

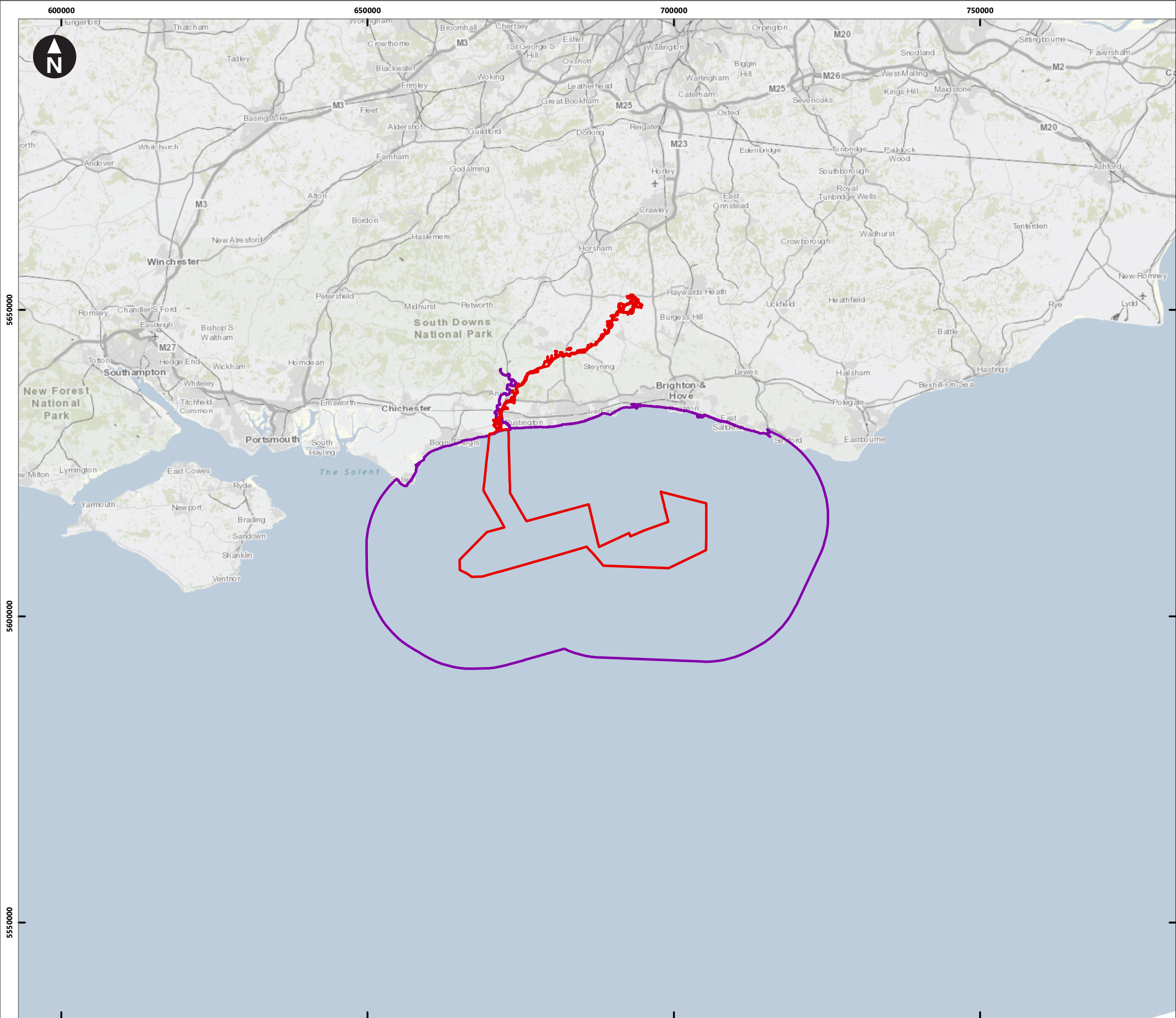
Volume 3, Chapter 8

Fish and Shellfish Ecology Figures



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Key

PEIR Assessment Boundary

Study Area

02.551020

Kilometres

02.551020

1:600,000

WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development

Rampion 2 Offshore Wind Farm

Figure 8.1 Fish and shellfish Study Area

Preliminary Environmental Information Report

System Identifier:

42285-GOBE-PE-OF-FG-O7-3430

Version:

1.1

Company:

GOBE

Drawn By:

BPHB

Chk/Aprvd:

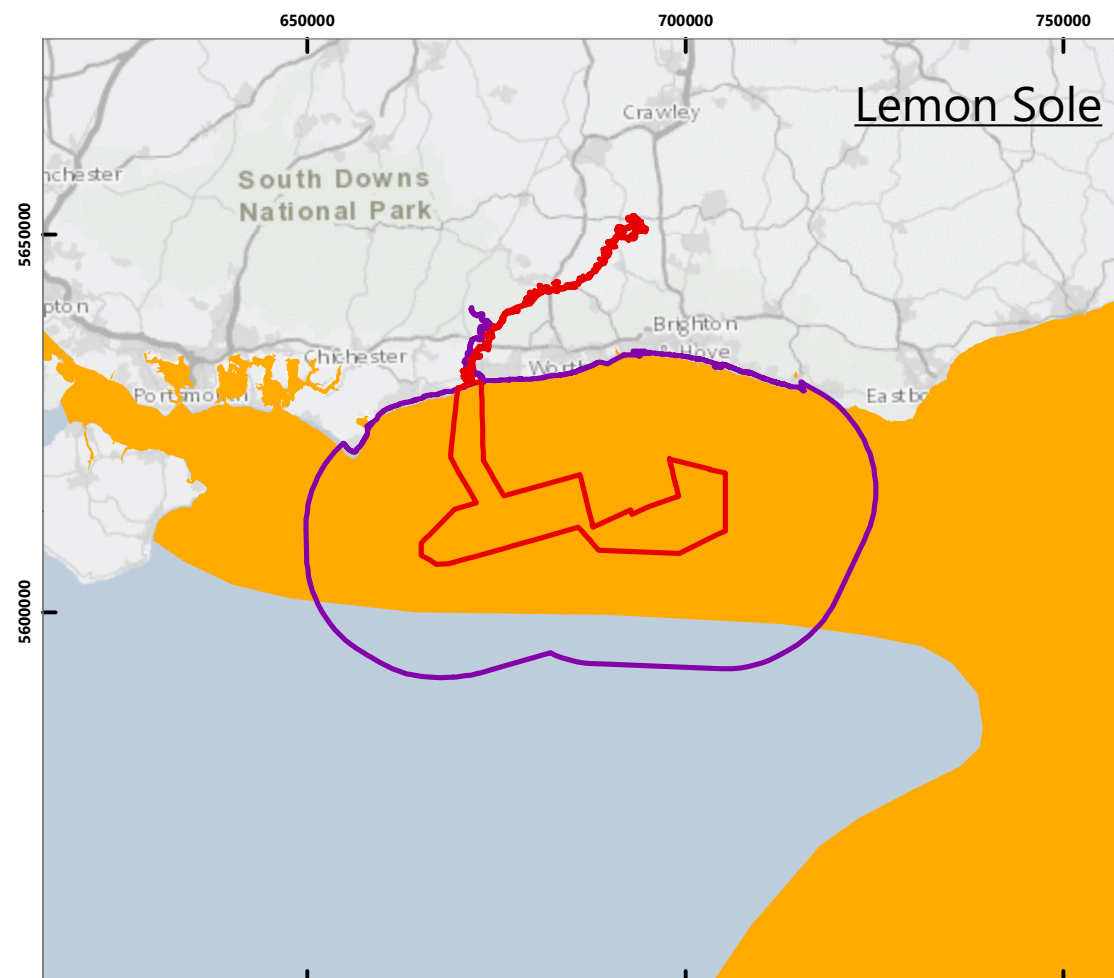
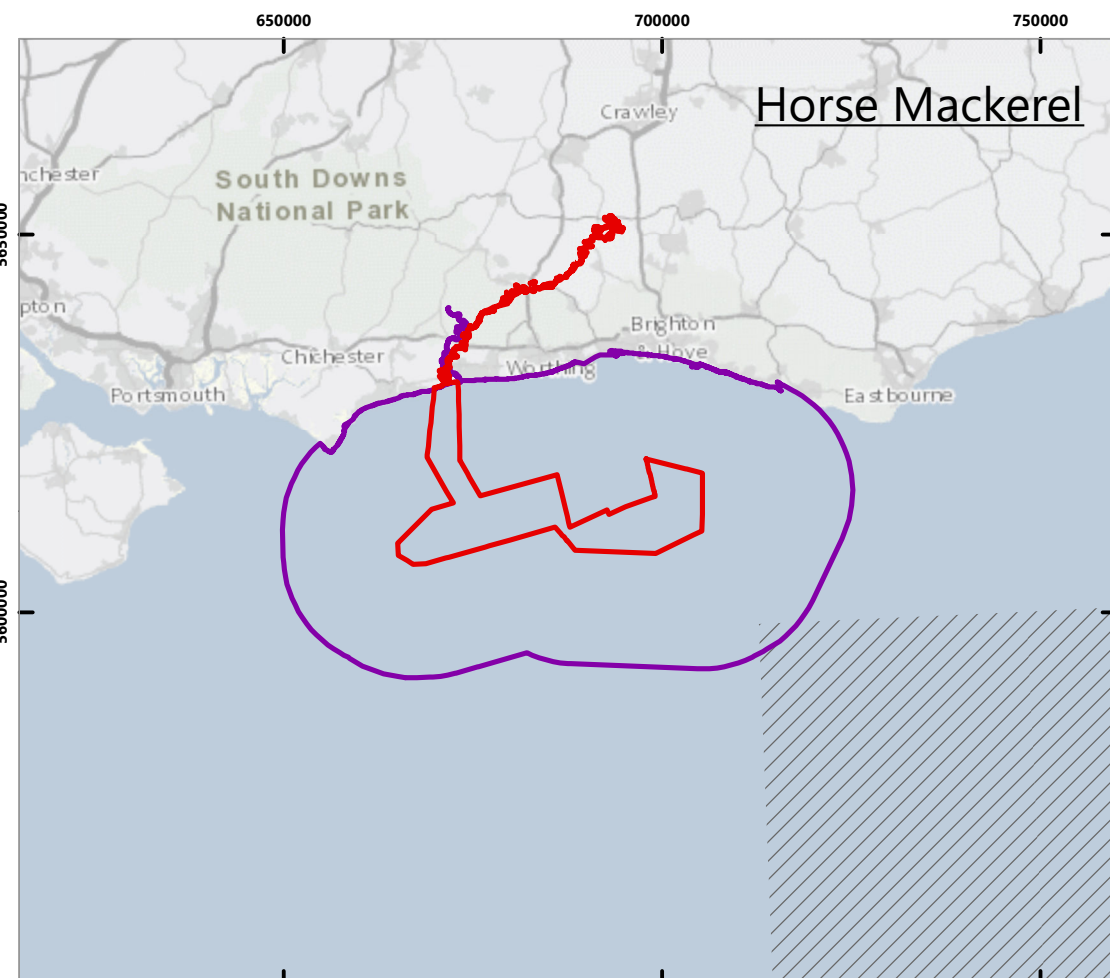
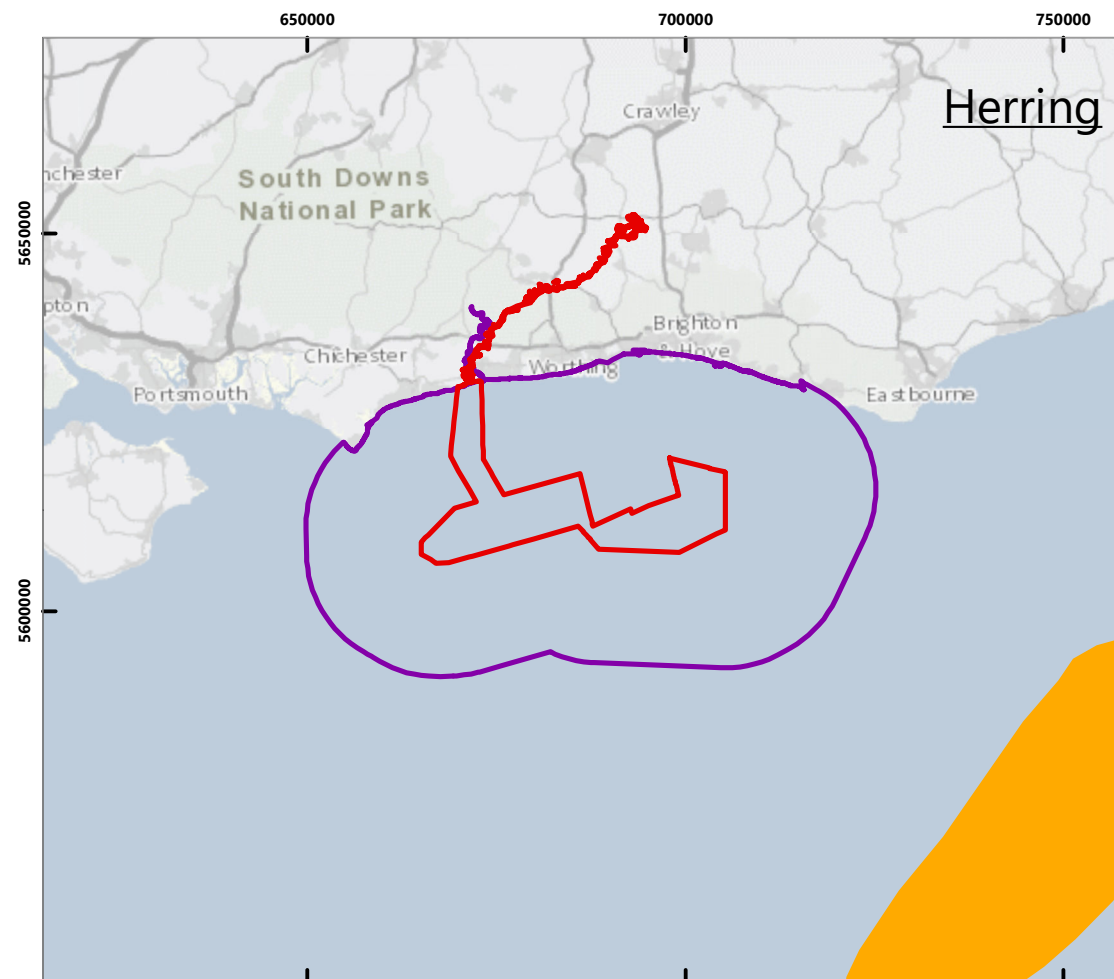
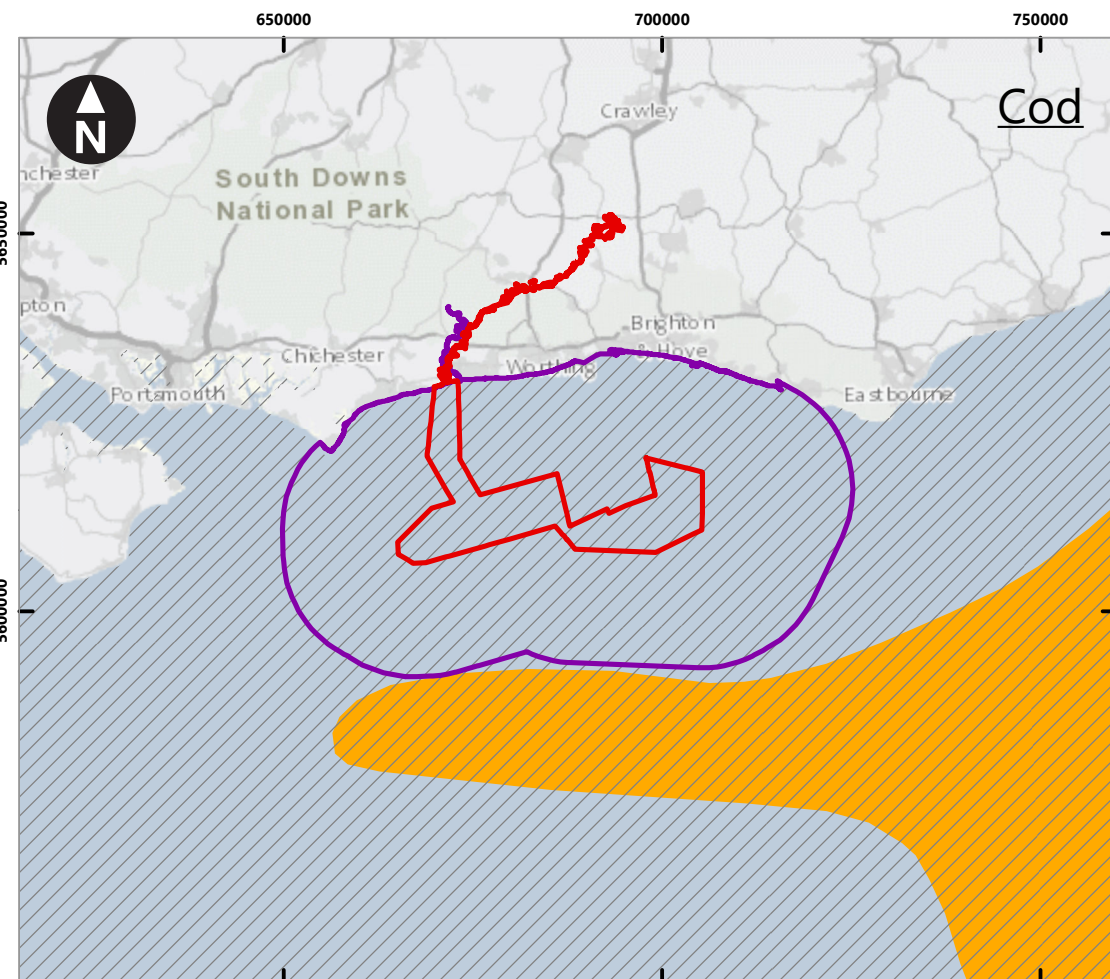
NH

Drawn Date:

07/05/2021

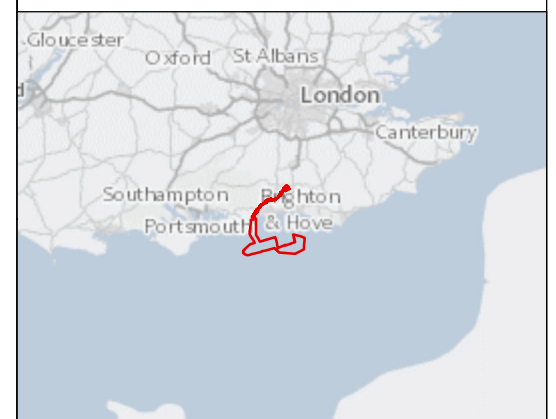
Status:

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- Key**
- PEIR Assessment Boundary
 - Fish and shellfish Study Area
 - Spawning area Ellis et al. 2010
 - Spawning area Coull et al. 1998



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Kilometres
1:1,000,000
WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development



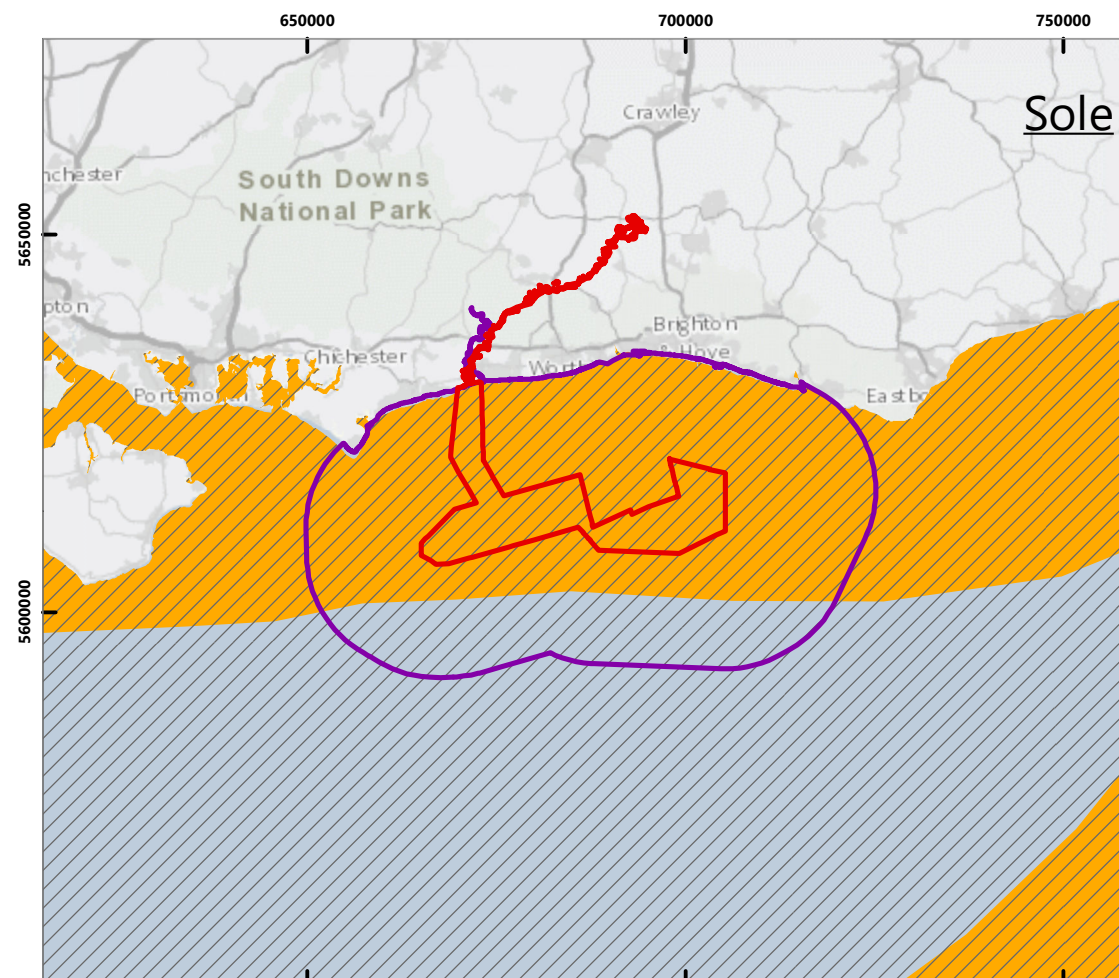
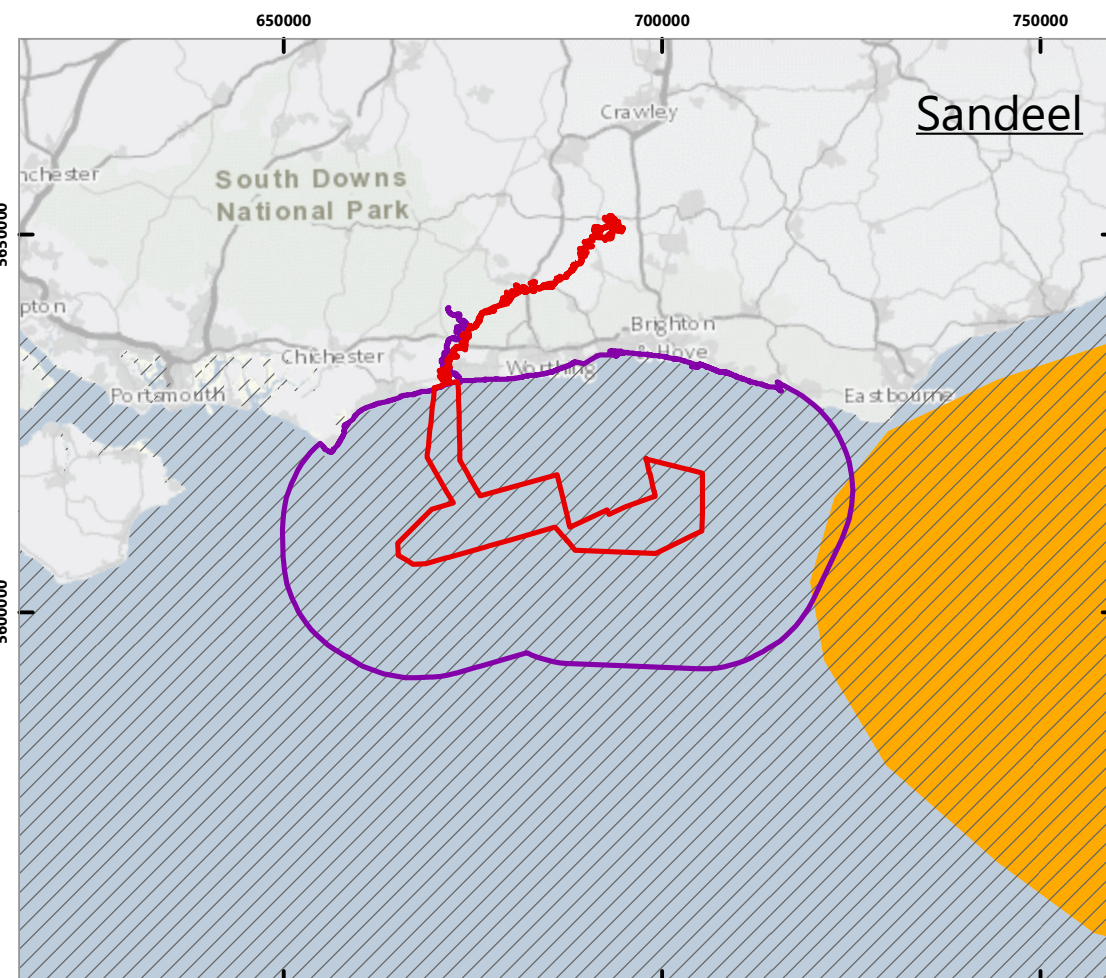
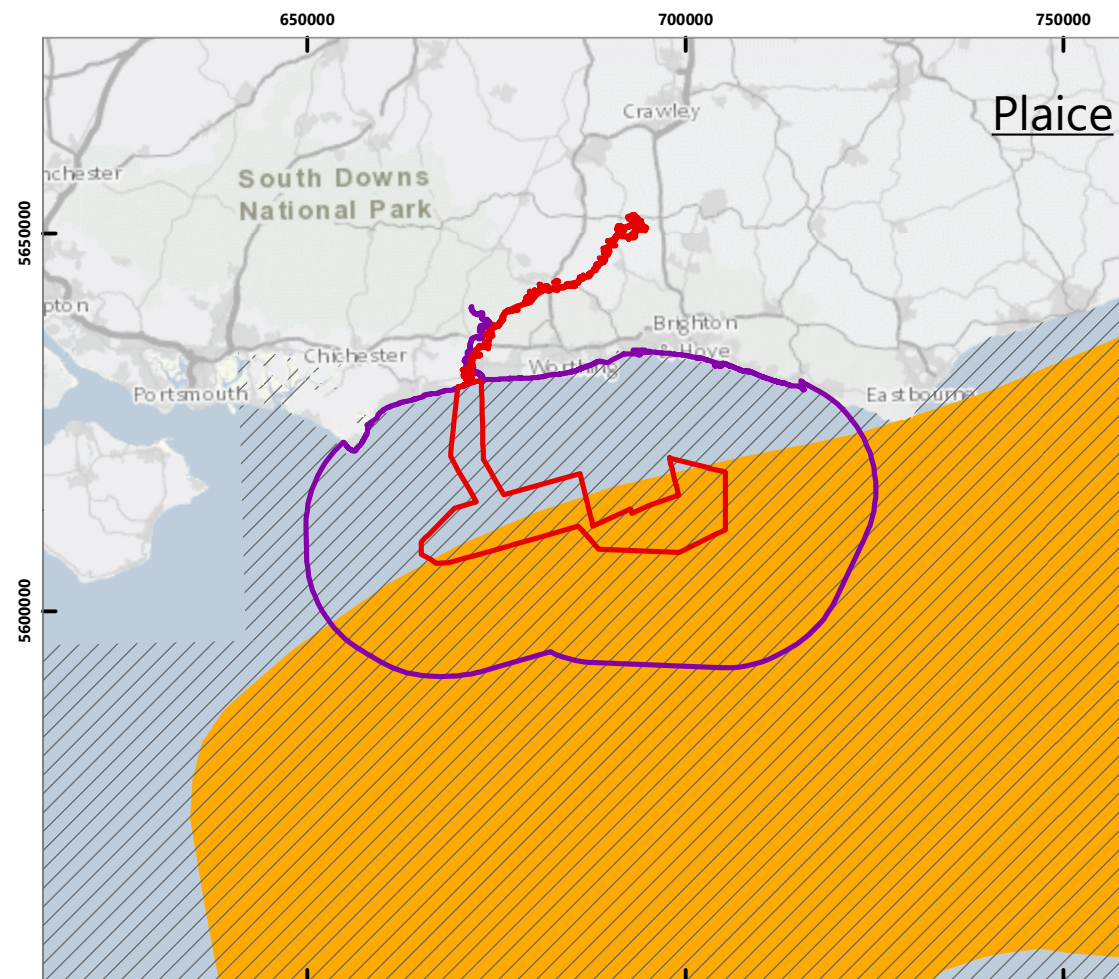
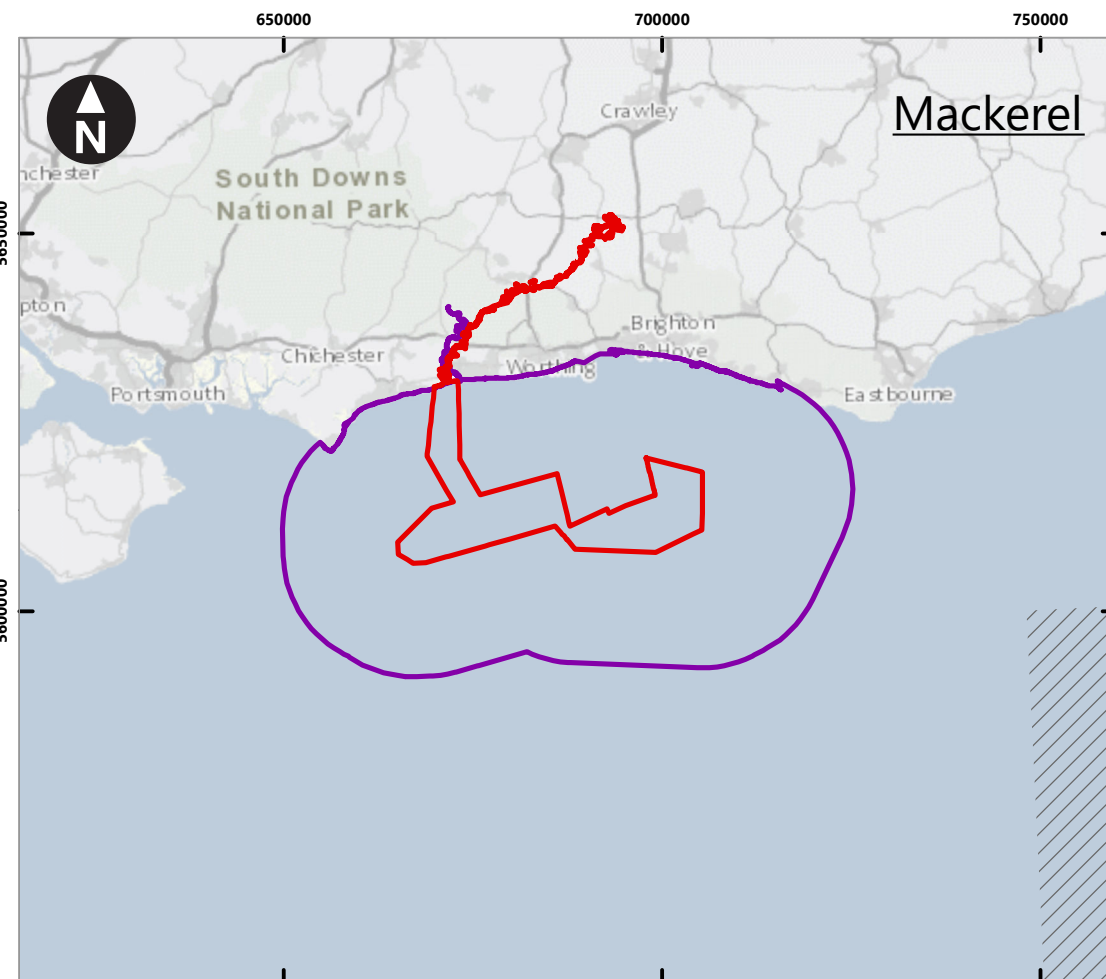
Rampion 2 Offshore Wind Farm

Figure 8.2 Spawning grounds in relation to Rampion 2: Cod, Herring, Horse mackerel and Lemon sole

Preliminary Environmental Information Report

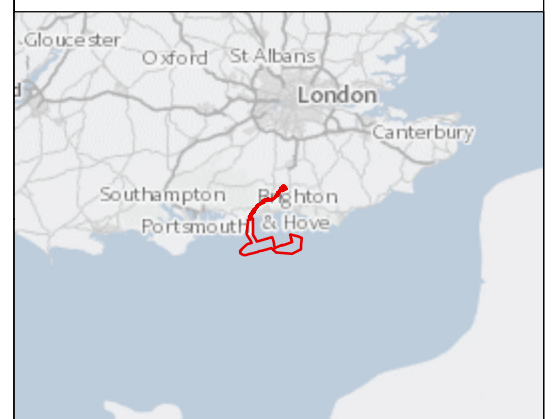
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- Key**
- PEIR Assessment Boundary
 - Fish and shellfish Study Area
 - Spawning area Ellis et al. 2010
 - Spawning area Coull et al. 1998



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Kilometres
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WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development



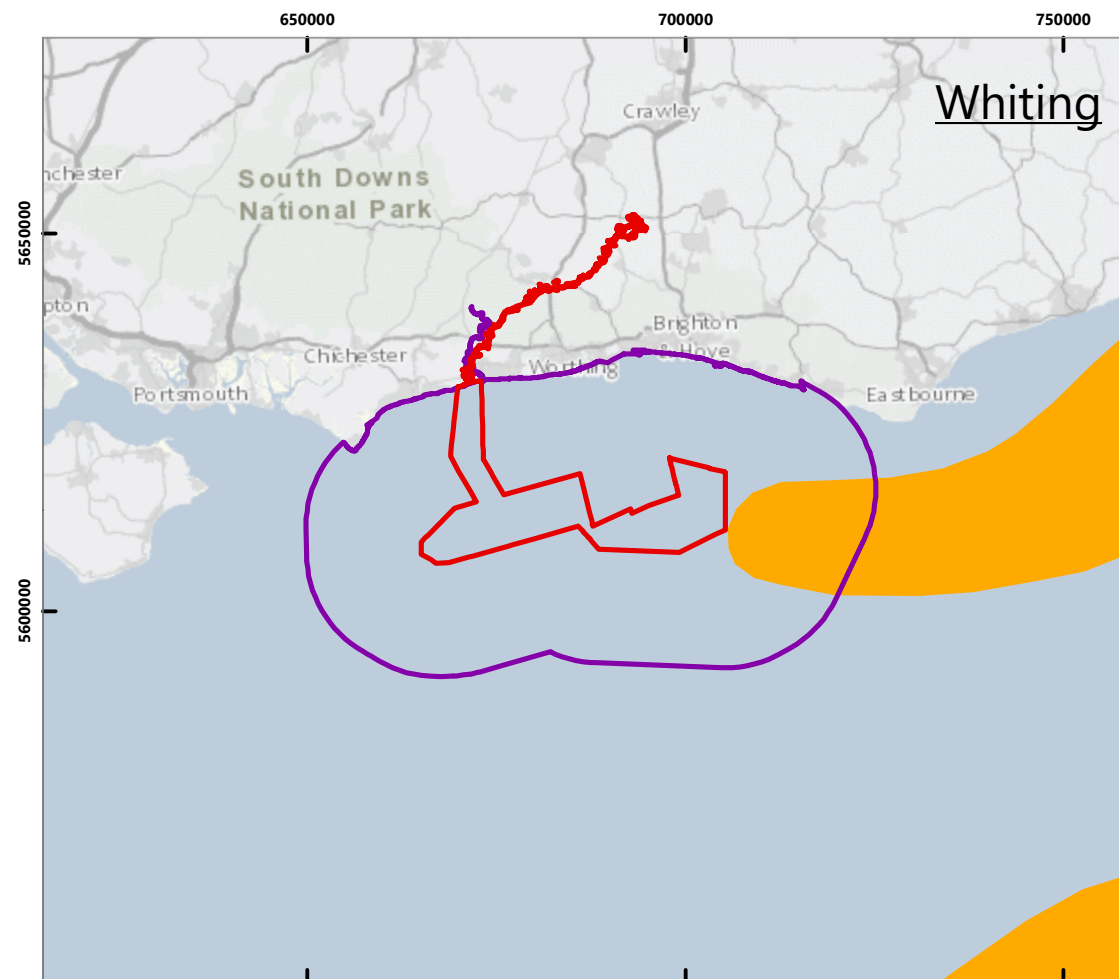
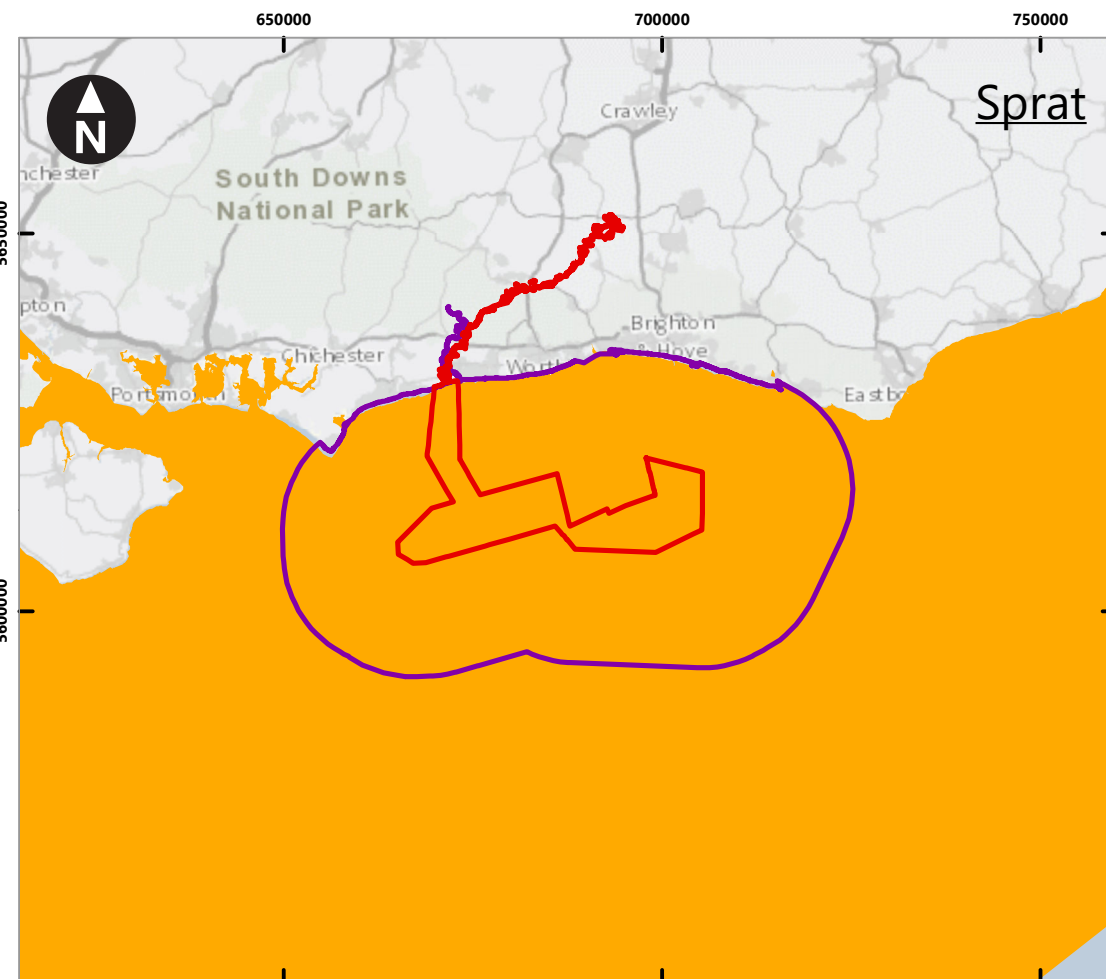
Rampion 2 Offshore Wind Farm

Figure 8.3 Spawning grounds in relation to
Rampion 2: Mackerel, Plaice, Sandeel, Sole





Preliminary Environmental Information Report

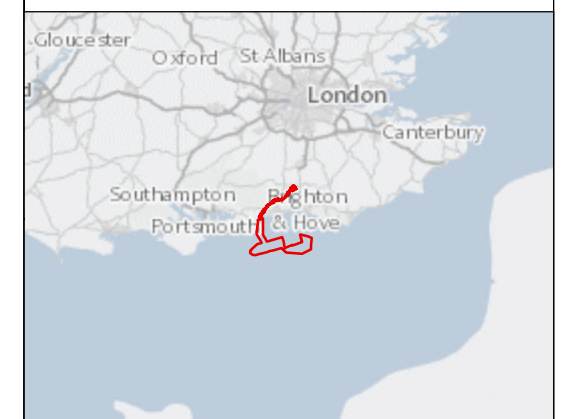
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Contains data sourced from Coull et al. 1998; and Ellis et al. 2010

- Key**
-  PEIR Assessment Boundary
 -  Fish and shellfish Study Area
 -  Spawning area Ellis et al. 2010
 -  Spawning area Coull et al. 1998



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Kilometres
1:1,000,000
WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development

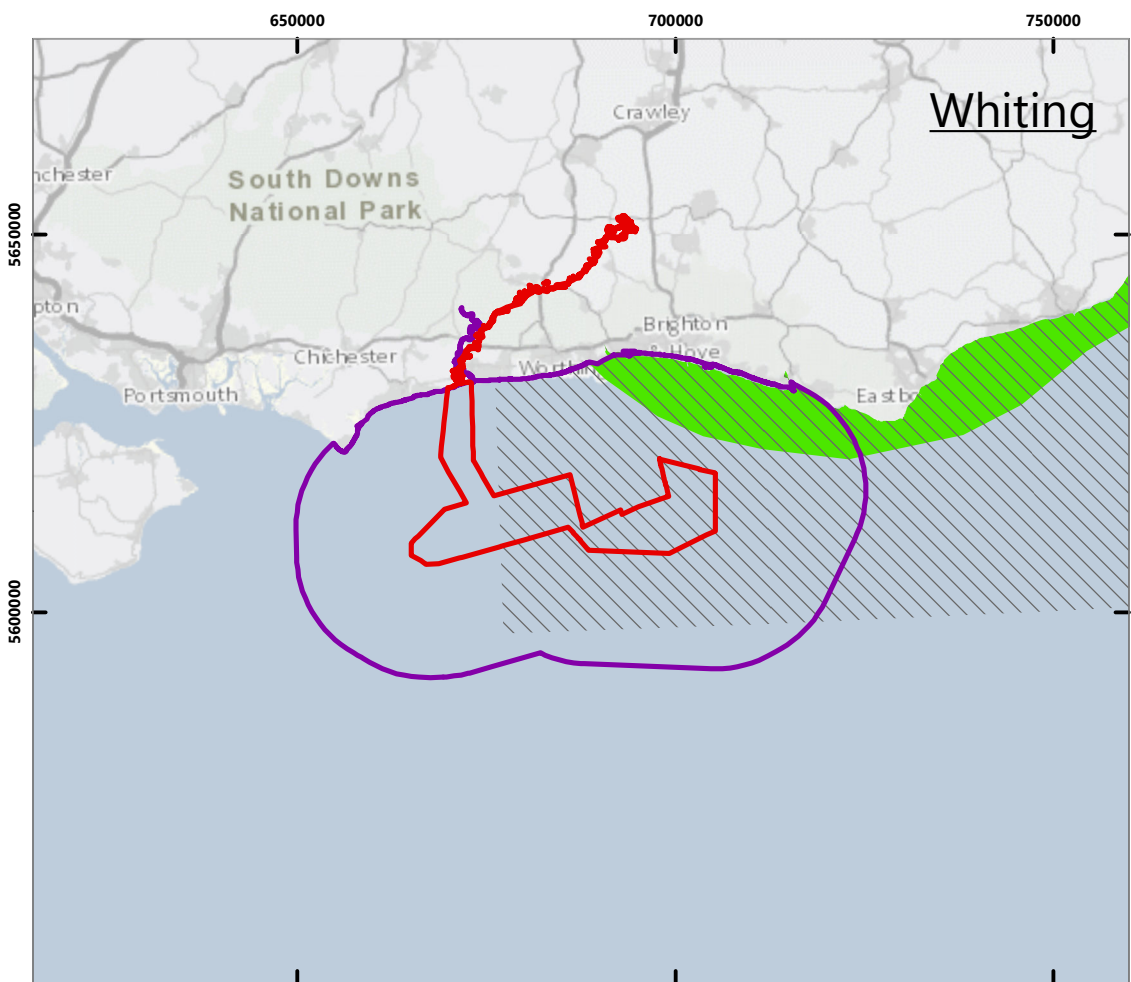
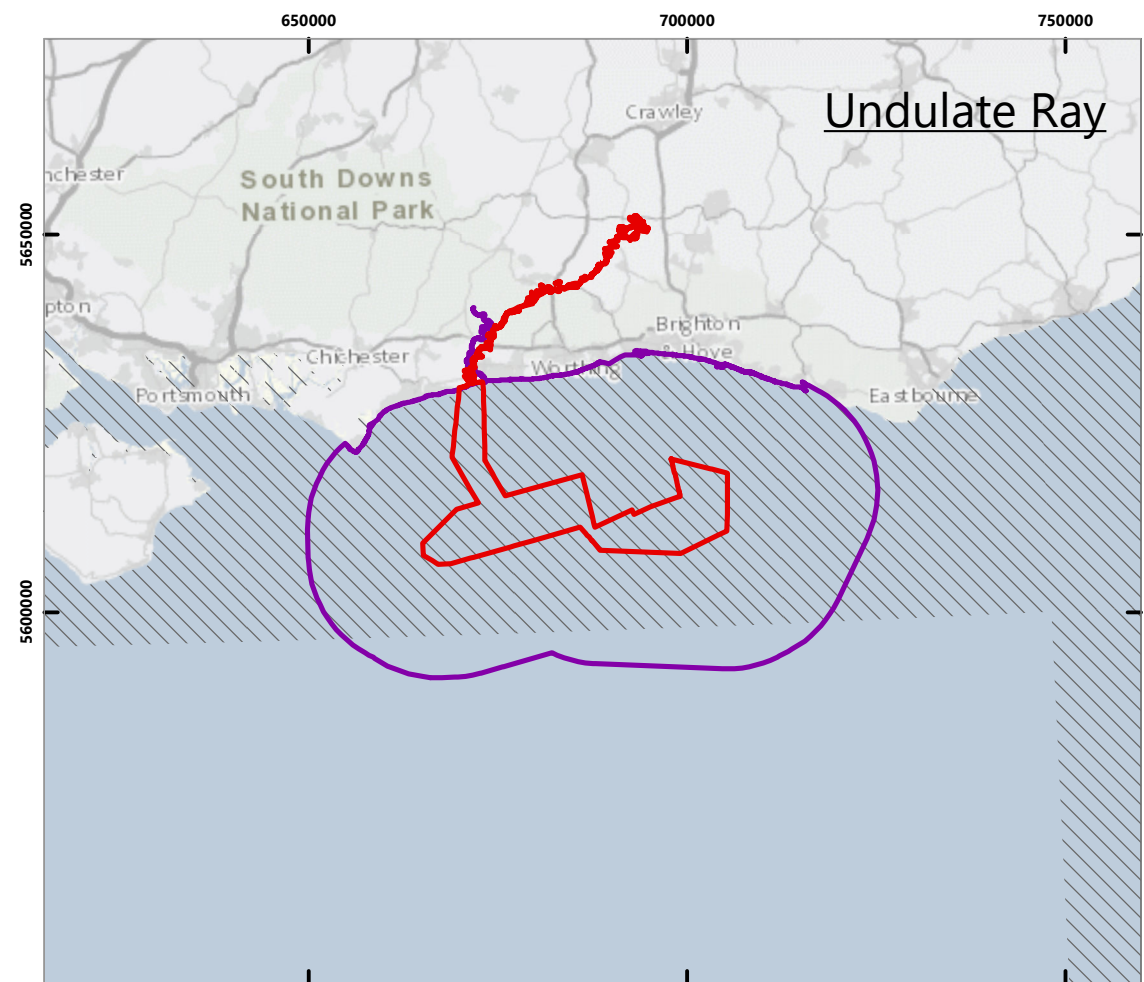
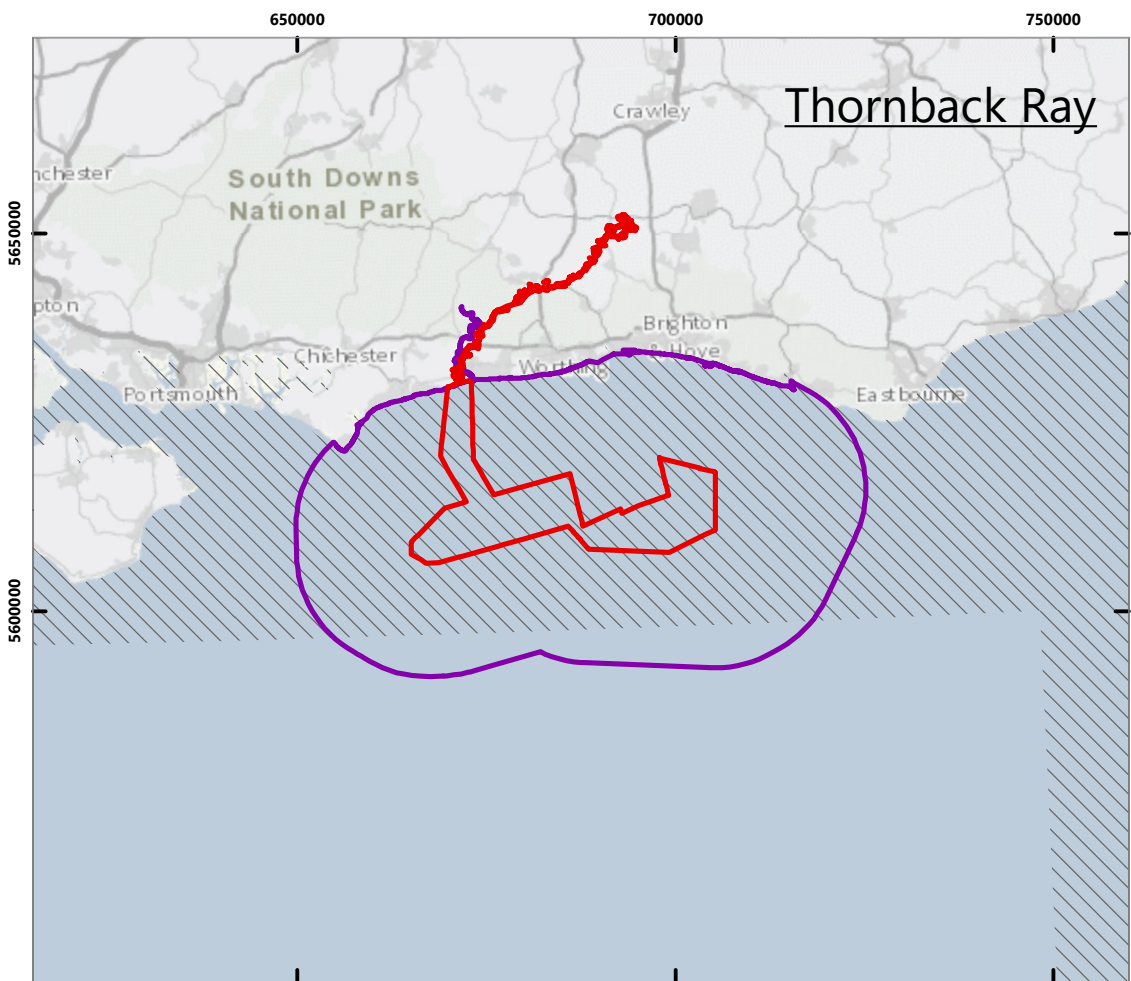
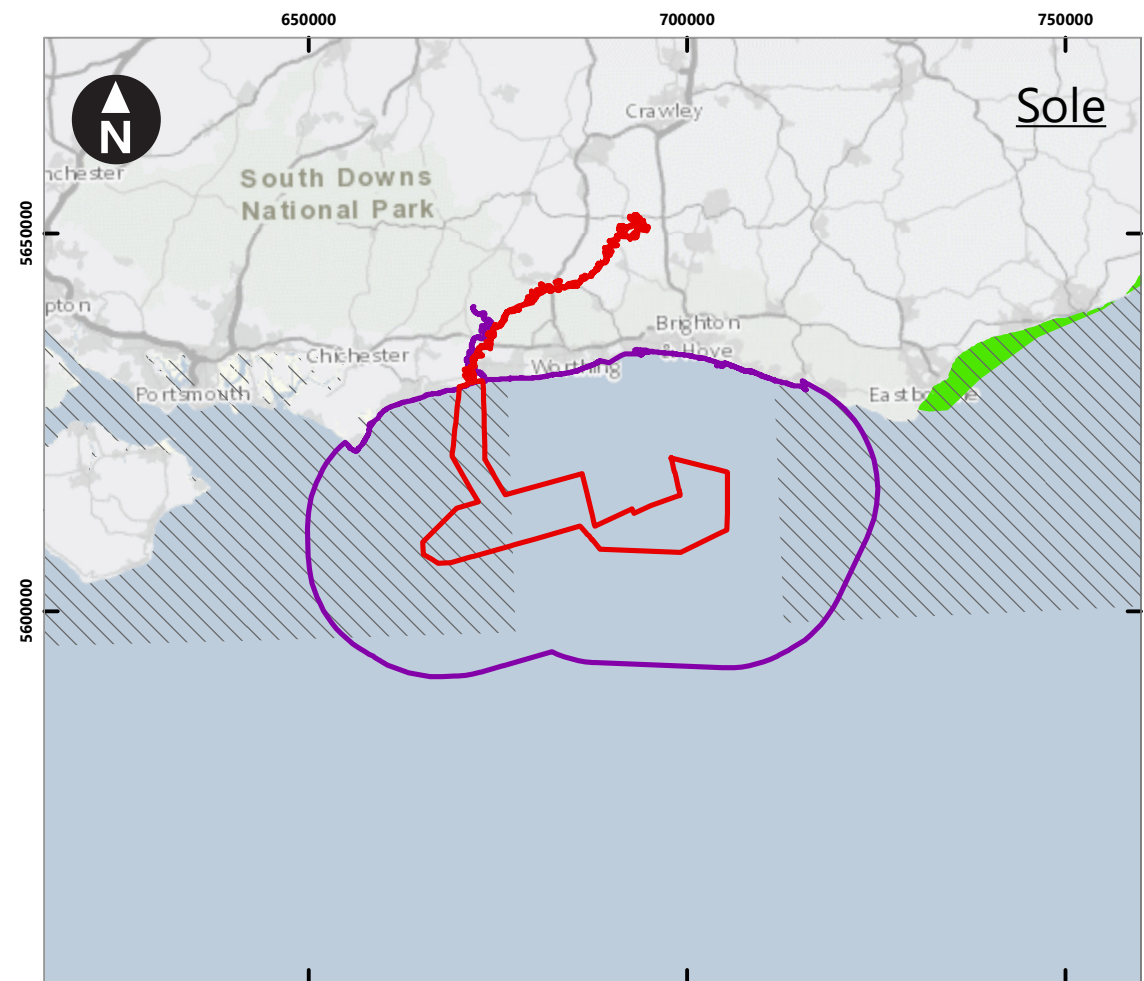


Rampion 2 Offshore Wind Farm





Figure 8.4 Spawning grounds in relation to
Rampion 2: Sprat, Whiting

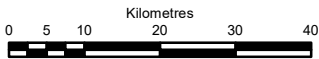
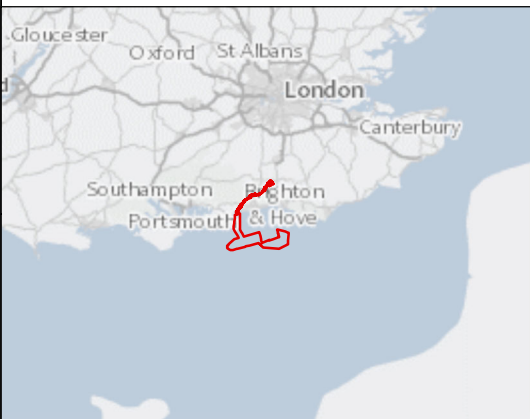
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Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 07/05/2021	Status: FINAL



Key

-  PEIR Assessment Boundary
-  Fish and shellfish Study Area
-  Nursery grounds Ellis et al. 2010
-  Nursery grounds Coull et al. 1998



WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development

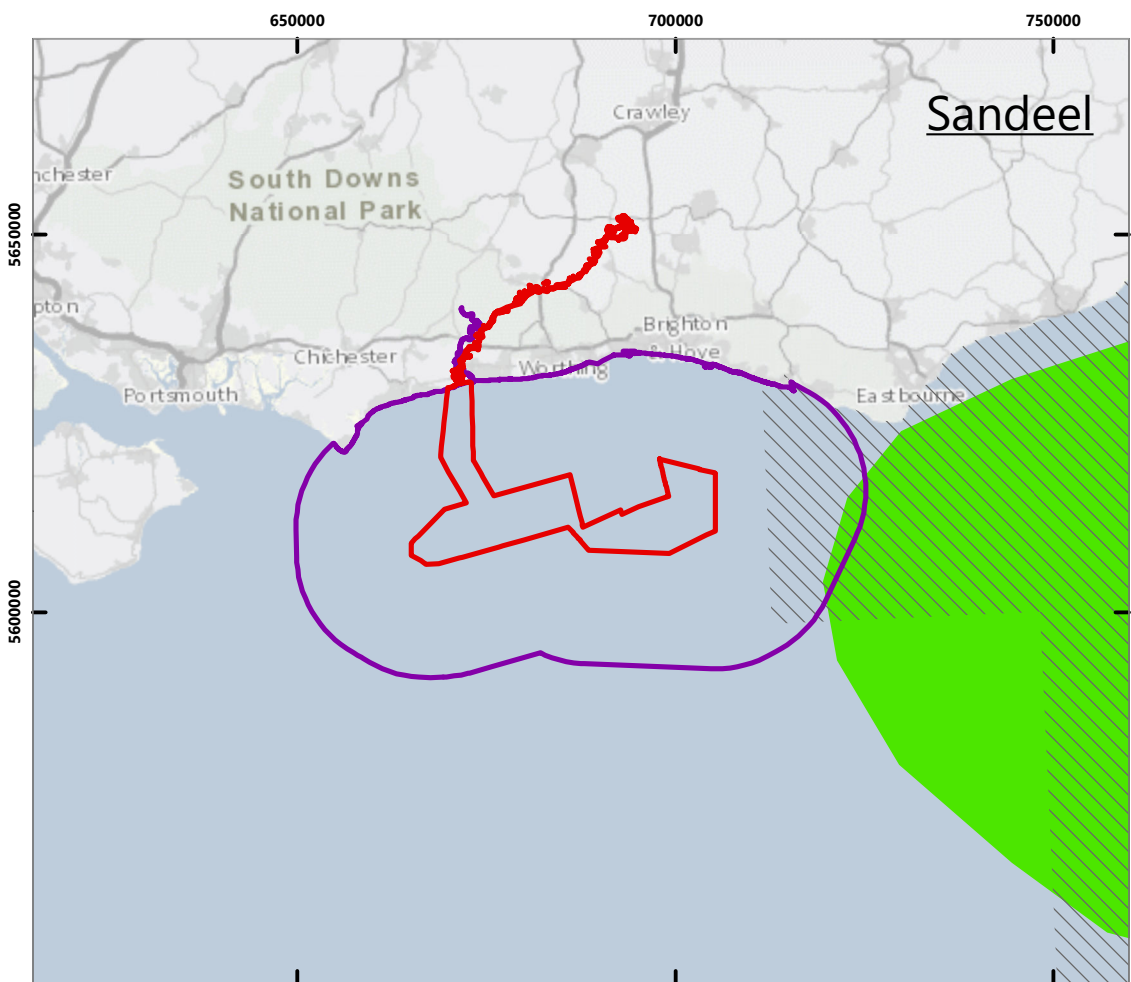
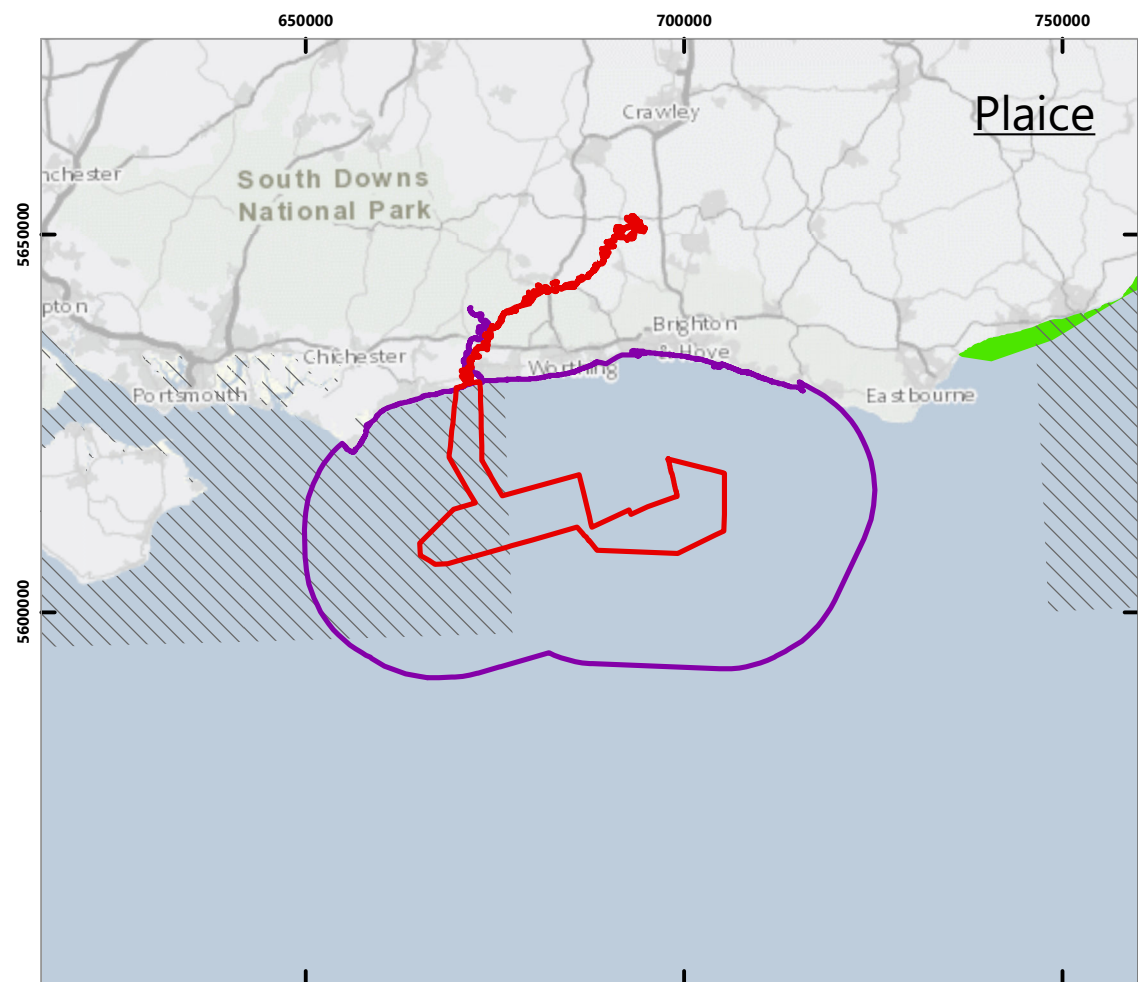
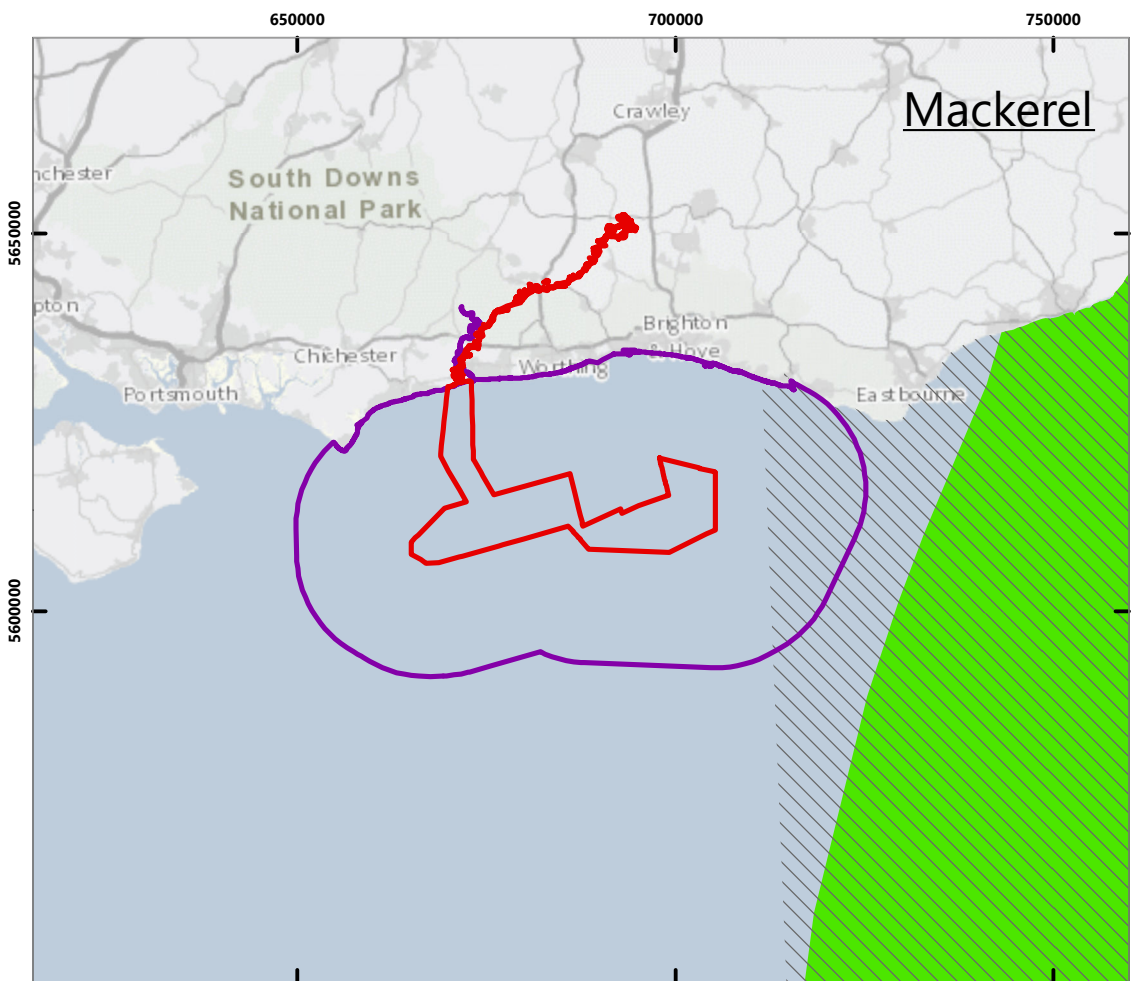
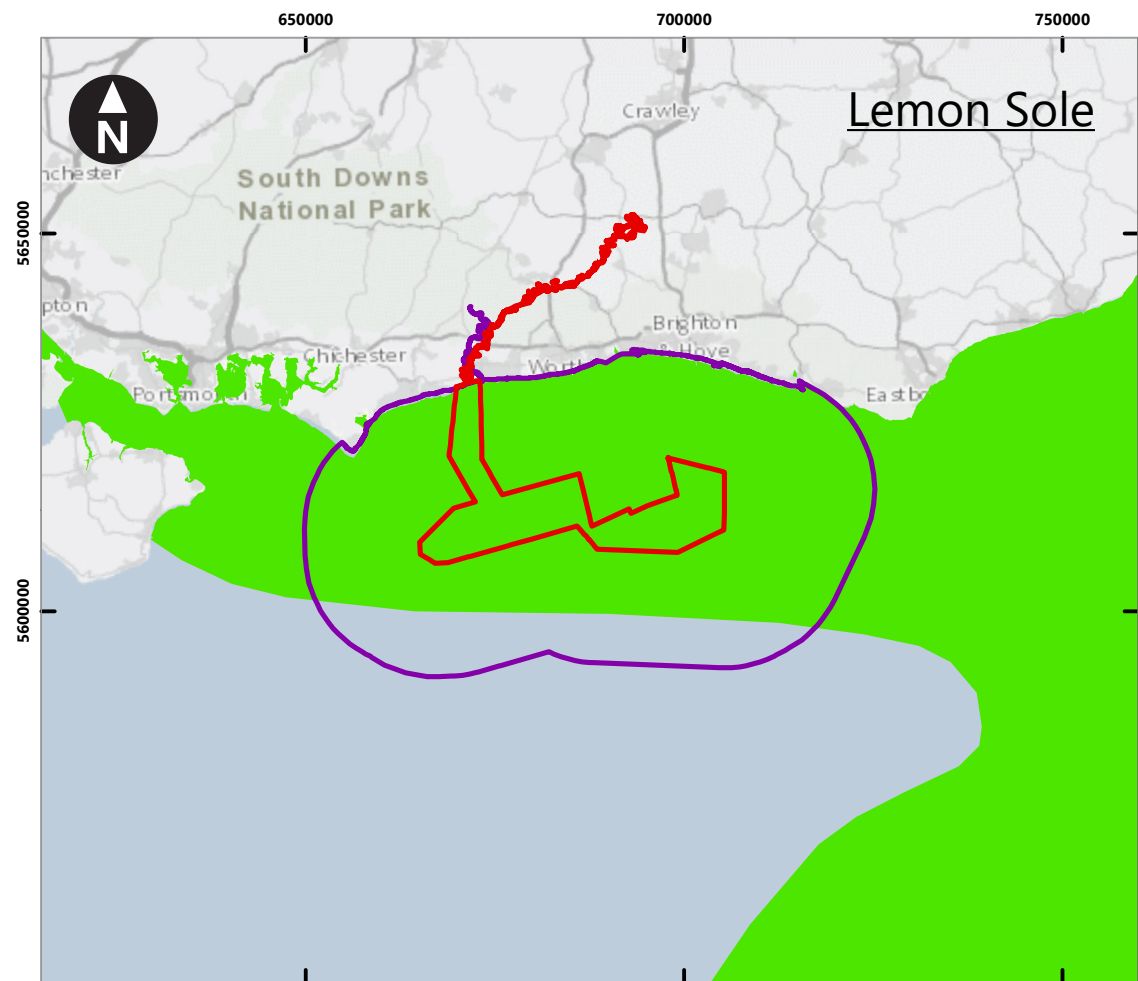


Rampion 2 Offshore Wind Farm

Figure 8.5 Nursery grounds in relation to
Rampion 2 : Sole, Thornback ray, Undulate ray
and Whiting

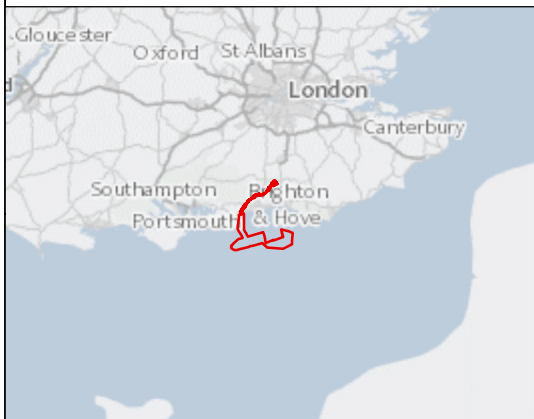
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Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 07/05/2021	Status: FINAL



Key

- PEIR Assessment Boundary
- Fish and shellfish Study Area
- Nursery grounds Ellis et al. 2010
- Nursery grounds Coull et al. 1998



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Rampion Extension Development



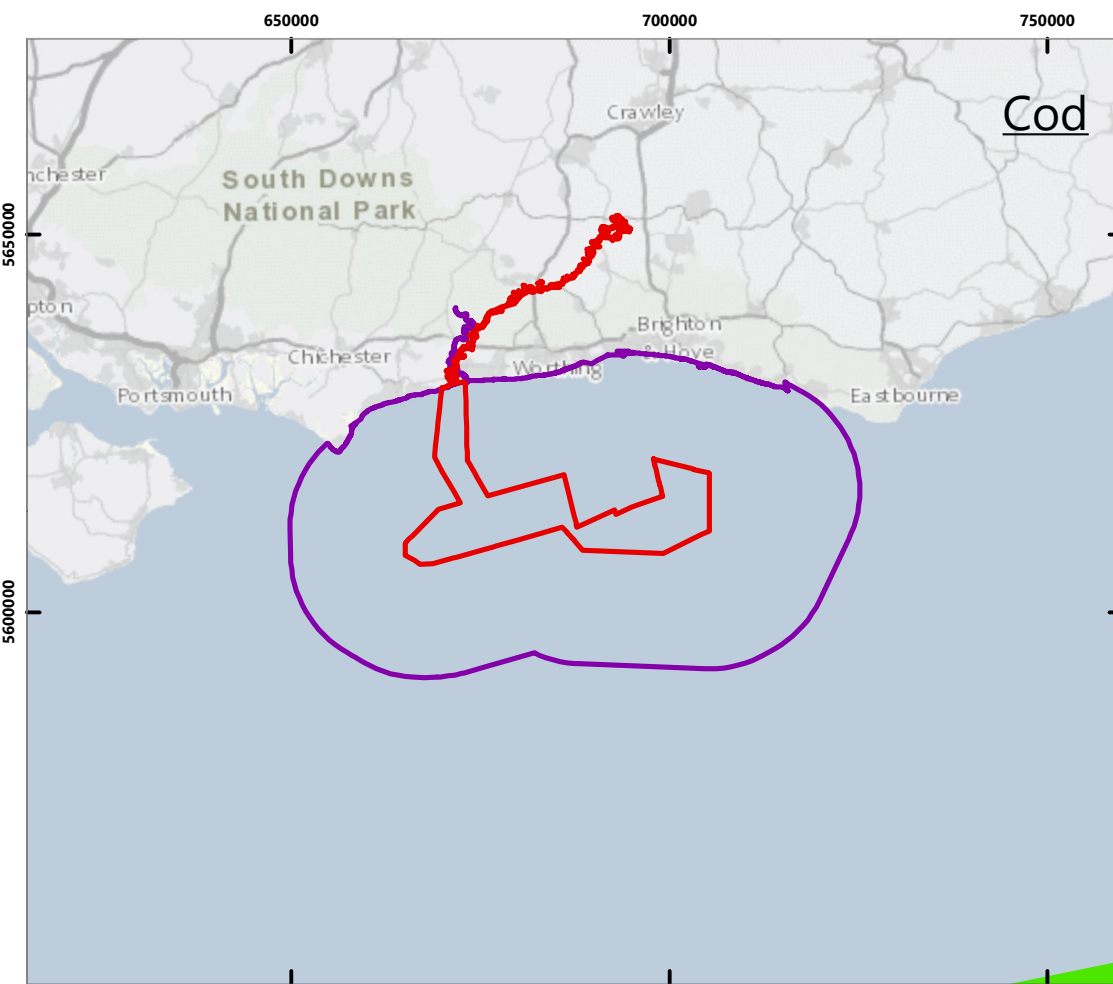
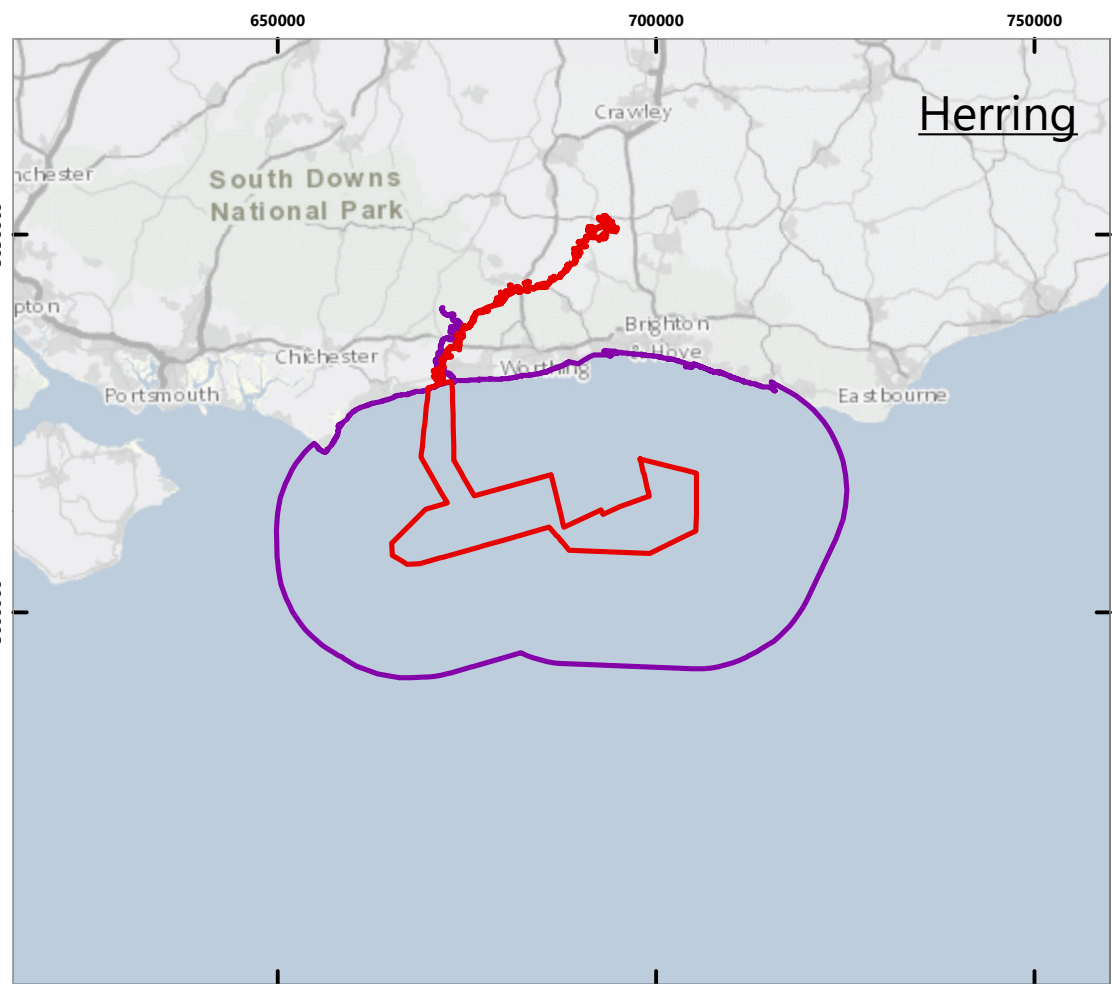
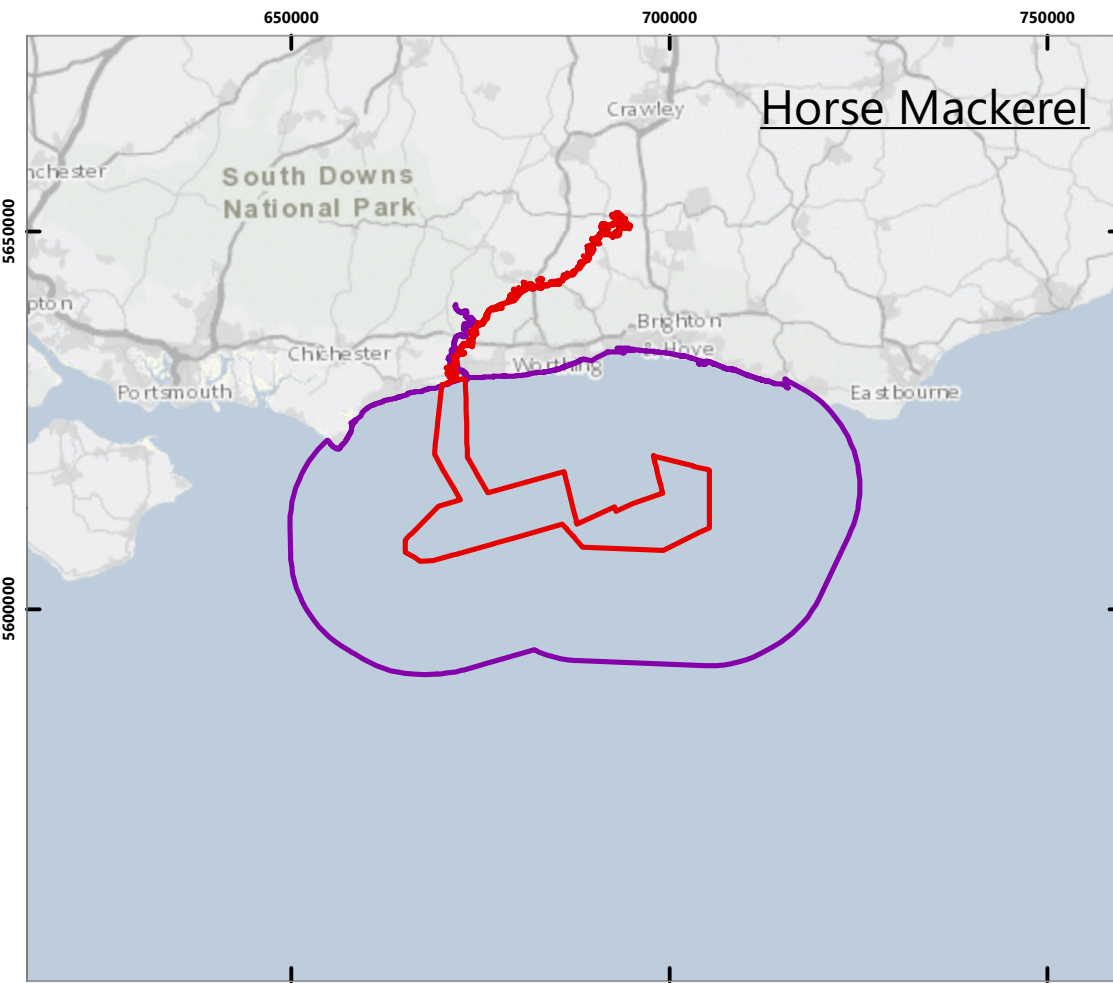
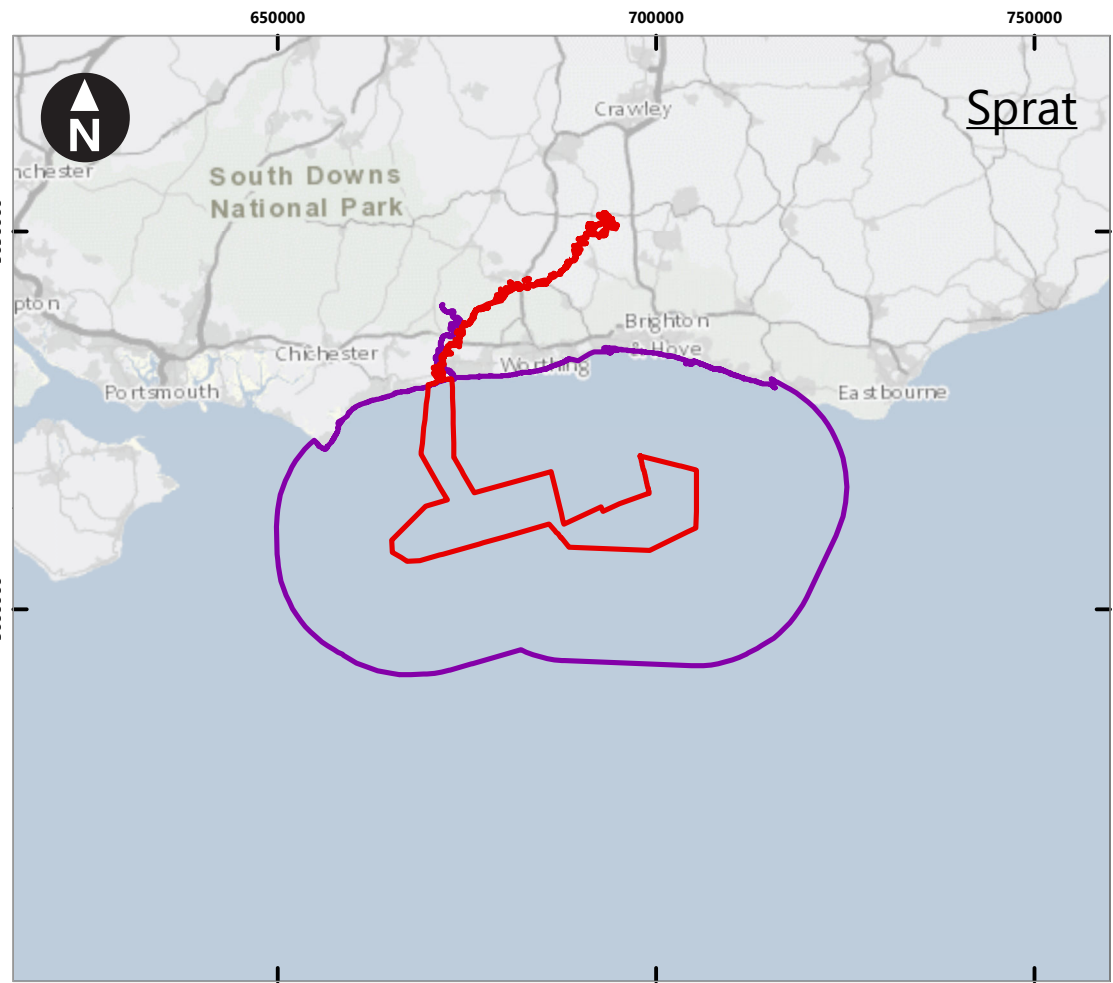
Rampion 2 Offshore Wind Farm

Figure 8.6 Nursery grounds in relation to
Rampion 2 : Lemon sole, Mackerel, Plaice,
Sandeel

Preliminary Environmental Information Report

System Identifier: 42285-GOBE-PE-OF-FG-07-5786 Version: 1.1

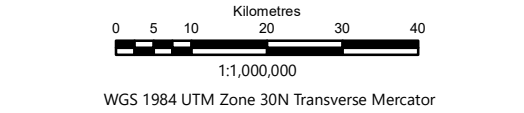
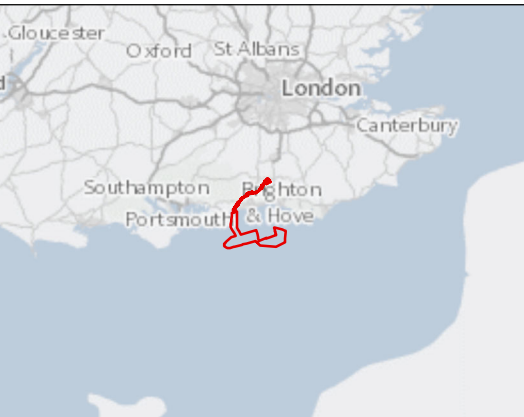
Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 07/05/2021	Status: FINAL
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Key

- PEIR Assessment Boundary
- Fish and shellfish Study Area
- Nursery grounds Ellis et al. 2010
- Nursery grounds Coull et al. 1998



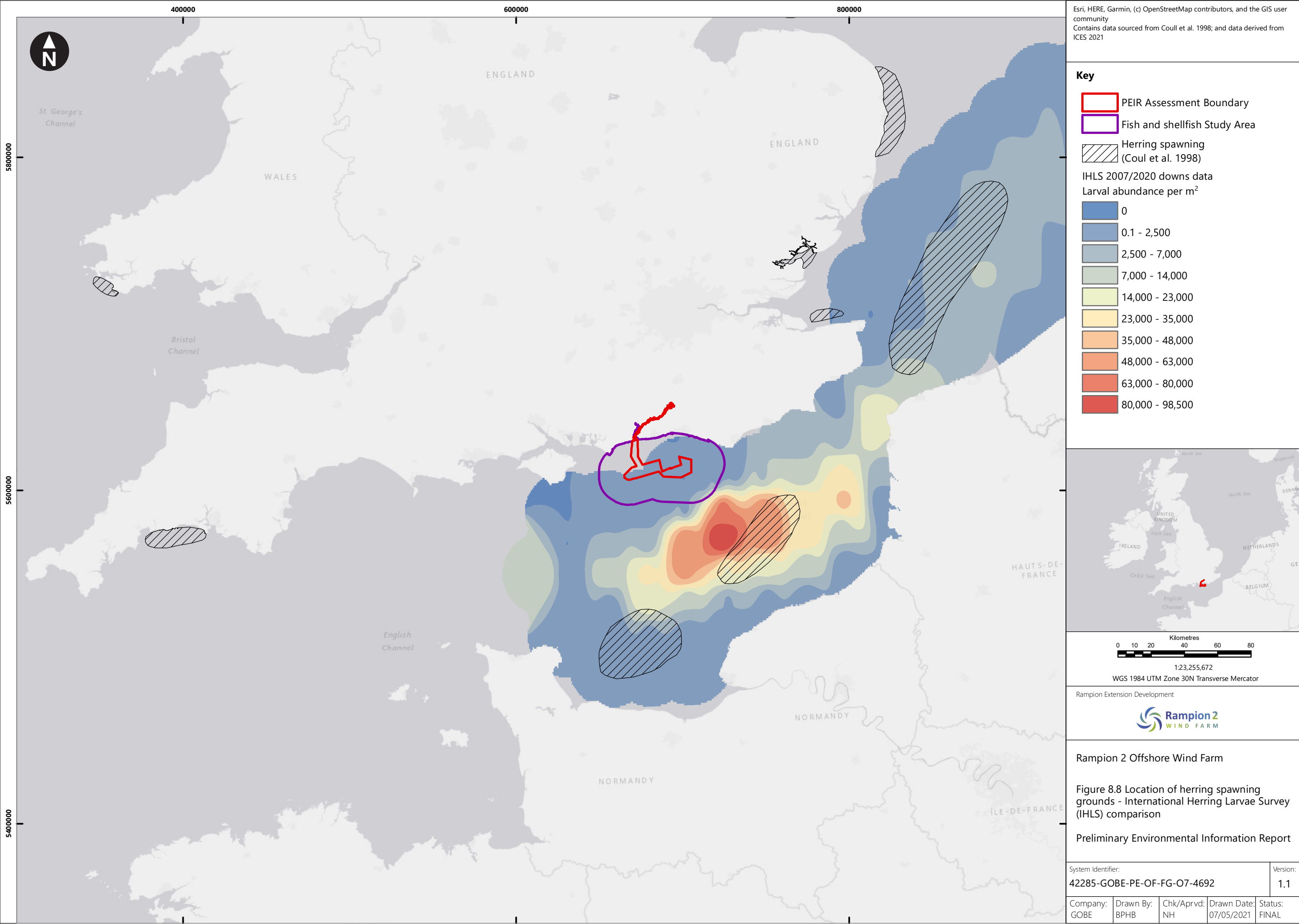
Rampion Extension Development

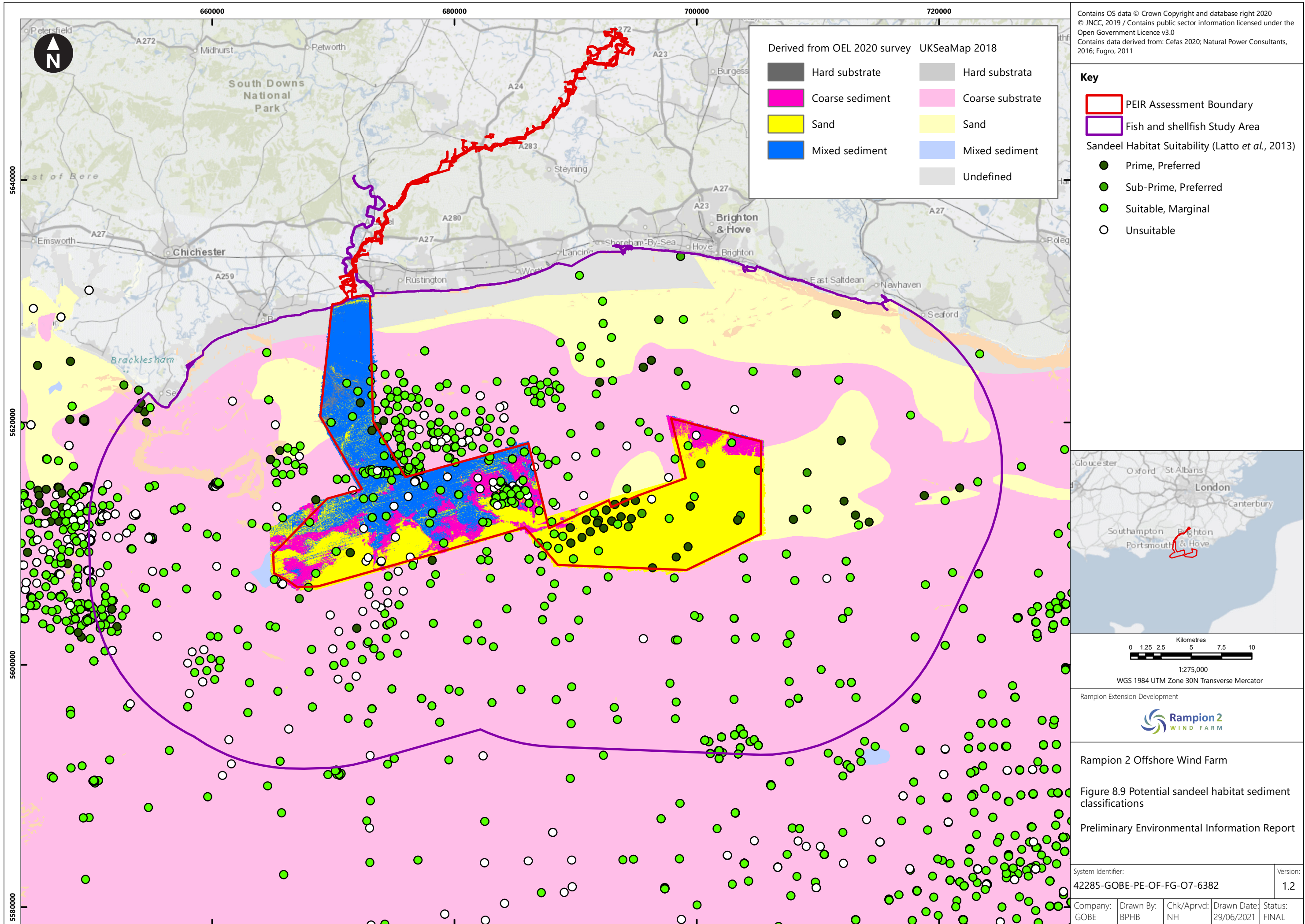
Rampion 2 Offshore Wind Farm

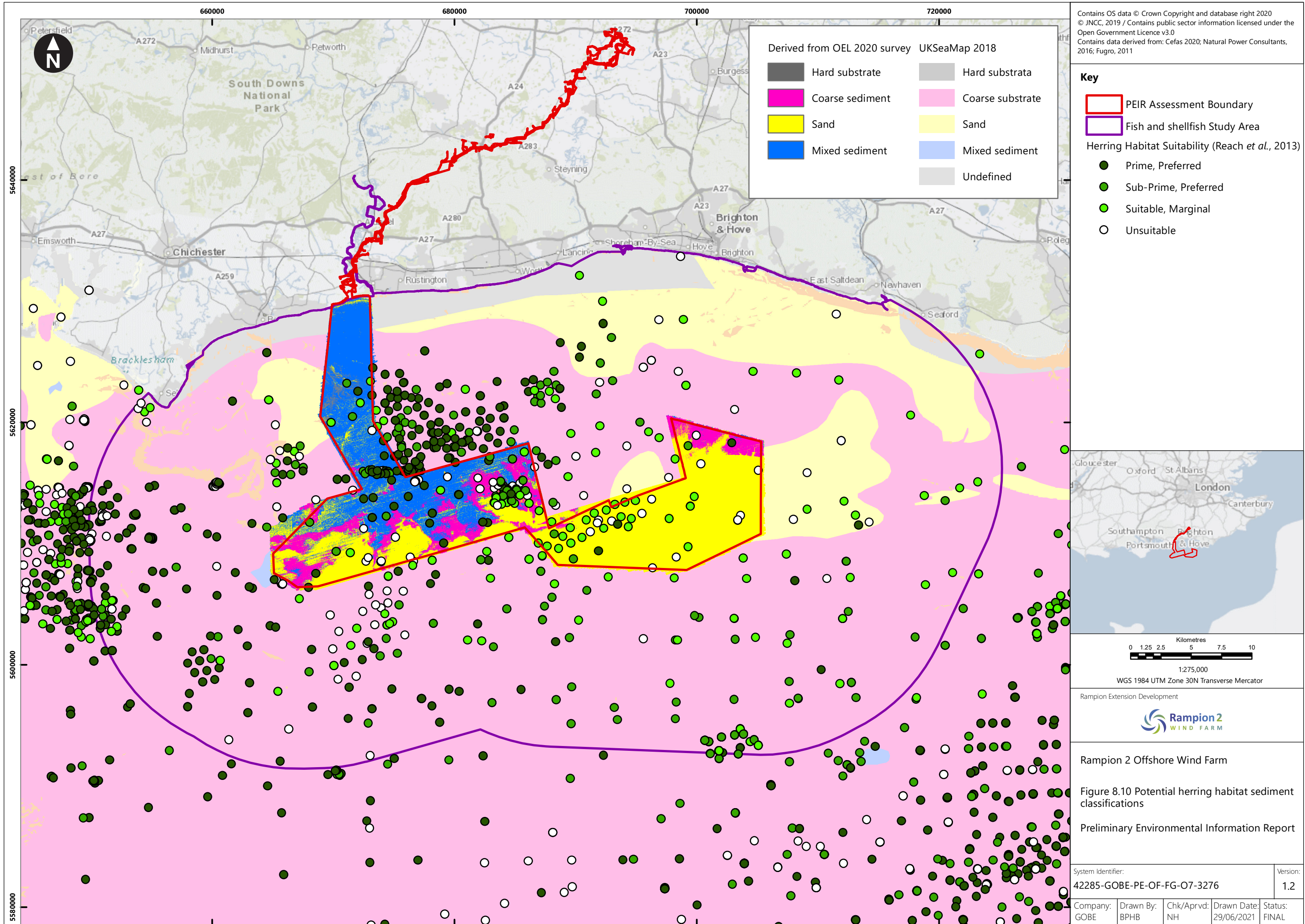
Figure 8.7 Nursery grounds in relation to Rampion 2 : Sprat, Horse Mackerel, Herring, Cod

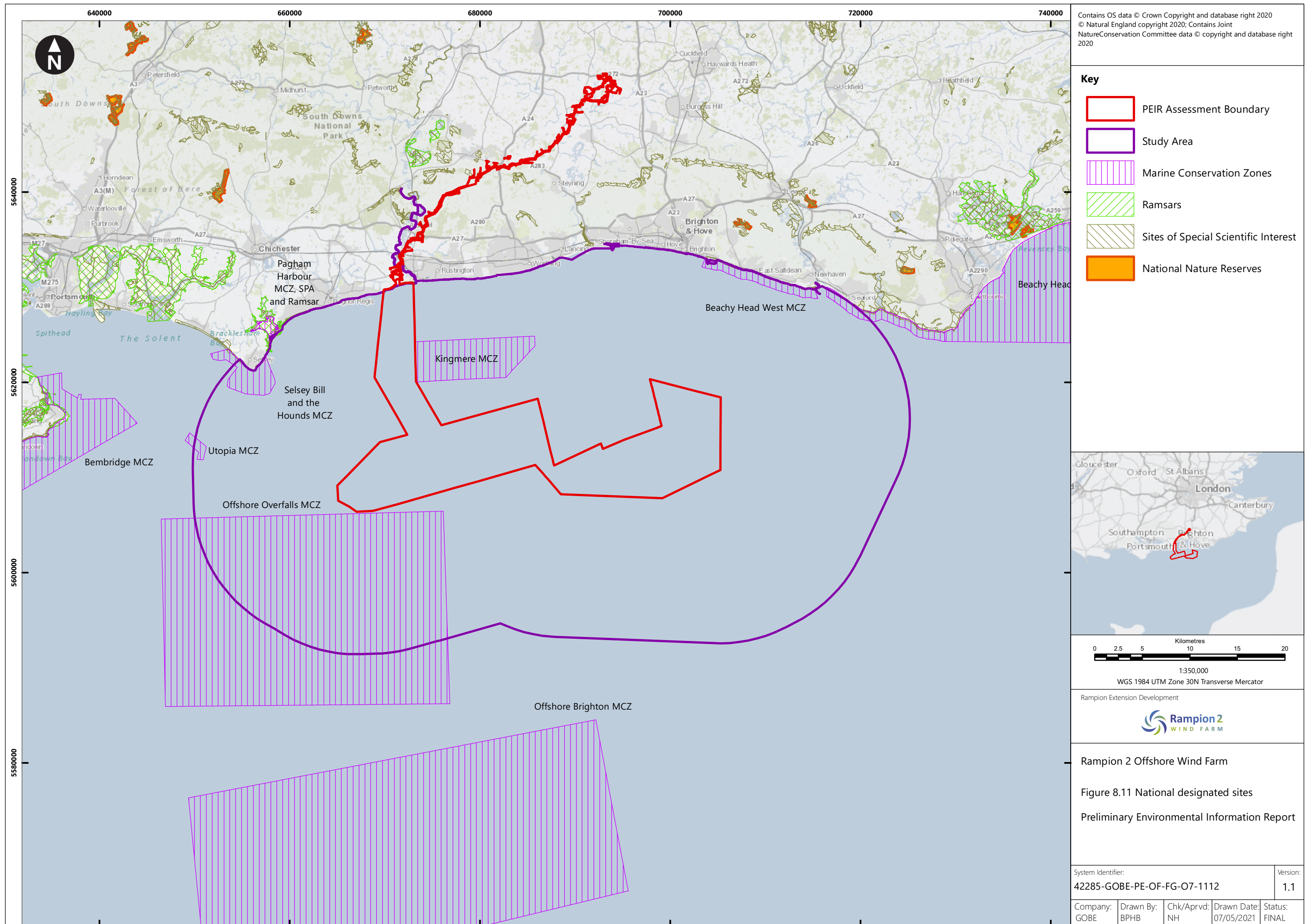
Preliminary Environmental Information Report

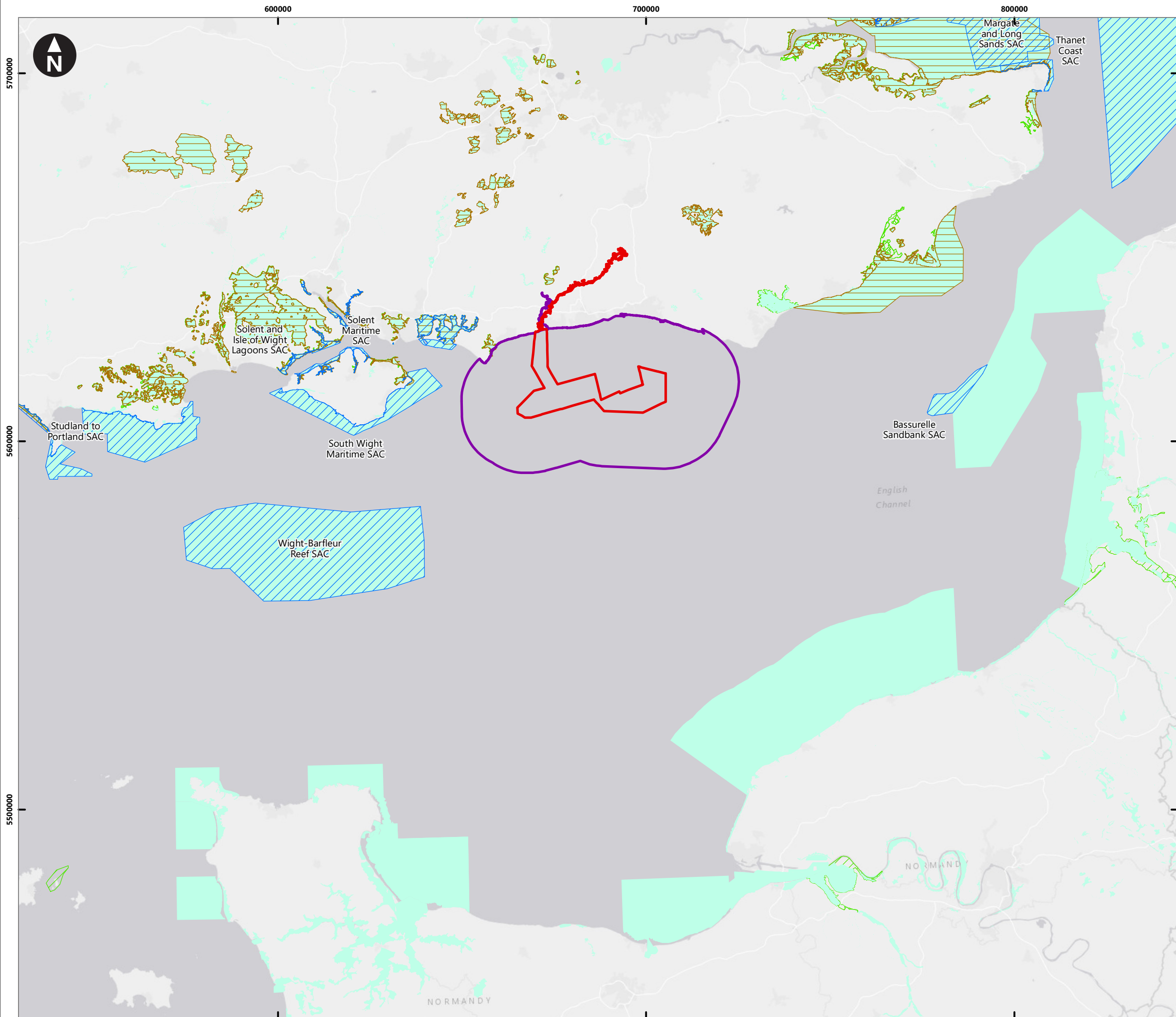
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Key

- PEIR Assessment Boundary
- Study Area
- Special Areas of Conservation with marine components
- Special Protected Areas
- Europe Natura 2000 sites
- Ramsars

0 5 10 20 30 40
Kilometres
1:1,000,000
WGS 1984 UTM Zone 30N Transverse Mercator

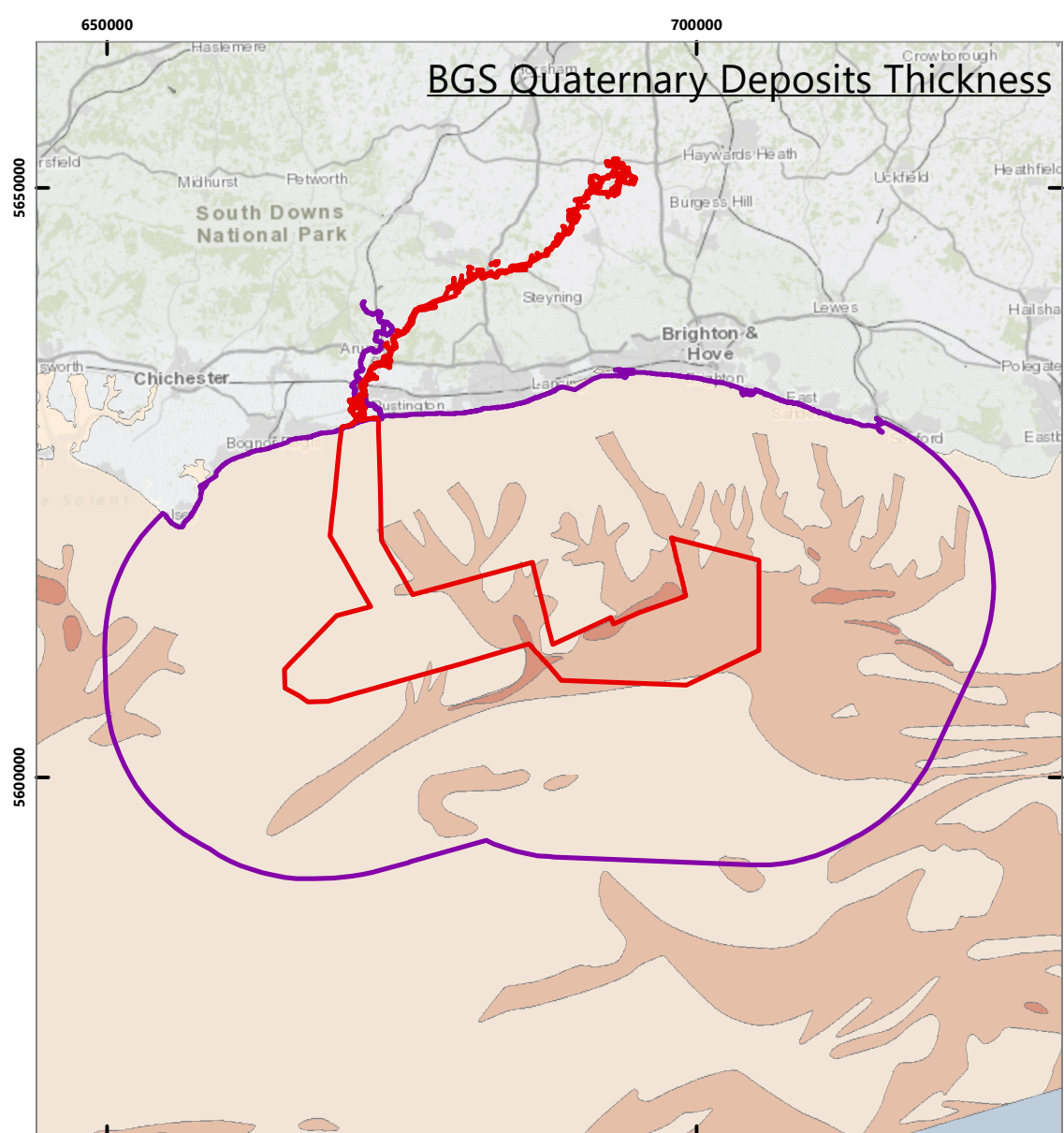
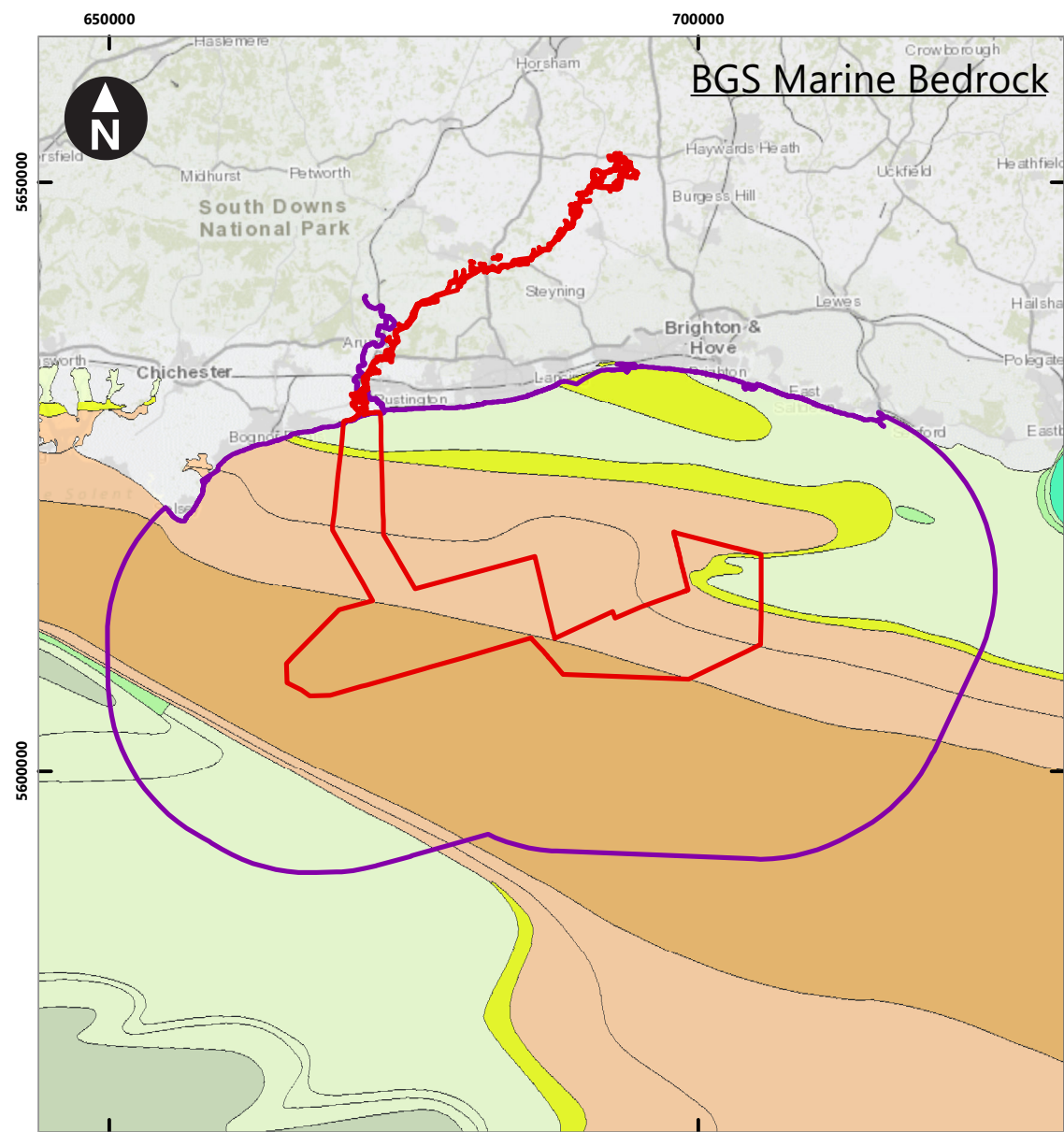
Rampion Extension Development

Rampion 2 Offshore Wind Farm

Figure 8.12 International designated sites

Preliminary Environmental Information Report

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Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 07/05/2021	Status: FINAL



Key

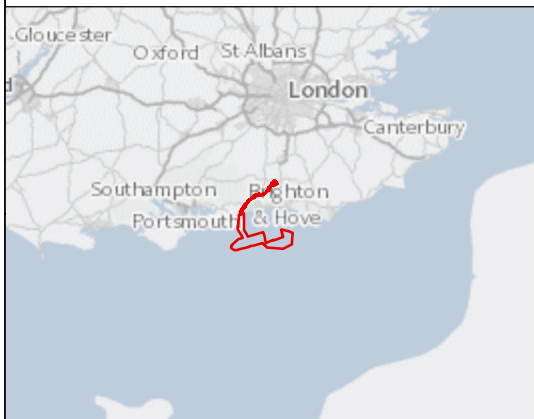
- PEIR Assessment Boundary
- Fish and shellfish Study Area

BGS Marine Bedrock

- Chalk
- Lower Chalk Formation
- Sandstone and Rock
- Clay and Silt
- Rock

BGS Quaternary Deposits Thickness

- <5m
- 5m - 20m
- 20m - 30m
- 30m - 50m
- >50m



Kilometres
0 2.5 5 10 15 20

1:600,000

WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development



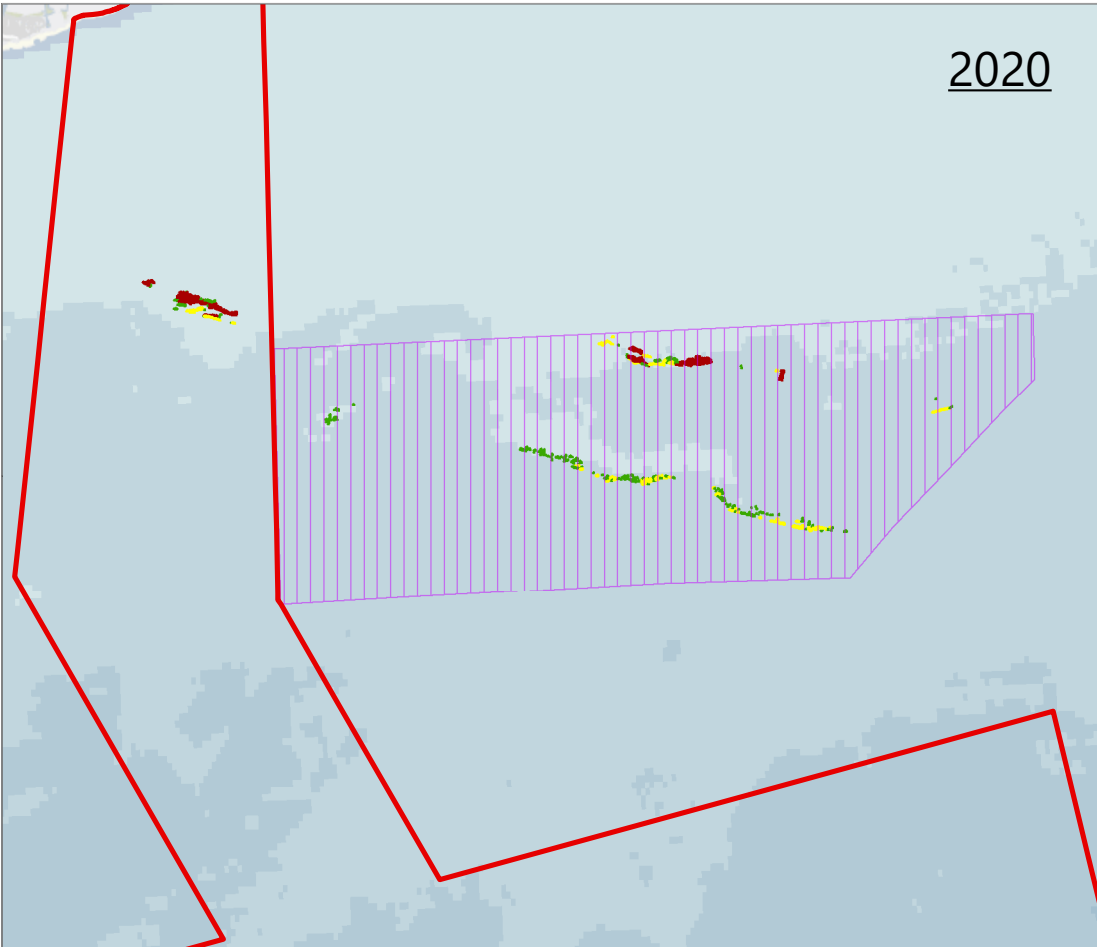
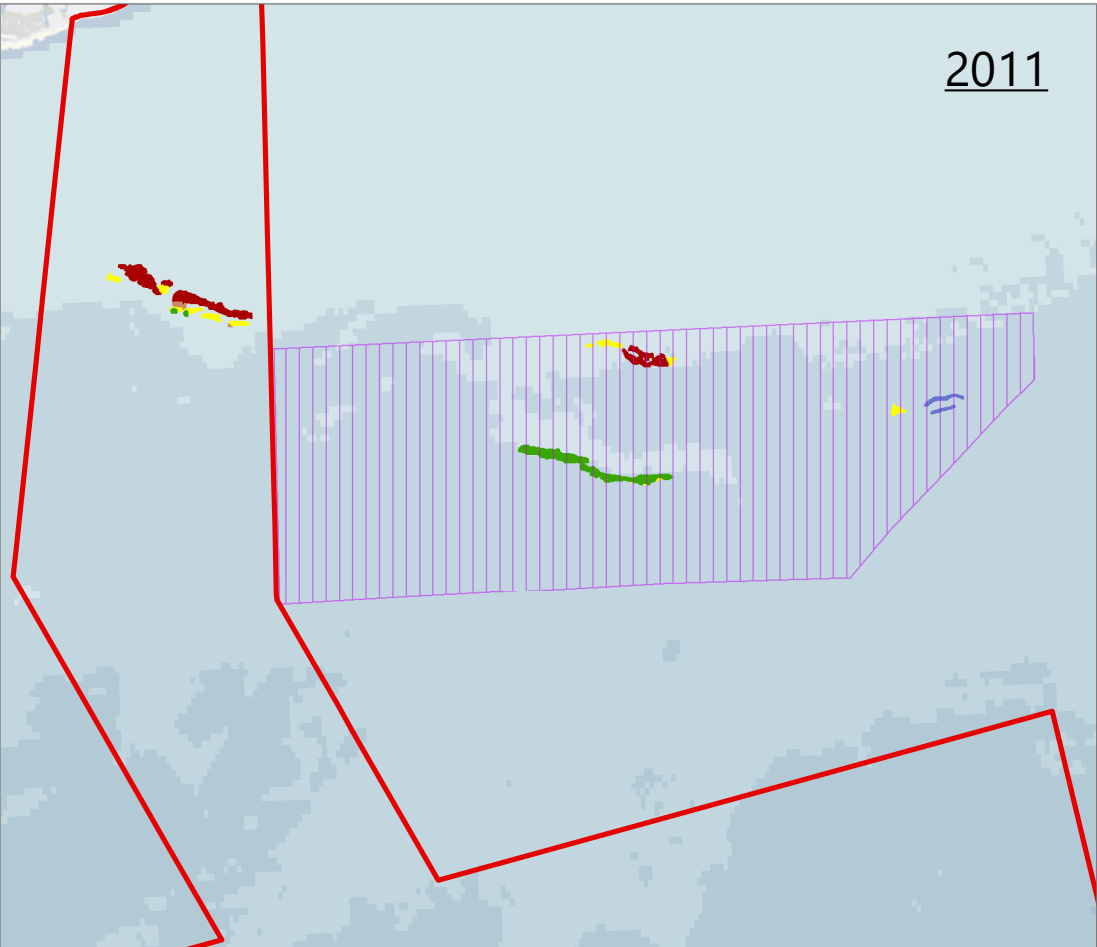
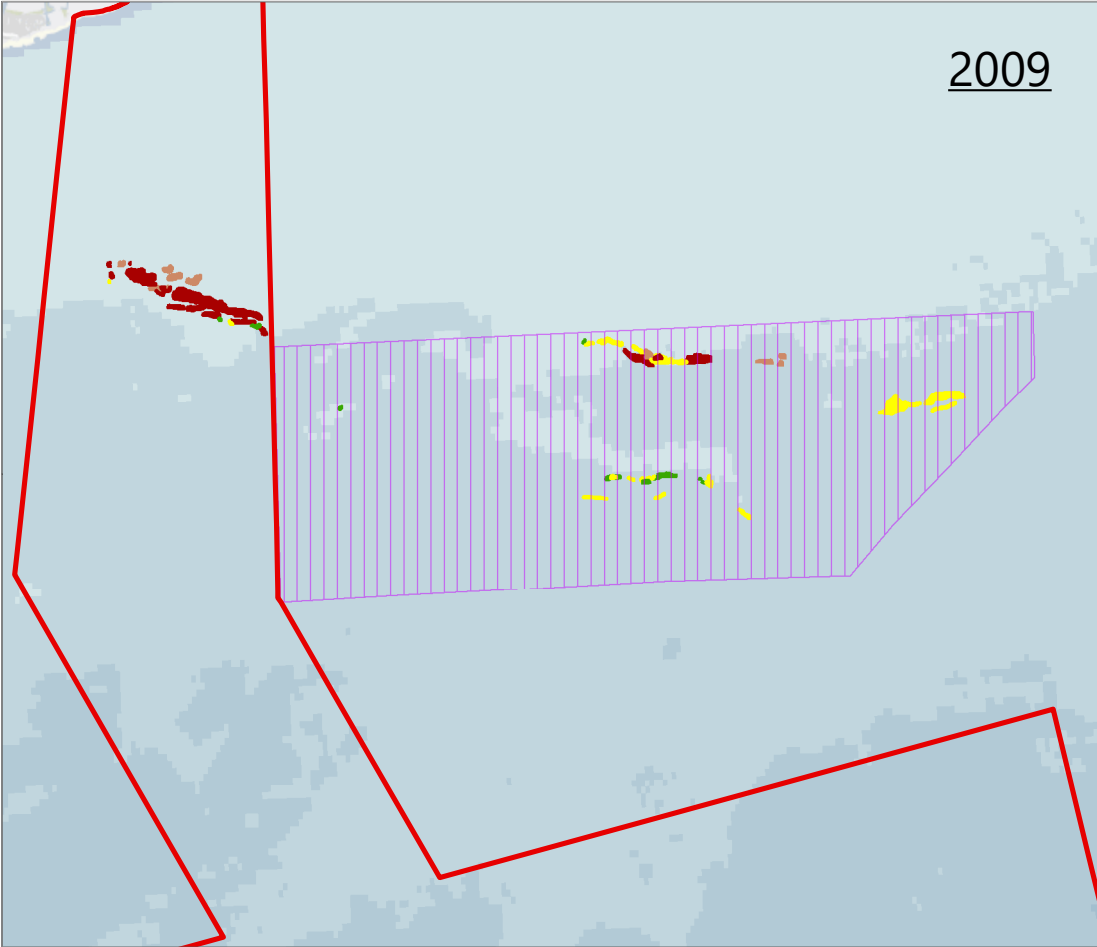
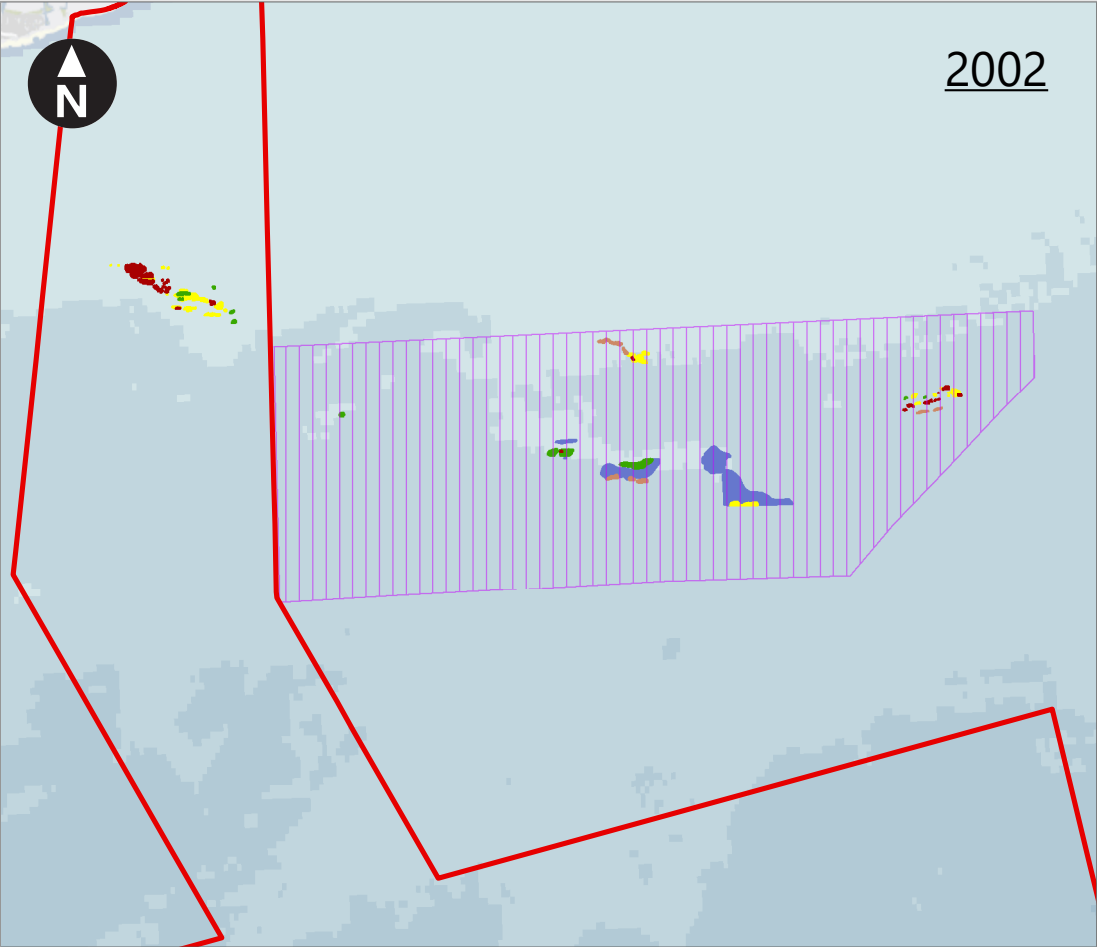
Rampion 2 Offshore Wind Farm

Figure 8.13 Location of potential black bream spawning grounds

Preliminary Environmental Information Report

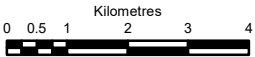
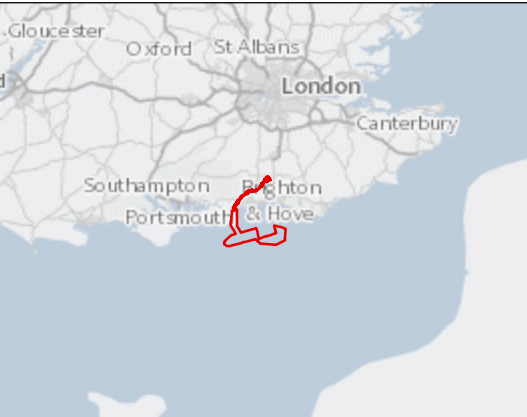
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Company: GOBE	Drawn By: AL	Chk/Prvd: NH	Drawn Date: 07/05/2021	Status: FINAL
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Key

- PEIR Assessment Boundary
- Kingmere Marine Conservation Zone (MCZ)
- Black bream nest density
 - Dense nests
 - Faint dense nests
 - Less dense / patchy nests
 - Small patches of nests
 - Sparse single nests



WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development

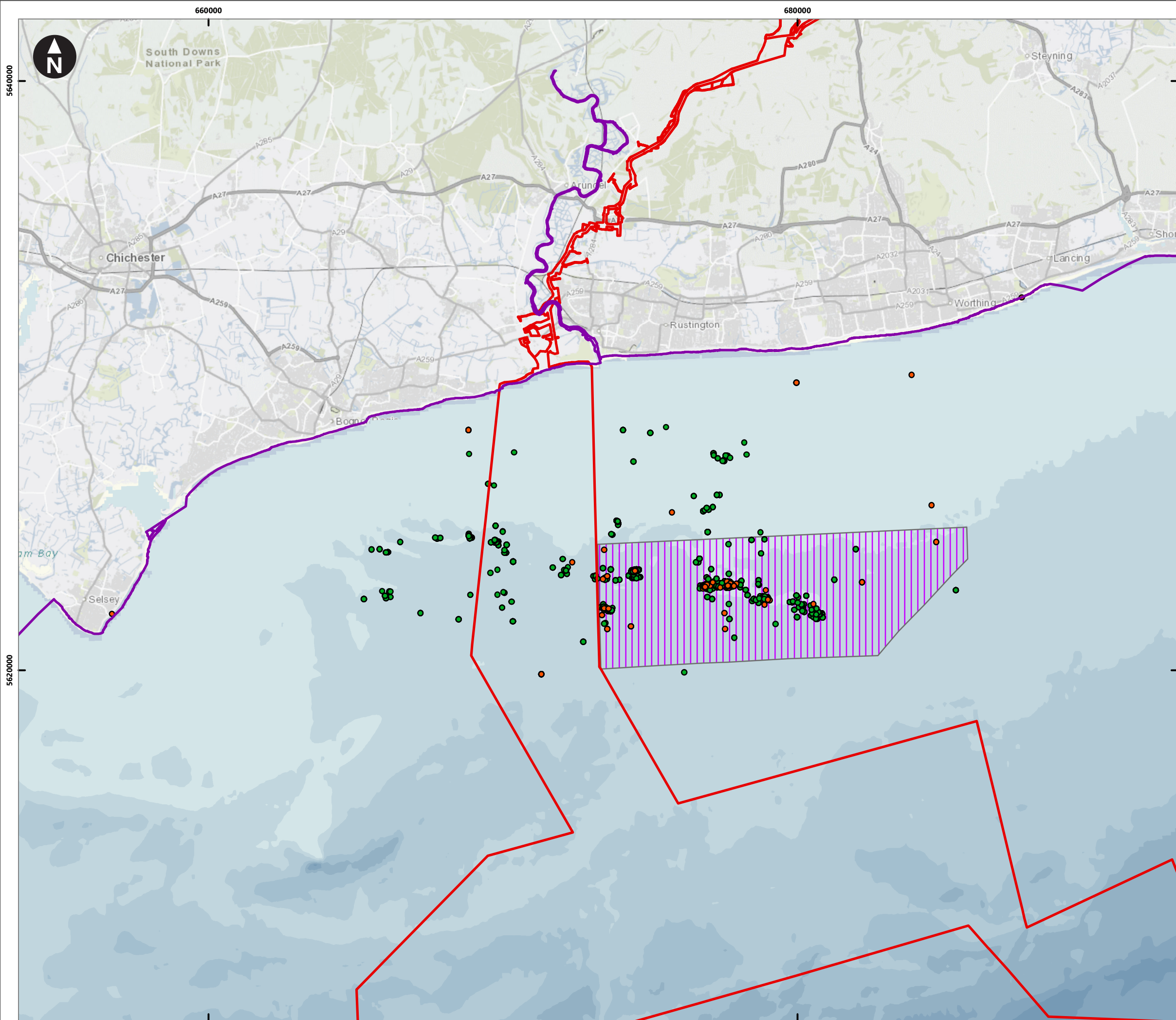


Rampion 2 Offshore Wind Farm

Figure 8.14 Locations and densities of black bream nests

Preliminary Environmental Information Report

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Company:	Drawn By:	Chk/Aprvd:	Drawn Date:	Status:
GOBE	AL	NH	30/06/2021	FINAL



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Key

- PEIR Assessment Boundary
- Fish and shellfish Study Area
- Kingmere Marine Conservation Zone
- Black bream recapture (2014-2016)
- Black bream release (2014-2016)

0 0.5 1 2 3 4
Kilometres

1:125,000
WGS 1984 UTM Zone 30N Transverse Mercator

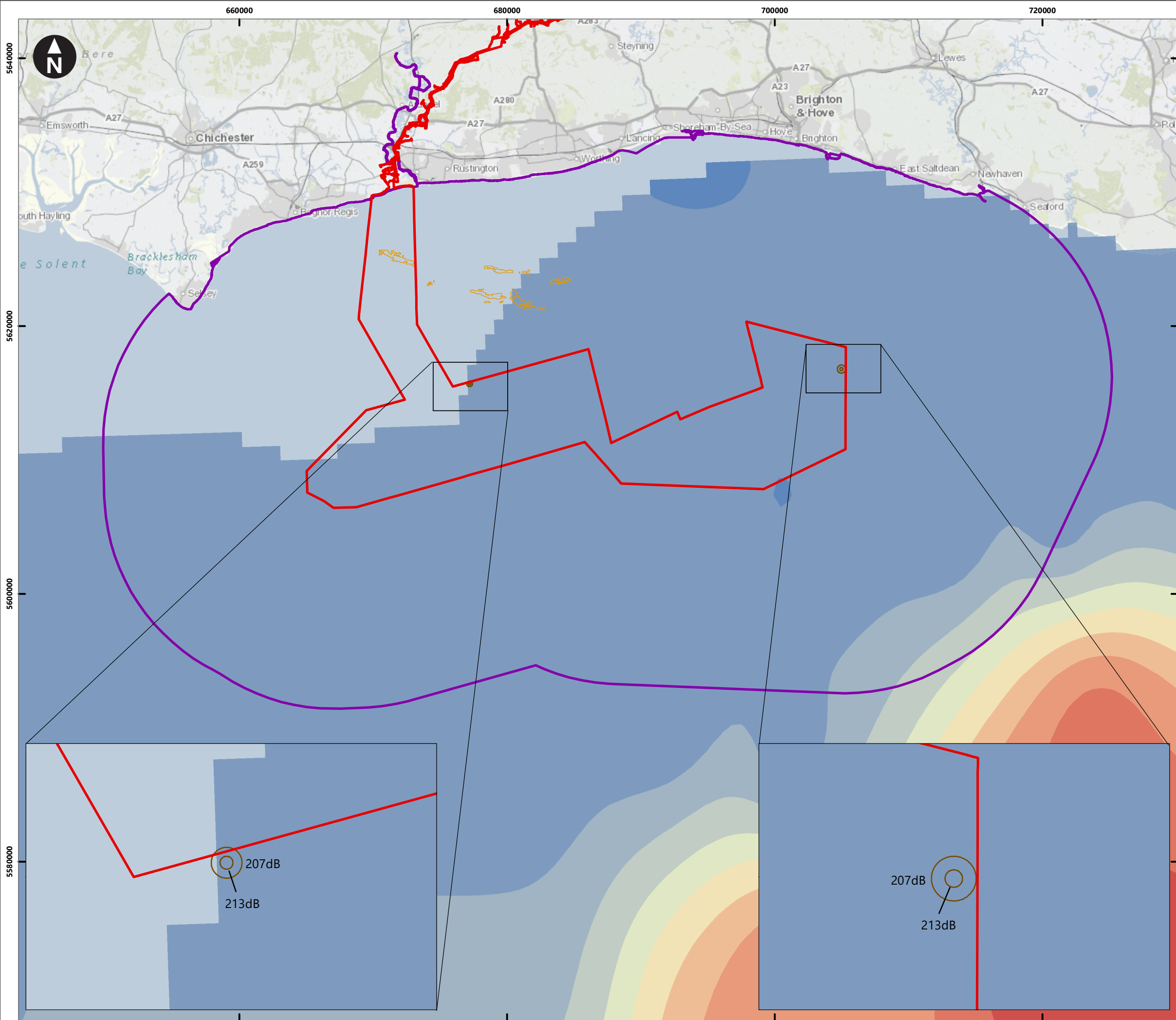
Rampion Extension Development

Rampion 2 Offshore Wind Farm

Figure 8.15 Black bream catch and release survey (Sussex IFCA)

Preliminary Environmental Information Report

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Company: GOBE	Drawn By: AL	Chk/Aprvd: NH	Drawn Date: 07/05/2021	Status: FINAL



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Derived from <https://www.ices.dk/> March 2021

Key

- PEIR Assessment Boundary
- Fish and shellfish Study Area
- MDS monopile contours
- 4400kJ hammer energy (dB SPLpeak)
- Bream nest extents (historic surveys)

IHLS 2007/2020 downs data
Larval abundance per m²

0
0.1 - 2,500
2,500 - 7,000
7,000 - 14,000
14,000 - 23,000
23,000 - 35,000
35,000 - 48,000
48,000 - 63,000
63,000 - 80,000
80,000 - 98,500

0 1.25 2.5 5 7.5 10
Kilometres

1:5,000,000
WGS 1984 UTM Zone 30N Transverse Mercator

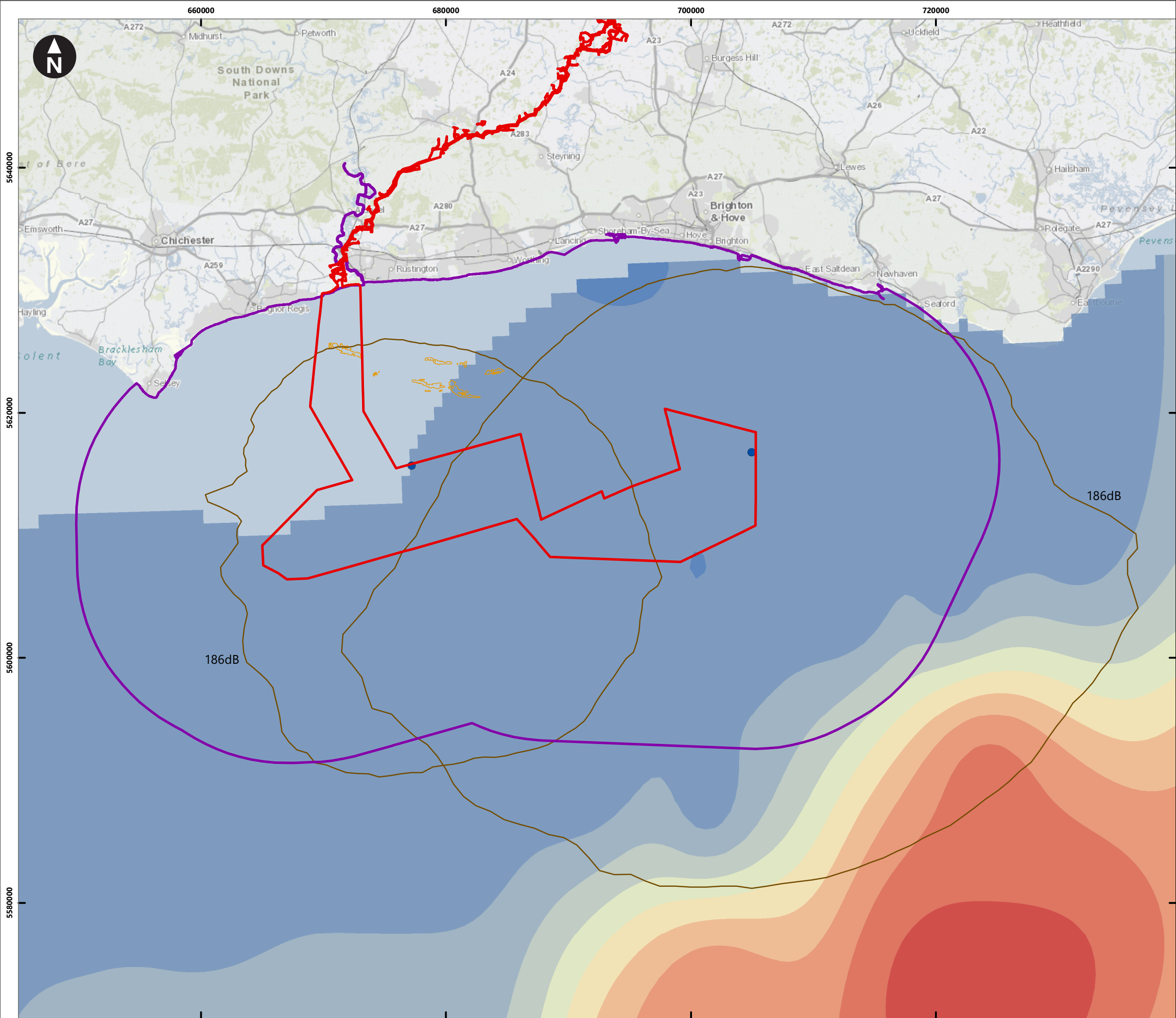
Rampion Extension Development

Rampion 2 Offshore Wind Farm

Figure 8.16 Predicted impact ranges
at the specified noise levels (SPLpeak)

Preliminary Environmental Information Report

System Identifier: 42285-GOBE-PE-OF-FG-07-9324				Version: 1.2
Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 29/06/2021	Status: FINAL



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Key

- PEIR Assessment Boundary
- Fish and shellfish Study Area
- Noise modelling location
- MDS monopile contours
- 4400kJ hammer energy (dB SELcum)
- Bream nest extents (historic surveys)

IHLS 2007/2020 downs data
Larval Abundance Per m²

0
0.1 - 2,500
2,500 - 7,000
7,000 - 14,000
14,000 - 23,000
23,000 - 35,000
35,000 - 48,000
48,000 - 63,000
63,000 - 80,000
80,000 - 98,500

186dB

186dB

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Kilometres
1:300,000
WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development

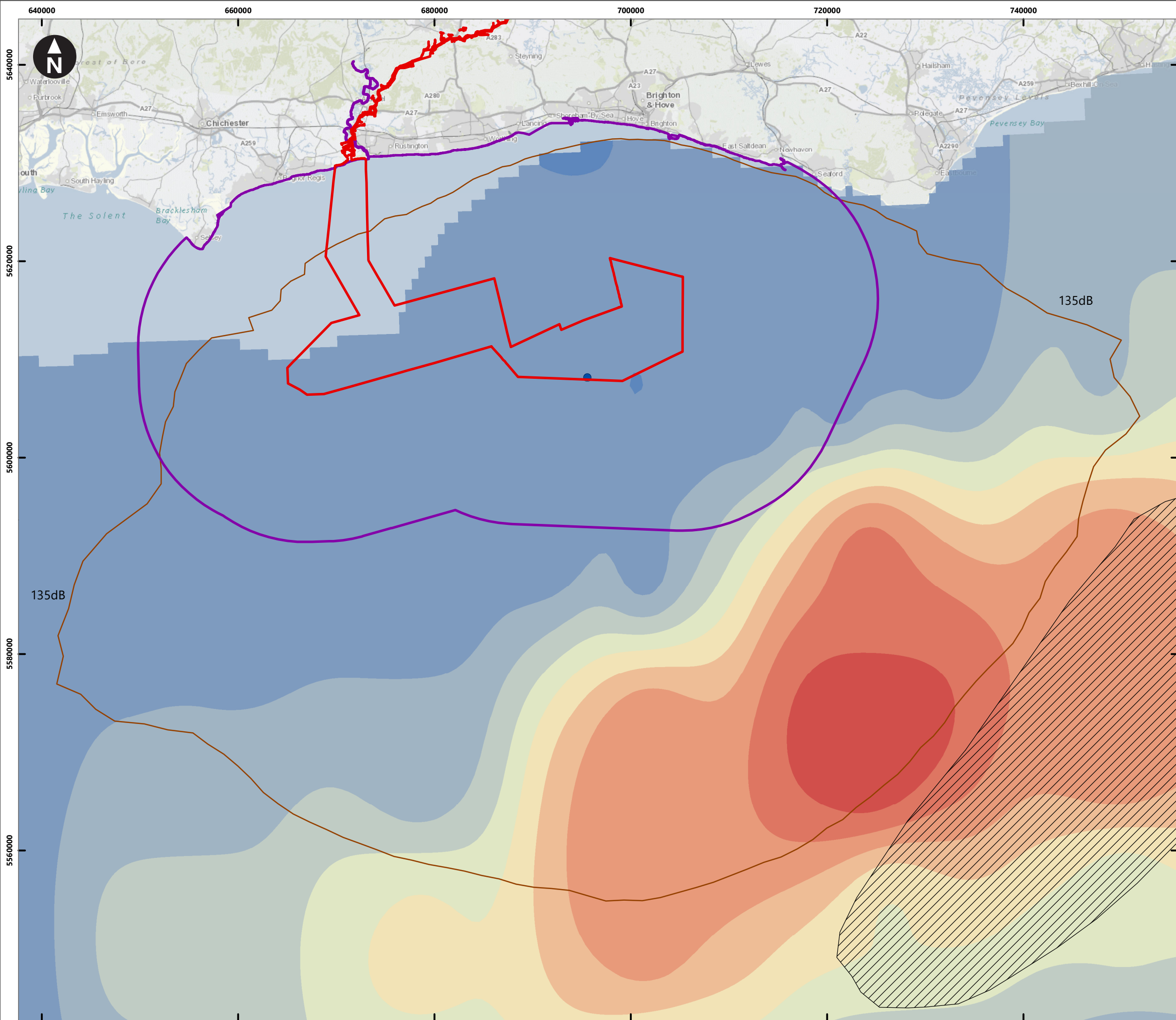
Rampion 2
WIND FARM

Rampion 2 Offshore Wind Farm

Figure 8.17 Predicted Impact Ranges at the Specified Noise Levels (SELcum)

Preliminary Environmental Information Report

System Identifier: 42285-GOBE-PE-OF-FG-07-6735				Version: 1.2
Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 29/06/2021	Status: FINAL



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IHLS raw data derivd from <https://www.ices.dk/> March 2021

Key

- PEIR Assessment Boundary
- Fish and shellfish Study Area
- Noise modelling location
- MDS jacket contours
- 4400kJ hammer energy (dB SELss)
- Herring spawning (Coull et al. 1998)

IHLS 2007/2020 downs data
Larval abundance per m²

0
0.1 - 2,500
2,500 - 7,000
7,000 - 14,000
14,000 - 23,000
23,000 - 35,000
35,000 - 48,000
48,000 - 63,000
63,000 - 80,000
80,000 - 98,500

Gloucester Oxford St Albans London Canterbury
Southampton Brighton Portsmouth & Hove

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Kilometres
1:375,000
WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development

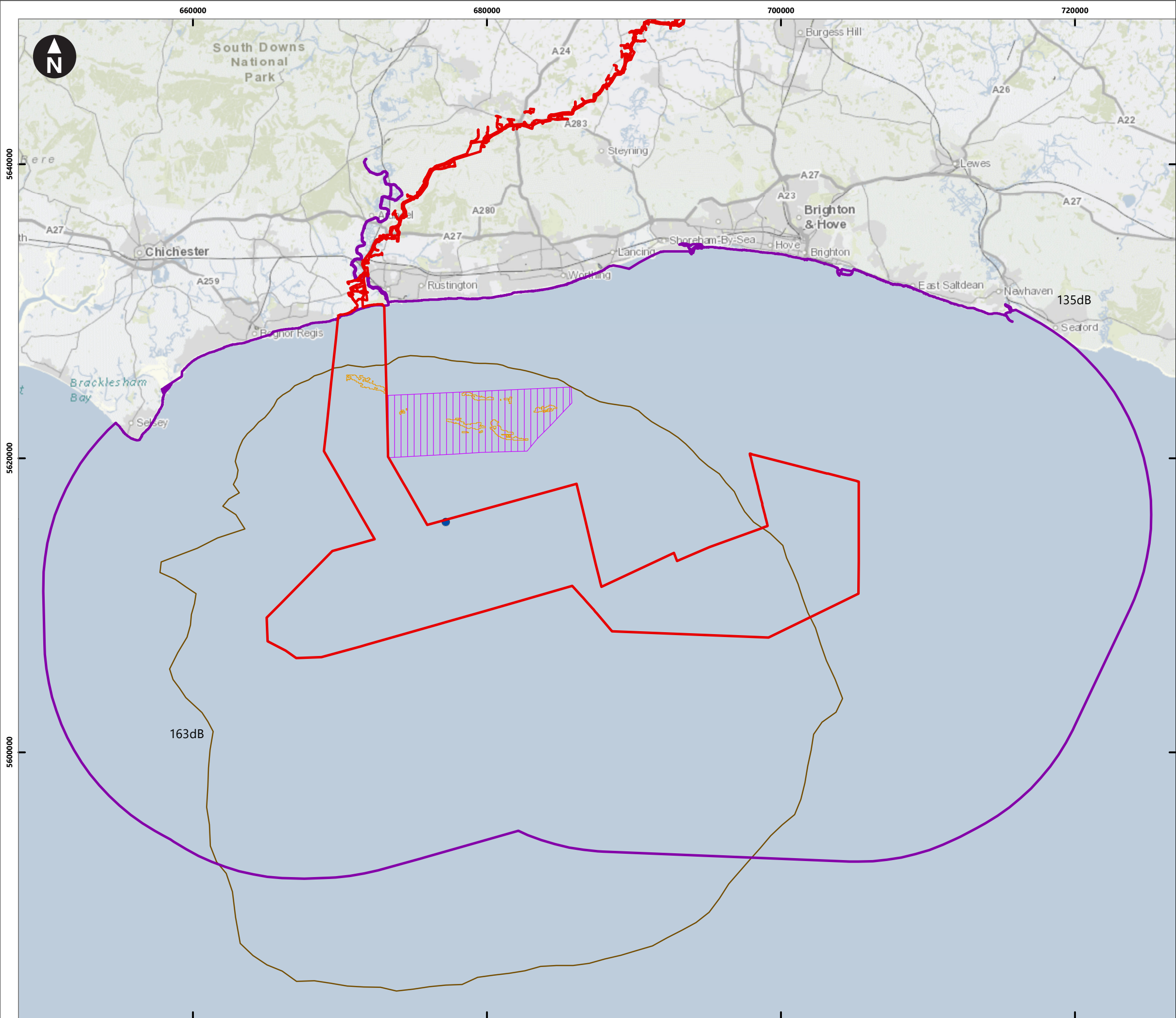
Rampion 2
WIND FARM

Rampion 2 Offshore Wind Farm

Figure 8.18 Comparison of SELcum noise contours with herring spawning grounds

Preliminary Environmental Information Report

System Identifier: 42285-GOBE-PE-OF-FG-07-9950				Version: 1.2
Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 29/06/2021	Status: FINAL



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IHLS data derived from <https://www.ices.dk/> March 2021

Key

- PEIR Assessment Boundary
- Fish and shellfish Study Area
- Kingmere Marine Conservation Zone (MCZ)
- Noise modelling location
- MDS monopile contours 4400kJ hammer energy (dB SELpeak-to-peak)
- Bream nest extents (historic surveys)

0 1.25 2.5 5 7.5 10
Kilometres
1:250,000
WGS 1984 UTM Zone 30N Transverse Mercator

Rampion Extension Development

Rampion 2
WIND FARM

Rampion 2 Offshore Wind Farm

Figure 8.19 Comparison of SPLpeak-to-peak noise contours with black bream nesting grounds

Preliminary Environmental Information Report

System Identifier: 42285-GOBE-PE-OF-FG-07-9302				Version: 1.2
Company: GOBE	Drawn By: BPHB	Chk/Aprvd: NH	Drawn Date: 29/06/2021	Status: FINAL

