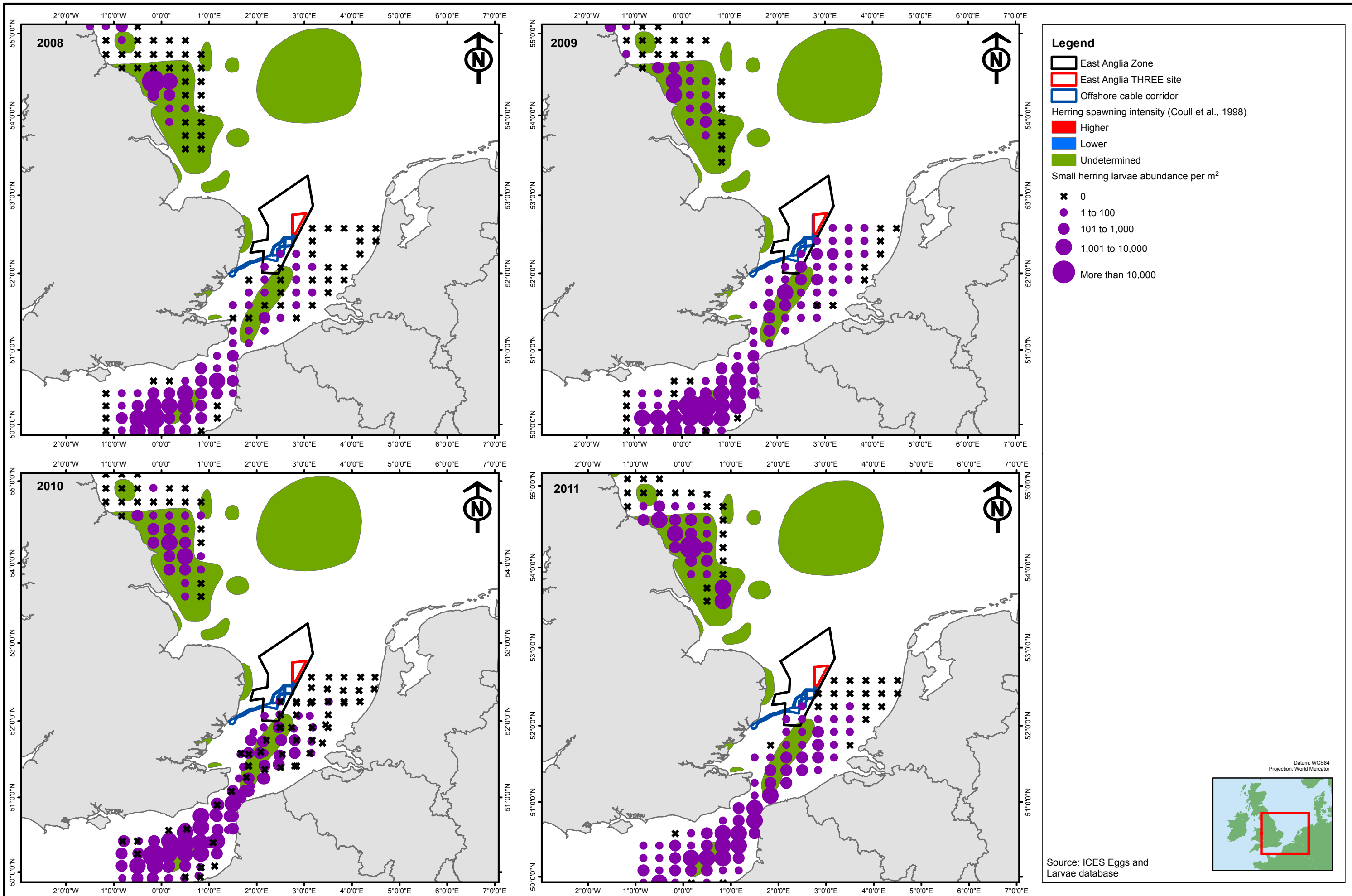
0 50 100 km      0 20 40 nm

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**East Anglia THREE Limited**  
IHLS herring small larvae abundance,  
2004 - 2007 and herring spawning area

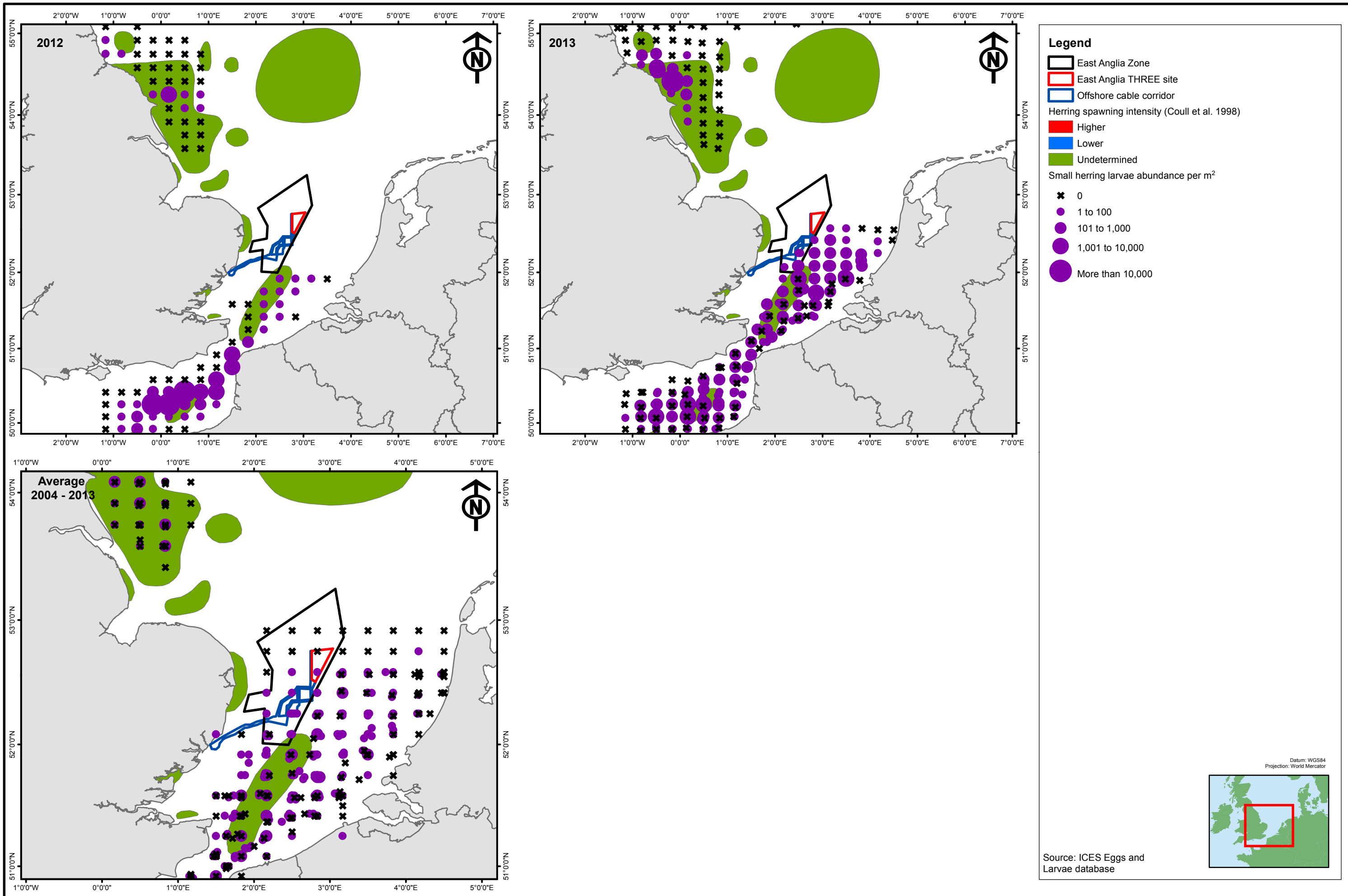
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Rev	D		
Date	14/10/2015	<b>Figure</b>	<b>11.26</b>
Layout	N/A		



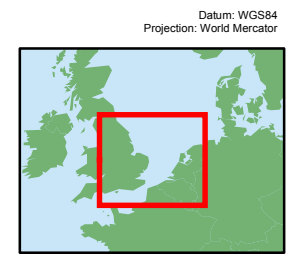


Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	13/05/15	SF	Third Issue. Update IHLS data & update cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Drg No	EA3-530-PB-569-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.27</b>
Date	14/10/2015		
Layout	N/A		



Source: ICES Eggs and Larvae database



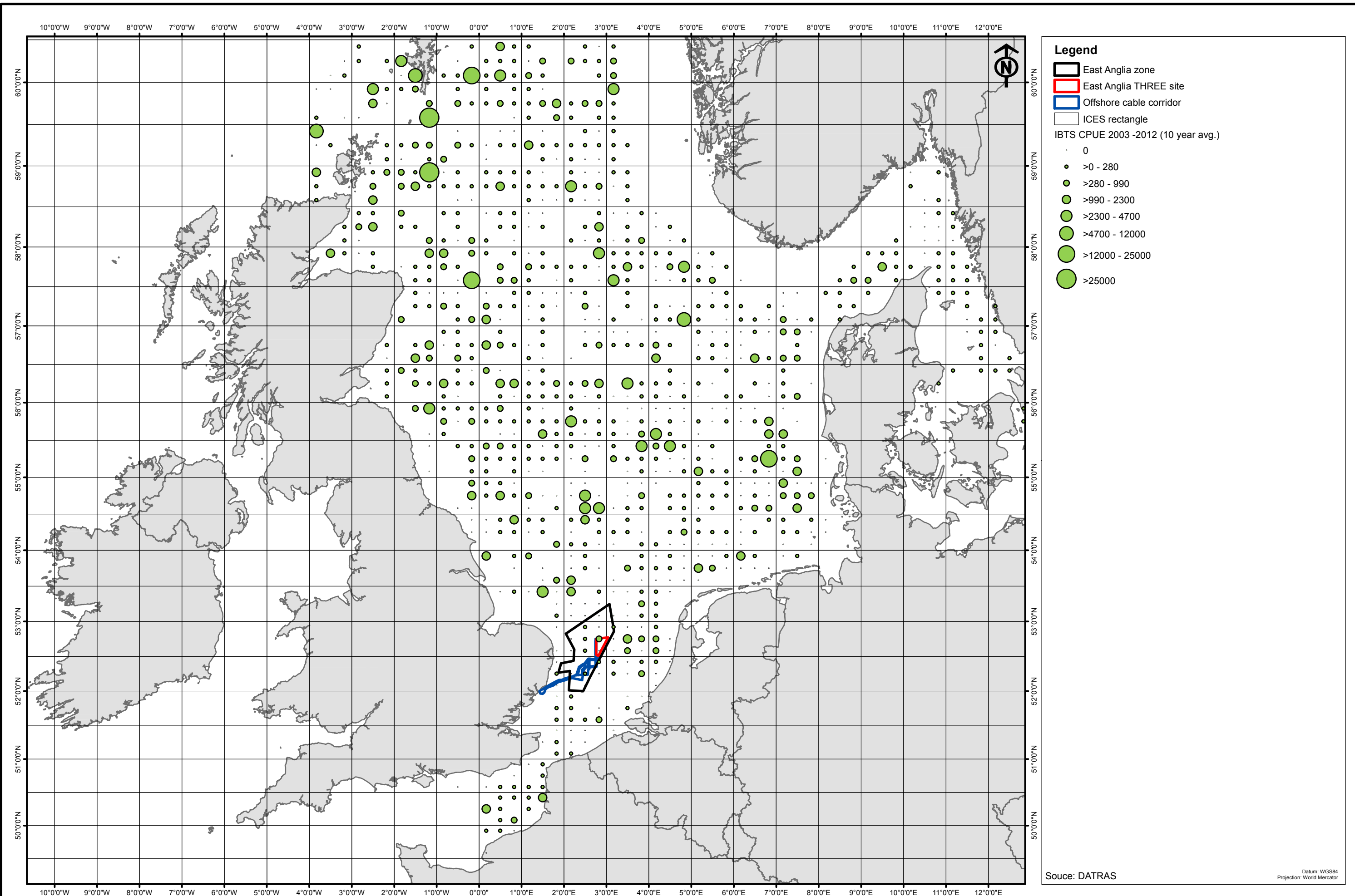
Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	13/05/15	SF	Third Issue. Update IHLS data & update EA3 cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale 1:8,000,000

0 50 100 km      0 20 40 nm

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Drg No	EA3-530-PB-570-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.28</b>
Date	14/10/2015		
Layout	N/A		



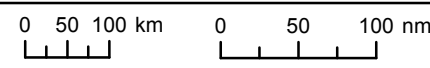
Source: DATRAS

Datum: WGS84  
Projection: World Mercator



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3  
Plot Scale  
1:9,000,000



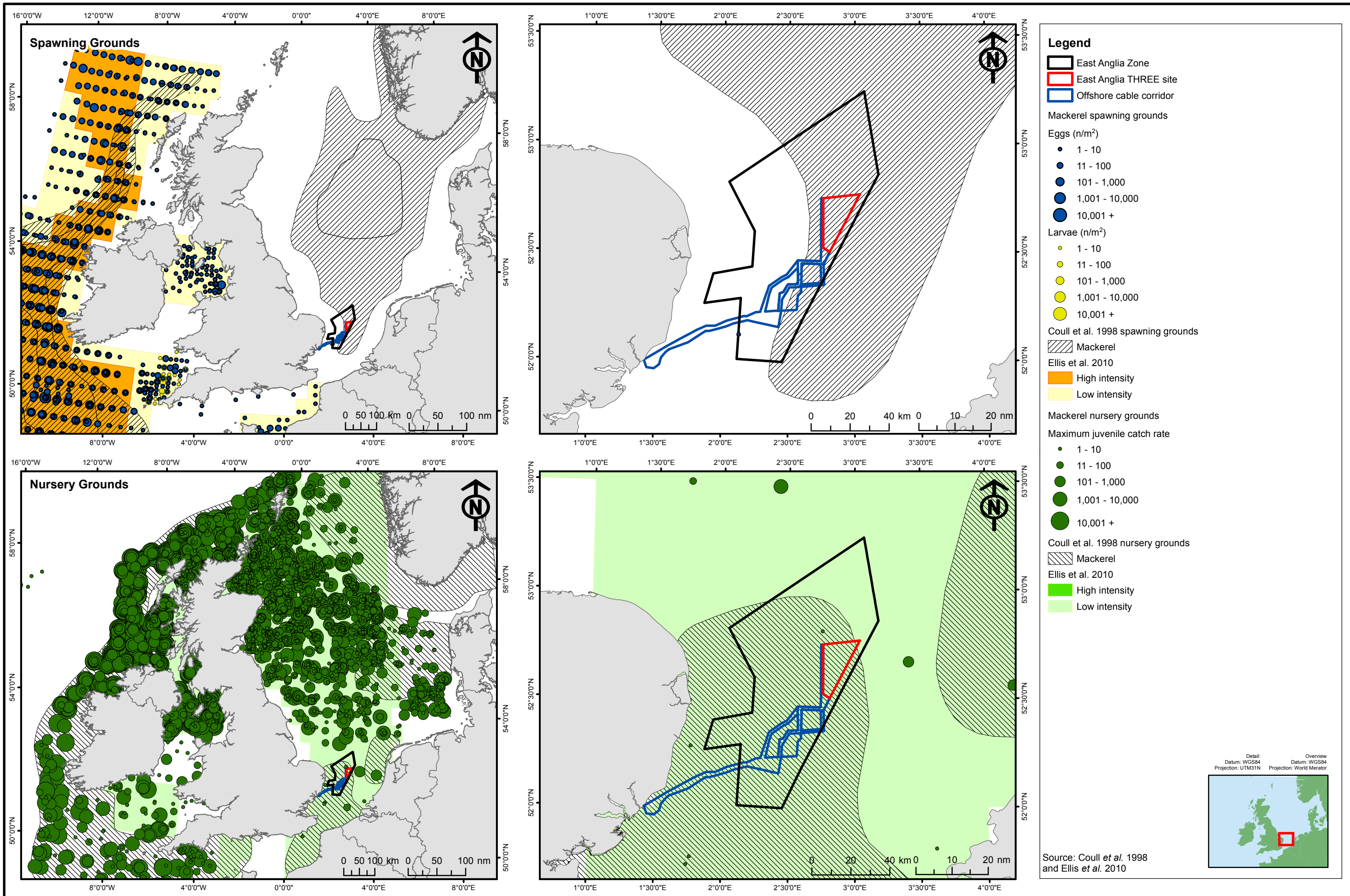
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Mackerel - CPUE 2003 - 2012 (10 year avg.)

Drg No	EA3-530-PB-571-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.29</b>
Date	14/10/2015		
Layout	N/A		

Ref.

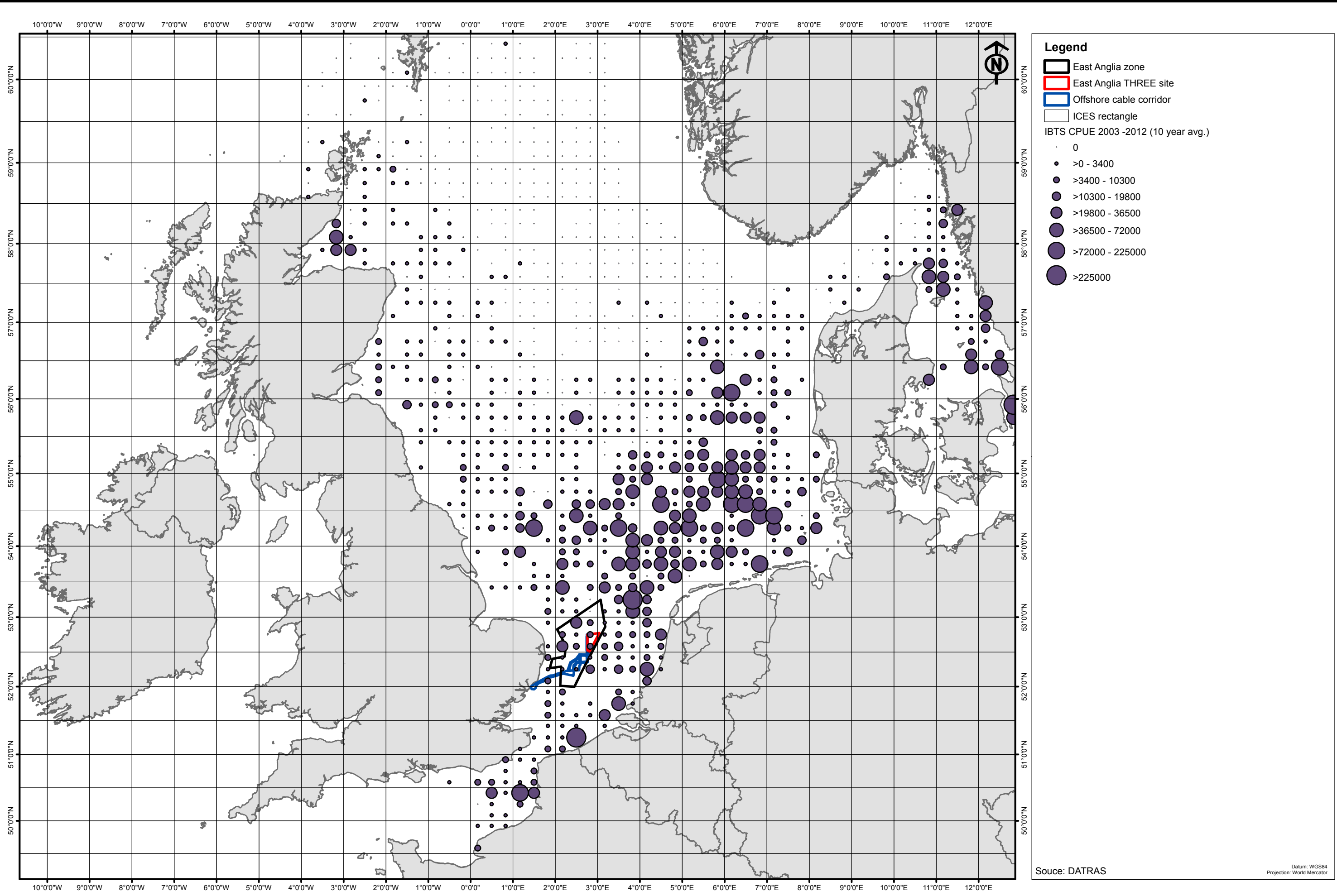




Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale	Overview: 1:11,000,000	Detail 1:1,750,000
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Drg No	EA3-530-PB-572-D	<b>Volume</b>	<b>2</b>
Rev	D	<b>Figure</b>	<b>11.30</b>
Date	14/10/2015		
Layout	N/A		



**Legend**

- East Anglia zone
- East Anglia THREE site
- Offshore cable corridor
- ICES rectangle

IBTS CPUE 2003 -2012 (10 year avg.)

- 0
- >0 - 3400
- >3400 - 10300
- >10300 - 19800
- >19800 - 36500
- >36500 - 72000
- >72000 - 225000
- >225000

Source: DATRAS Datum: WGS84  
Projection: World Mercator



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale 1:9,000,000

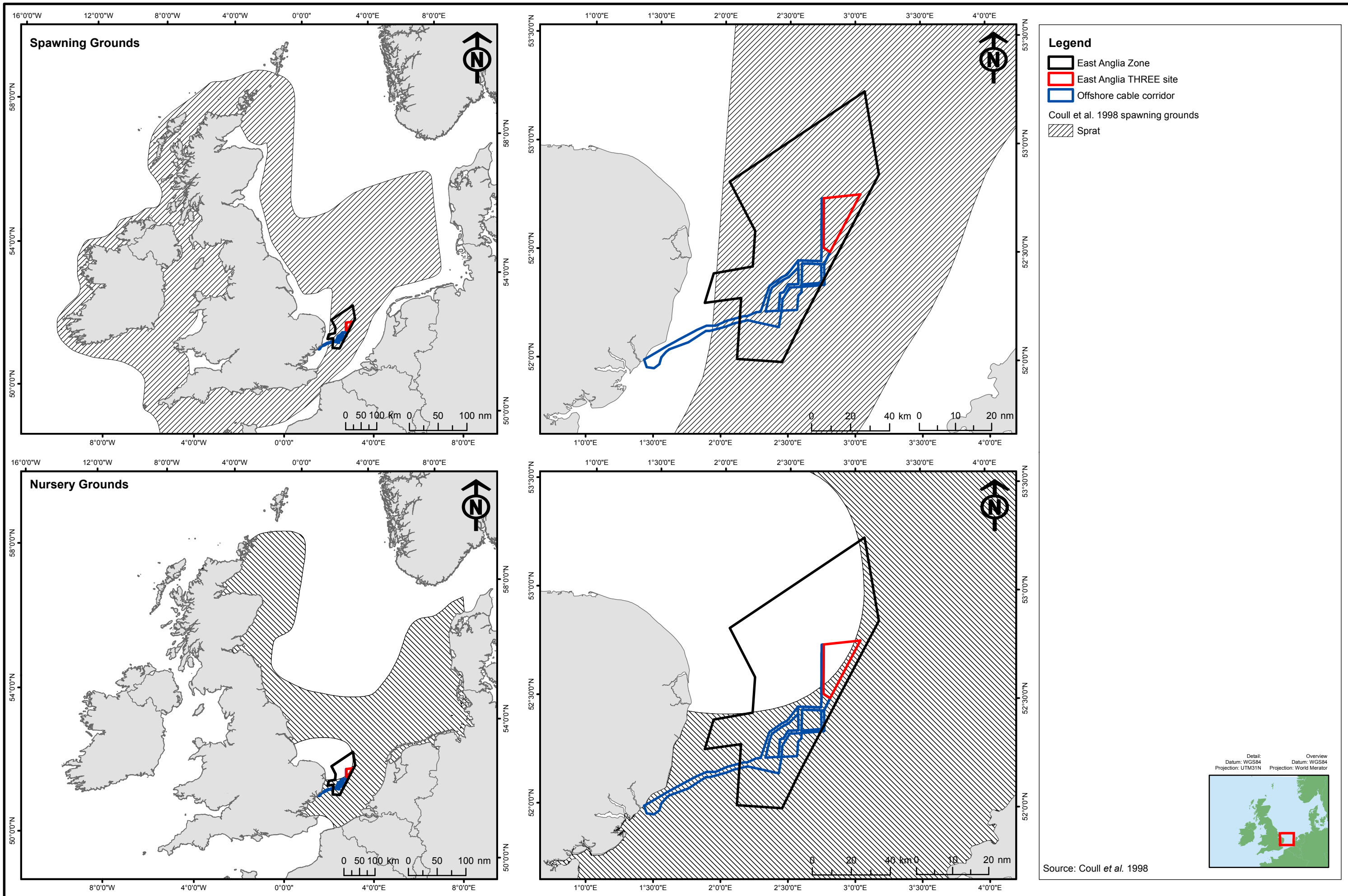
0 50 100 km    0 50 100 nm

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**East Anglia THREE Limited**  
Sprat - CPUE 2003 - 2012 (10 year avg.)

Drg No	EA3-530-PB-573-D	<b>Volume</b> <b>2</b>
Rev	D	
Date	14/10/2015	<b>Figure</b> <b>11.31</b>
Layout	N/A	



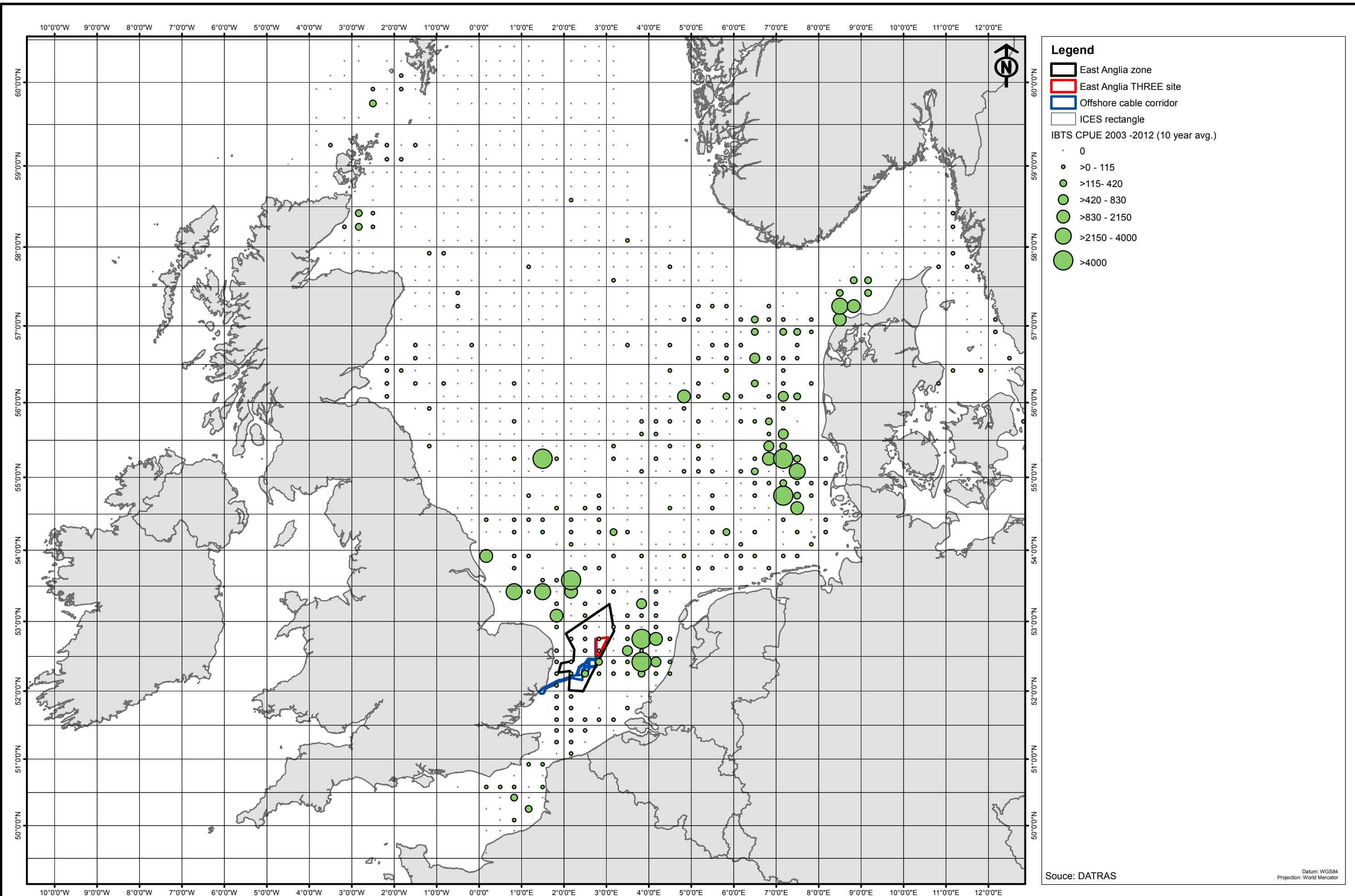


Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	01/05/14	RP	Second Issue. Update cable corridor to V20

Original A3 Plot Scale	Overview:	Detail
	1:11,000,000	1:1,750,000

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Drg No	EA3-530-PB-574-D	Volume
Rev	D	2
Date	14/10/2015	Figure
Layout	N/A	11.32



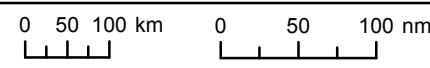
Source: DATRAS

Datum: WGS84  
Projection: World Mercator



Rev	Date	By	Comment
D	14/10/15	SF	Fourth Issue. Post Review
C	12/05/15	SF	Third Issue. Update EA3 export cable corridor
B	30/04/14	RP	Second Issue. Update cable corridor to V20

Original A3  
Plot Scale  
1:9,000,000



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**East Anglia THREE Limited**  
Greater sandeel - CPUE 2003 - 2012  
(10 year avg.)

Drg No	EA3-530-PB-575-D
Rev	D
Date	14/10/2015
Layout	N/A

**Volume**  
2  
**Figure**  
11.33

**Chapter 11(a) Figures End Here**