



# Hornsea Project Four

## Appendix to Technical Note: Impact of Protective Provisions on Seabird Modelling Request for Further Information

Date: 16 May 2023

Document Reference: G13.3

Revision: 01

**Prepared** APEM, May 2023  
**Checked** Pinsent Masons, May 2023  
**Accepted** Natalie Bown, Orsted, May 2023  
**Approved** Jamie Baldwin, Orsted, May 2023

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**Document Properties**

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<i>Checked by</i>	Pinsent Masons, May 2023
<i>Approved by</i>	Natalie Bown, Orsted, May 2023
<i>Title</i>	Appendix to Technical Note: Impact of Protective Provisions on Seabird Modelling Impact of Protective Provisions on Seabird Modelling

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**Version History**

<i>Date</i>	<i>Version</i>	<i>Status</i>	<i>Description / Changes</i>
16 May 2023	A	-	Submitted in response to RFI letter dated 5 April 2023

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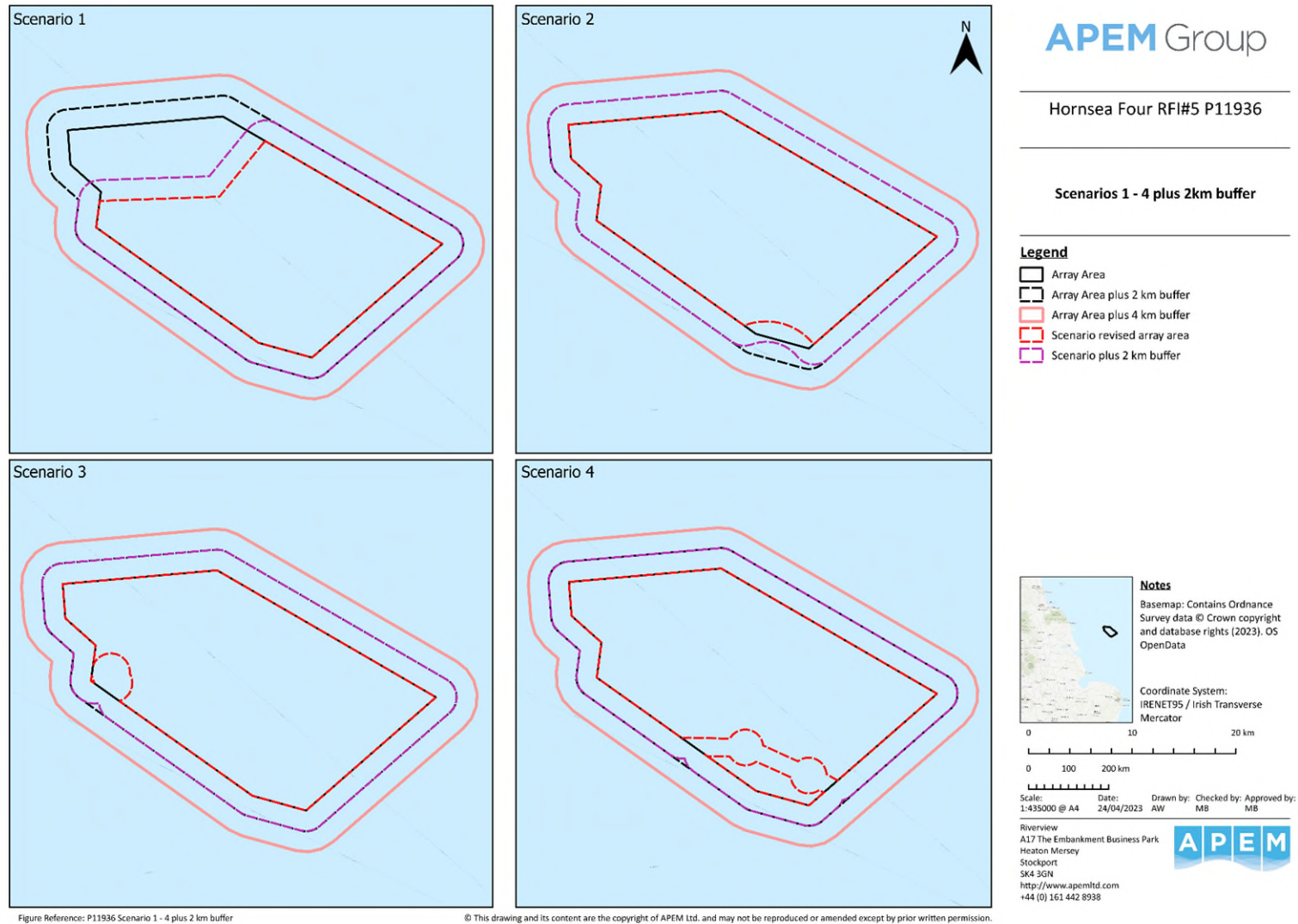
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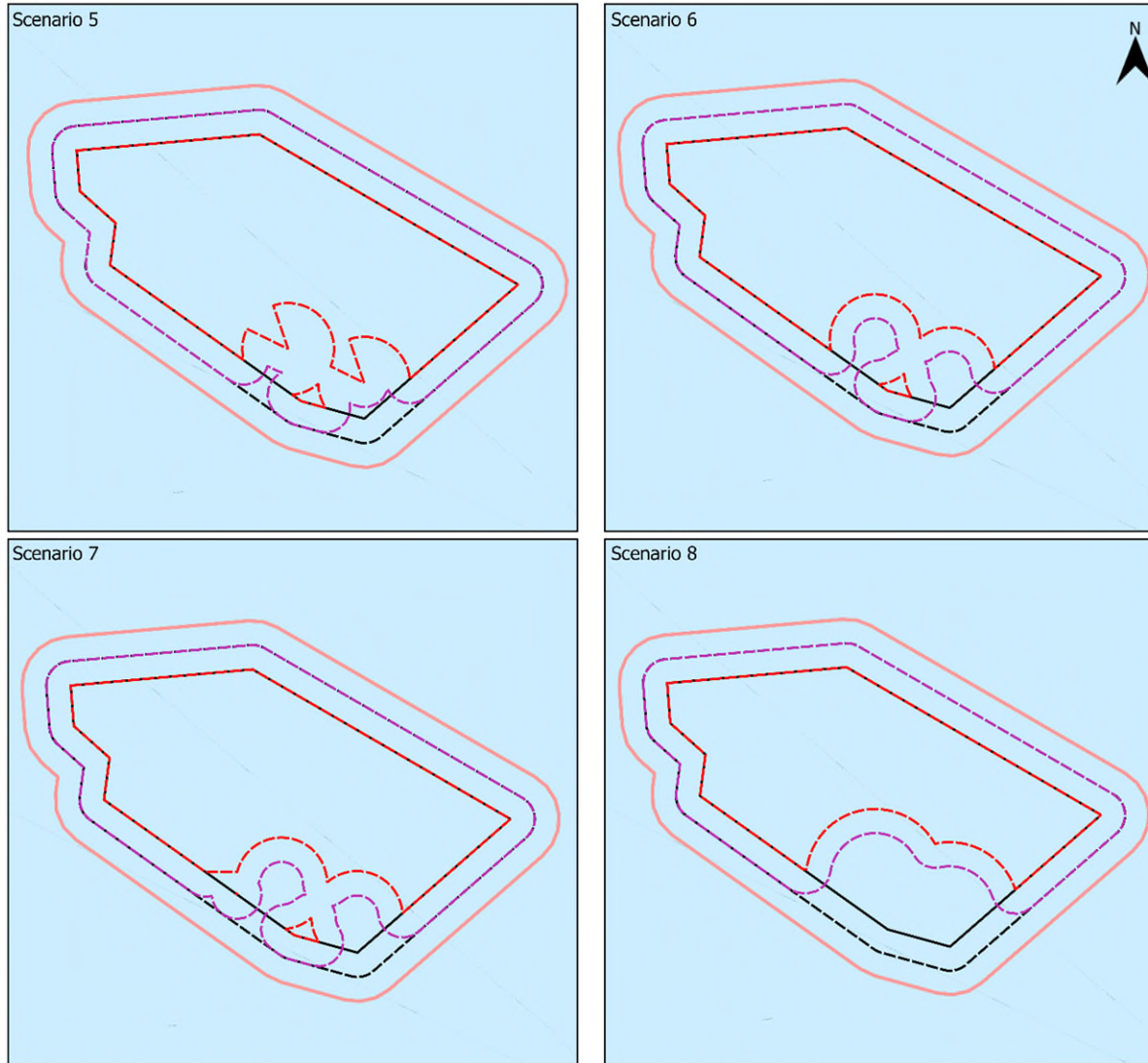
## Appendix A. Protective provision scenario figures



**Figure 1 Protective provision scenarios 1 to 4 including the scenario area plus a 2km and 4km buffer.**

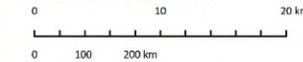
### Legend

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario revised array area
- Scenario plus 2 km buffer



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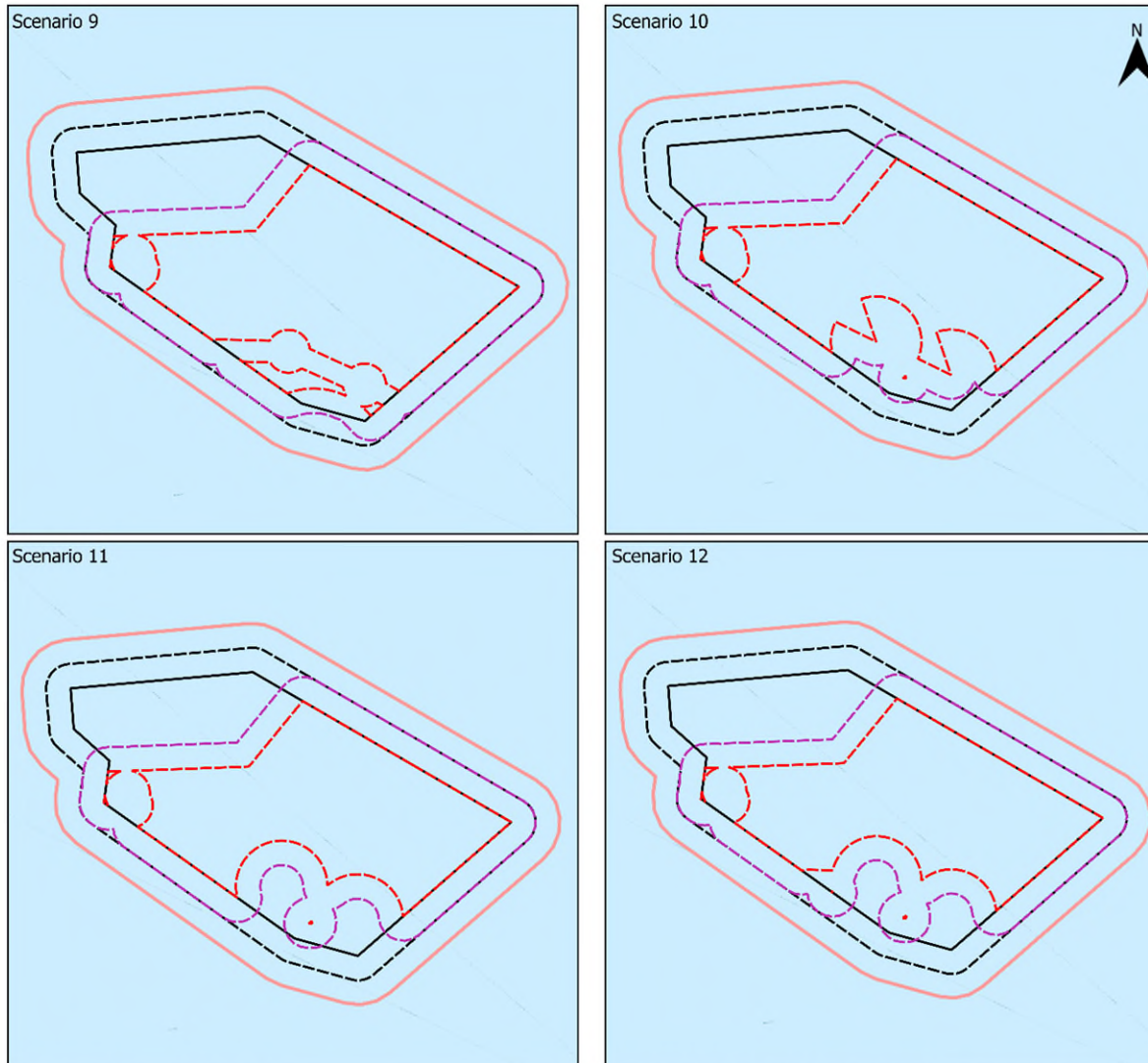
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Figure Reference: P11936 Scenario 5 - 8 plus 2 km buffer

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**Figure 2 Protective provision scenarios 5 to 8 including the scenario area plus a 2km and 4km buffer.**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario revised array area
- Scenario plus 2 km buffer



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0 10 20 km

0 100 200 km

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Figure Reference: P11936 Scenario 9 - 12 plus 2 km buffer

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**Figure 3 Protective provision scenarios 9 to 12 including the scenario area plus a 2km and 4km buffer.**

# Hornsea 4



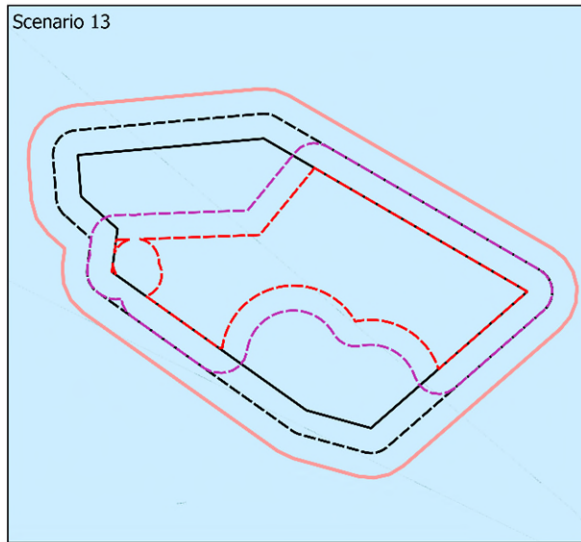
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**Scenarios 13 plus 2km buffer**

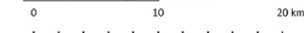
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario revised array area
- Scenario plus 2 km buffer



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Figure Reference: P11936 Scenario 13 plus 2 km buffer

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**Figure 4 Protective provision scenario 13 including the scenario area plus a 2km and 4km buffer.**

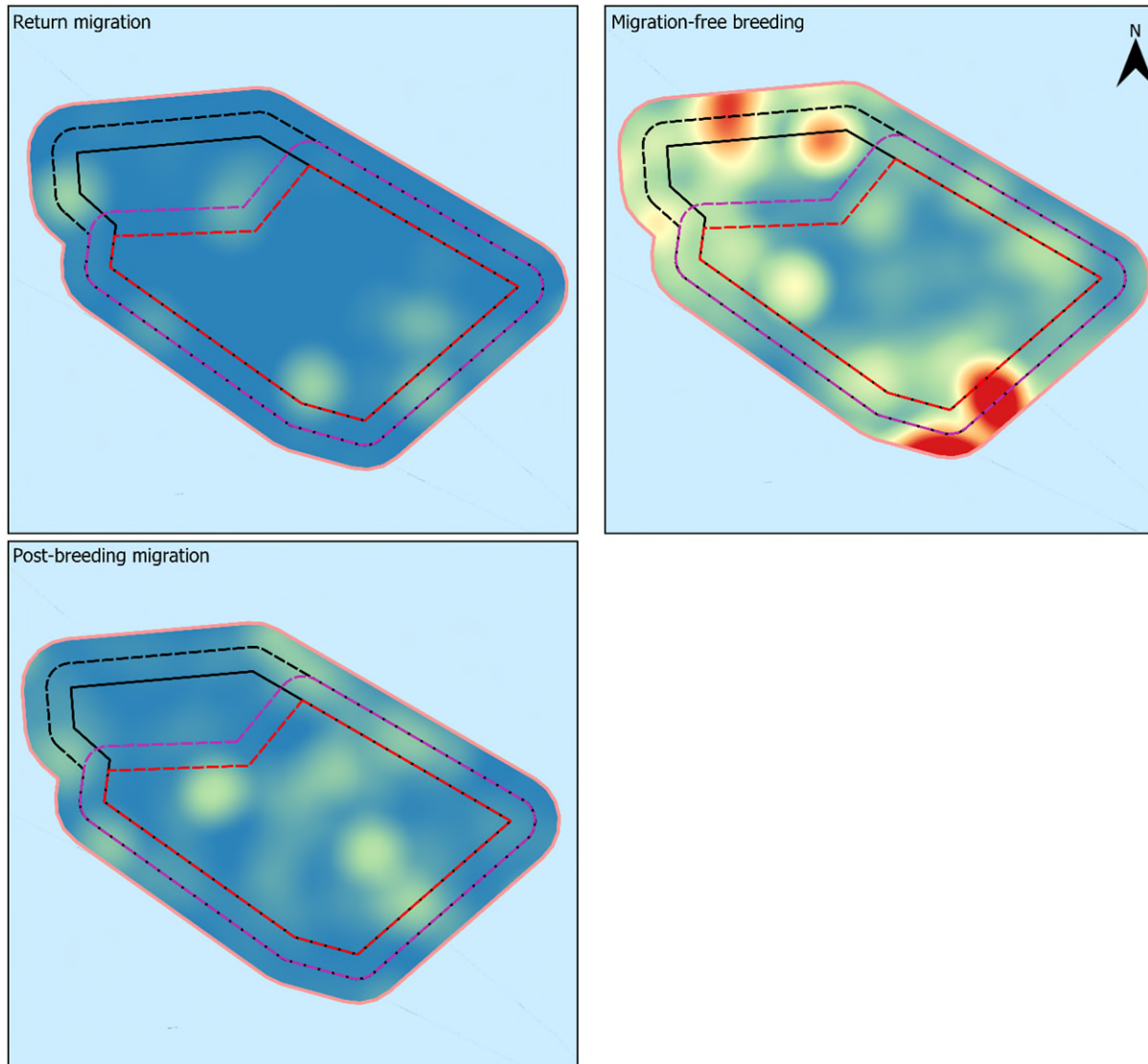
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Gannet seasonal heatmap for Scenario 1 plus 2km buffer



**Legend**

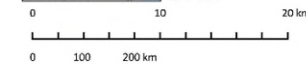
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 1 revised array area
- Scenario 1 plus 2 km buffer
- Gannet relative density
- 87
- 1



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Figure Reference: P11936 gannet relative density heatmap for Scenario 1 plus 2 km buffer

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**Figure 5 Protective provision Scenario 1 gannet seasonal heatmap plus 2km buffer.**

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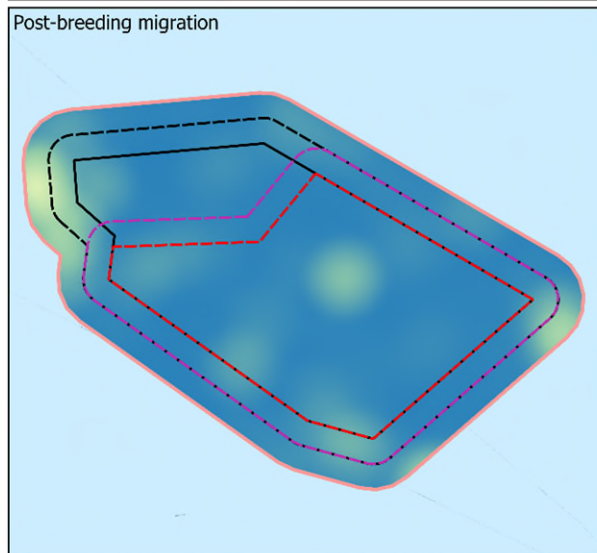
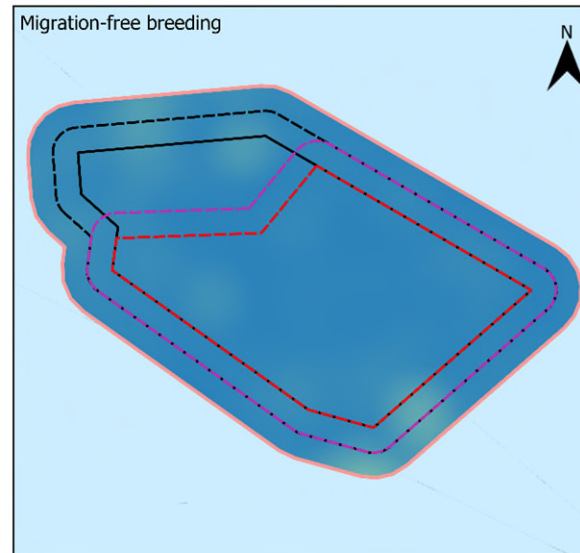
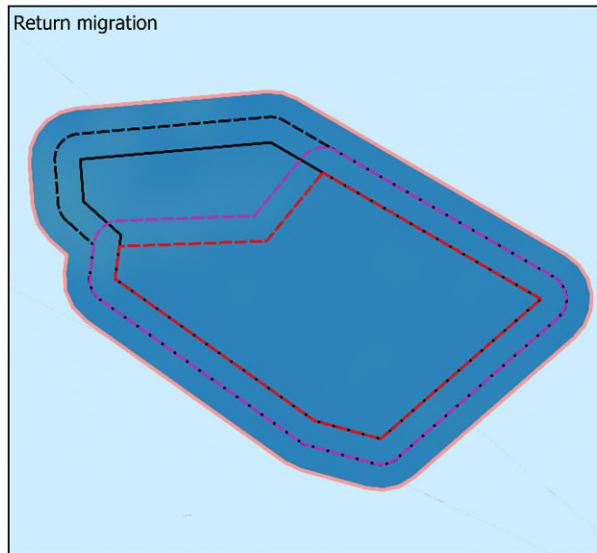
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**Kittiwake seasonal heatmap for Scenario 1 plus 2km buffer**

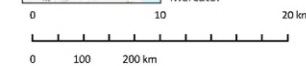
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 1 revised array area
- Scenario 1 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 1 plus 2 km buffer

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**Figure 6 Protective provision Scenario 1 kittiwake seasonal heatmap plus 2km buffer.**

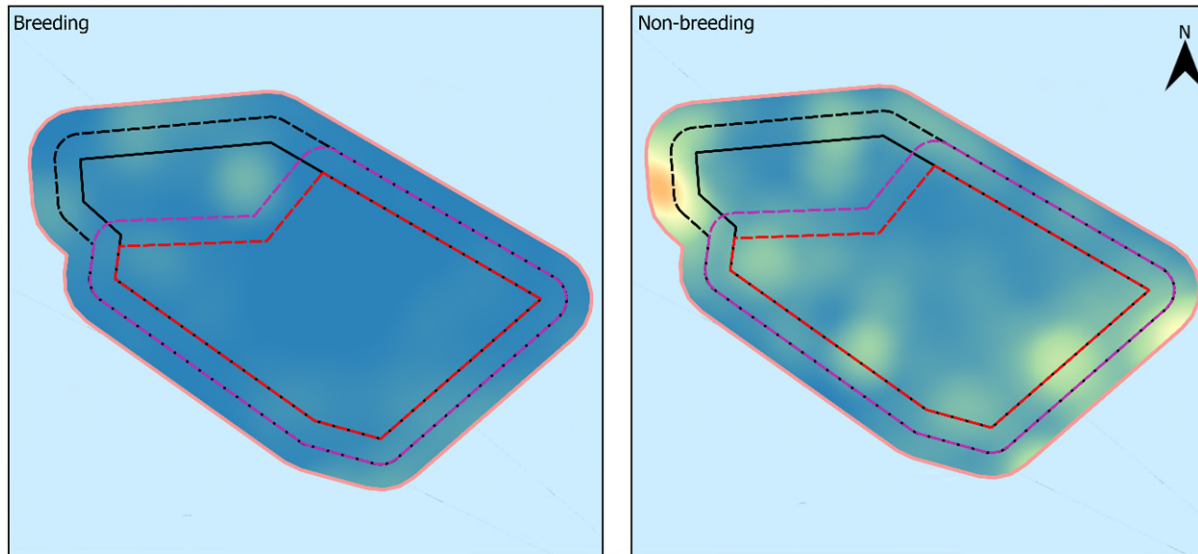
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**Guillemot seasonal heatmap for Scenario 1 plus 2km buffer**



**Legend**

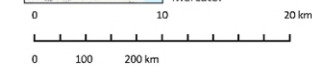
- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 1 revised array area
  - Scenario 1 plus 2 km buffer
- Guillemot relative density
- 
- 2,057  
53



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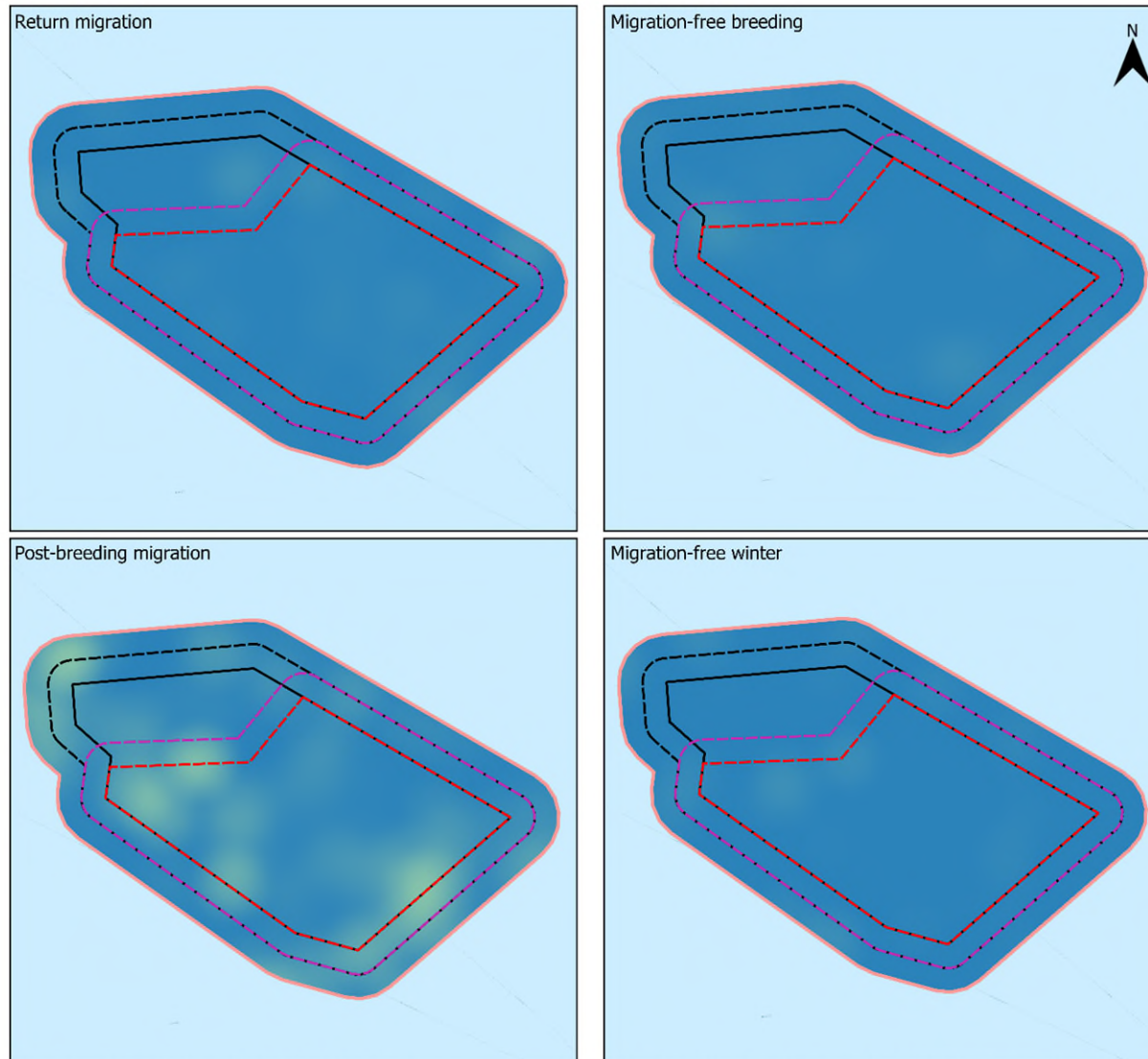
Figure Reference: P11936 guillemot relative density heatmap for Scenario 1 plus 2 km buffer

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**Figure 7 Protective provision Scenario 1 guillemot seasonal heatmap plus 2km buffer.**



### Razorbill seasonal heatmap for Scenario 1 plus 2km buffer



#### Legend

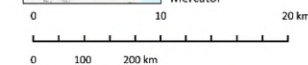
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 1 revised array area
- Scenario 1 plus 2 km buffer
- Razorbill relative density
- 411
- 1



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Figure Reference: P11936 razorbill relative density heatmap for Scenario 1 plus 2 km buffer

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**Figure 8 Protective provision Scenario 1 razorbill seasonal heatmap plus 2km buffer.**

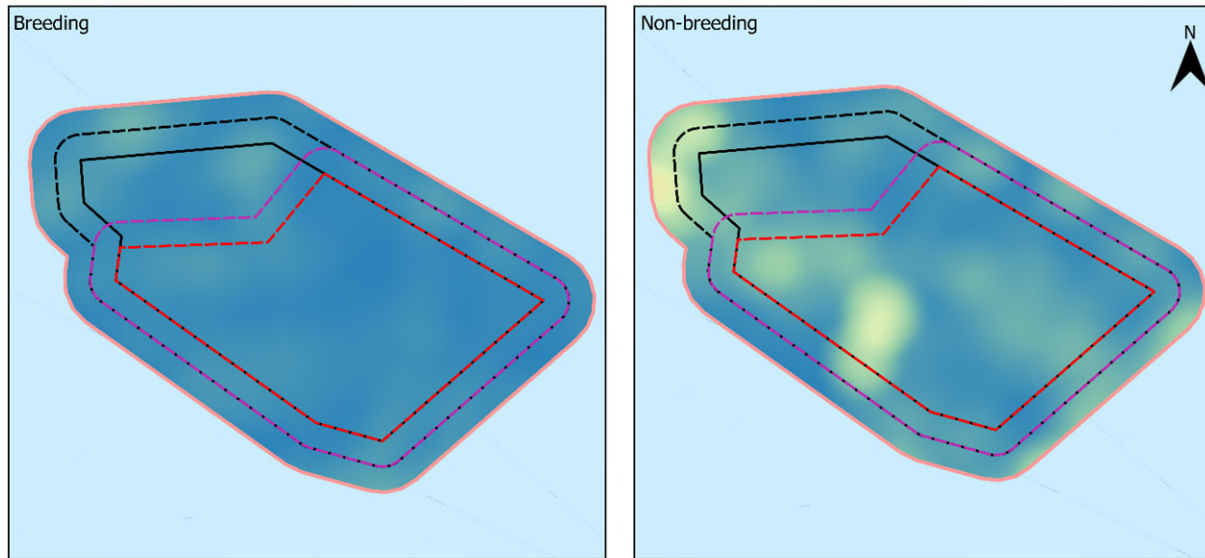
# Hornsea 4



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**Guillemot/ razorbill seasonal heatmap for Scenario 1 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 1 revised array area
- Scenario 1 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1

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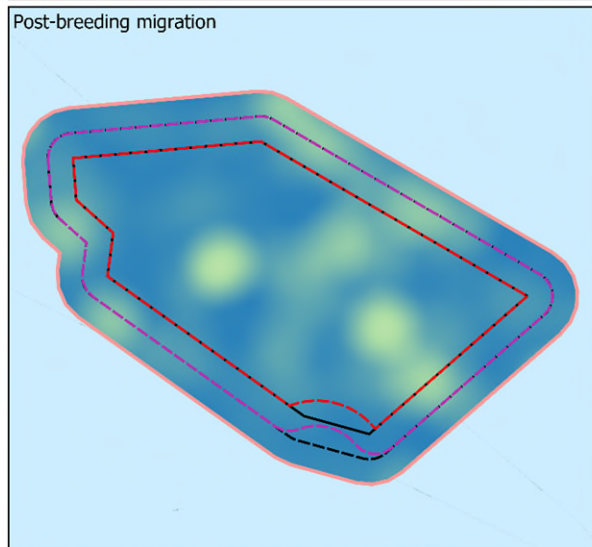
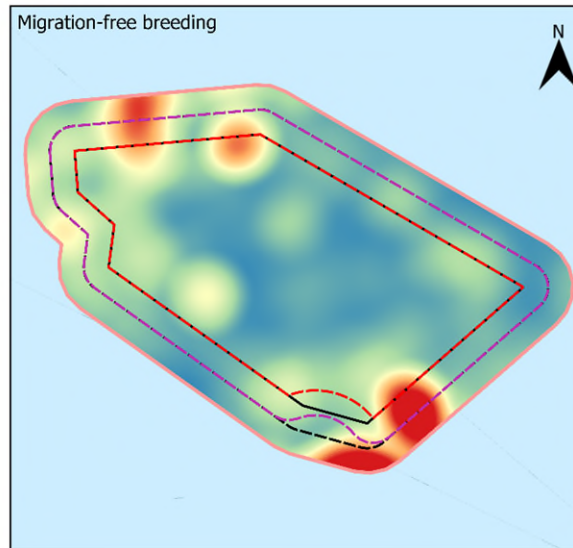
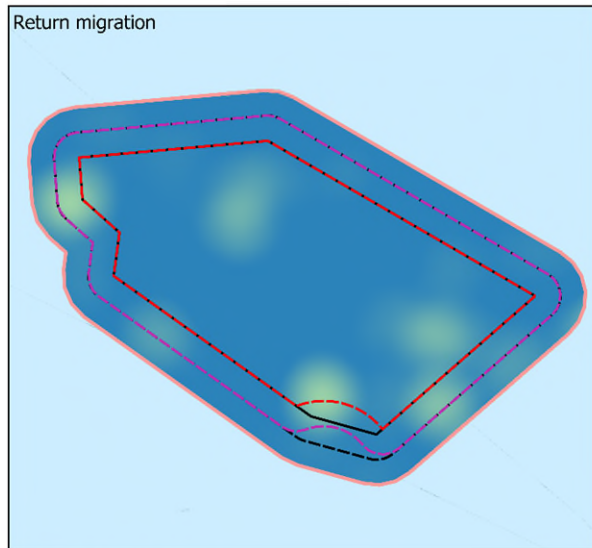
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Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 1 plus 2 km buffer

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**Figure 9 Protective provision Scenario 1 unidentified auk species seasonal heatmap plus 2km buffer.**

**Gannet seasonal heatmap for Scenario 2 plus 2km buffer**



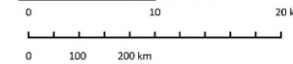
**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 2 revised array area
  - Scenario 2 plus 2 km buffer
  - Gannet relative density
- 87  
1



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Figure Reference: P11936 gannet relative density heatmap for Scenario 2 plus 2 km buffer

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**Figure 10 Protective provision Scenario 2 gannet seasonal heatmap plus 2km buffer.**

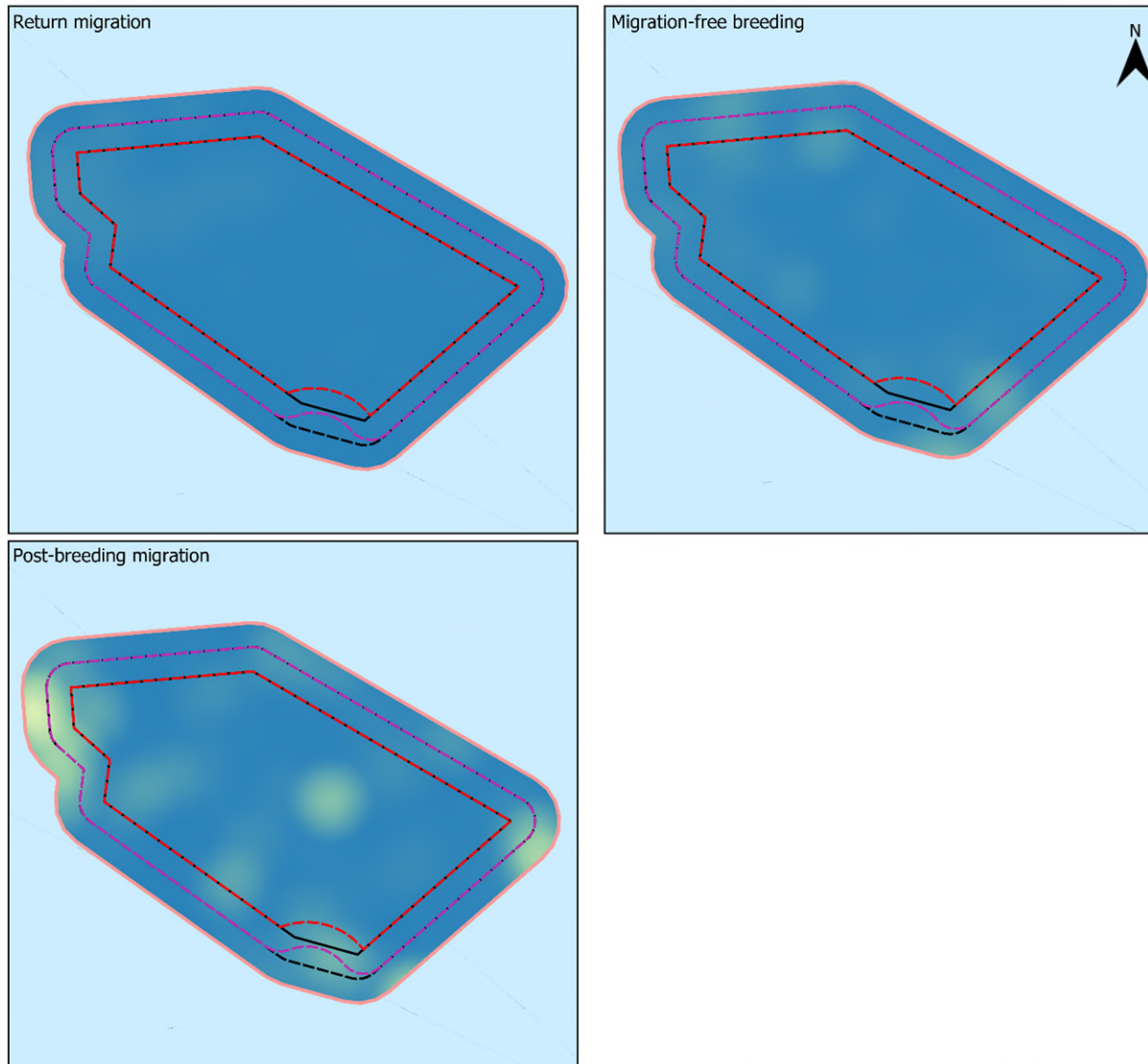
# Hornsea 4



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Kittiwake seasonal heatmap for Scenario 2 plus 2km buffer



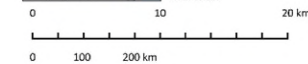
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 2 revised array area
- Scenario 2 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 2 plus 2 km buffer

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**Figure 11 Protective provision Scenario 2 kittiwake seasonal heatmap plus 2km buffer.**

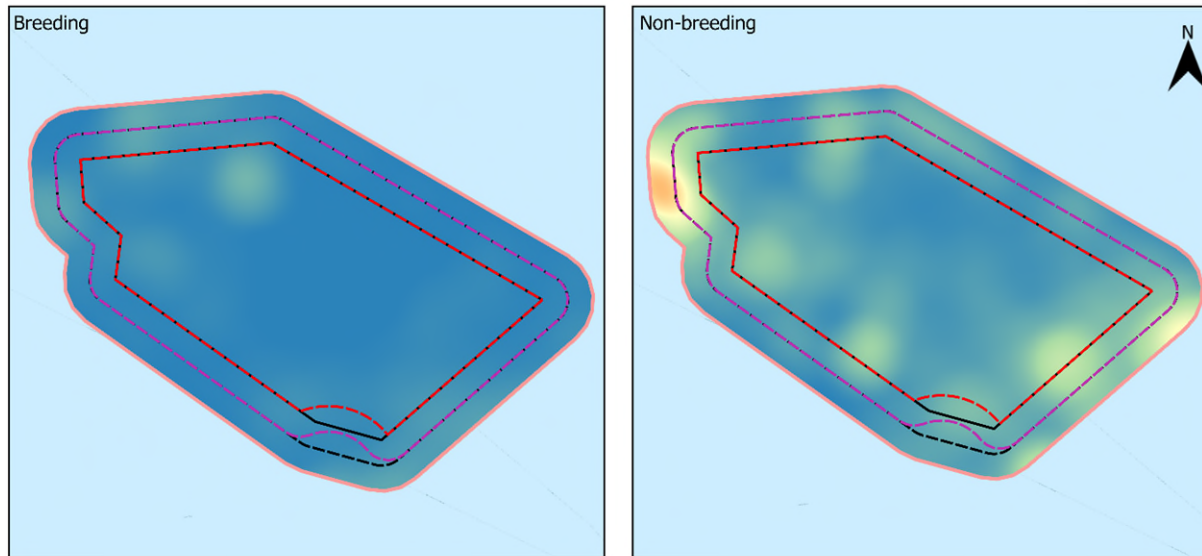
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**Guillemot seasonal heatmap for Scenario 2 plus 2km buffer**



**Legend**

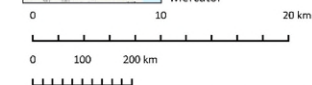
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 2 revised array area
- Scenario 2 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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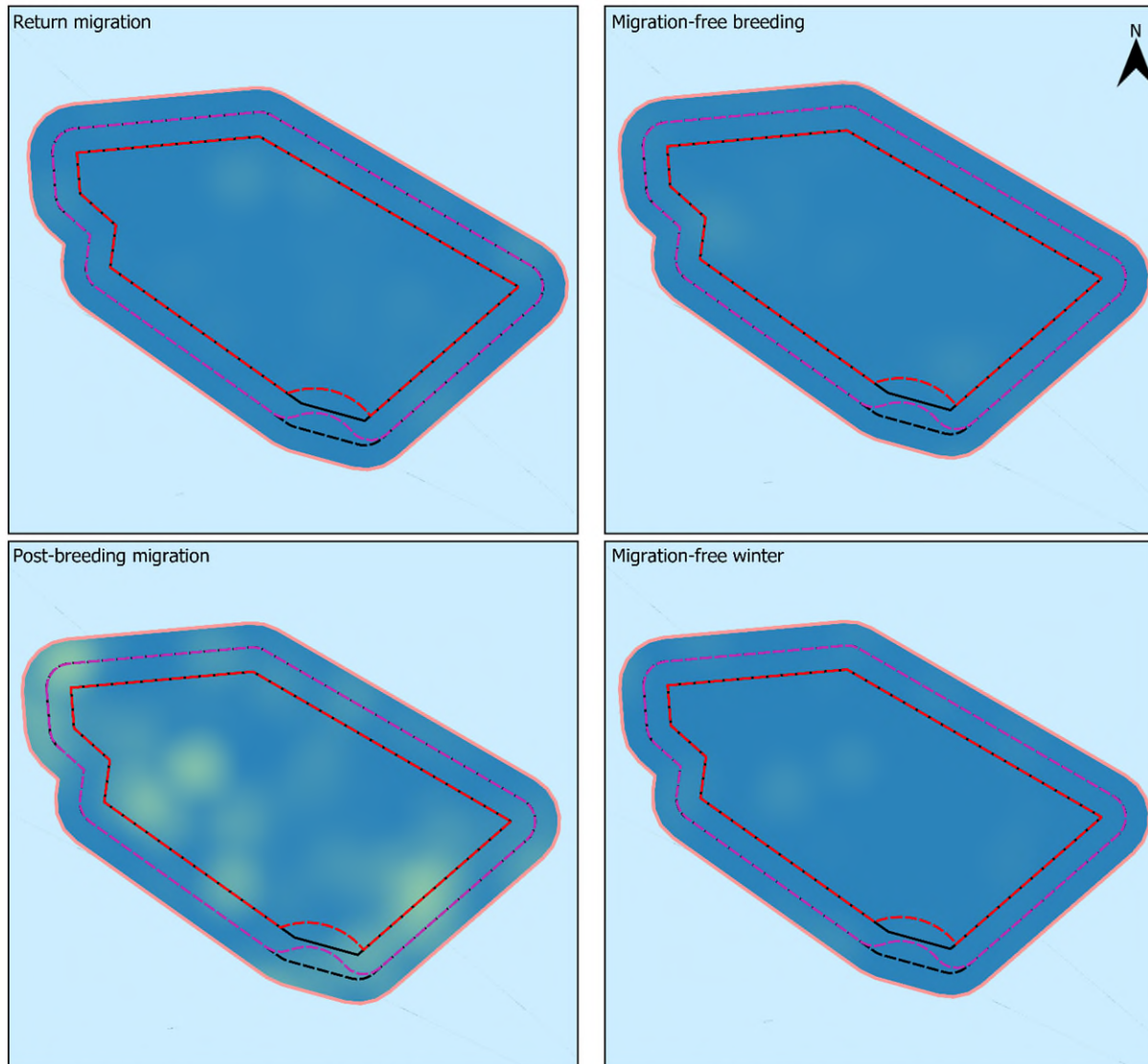


Figure Reference: P11936 guillemot relative density heatmap for Scenario 2 plus 2 km buffer

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**Figure 12 Protective provision Scenario 2 guillemot seasonal heatmap plus 2km buffer.**

**Razorbill seasonal heatmap for Scenario 2 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 2 revised array area
- Scenario 2 plus 2 km buffer
- Razorbill relative density
- 411
- 1



**Notes**

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0 10 20 km

0 100 200 km

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Figure Reference: P11936 razorbill relative density heatmap for Scenario 2 plus 2 km buffer

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**Figure 13 Protective provision Scenario 2 razorbill seasonal heatmap plus 2km buffer.**

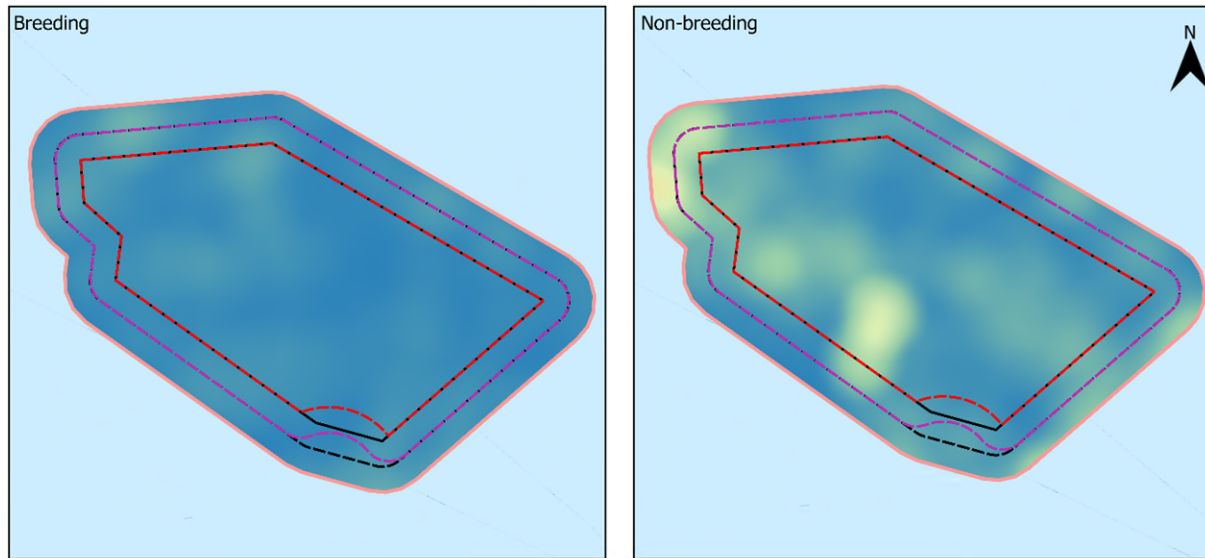
# Hornsea 4



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Hornsea Four RFI#5 P11936

Guillemot/ razorbill seasonal heatmap for Scenario 2 plus 2km buffer



**Legend**

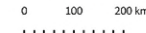
- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 2 revised array area
  - Scenario 2 plus 2 km buffer
  - Guillemot/ razorbill relative density
- 164  
1



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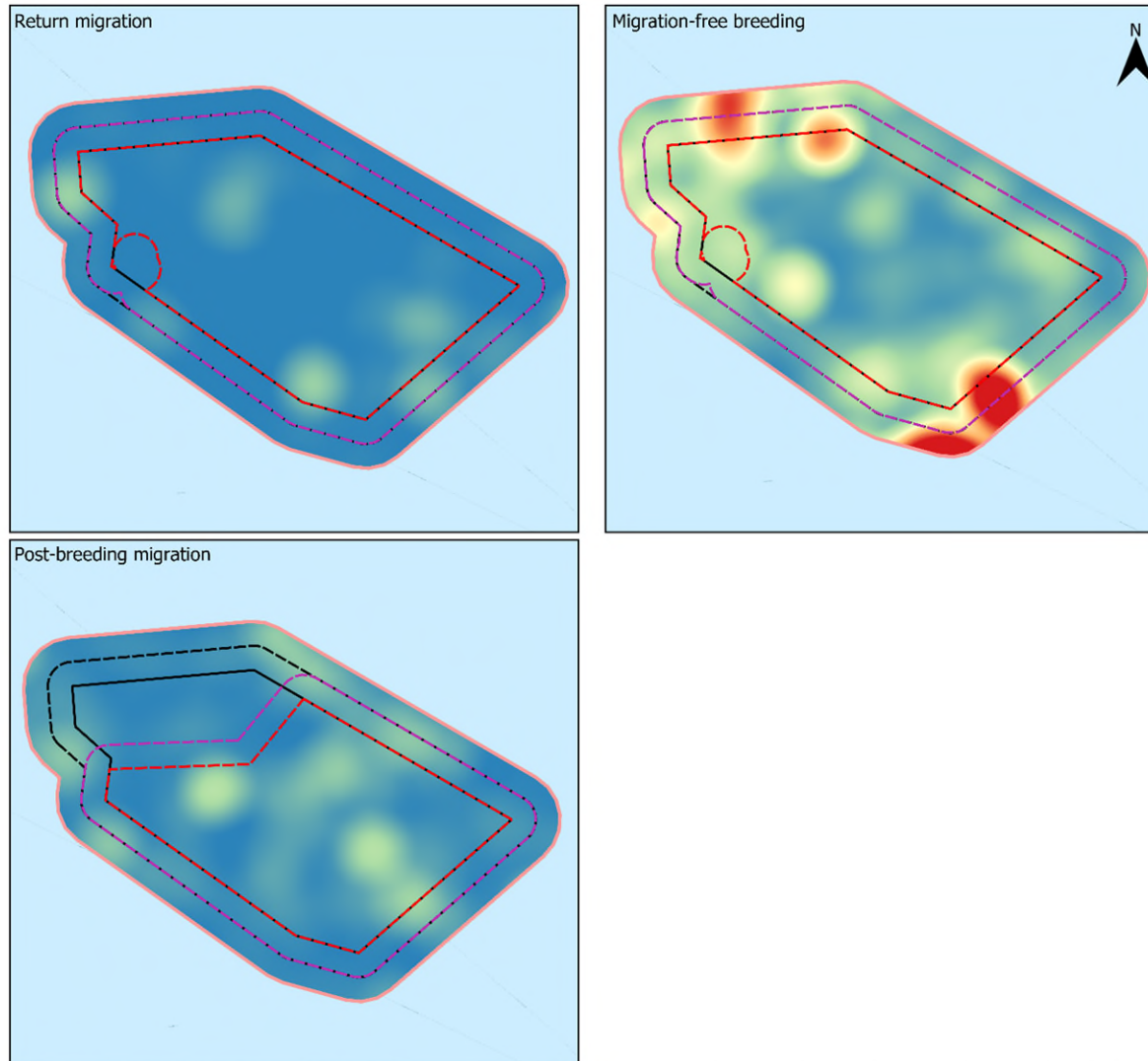


Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 2 plus 2 km buffer

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**Figure 14 Protective provision Scenario 2 unidentified auk species seasonal heatmap plus 2km buffer.**

**Gannet seasonal heatmap for Scenario 3 plus 2km buffer**



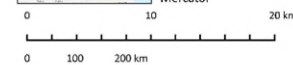
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 3 revised array area
- Scenario 3 plus 2 km buffer
- Gannet relative density
- 87
- 1



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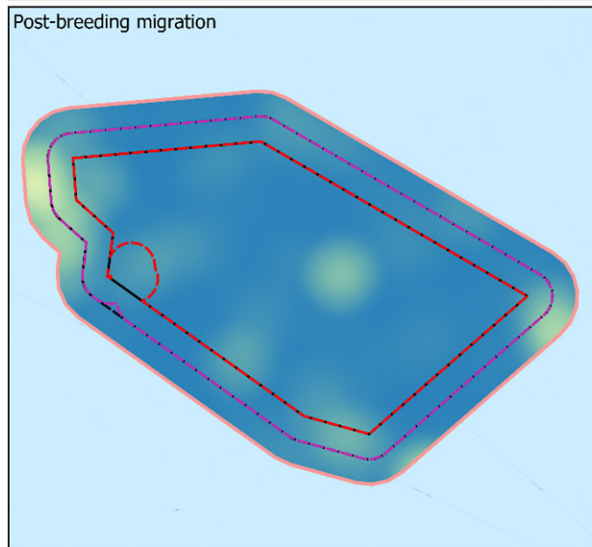
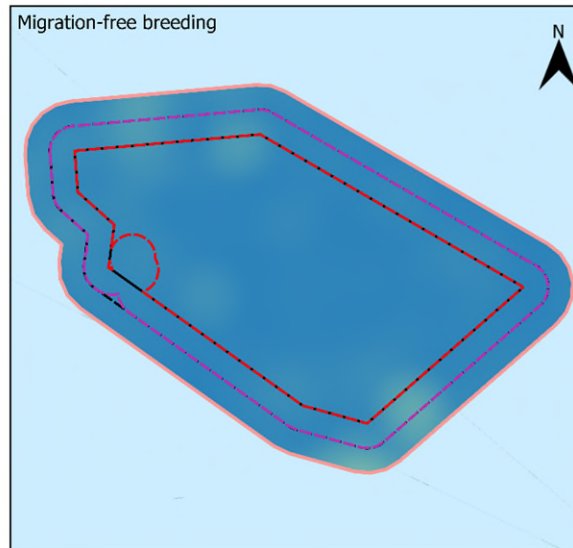
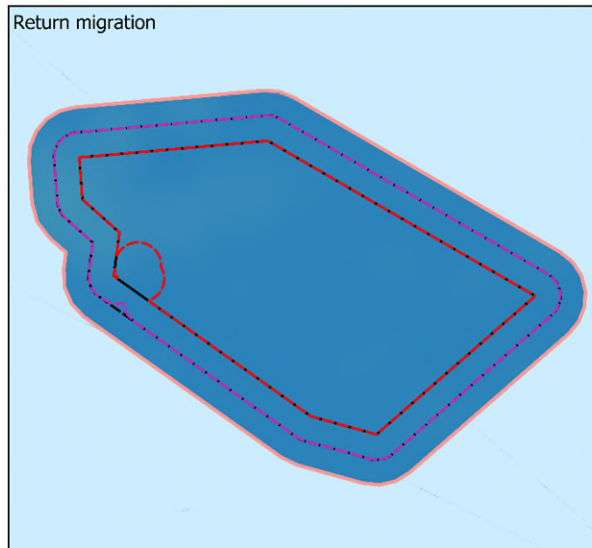


Figure Reference: P11936 gannet relative density heatmap for Scenario 3 plus 2 km buffer © This drawing and its content are the copyright of APEM Ltd. and may not be reproduced or amended except by prior written permission.

**Figure 15 Protective provision Scenario 3 gannet seasonal heatmap plus 2km buffer.**



**Kittiwake seasonal heatmap for Scenario 3 plus 2km buffer**



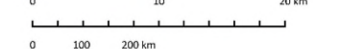
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 3 revised array area
- Scenario 3 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 3 plus 2 km buffer

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**Figure 16 Protective provision Scenario 3 kittiwake seasonal heatmap plus 2km buffer.**

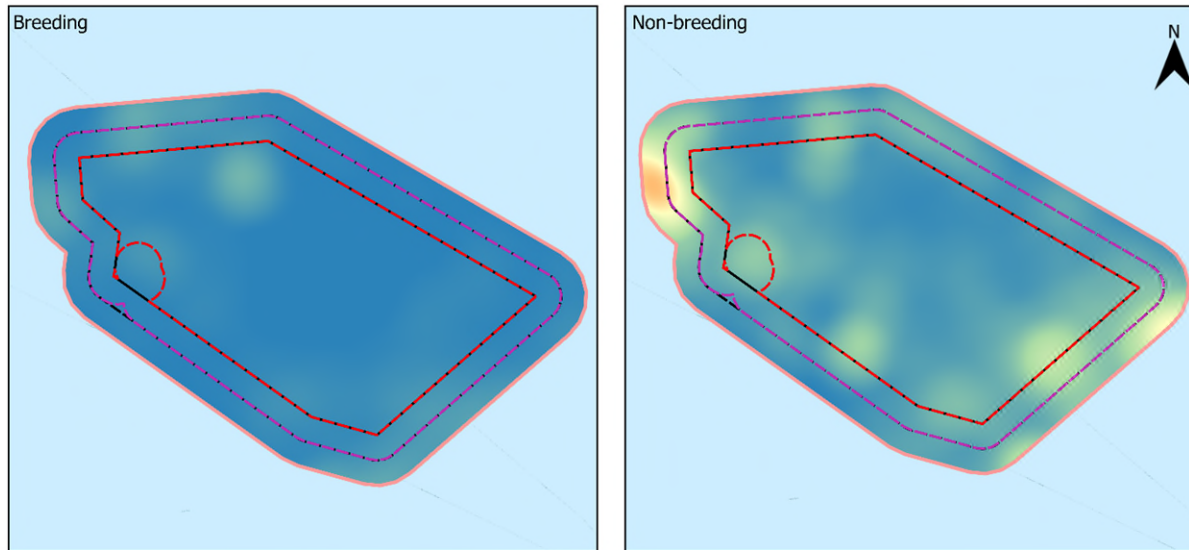
# Hornsea 4



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Guillemot seasonal heatmap for Scenario 3 plus 2km buffer



**Legend**

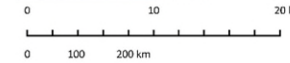
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 3 revised array area
- Scenario 3 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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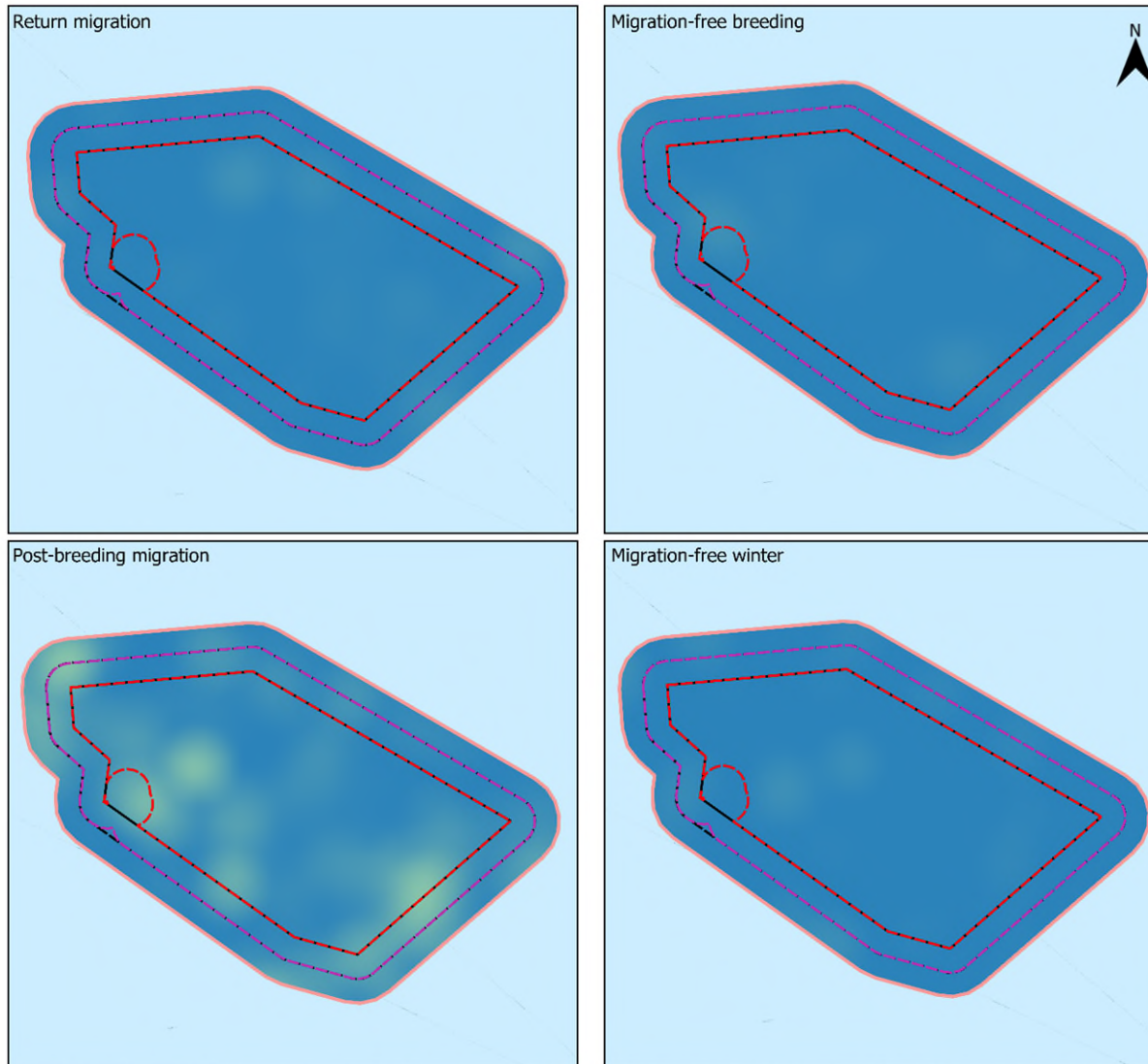


Figure Reference: P11936 guillemot relative density heatmap for Scenario 3 plus 2 km buffer

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**Figure 17 Protective provision Scenario 3 guillemot seasonal heatmap plus 2km buffer.**

**Razorbill seasonal heatmap for Scenario 3 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 3 revised array area
- Scenario 3 plus 2 km buffer
- Razorbill relative density

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Figure Reference: P11936 razorbill relative density heatmap for Scenario 3 plus 2 km buffer

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**Figure 18 Protective provision Scenario 3 razorbill seasonal heatmap plus 2km buffer.**

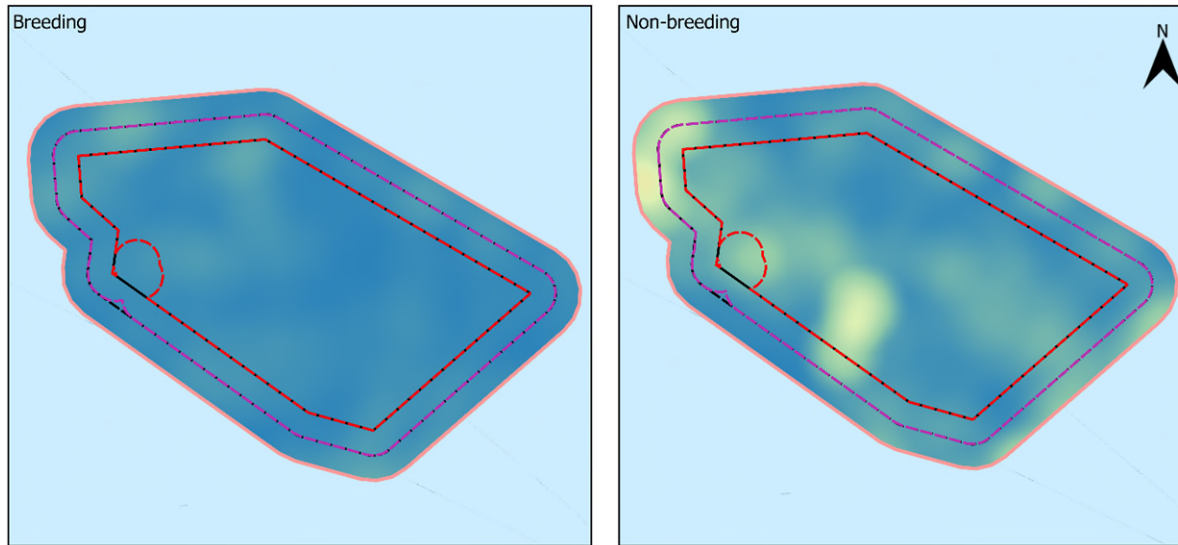
# Hornsea 4



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Guillemot/ razorbill seasonal heatmap for Scenario 3 plus 2km buffer



**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 3 revised array area
  - Scenario 3 plus 2 km buffer
  - Guillemot/ razorbill relative density
- 164  
1



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0 10 20 km

0 100 200 km

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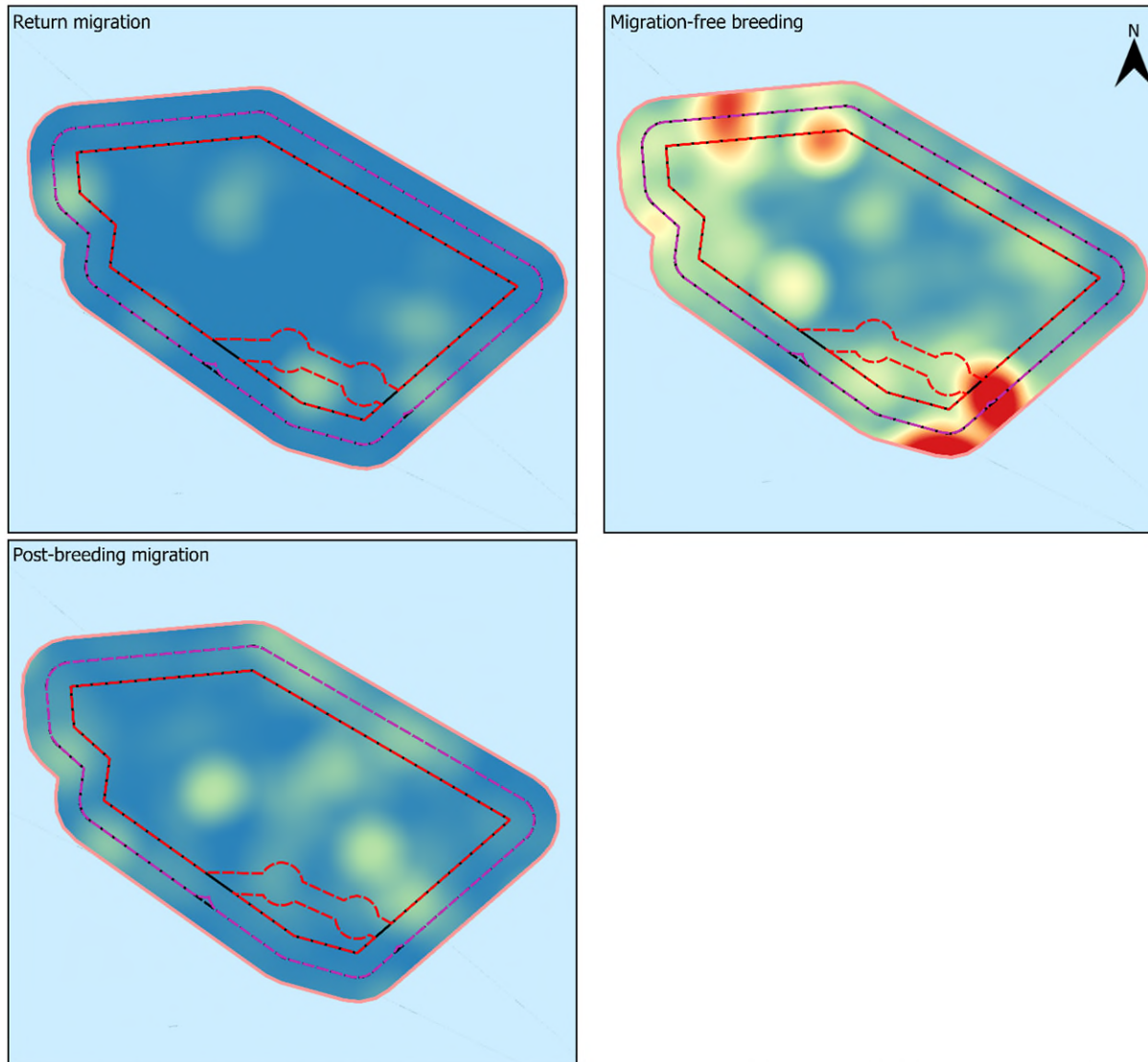
Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 3 plus 2 km buffer

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**Figure 19 Protective provision Scenario 3 unidentified auk species seasonal heatmap plus 2km buffer.**

# Hornsea 4

Gannet seasonal heatmap for Scenario 4 plus 2km buffer



Legend

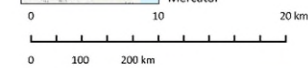
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 4 revised array area
- Scenario 4 plus 2 km buffer
- Gannet relative density
- 87
- 1



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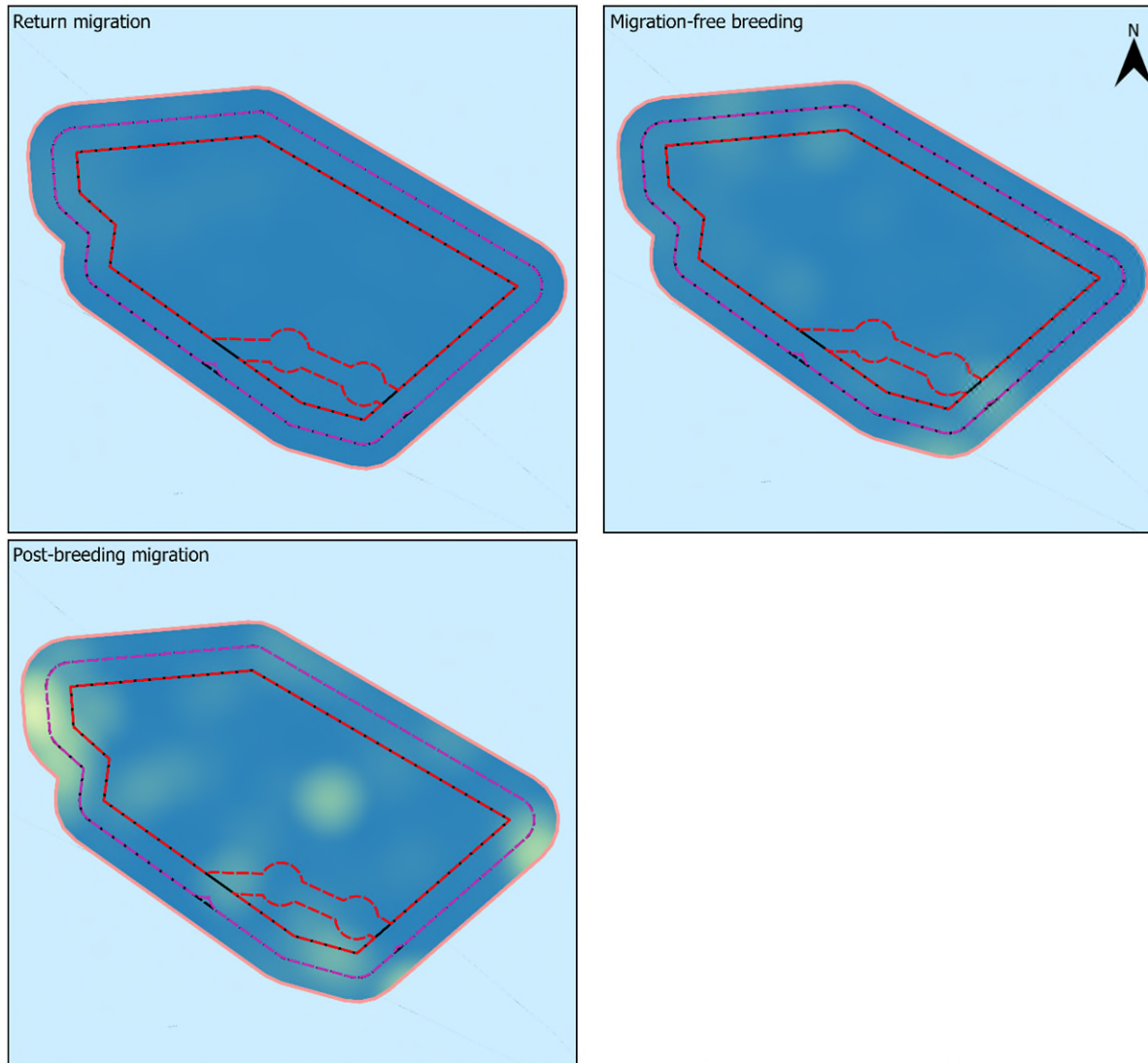


Figure Reference: P11936 gannet relative density heatmap for Scenario 4 plus 2 km buffer

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Figure 20 Protective provision Scenario 4 gannet seasonal heatmap plus 2km buffer.

**Kittiwake seasonal heatmap for Scenario 4 plus 2km buffer**

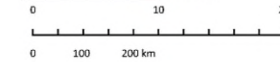


**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 4 revised array area
- Scenario 4 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3

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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 4 plus 2 km buffer

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**Figure 21 Protective provision Scenario 4 kittiwake seasonal heatmap plus 2km buffer.**

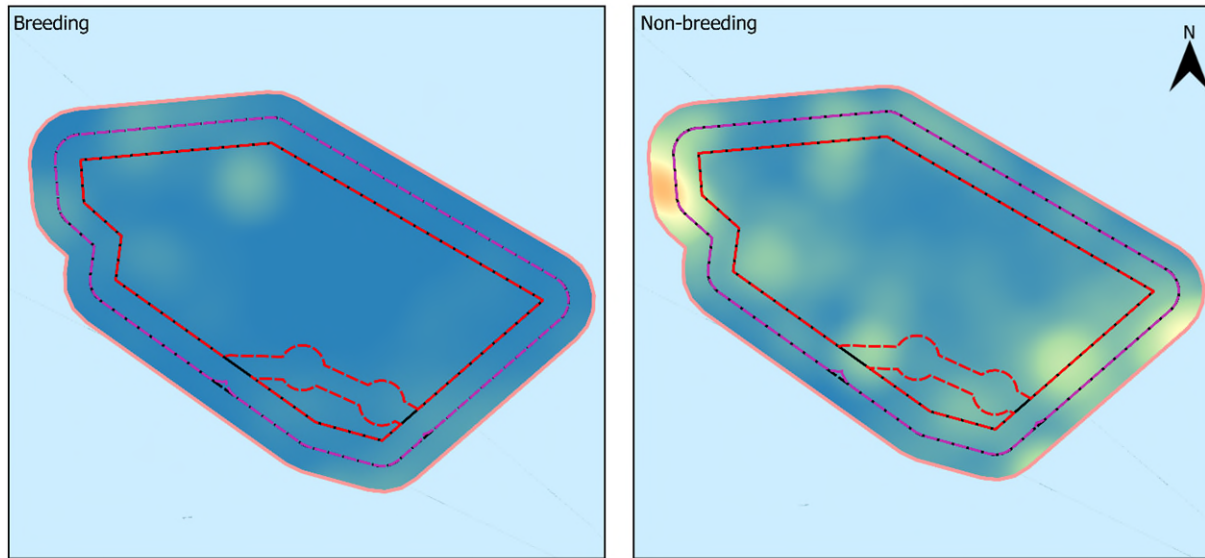
# Hornsea 4



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Hornsea Four RFI#5 P11936

Guillemot seasonal heatmap for Scenario 4 plus 2km buffer



**Legend**

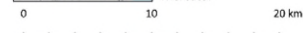
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 4 revised array area
- Scenario 4 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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Figure Reference: P11936 guillemot relative density heatmap for Scenario 4 plus 2 km buffer

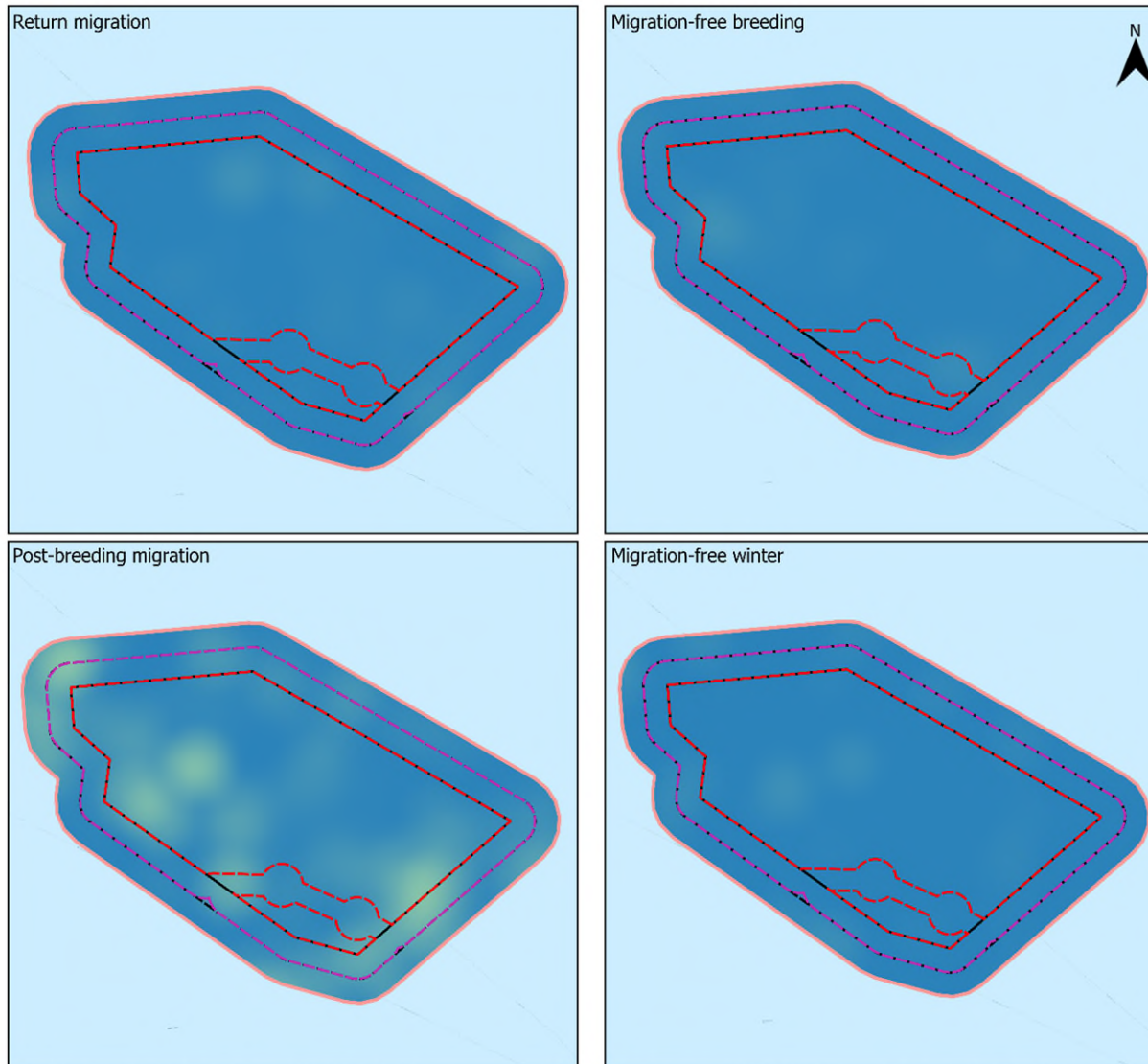
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**Figure 22 Protective provision Scenario 4 guillemot seasonal heatmap plus 2km buffer.**

### Razorbill seasonal heatmap for Scenario 4 plus 2km buffer

#### Legend

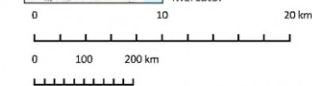
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 4 revised array area
- Scenario 4 plus 2 km buffer
- Razorbill relative density
- 411
- 1



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Figure Reference: P11936 razorbill relative density heatmap for Scenario 4 plus 2 km buffer

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**Figure 23 Protective provision Scenario 4 razorbill seasonal heatmap plus 2km buffer.**



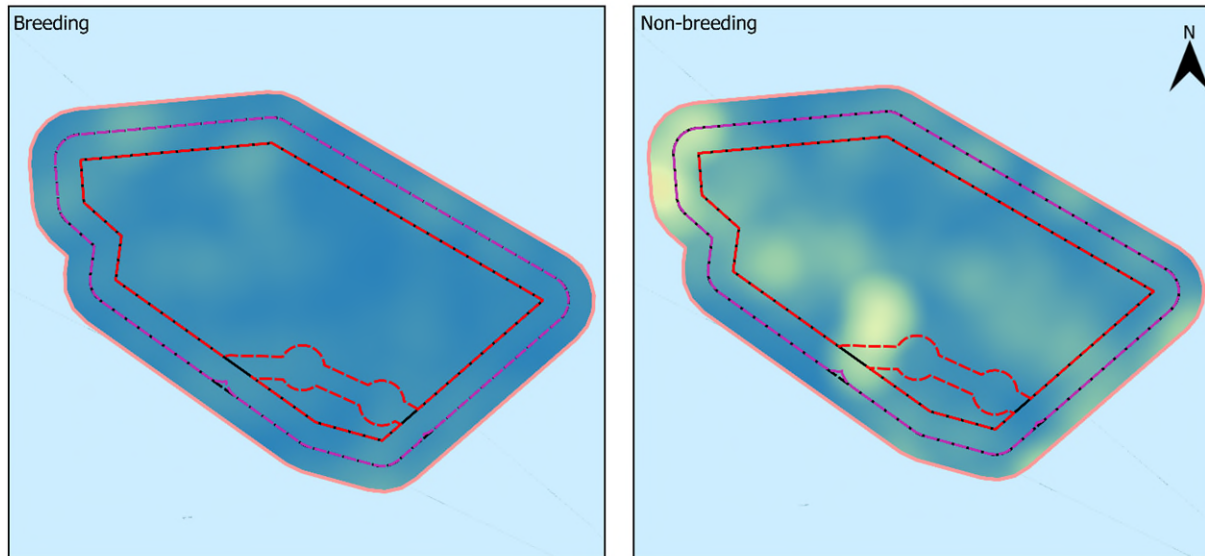
# Hornsea 4



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Hornsea Four RFI#5 P11936

Guillemot/ razorbill seasonal heatmap for Scenario 4 plus 2km buffer



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 4 revised array area
- Scenario 4 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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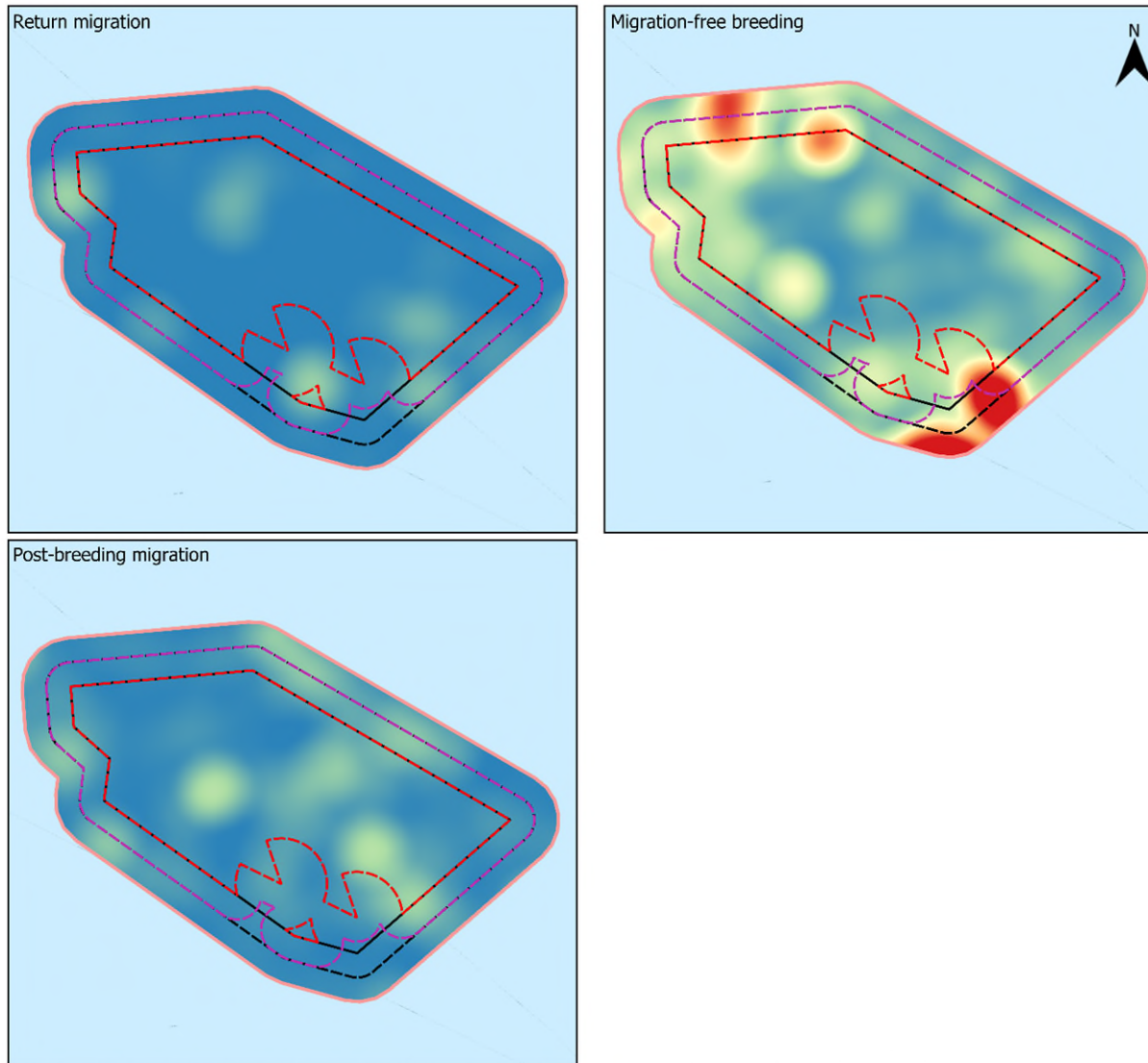


Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 4 plus 2 km buffer

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**Figure 24 Protective provision Scenario 4 unidentified auk species seasonal heatmap plus 2km buffer.**

### Gannet seasonal heatmap for Scenario 5 plus 2km buffer



#### Legend

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 5 revised array area
- Scenario 5 plus 2 km buffer
- Gannet relative density
- 87
- 1



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0 100 200 km

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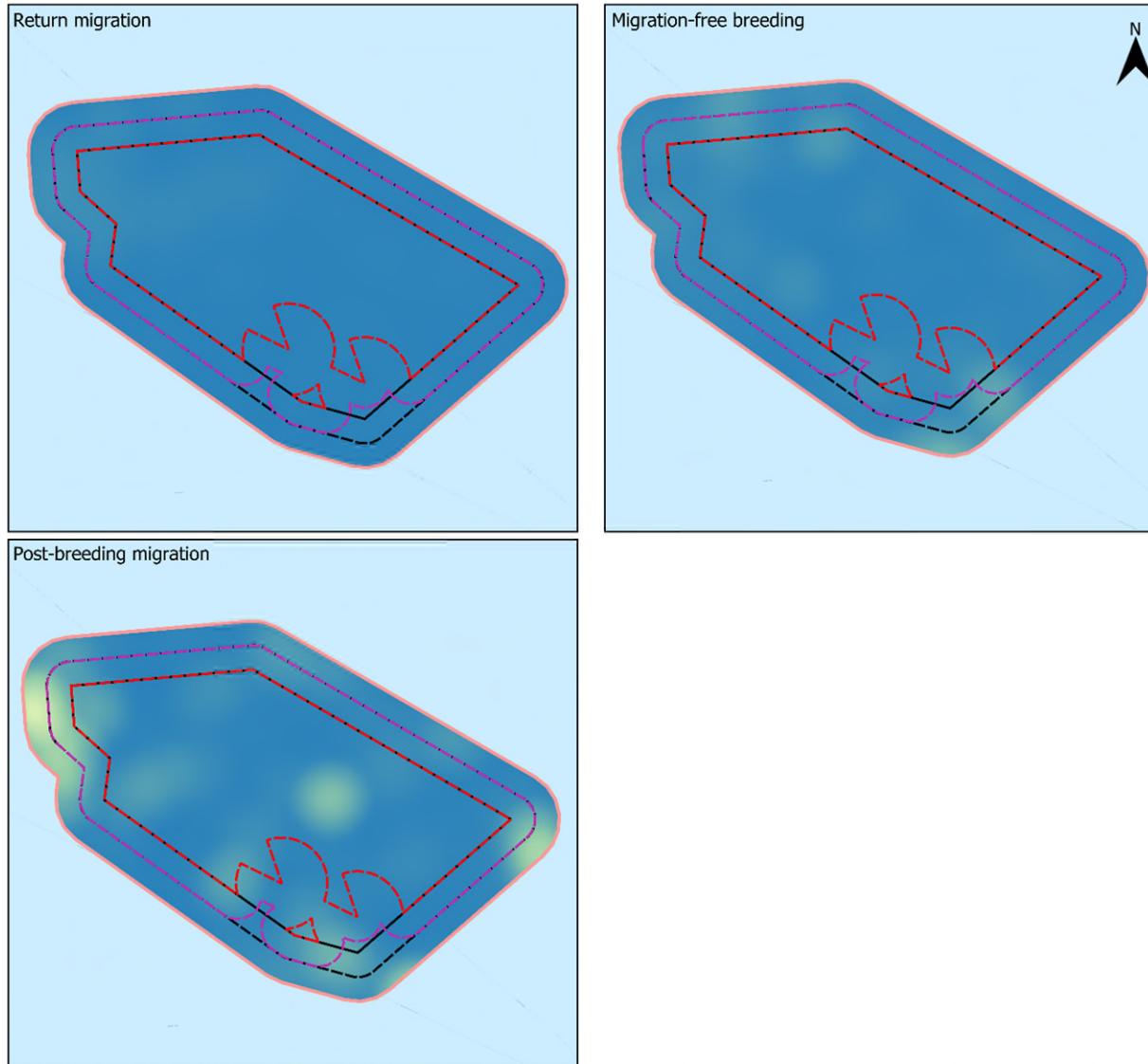


Figure Reference: P11936 gannet relative density heatmap for Scenario 5 plus 2 km buffer

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**Figure 25 Protective provision Scenario 5 gannet seasonal heatmap plus 2km buffer.**

**Kittiwake seasonal heatmap for Scenario 5 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 5 revised array area
- Scenario 5 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3

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0 10 20 km

0 100 200 km

Scale: 1:435000 @ A4 Date: 24/04/2023 AW Drawn by: MB Checked by: MB Approved by: MB

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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 5 plus 2 km buffer © This drawing and its content are the copyright of APEM Ltd. and may not be reproduced or amended except by prior written permission.

**Figure 26 Protective provision Scenario 5 kittiwake seasonal heatmap plus 2km buffer.**

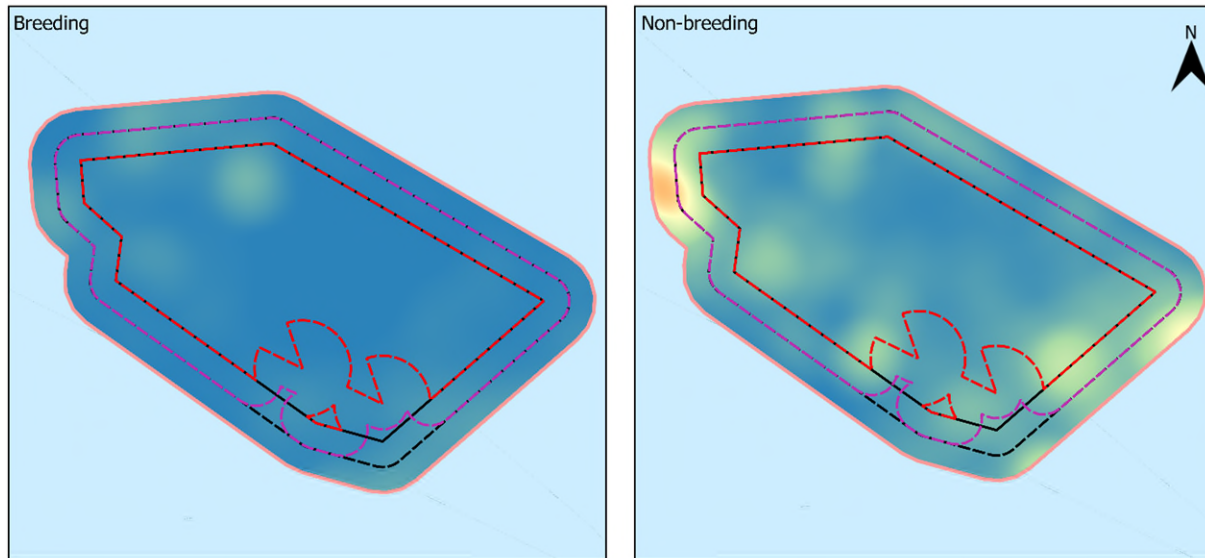
# Hornsea 4



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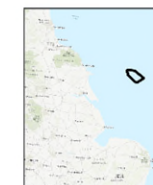
Hornsea Four RFI#5 P11936

Guillemot seasonal heatmap for Scenario 5 plus 2km buffer



**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 5 revised array area
  - Scenario 5 plus 2 km buffer
- Guillemot relative density
- 
- 2,057  
53



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0 10 20 km

0 100 200 km

Scale: 1:435000 @ A4 Date: 24/04/2023 Drawn by: AW Checked by: MB Approved by: MB

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Figure Reference: P11936 guillemot relative density heatmap for Scenario 5 plus 2 km buffer

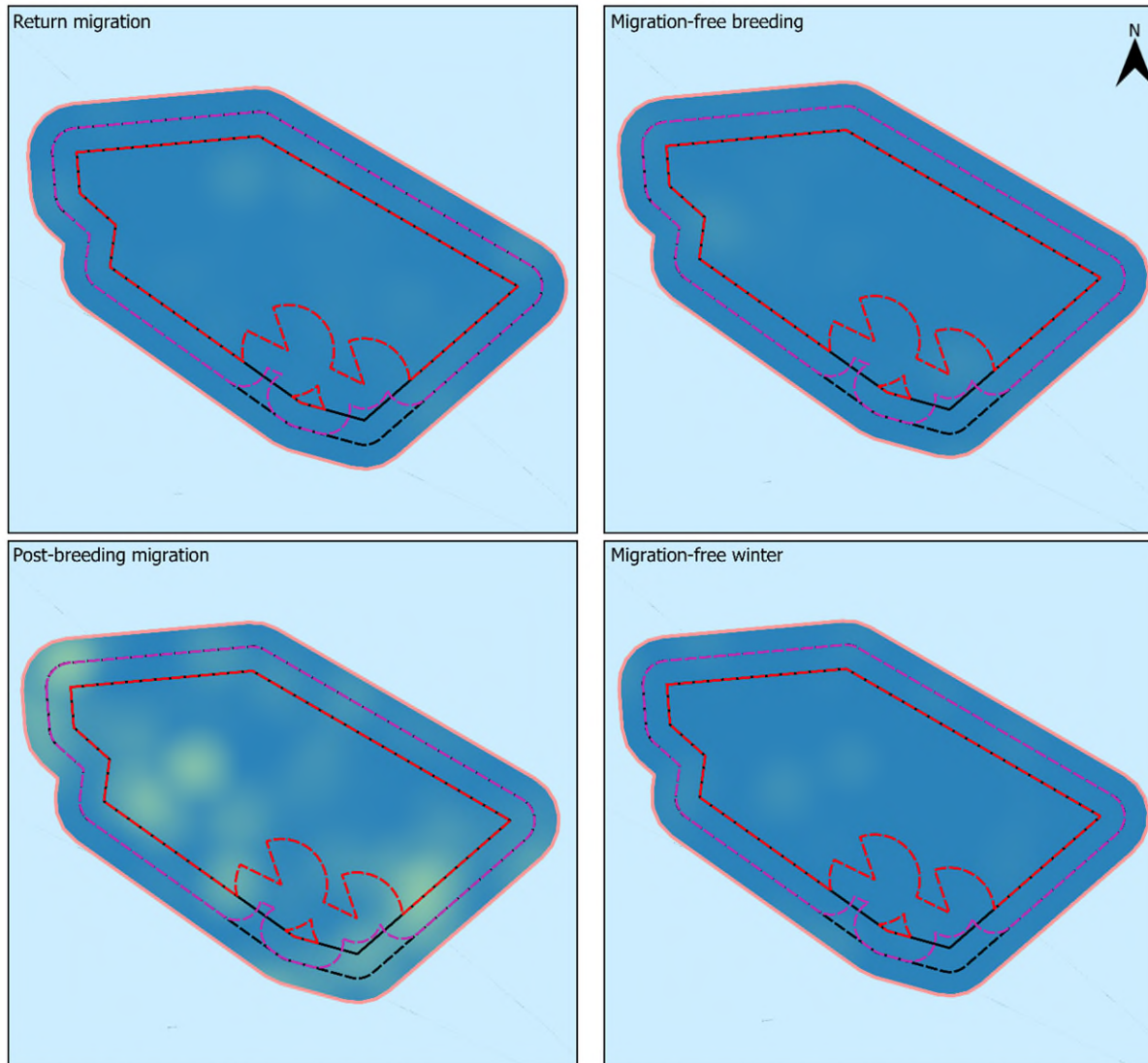
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**Figure 27 Protective provision Scenario 5 guillemot seasonal heatmap plus 2km buffer.**

**Razorbill seasonal heatmap for Scenario 5 plus 2km buffer**

**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 5 revised array area
  - Scenario 5 plus 2 km buffer
  - Razorbill relative density
- 411  
1



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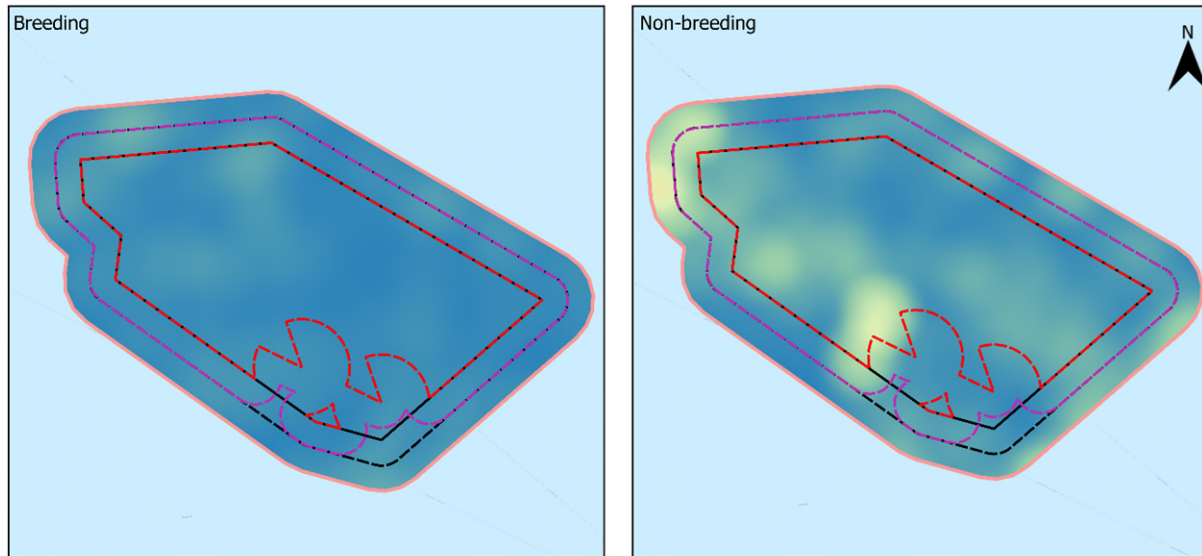
Figure Reference: P11936 razorbill relative density heatmap for Scenario 5 plus 2 km buffer

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**Figure 28 Protective provision Scenario 5 razorbill seasonal heatmap plus 2km buffer.**

# Hornsea 4

**Guillemot/ razorbill seasonal heatmap for Scenario 5 plus 2km buffer**



**Legend**

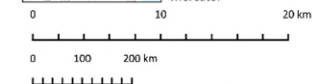
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 5 revised array area
- Scenario 5 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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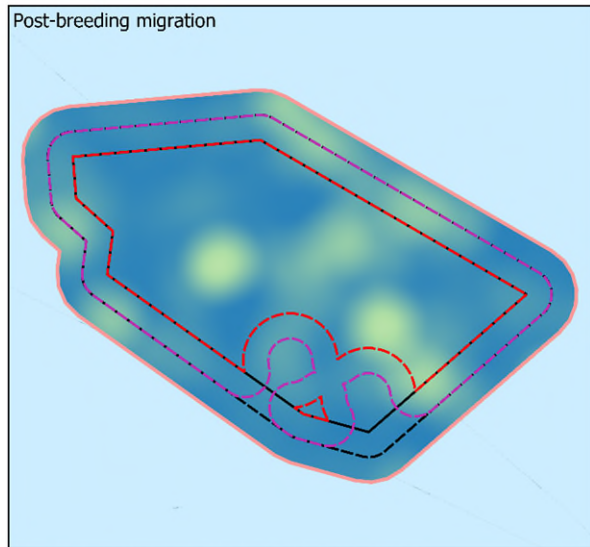
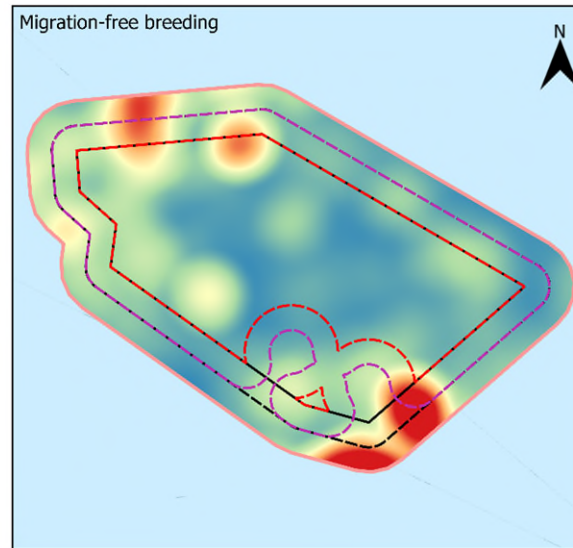
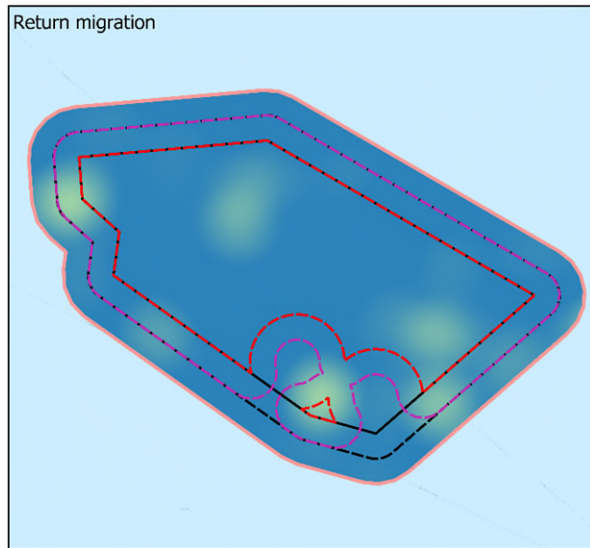


Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 5 plus 2 km buffer

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**Figure 29 Protective provision Scenario 5 unidentified auk species seasonal heatmap plus 2km buffer.**

**Gannet seasonal heatmap for Scenario 6 plus 2km buffer**



**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 6 revised array area
  - Scenario 6 plus 2 km buffer
  - Gannet relative density
- 87  
1



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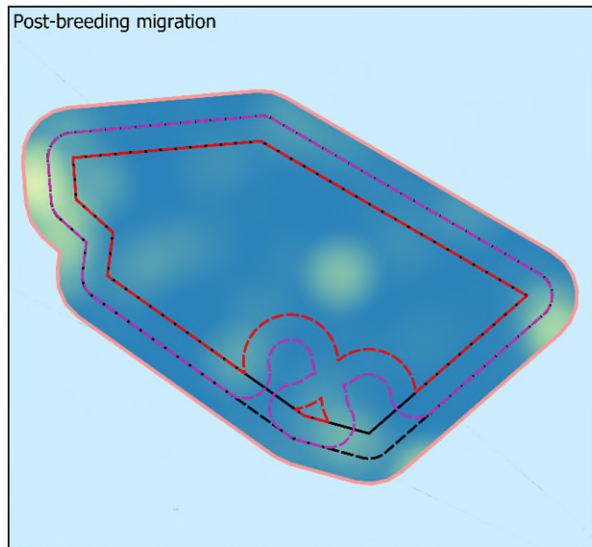
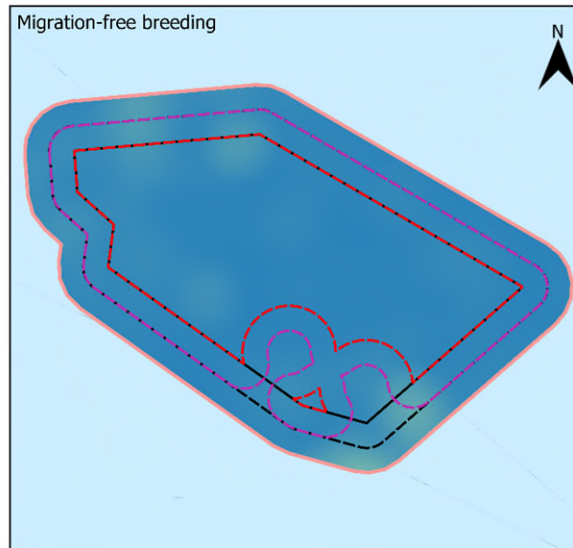
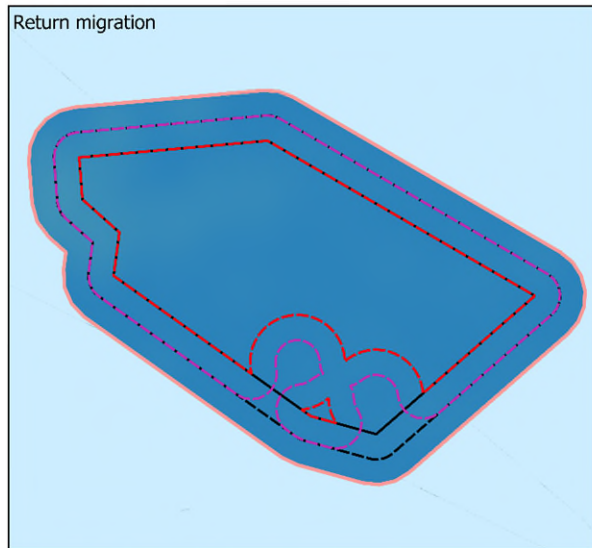


Figure Reference: P11936 gannet relative density heatmap for Scenario 6 plus 2 km buffer

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**Figure 30 Protective provision Scenario 6 gannet seasonal heatmap plus 2km buffer.**

**Kittiwake seasonal heatmap for Scenario 6 plus 2km buffer**



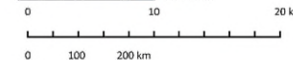
**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 6 revised array area
  - Scenario 6 plus 2 km buffer
  - Kittiwake relative density
- 1,042  
3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 6 plus 2 km buffer

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**Figure 31 Protective provision Scenario 6 kittiwake seasonal heatmap plus 2km buffer.**



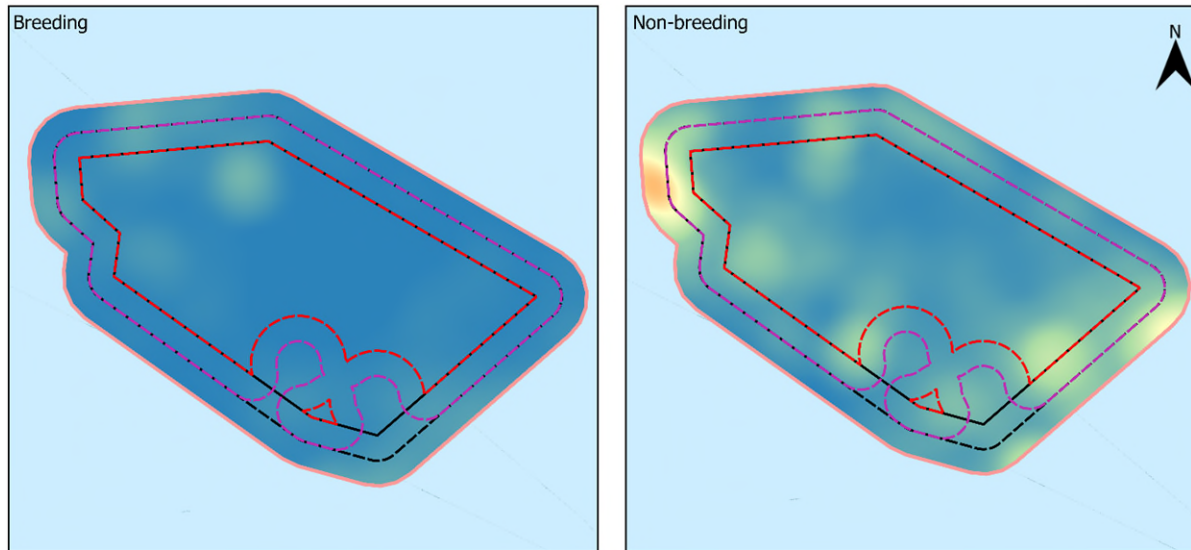
# Hornsea 4



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**Guillemot seasonal heatmap for Scenario 6 plus 2km buffer**



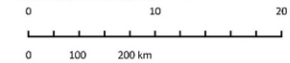
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 6 revised array area
- Scenario 6 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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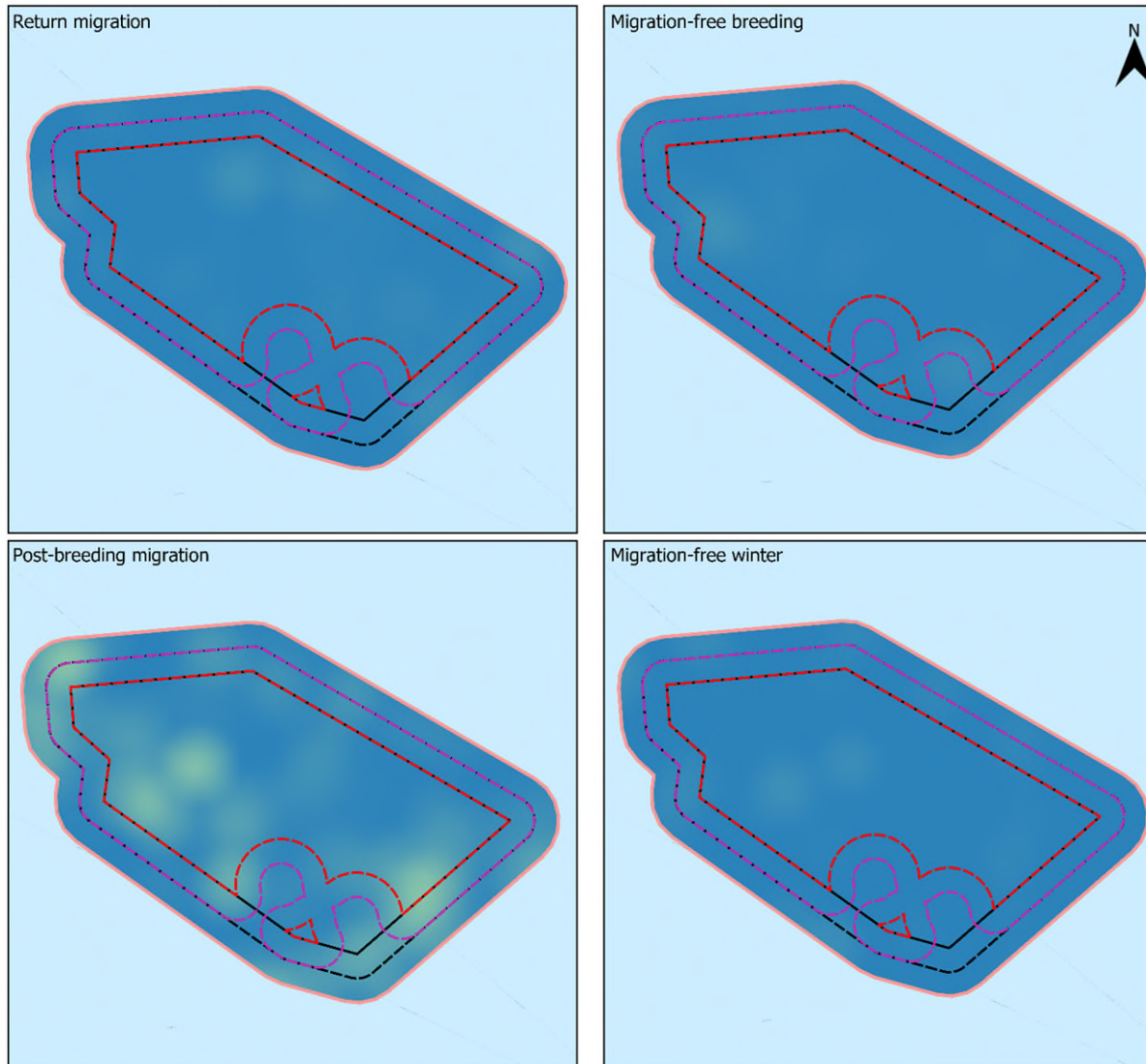


Figure Reference: P11936 guillemot relative density heatmap for Scenario 6 plus 2 km buffer

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**Figure 32 Protective provision Scenario 6 guillemot seasonal heatmap plus 2km buffer.**

**Razorbill seasonal heatmap for Scenario 6 plus 2km buffer**



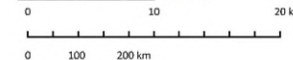
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 6 revised array area
- Scenario 6 plus 2 km buffer
- Razorbill relative density
- 411
- 1



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Figure Reference: P11936 razorbill relative density heatmap for Scenario 6 plus 2 km buffer

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**Figure 33 Protective provision Scenario 6 razorbill seasonal heatmap plus 2km buffer.**

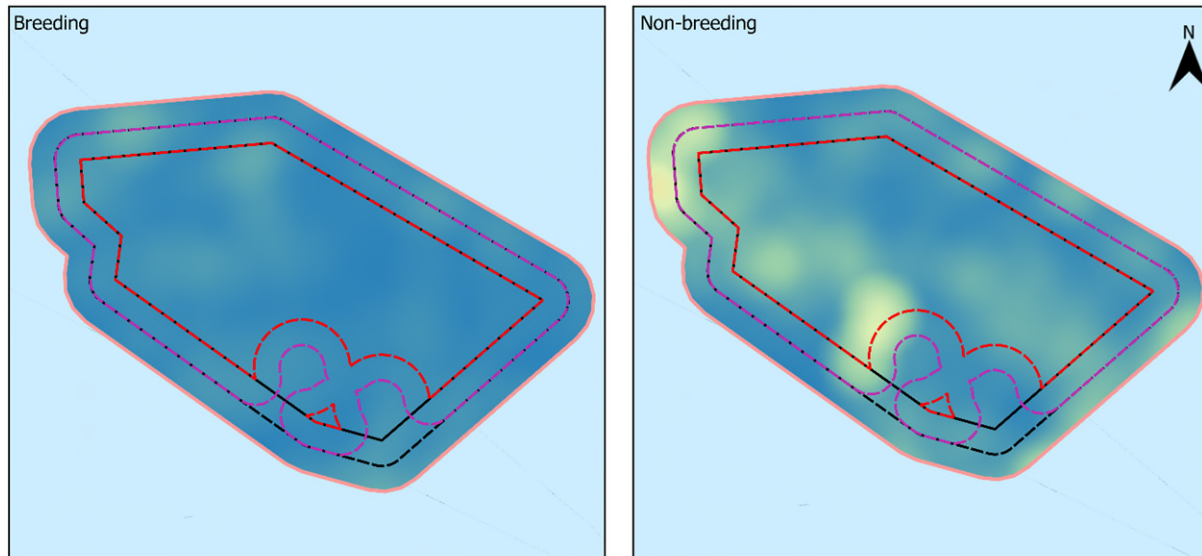
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Guillemot/ razorbill seasonal heatmap for Scenario 6 plus 2km buffer



**Legend**

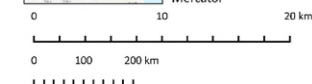
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 6 revised array area
- Scenario 6 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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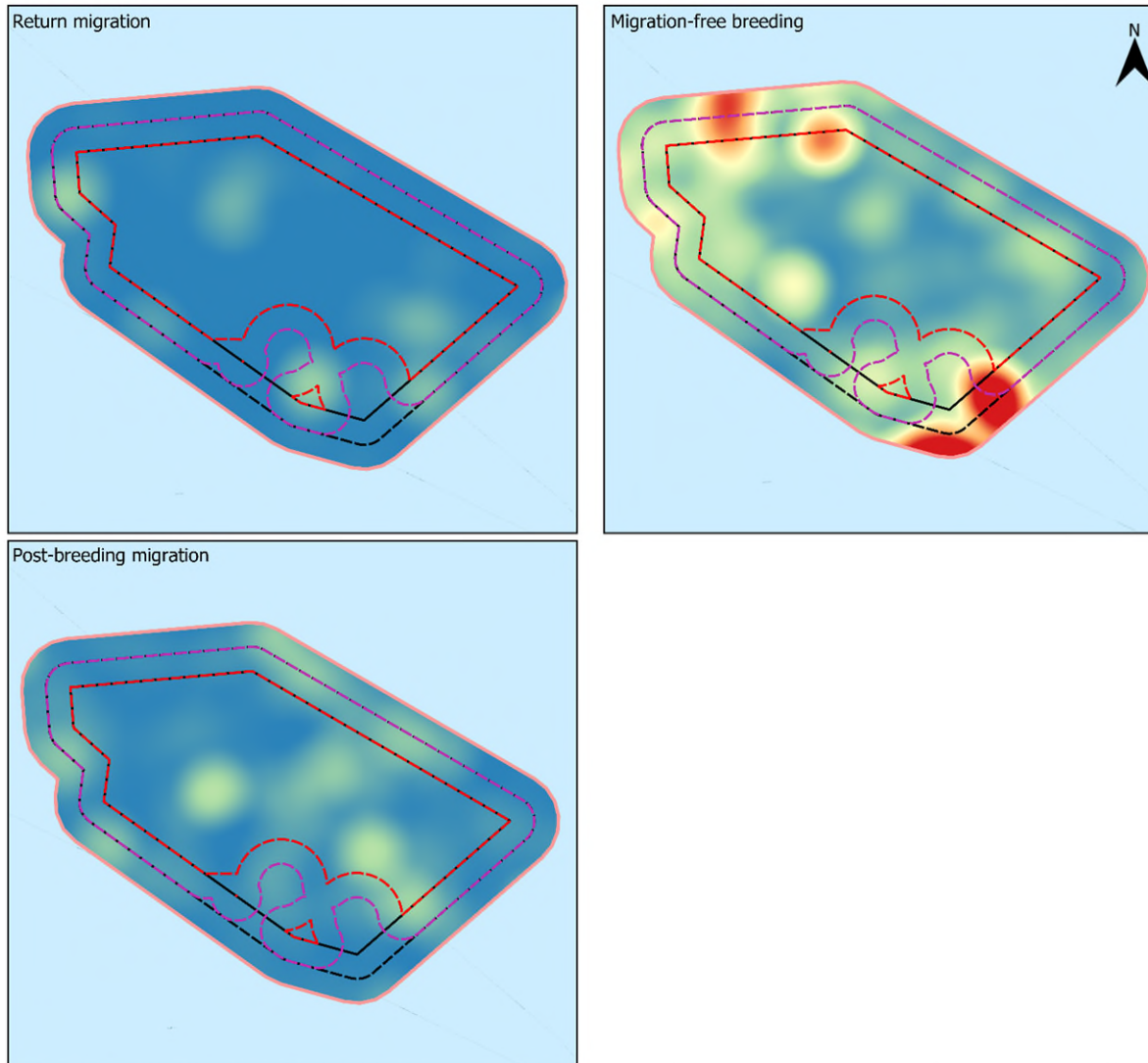


Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 6 plus 2 km buffer

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**Figure 34 Protective provision Scenario 6 unidentified auk species seasonal heatmap plus 2km buffer.**

**Gannet seasonal heatmap for Scenario 7 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 7 revised array area
- Scenario 7 plus 2 km buffer
- Gannet relative density
- 87
- 1



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0 100 200 km

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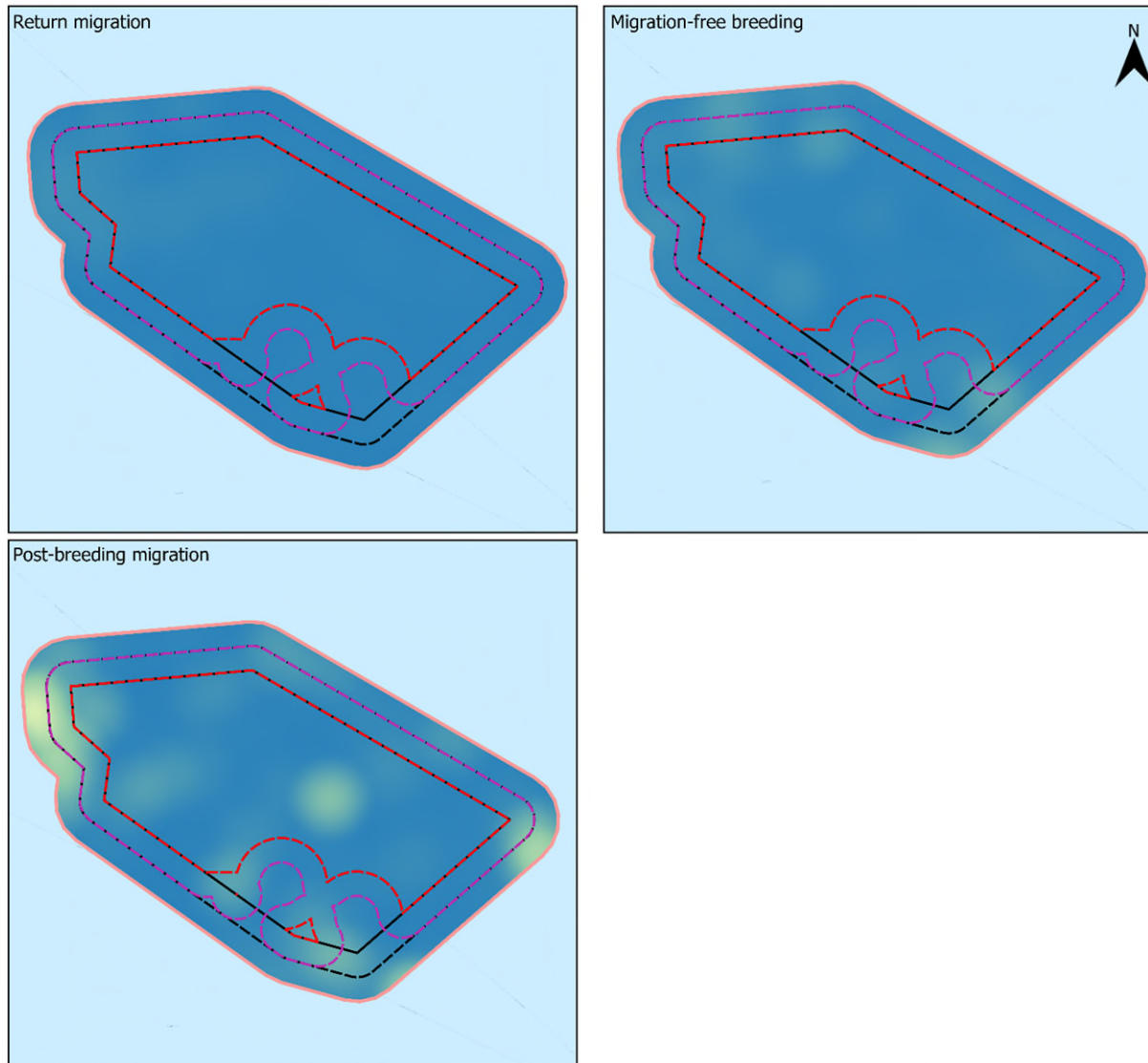


Figure Reference: P11936 gannet relative density heatmap for Scenario 7 plus 2 km buffer

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**Figure 35 Protective provision Scenario 7 gannet seasonal heatmap plus 2km buffer.**

### Kittiwake seasonal heatmap for Scenario 7 plus 2km buffer



#### Legend

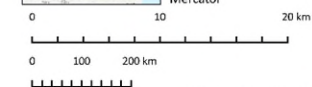
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 7 revised array area
- Scenario 7 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 7 plus 2 km buffer

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**Figure 36 Protective provision Scenario 7 kittiwake seasonal heatmap plus 2km buffer.**

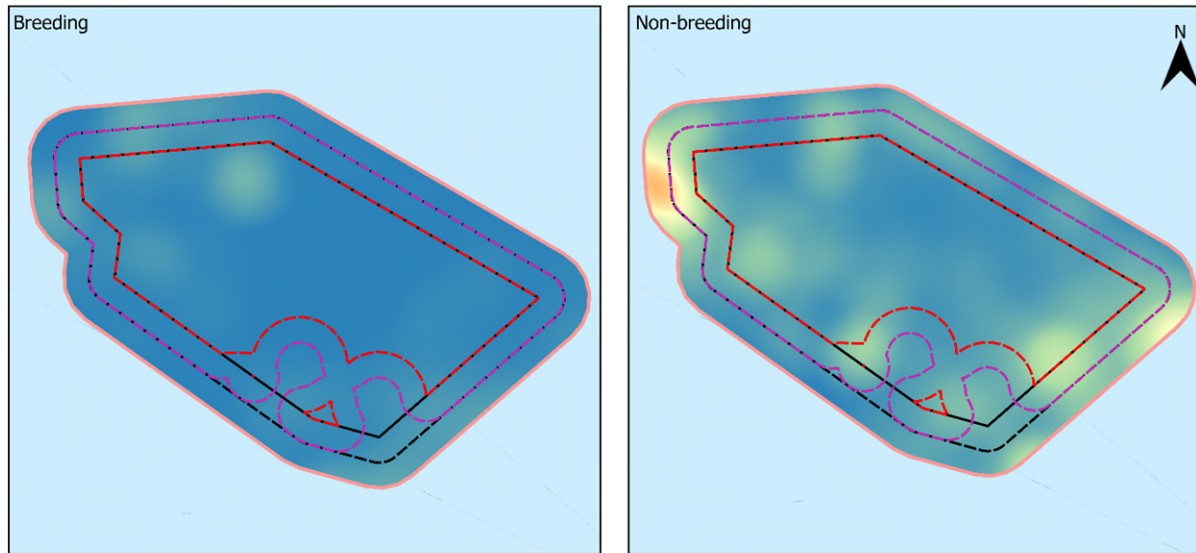
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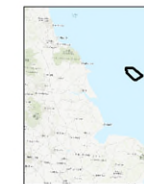
Hornsea Four RFI#5 P11936

Guillemot seasonal heatmap for Scenario 7 plus 2km buffer



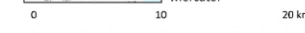
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 7 revised array area
- Scenario 7 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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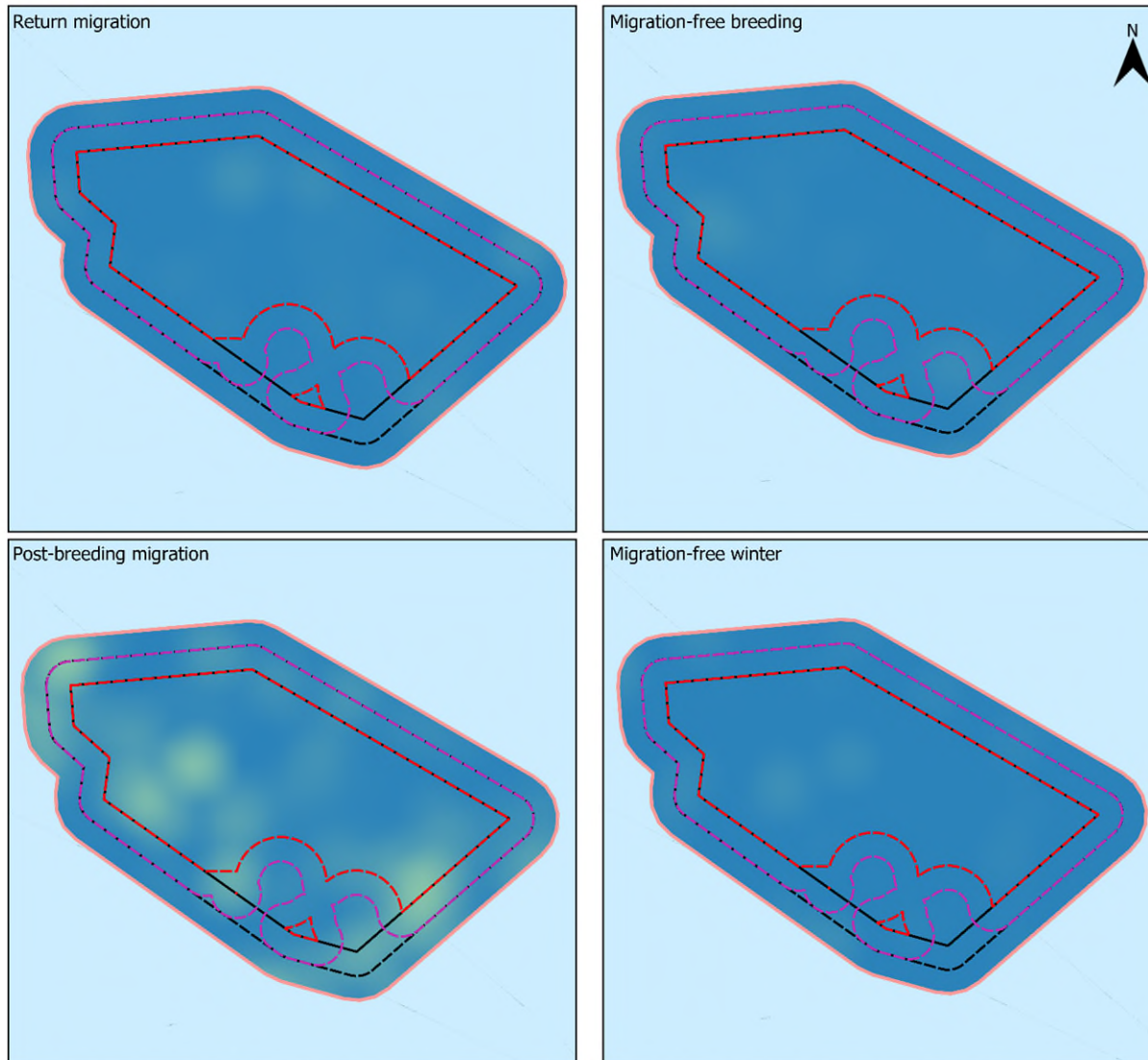


Figure Reference: P11936 guillemot relative density heatmap for Scenario 7 plus 2 km buffer

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**Figure 37 Protective provision Scenario 7 guillemot seasonal heatmap plus 2km buffer.**

**Razorbill seasonal heatmap for Scenario 7 plus 2km buffer**



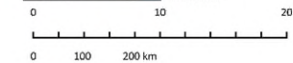
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 7 revised array area
- Scenario 7 plus 2 km buffer
- Razorbill relative density
- 411
- 1



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Figure Reference: P11936 razorbill relative density heatmap for Scenario 7 plus 2 km buffer

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**Figure 38 Protective provision Scenario 7 razorbill seasonal heatmap plus 2km buffer.**

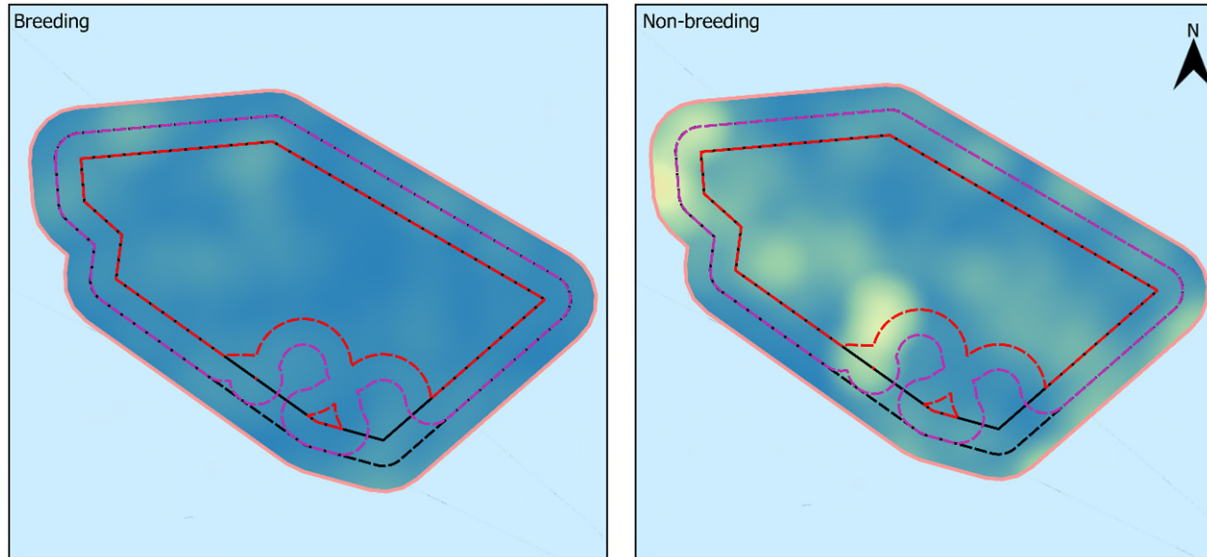
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Guillemot/ razorbill seasonal heatmap for Scenario 7 plus 2km buffer



**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 7 revised array area
  - Scenario 7 plus 2 km buffer
  - Guillemot/ razorbill relative density
- 164  
1



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0 100 200 km

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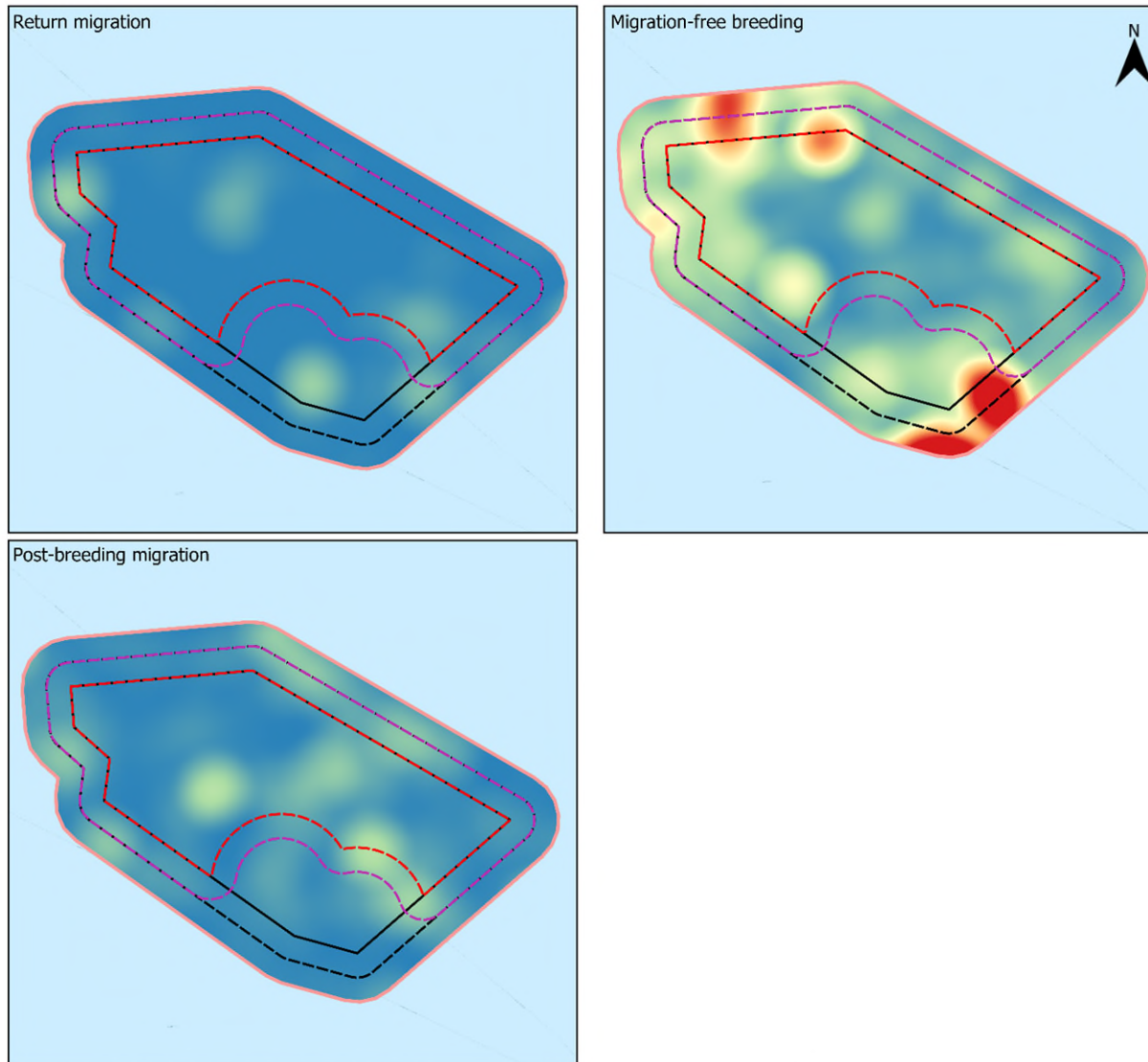
Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 7 plus 2 km buffer

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**Figure 39 Protective provision Scenario 7 unidentified auk species seasonal heatmap plus 2km buffer.**

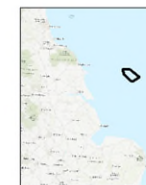


**Gannet seasonal heatmap for Scenario 8 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 8 revised array area
- Scenario 8 plus 2 km buffer
- Gannet relative density
- 87
- 1



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Figure Reference: P11936 gannet relative density heatmap for Scenario 8 plus 2 km buffer

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**Figure 40 Protective provision Scenario 8 gannet seasonal heatmap plus 2km buffer.**

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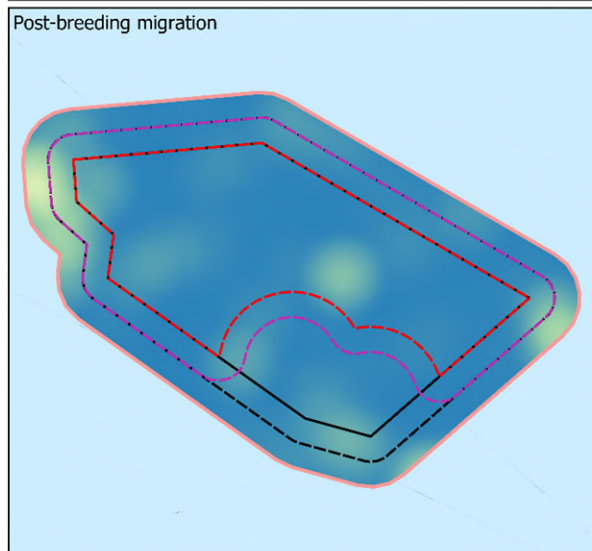
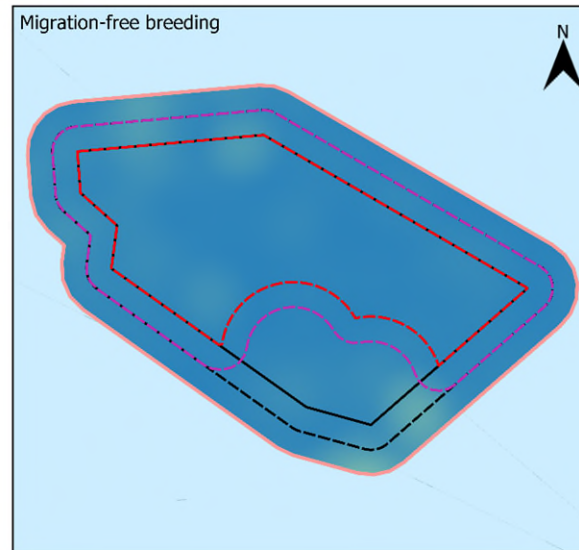
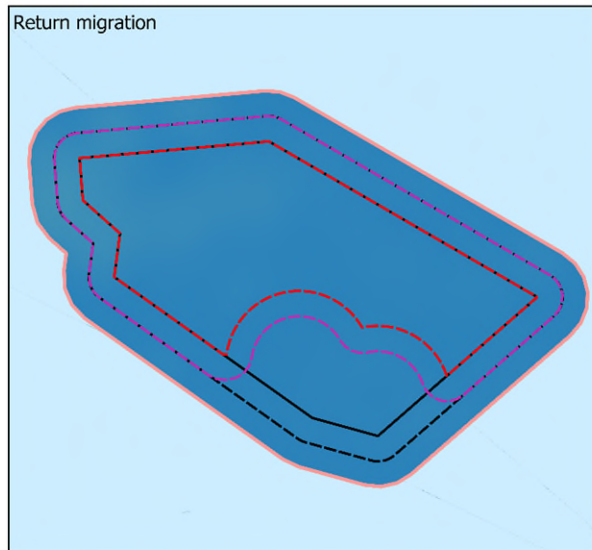
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Hornsea Four RFI#5 P11936

Kittiwake seasonal heatmap for Scenario 8 plus 2km buffer

**Legend**

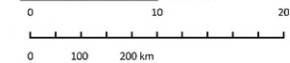
- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 8 revised array area
  - Scenario 8 plus 2 km buffer
- Kittiwake relative density
- 1,042
  - 3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 8 plus 2 km buffer

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**Figure 41 Protective provision Scenario 8 kittiwake seasonal heatmap plus 2km buffer.**

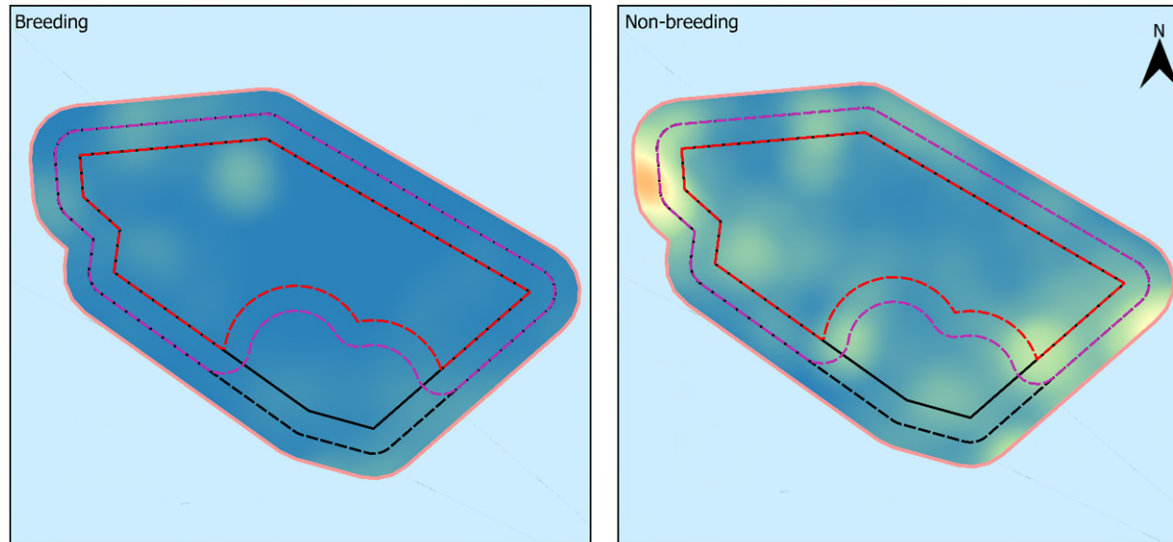
# Hornsea 4



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**Guillemot seasonal heatmap for Scenario 8 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 8 revised array area
- Scenario 8 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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0 100 200 km

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Figure Reference: P11936 guillemot relative density heatmap for Scenario 8 plus 2 km buffer

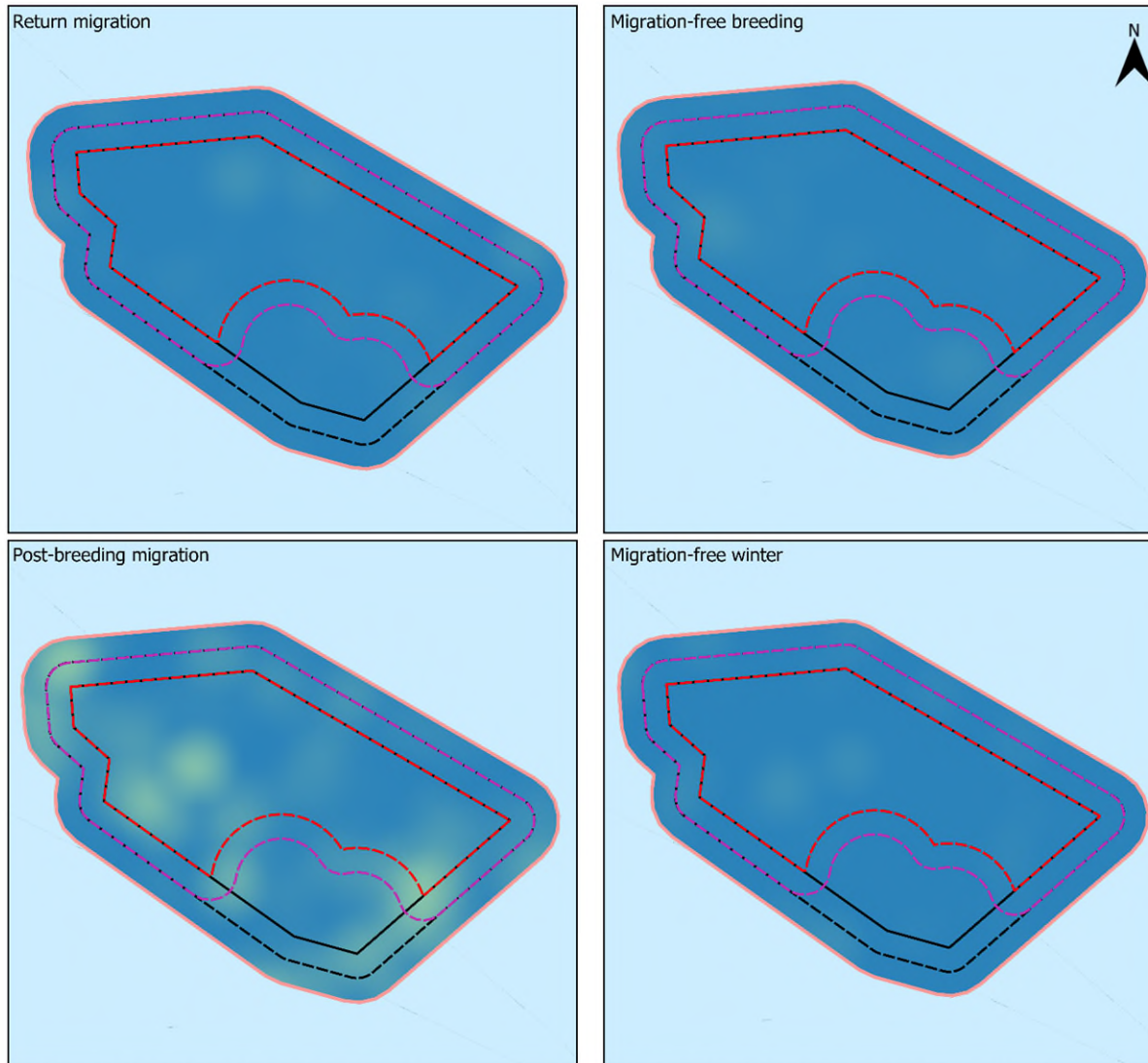
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**Figure 42 Protective provision Scenario 8 guillemot seasonal heatmap plus 2km buffer.**

### Razorbill seasonal heatmap for Scenario 8 plus 2km buffer

#### Legend

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 8 revised array area
- Scenario 8 plus 2 km buffer
- Razorbill relative density
- 411
- 1



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0 10 20 km

0 100 200 km

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Figure Reference: P11936 razorbill relative density heatmap for Scenario 8 plus 2 km buffer

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**Figure 43 Protective provision Scenario 8 razorbill seasonal heatmap plus 2km buffer.**

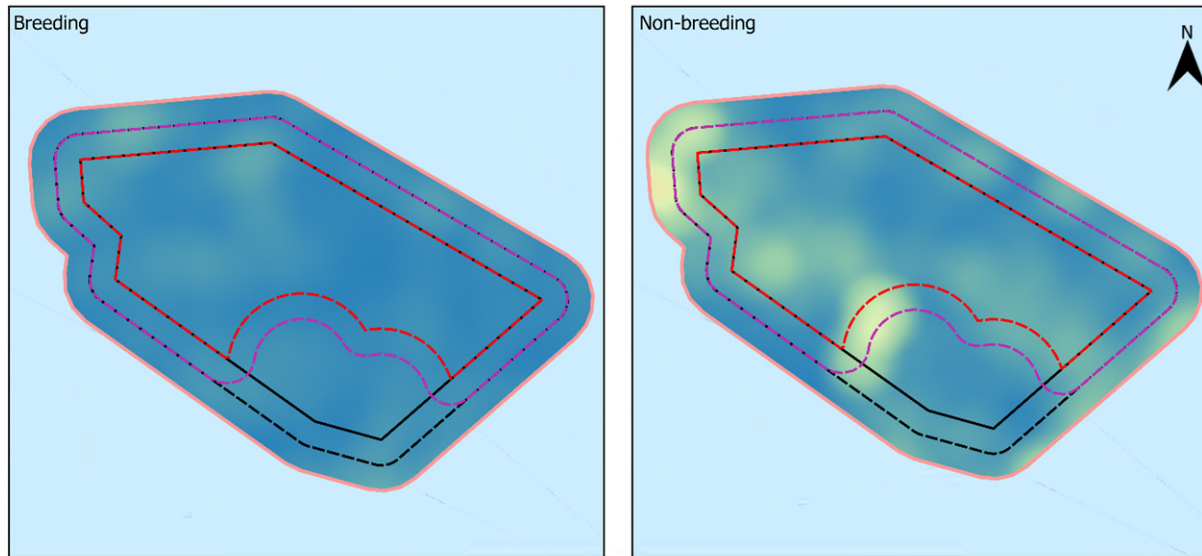
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**Guillemot/ razorbill seasonal heatmap for Scenario 8 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 8 revised array area
- Scenario 8 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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0 10 20 km

0 100 200 km

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Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 8 plus 2 km buffer

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**Figure 44 Protective provision Scenario 8 unidentified auk species seasonal heatmap plus 2km buffer.**

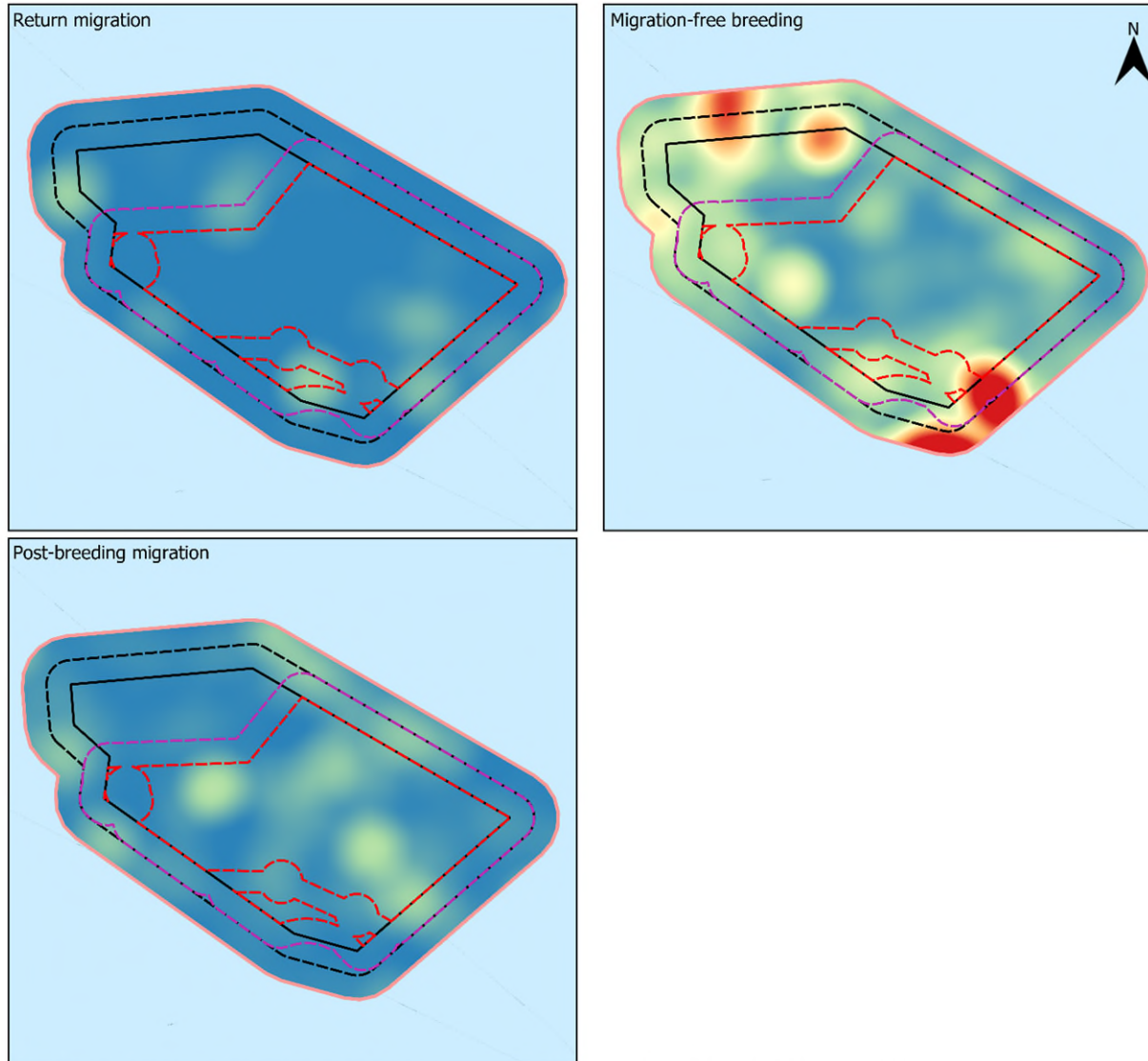
# Hornsea 4



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Gannet seasonal heatmap for Scenario 9 plus 2km buffer



**Legend**

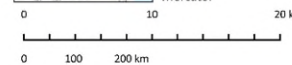
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 9 revised array area
- Scenario 9 plus 2 km buffer
- Gannet relative density
- 87
- 1



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Figure Reference: P11936 gannet relative density heatmap for Scenario 9 plus 2 km buffer

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**Figure 45 Protective provision Scenario 9 gannet seasonal heatmap plus 2km buffer.**

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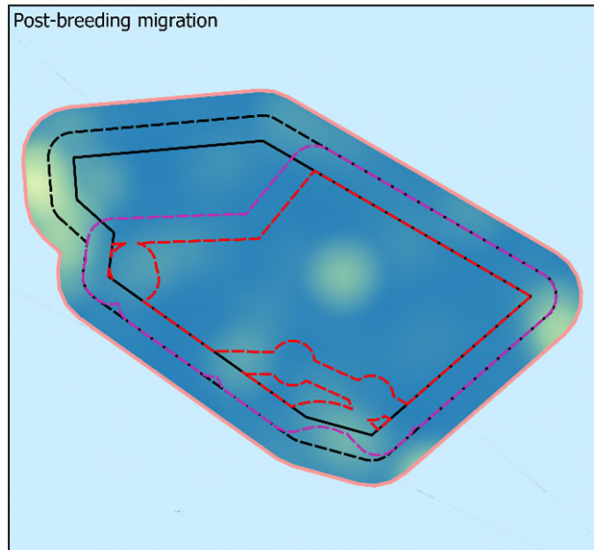
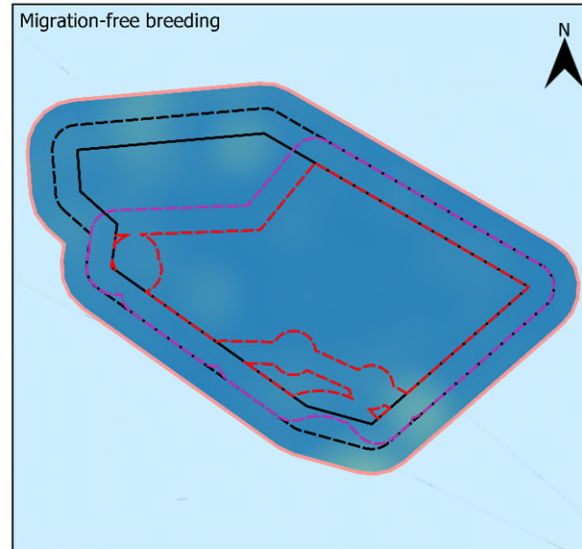
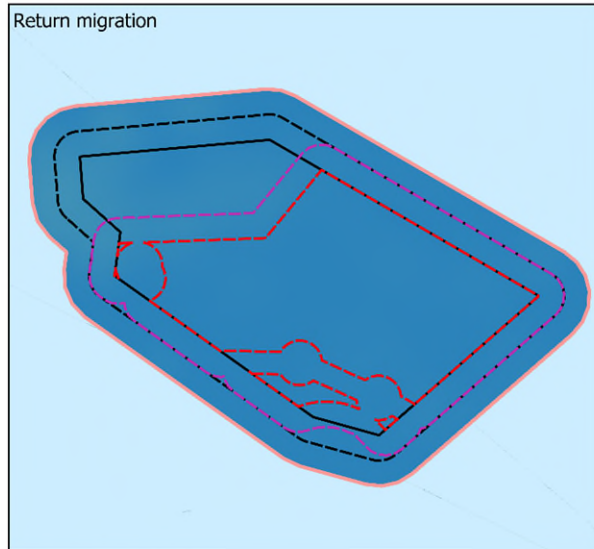
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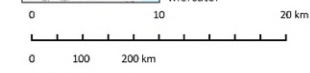
**Kittiwake seasonal heatmap for Scenario 9 plus 2km buffer**

**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 9 revised array area
- Scenario 9 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 9 plus 2 km buffer

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**Figure 46 Protective provision Scenario 9 kittiwake seasonal heatmap plus 2km buffer.**

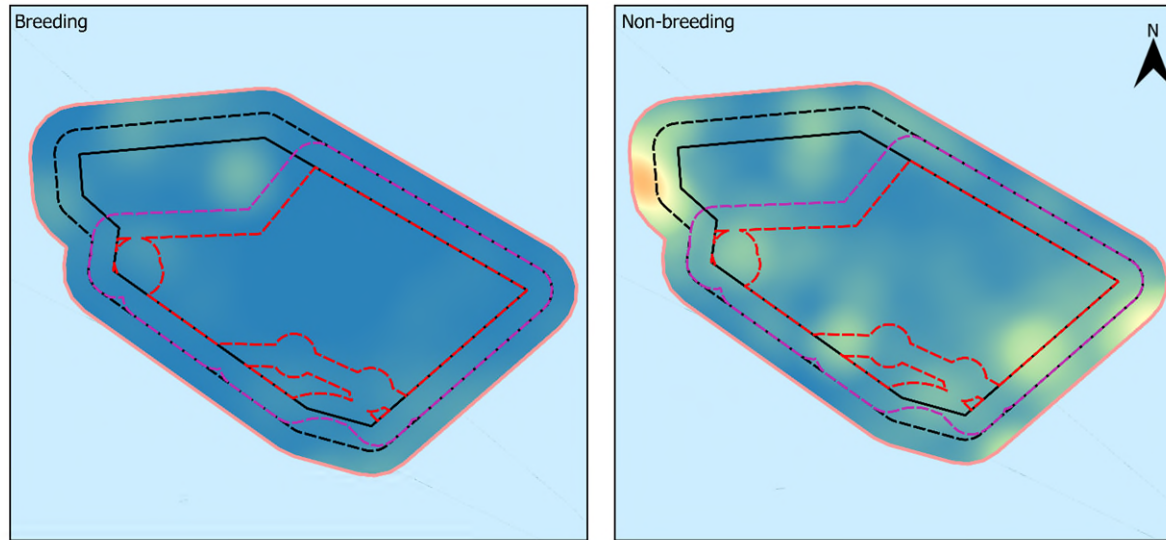
# Hornsea 4



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Hornsea Four RFI#5 P11936

**Guillemot seasonal heatmap for Scenario 9 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 9 revised array area
- Scenario 9 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



**Notes**

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0 10 20 km

0 100 200 km

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Figure Reference: P11936 guillemot relative density heatmap for Scenario 9 plus 2 km buffer

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**Figure 47 Protective provision Scenario 9 guillemot seasonal heatmap plus 2km buffer.**



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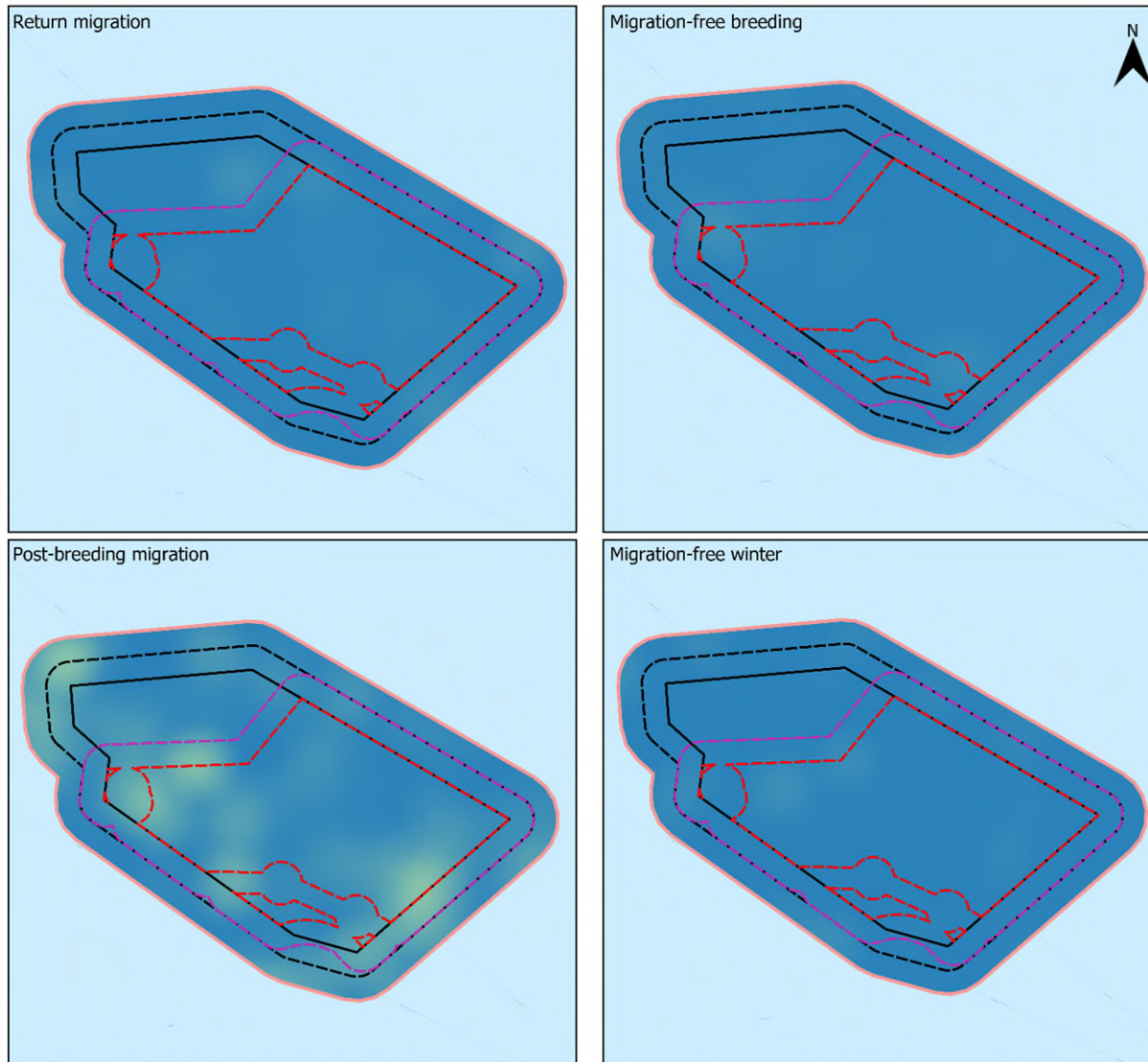
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Hornsea Four RFI#5 P11936

Razorbill seasonal heatmap for Scenario 9 plus 2km buffer

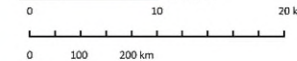
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 9 revised array area
- Scenario 9 plus 2 km buffer
- Razorbill relative density
- 411
- 1



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Figure Reference: P11936 razorbill relative density heatmap for Scenario 9 plus 2 km buffer

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**Figure 48 Protective provision Scenario 9 razorbill seasonal heatmap plus 2km buffer.**

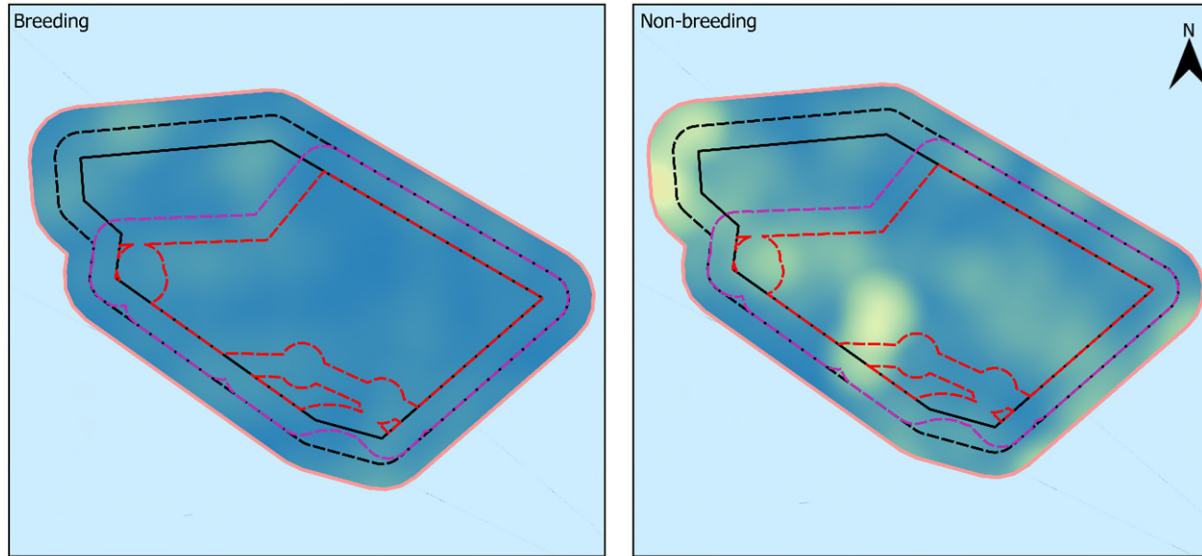
# Hornsea 4



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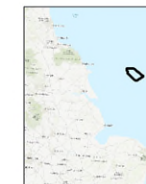
Hornsea Four RFI#5 P11936

**Guillemot/ razorbill seasonal heatmap for Scenario 9 plus 2km buffer**



**Legend**

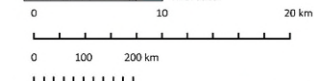
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 9 revised array area
- Scenario 9 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 9 plus 2 km buffer

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**Figure 49 Protective provision Scenario 9 unidentified auk species seasonal heatmap plus 2km buffer.**

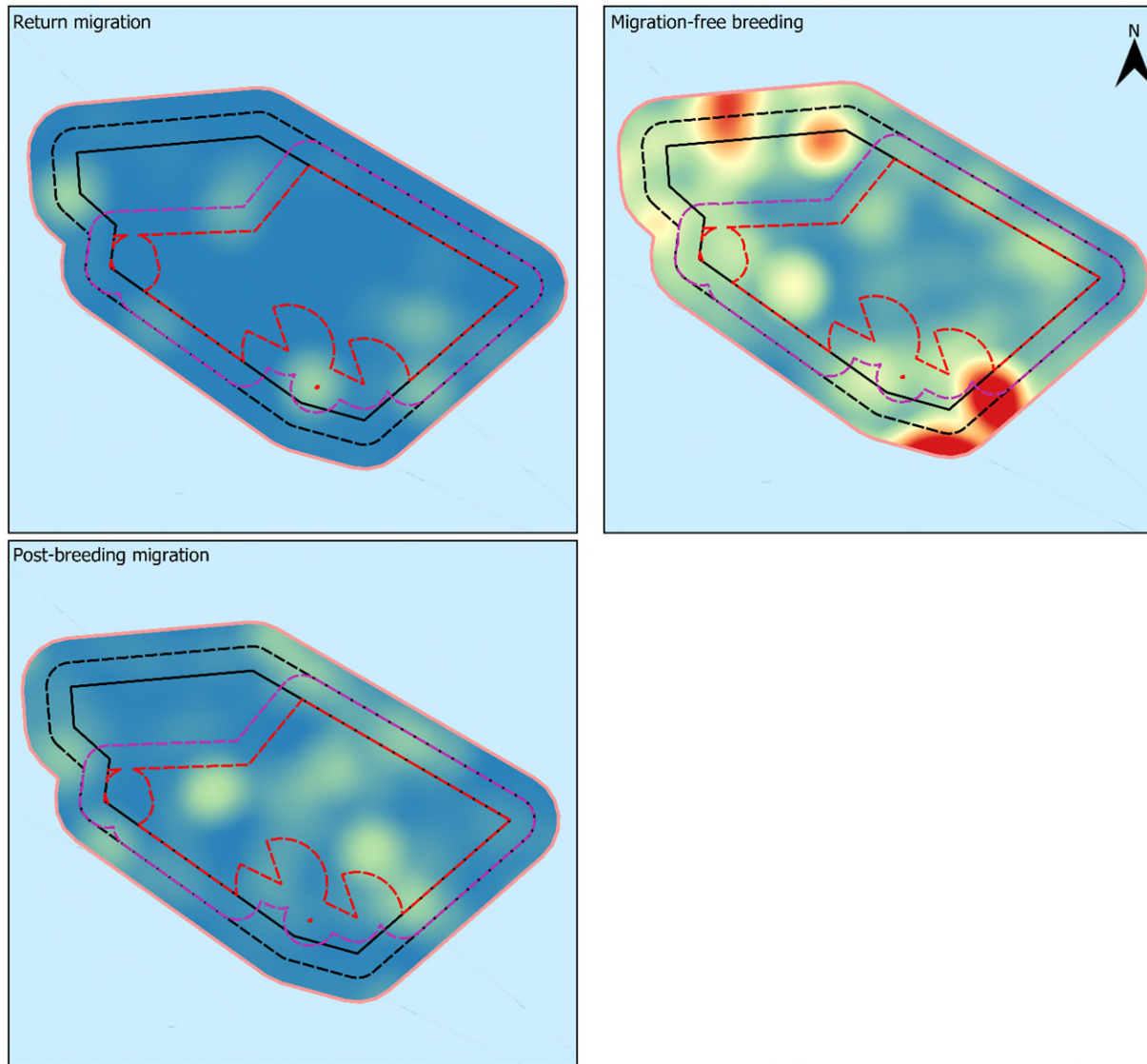
# Hornsea 4



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Hornsea Four RFI#5 P11936

Gannet seasonal heatmap for Scenario 10 plus 2km buffer



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 10 revised array area
- Scenario 10 plus 2 km buffer
- Gannet relative density
- 87
- 1



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0 10 20 km

0 100 200 km

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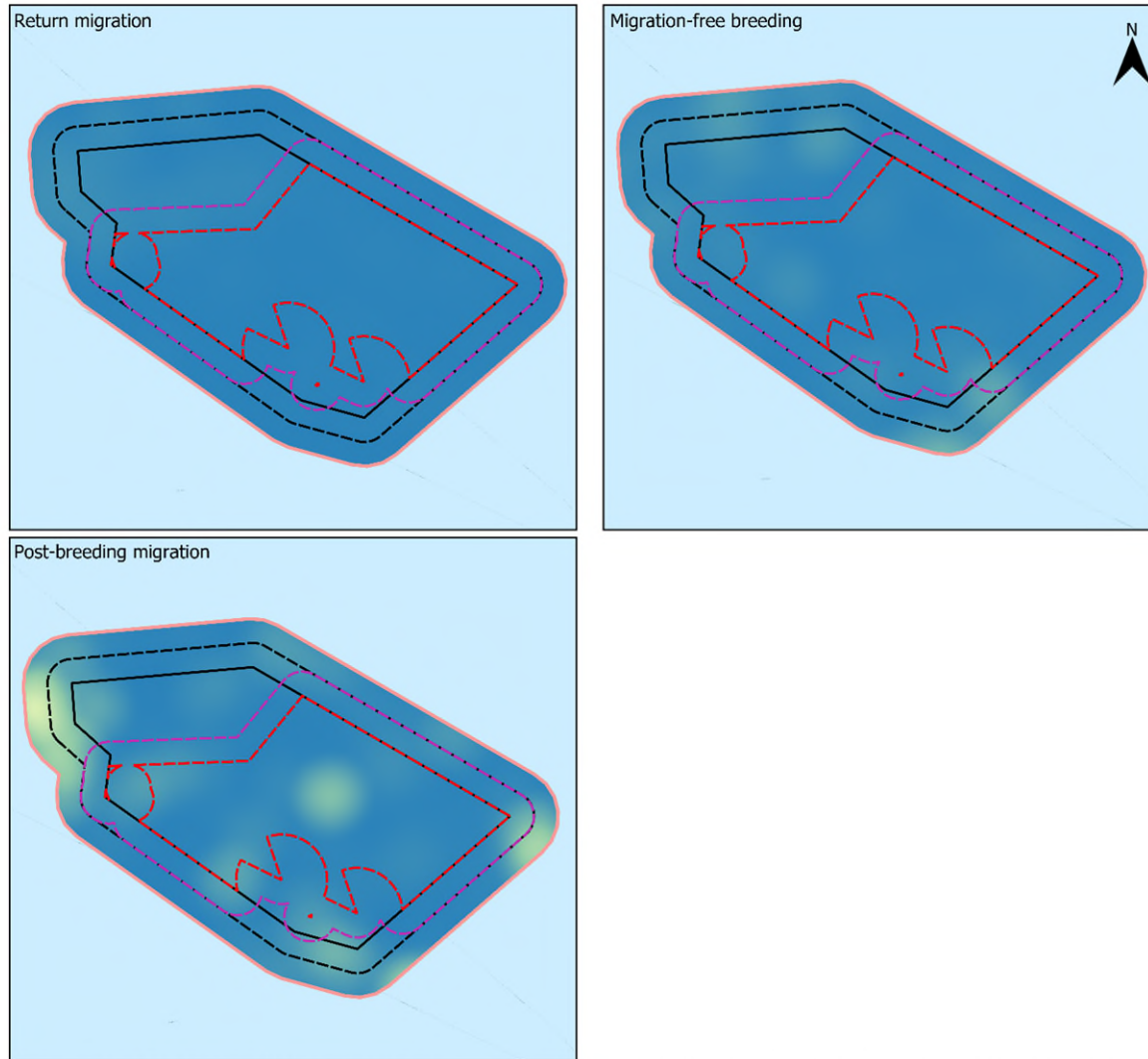


Figure Reference: P11936 gannet relative density heatmap for Scenario 10 plus 2 km buffer

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Figure 50 Protective provision Scenario 10 gannet seasonal heatmap plus 2km buffer.

### Kittiwake seasonal heatmap for Scenario 10 plus 2km buffer



#### Legend

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 10 revised array area
- Scenario 10 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3



#### Notes

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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 10 plus 2 km buffer

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**Figure 51 Protective provision Scenario 10 kittiwake seasonal heatmap plus 2km buffer.**

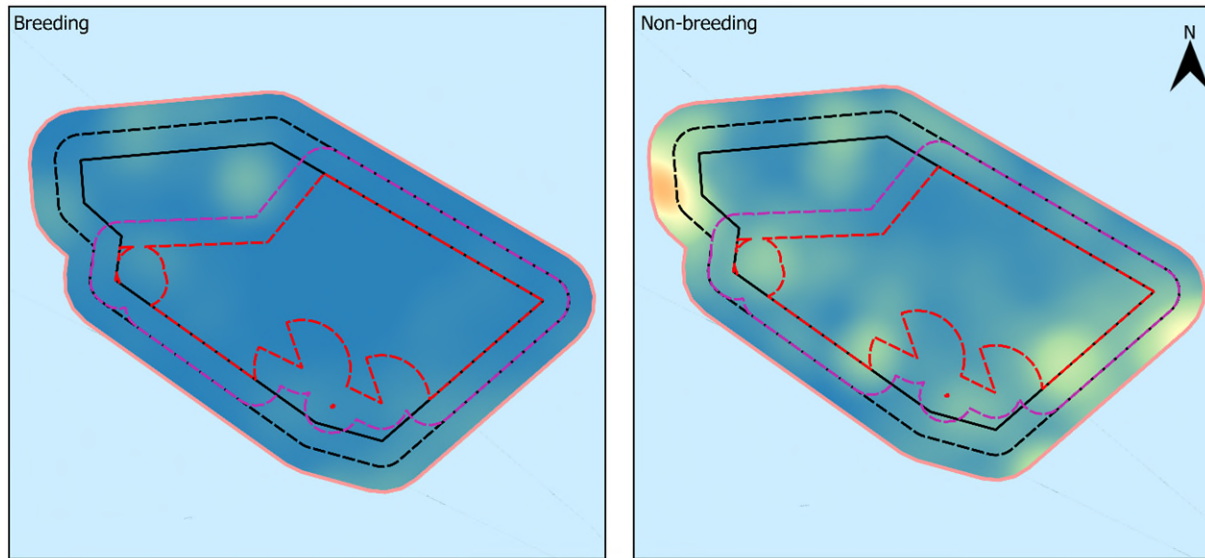
# Hornsea 4



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**Guillemot seasonal heatmap for Scenario 10 plus 2km buffer**



**Legend**

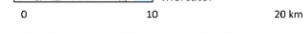
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 10 revised array area
- Scenario 10 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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Figure Reference: P11936 guillemot relative density heatmap for Scenario 10 plus 2 km buffer

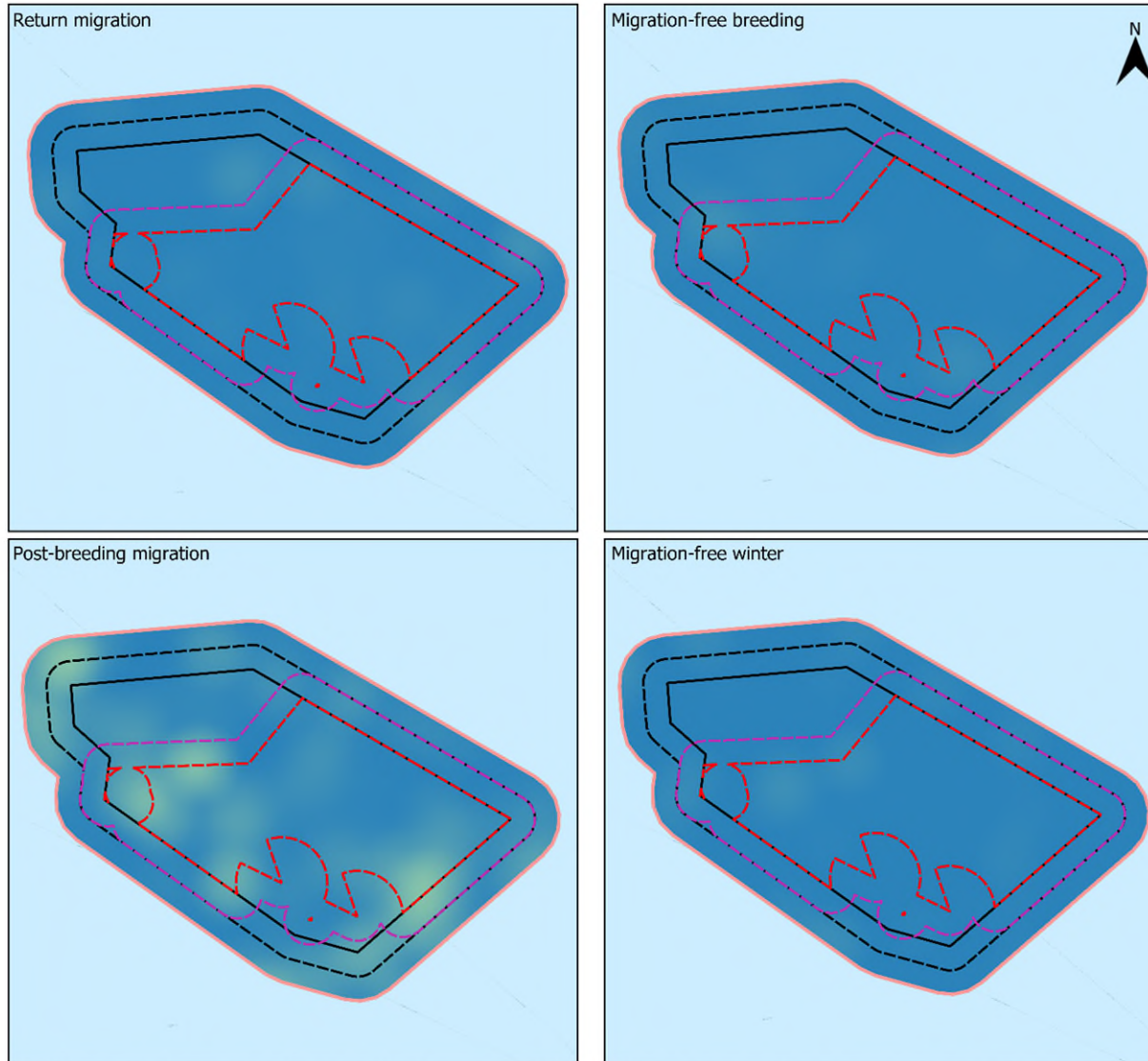
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**Figure 52 Protective provision Scenario 10 guillemot seasonal heatmap plus 2km buffer.**

### Razorbill seasonal heatmap for Scenario 10 plus 2km buffer

#### Legend

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 10 revised array area
- Scenario 10 plus 2 km buffer
- Razorbill relative density
- 411
- 1



#### Notes

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0 10 20 km

0 100 200 km

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Figure Reference: P11936 razorbill relative density heatmap for Scenario 10 plus 2 km buffer

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**Figure 53 Protective provision Scenario 10 razorbill seasonal heatmap plus 2km buffer.**

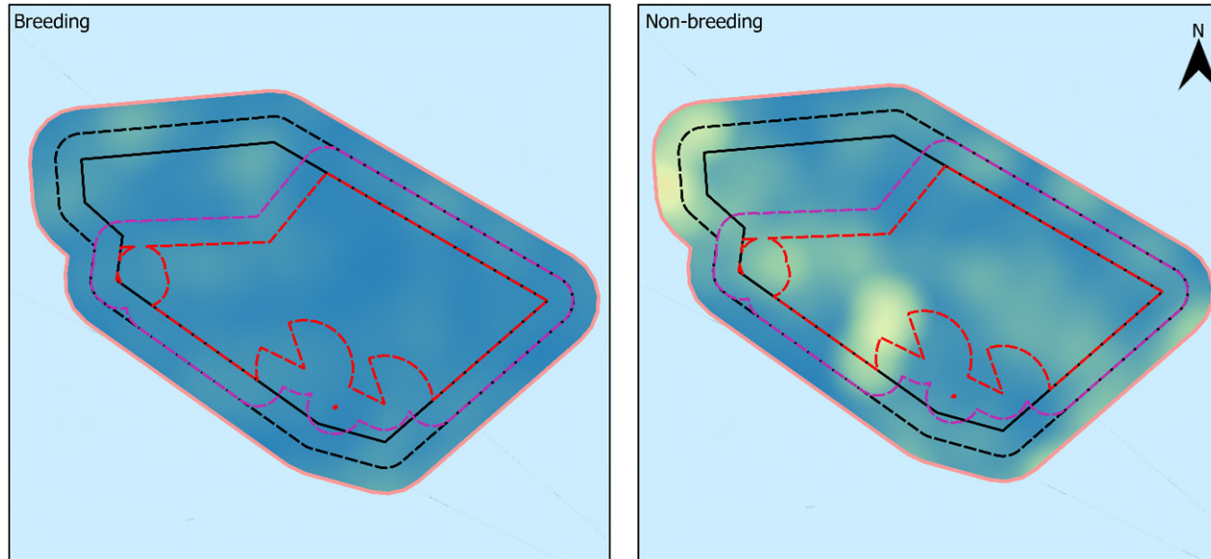
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Guillemot/ razorbill seasonal heatmap for Scenario 10 plus 2km buffer



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 10 revised array area
- Scenario 10 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1

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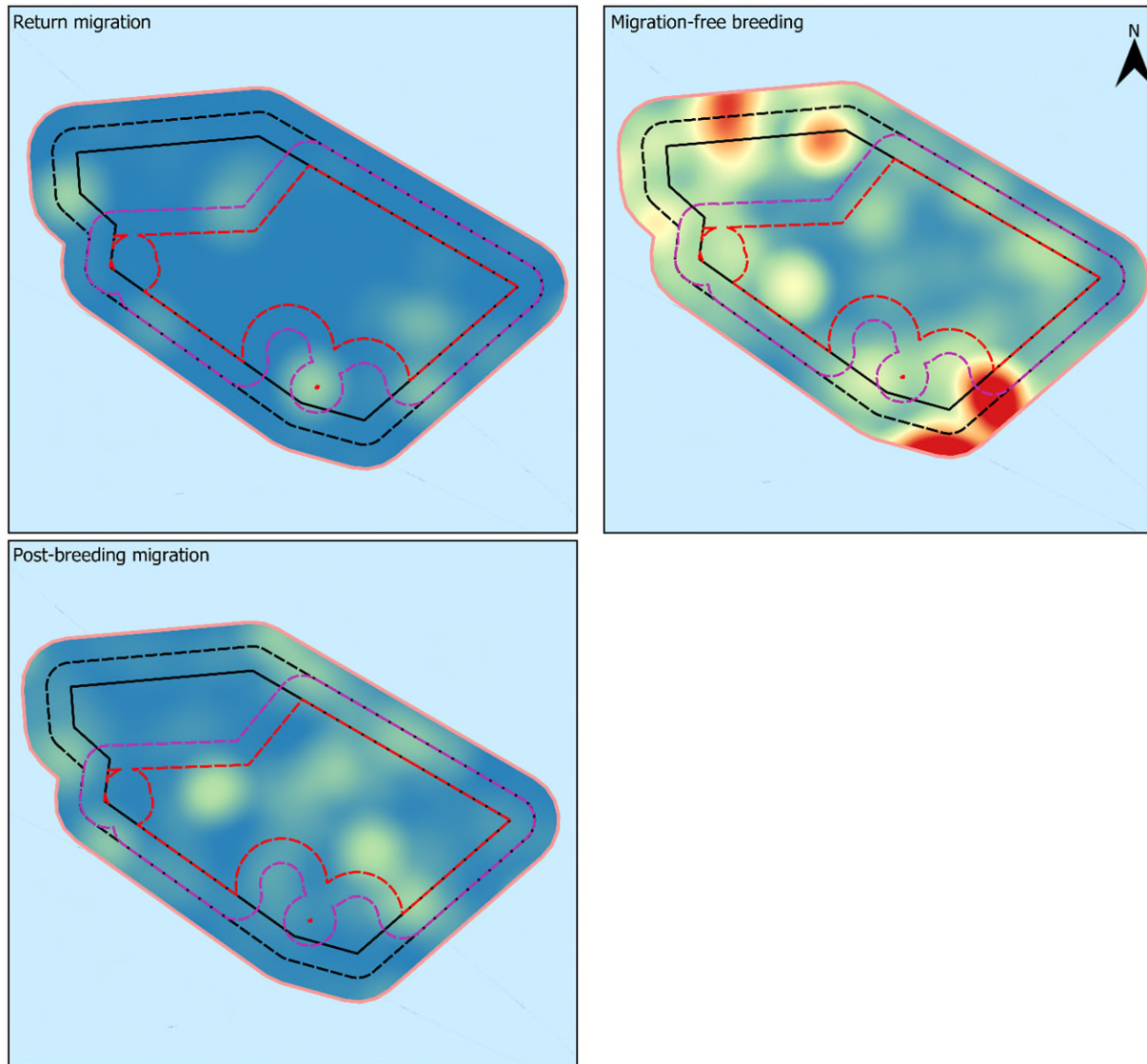
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Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 10 plus 2 km buffer © This drawing and its content are the copyright of APEM Ltd. and may not be reproduced or amended except by prior written permission.

**Figure 54 Protective provision Scenario 10 unidentified auk species seasonal heatmap plus 2km buffer.**

# Hornsea 4

**Gannet seasonal heatmap for Scenario 11 plus 2km buffer**



**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 11 revised array area
  - Scenario 11 plus 2 km buffer
  - Gannet relative density
- 87  
1



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0 10 20 km

0 100 200 km

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Figure Reference: P11936 gannet relative density heatmap for Scenario 11 plus 2 km buffer

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**Figure 55 Protective provision Scenario 11 gannet seasonal heatmap plus 2km buffer.**



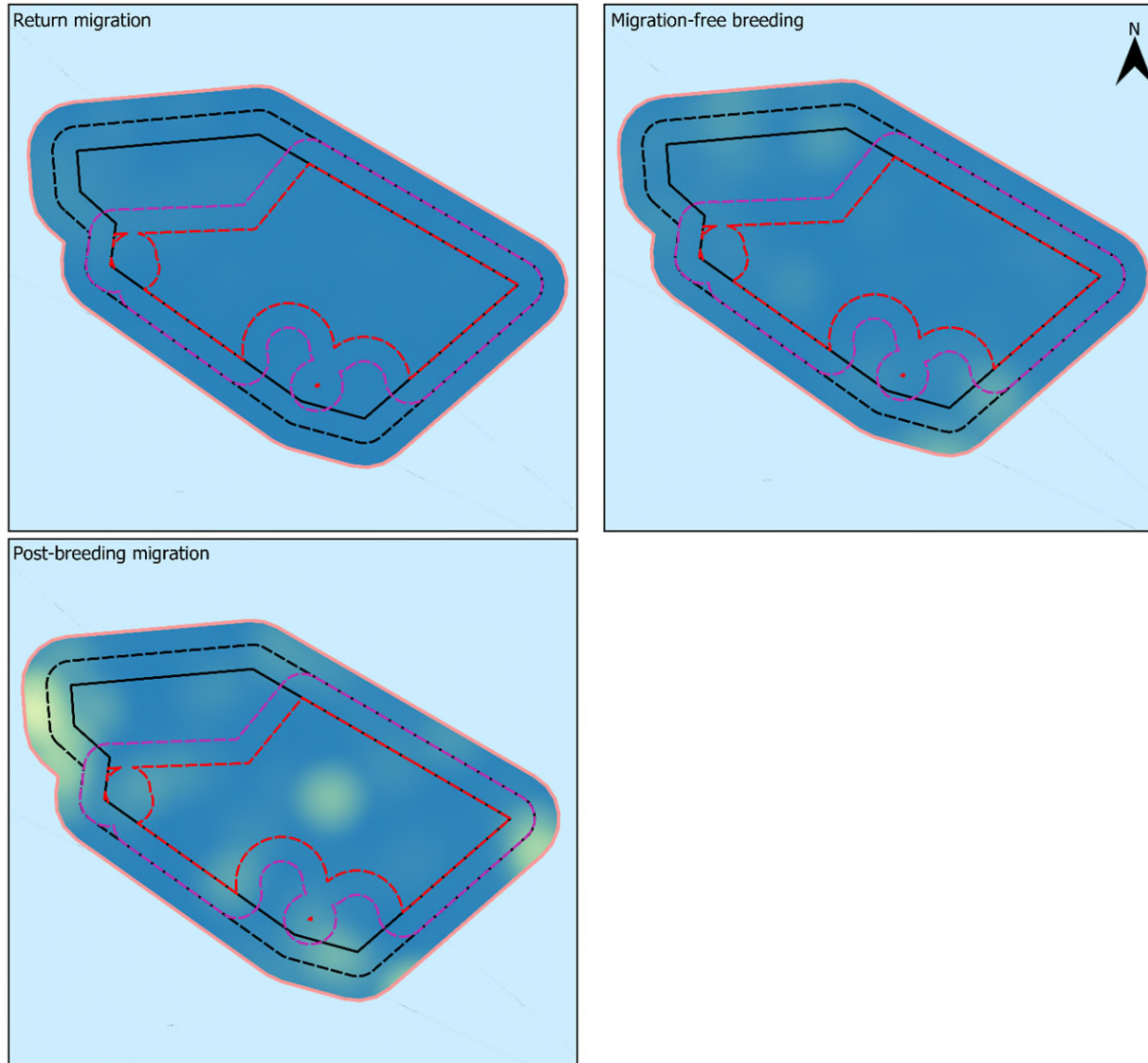
# Hornsea 4



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Kittiwake seasonal heatmap for Scenario 11 plus 2km buffer



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 11 revised array area
- Scenario 11 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3

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0 100 200 km  
 Scale: 1:435000 @ A4 Date: 24/04/2023 Drawn by: AW Checked by: MB Approved by: MB

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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 11 plus 2 km buffer

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**Figure 56 Protective provision Scenario 11 kittiwake seasonal heatmap plus 2km buffer.**

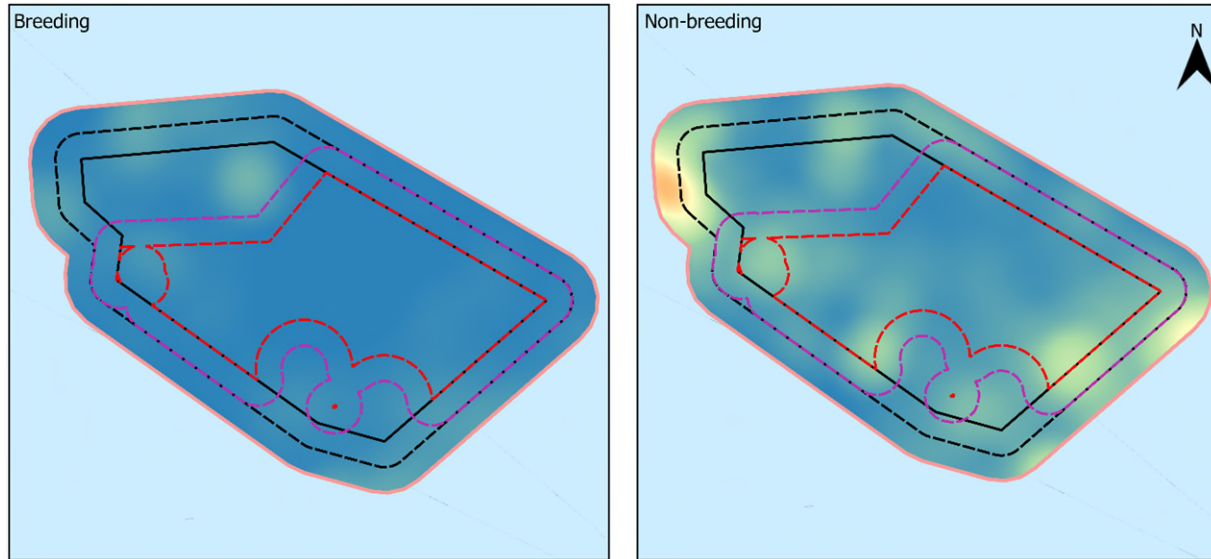
# Hornsea 4



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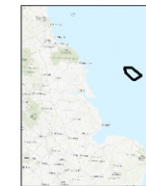
Hornsea Four RFI#5 P11936

Guillemot seasonal heatmap for Scenario 11 plus 2km buffer



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 11 revised array area
- Scenario 11 plus 2 km buffer
- Guillemot relative density
- 2,057  
53



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0 100 200 km

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Figure Reference: P11936 guillemot relative density heatmap for Scenario 11 plus 2 km buffer

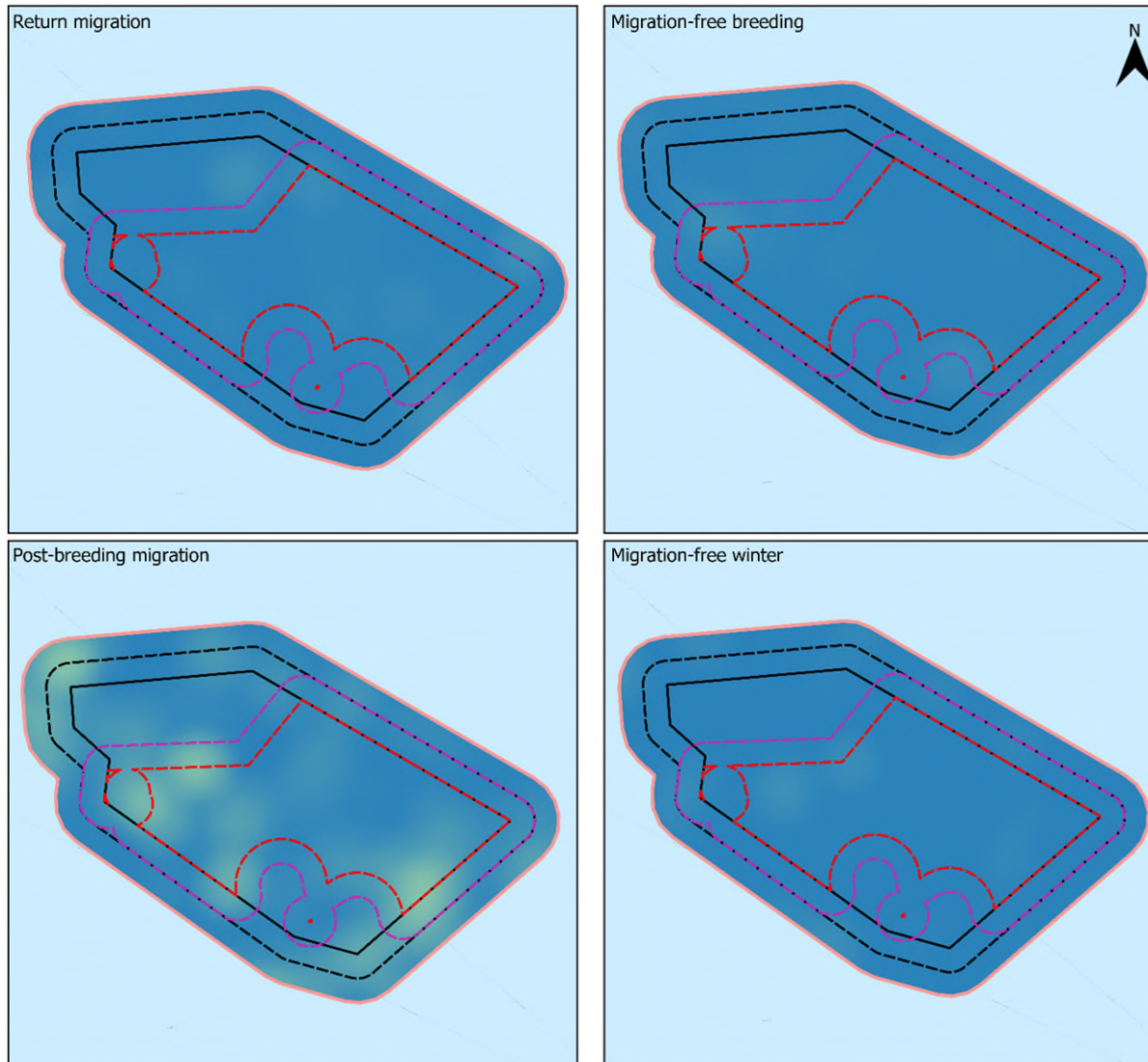
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**Figure 57 Protective provision Scenario 11 guillemot seasonal heatmap plus 2km buffer.**

**Razorbill seasonal heatmap for Scenario 11 plus 2km buffer**

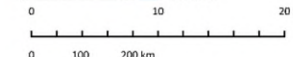
**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 11 revised array area
  - Scenario 11 plus 2 km buffer
  - Razorbill relative density
- 411  
1



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Figure Reference: P11936 razorbill relative density heatmap for Scenario 11 plus 2 km buffer

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**Figure 58 Protective provision Scenario 11 razorbill seasonal heatmap plus 2km buffer.**

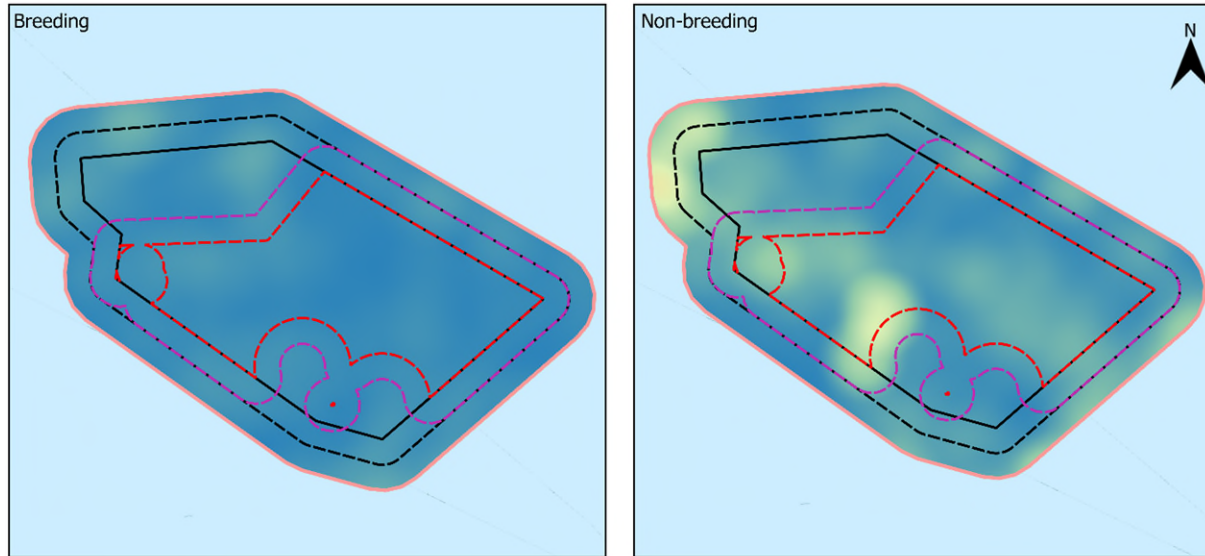
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**Guillemot/ razorbill seasonal heatmap for Scenario 11 plus 2km buffer**



**Legend**

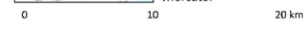
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 11 revised array area
- Scenario 11 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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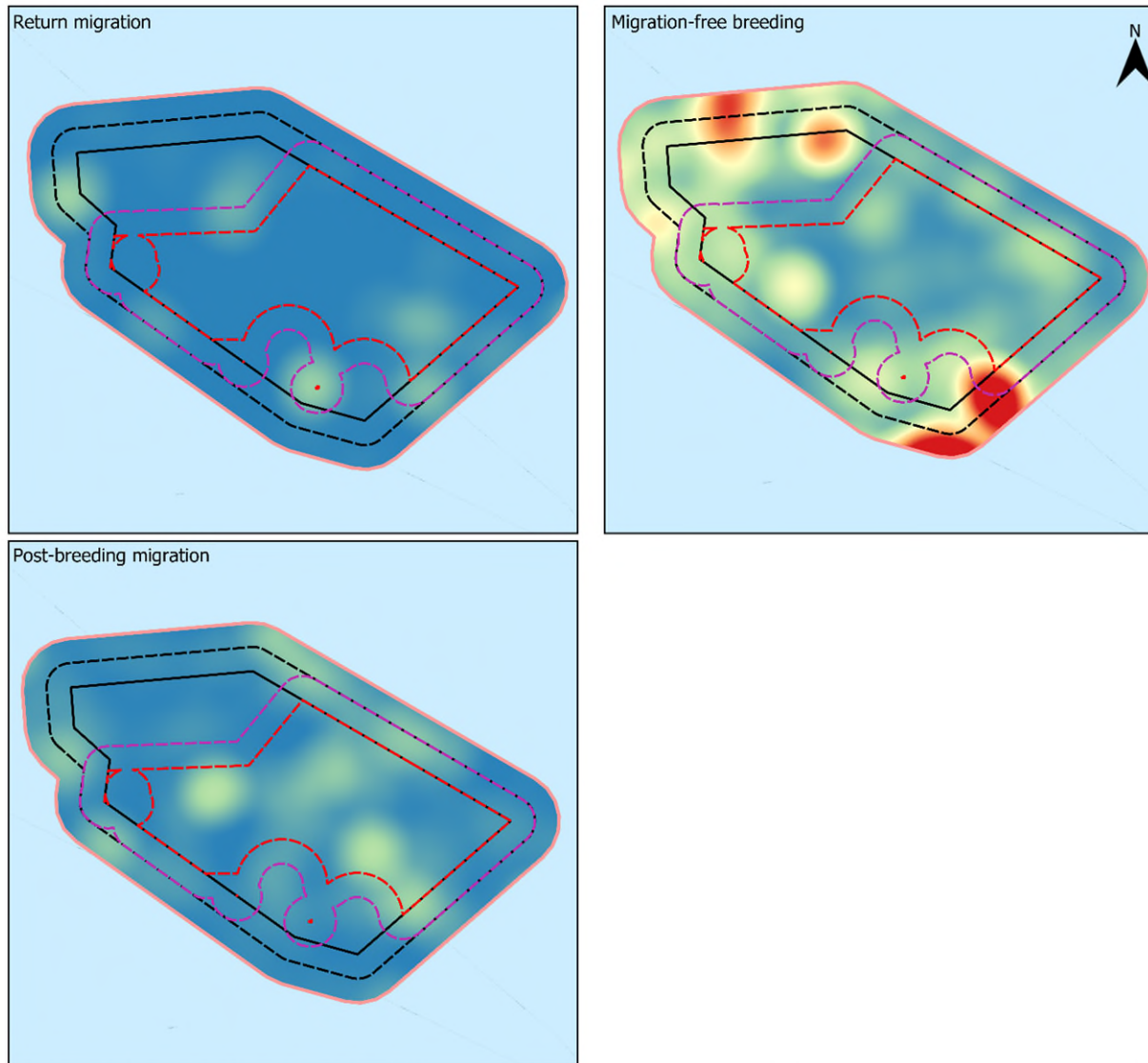
Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 11 plus 2 km buffer

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**Figure 59 Protective provision Scenario 11 unidentified auk species seasonal heatmap plus 2km buffer.**

# Hornsea 4

**Gannet seasonal heatmap for Scenario 12 plus 2km buffer**



**Legend**

- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 12 revised array area
  - Scenario 12 plus 2 km buffer
  - Gannet relative density
- 87  
1



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0 100 200 km

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Figure Reference: P11936 gannet relative density heatmap for Scenario 12 plus 2 km buffer

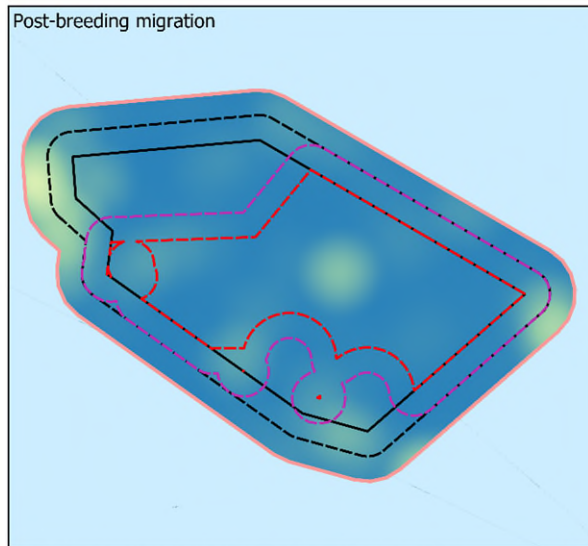
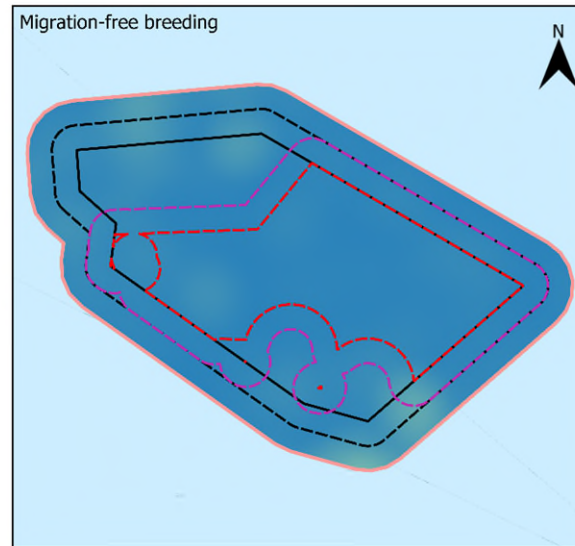
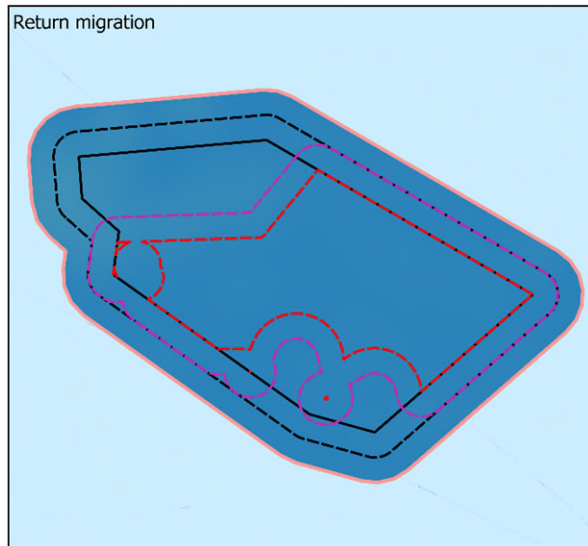
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**Figure 60 Protective provision Scenario 12 gannet seasonal heatmap plus 2km buffer.**

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**Kittiwake seasonal heatmap for Scenario 12 plus 2km buffer**



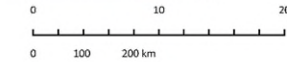
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 12 revised array area
- Scenario 12 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3



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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 12 plus 2 km buffer

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**Figure 61 Protective provision Scenario 12 kittiwake seasonal heatmap plus 2km buffer.**

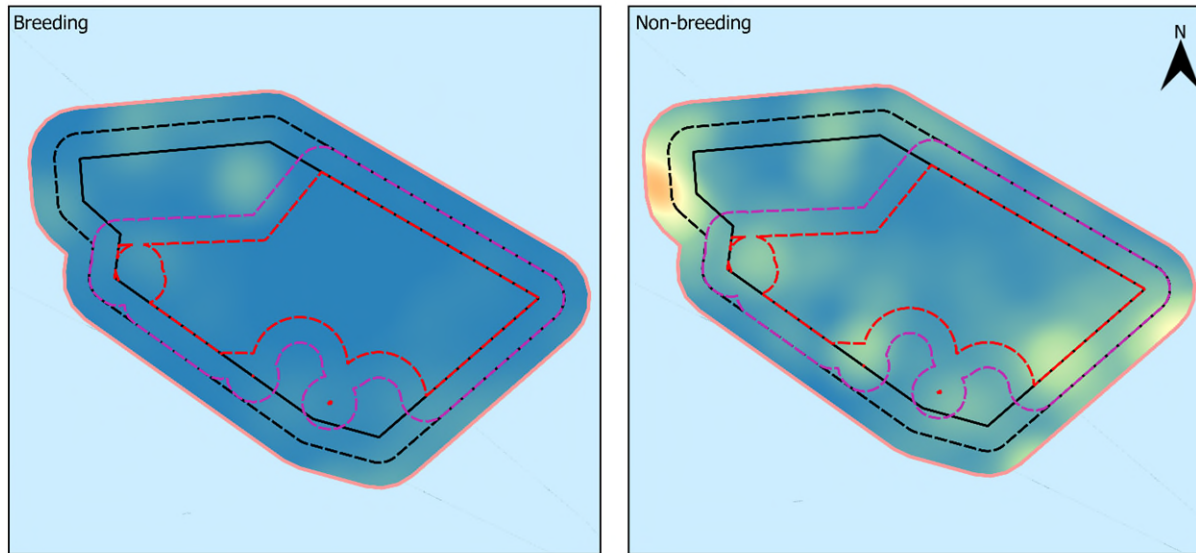
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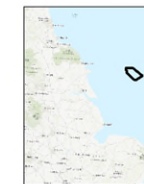
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Guillemot seasonal heatmap for Scenario 12 plus 2km buffer



**Legend**

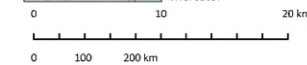
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 12 revised array area
- Scenario 12 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



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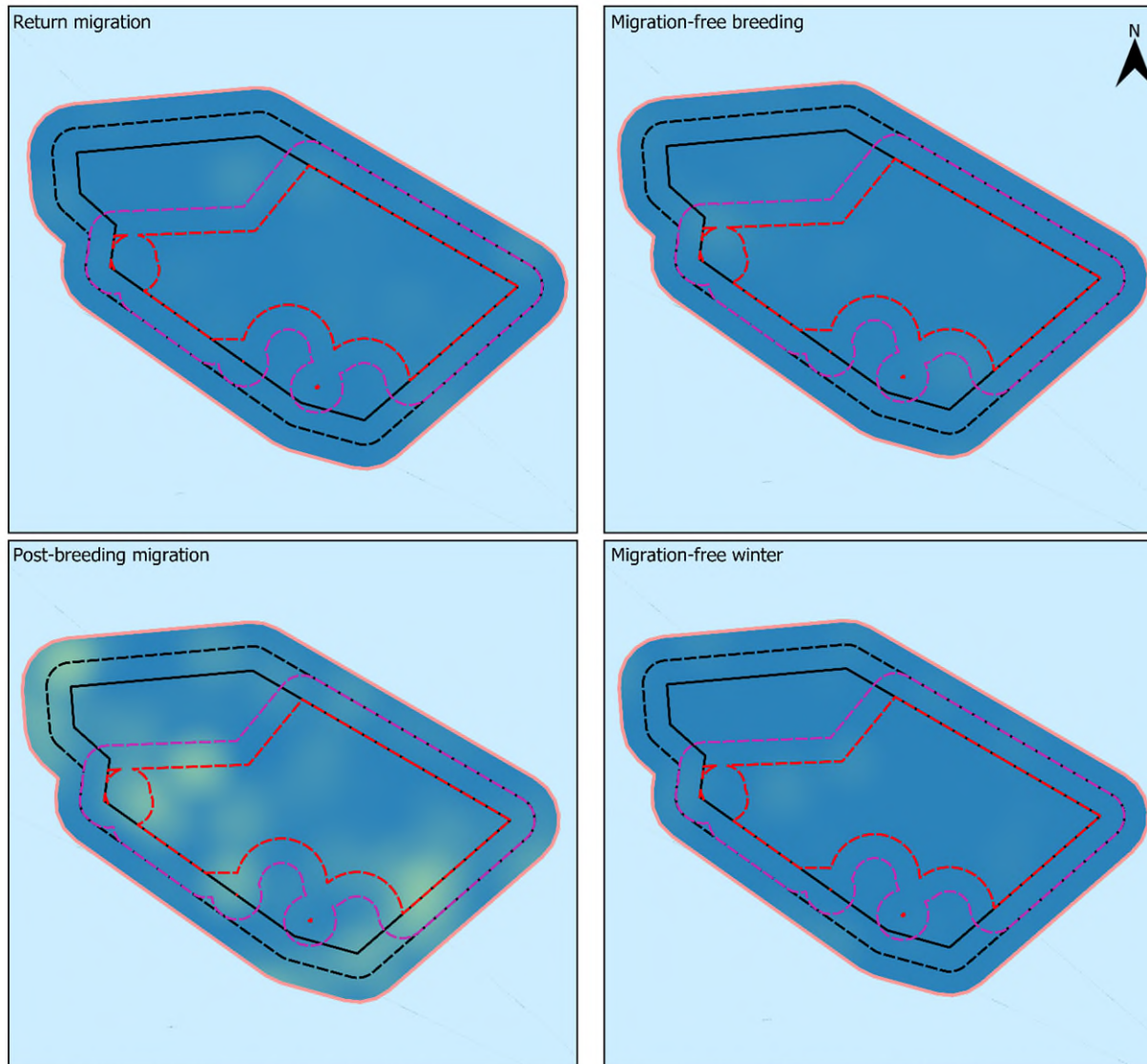


Figure Reference: P11936 guillemot relative density heatmap for Scenario 12 plus 2 km buffer

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**Figure 62 Protective provision Scenario 12 guillemot seasonal heatmap plus 2km buffer.**

### Razorbill seasonal heatmap for Scenario 12 plus 2km buffer



#### Legend

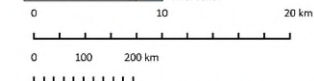
- Array Area
  - Array Area plus 2 km buffer
  - Array Area plus 4 km buffer
  - Scenario 12 revised array area
  - Scenario 12 plus 2 km buffer
- Razorbill relative density
- 



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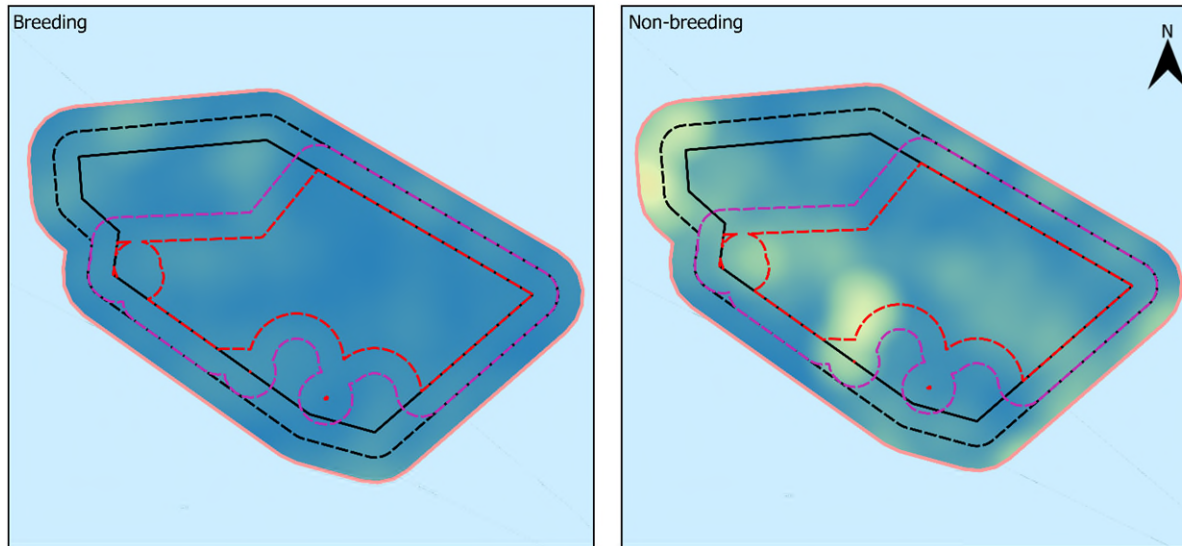
Figure Reference: P11936 razorbill relative density heatmap for Scenario 12 plus 2 km buffer

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**Figure 63 Protective provision Scenario 12 razorbill seasonal heatmap plus 2km buffer.**



**Guillemot/ razorbill seasonal heatmap for Scenario 12 plus 2km buffer**



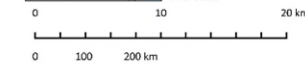
**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 12 revised array area
- Scenario 12 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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Coordinate System:  
 IRENET95 / Irish Transverse Mercator



Scale: 1:435000 @ A4 Date: 24/04/2023 Drawn by: AW Checked by: MB Approved by: MB

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Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 12 plus 2 km buffer

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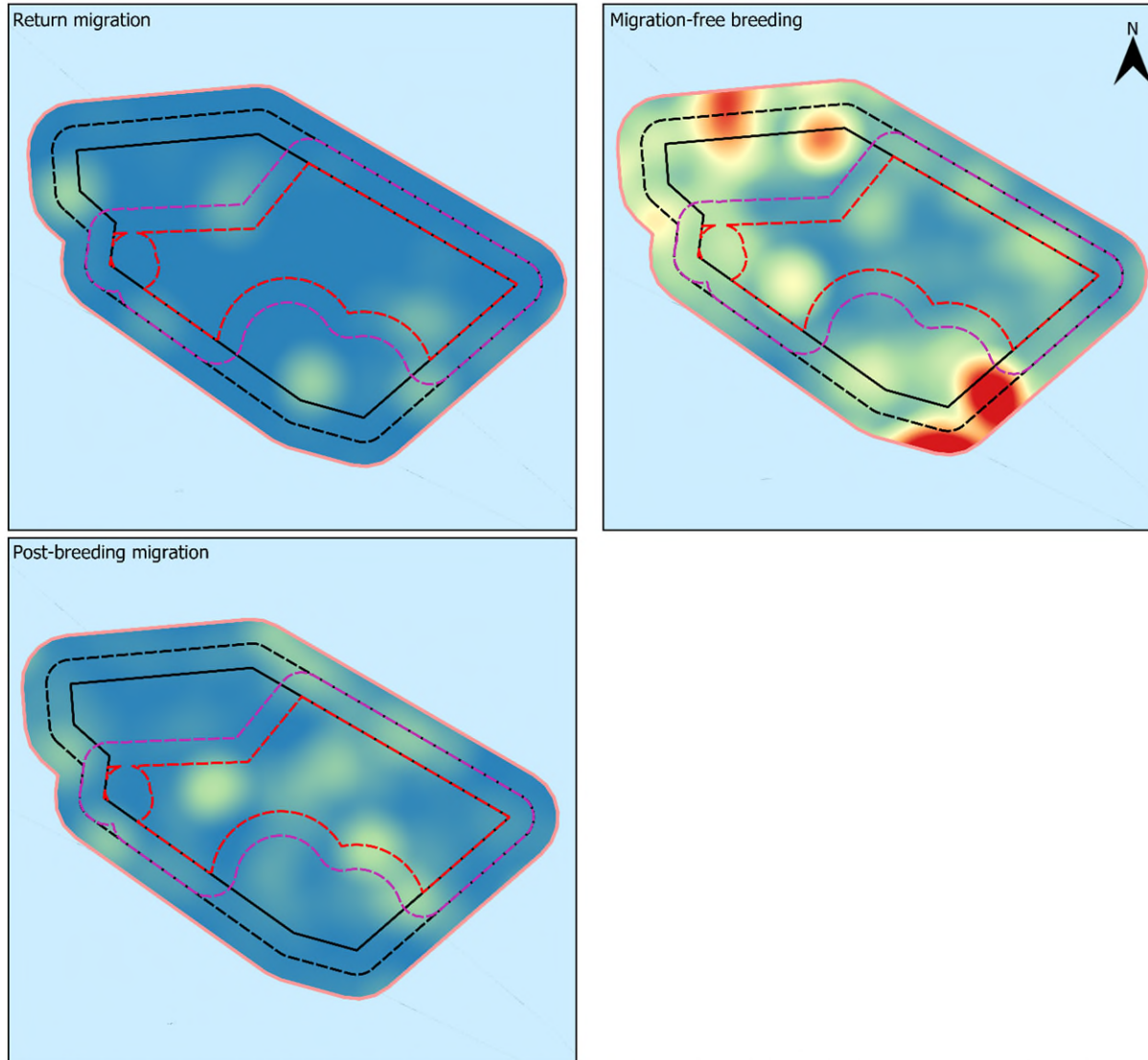
**Figure 64 Protective provision Scenario 12 unidentified auk species seasonal heatmap plus 2km buffer.**

# Hornsea 4

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Hornsea Four RFI#5 P11936

Gannet seasonal heatmap for Scenario 13 plus 2km buffer



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 13 revised array area
- Scenario 13 plus 2 km buffer
- Gannet relative density
- 87
- 1



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Figure Reference: P11936 gannet relative density heatmap for Scenario 13 plus 2 km buffer

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**Figure 65 Protective provision Scenario 13 gannet seasonal heatmap plus 2km buffer.**

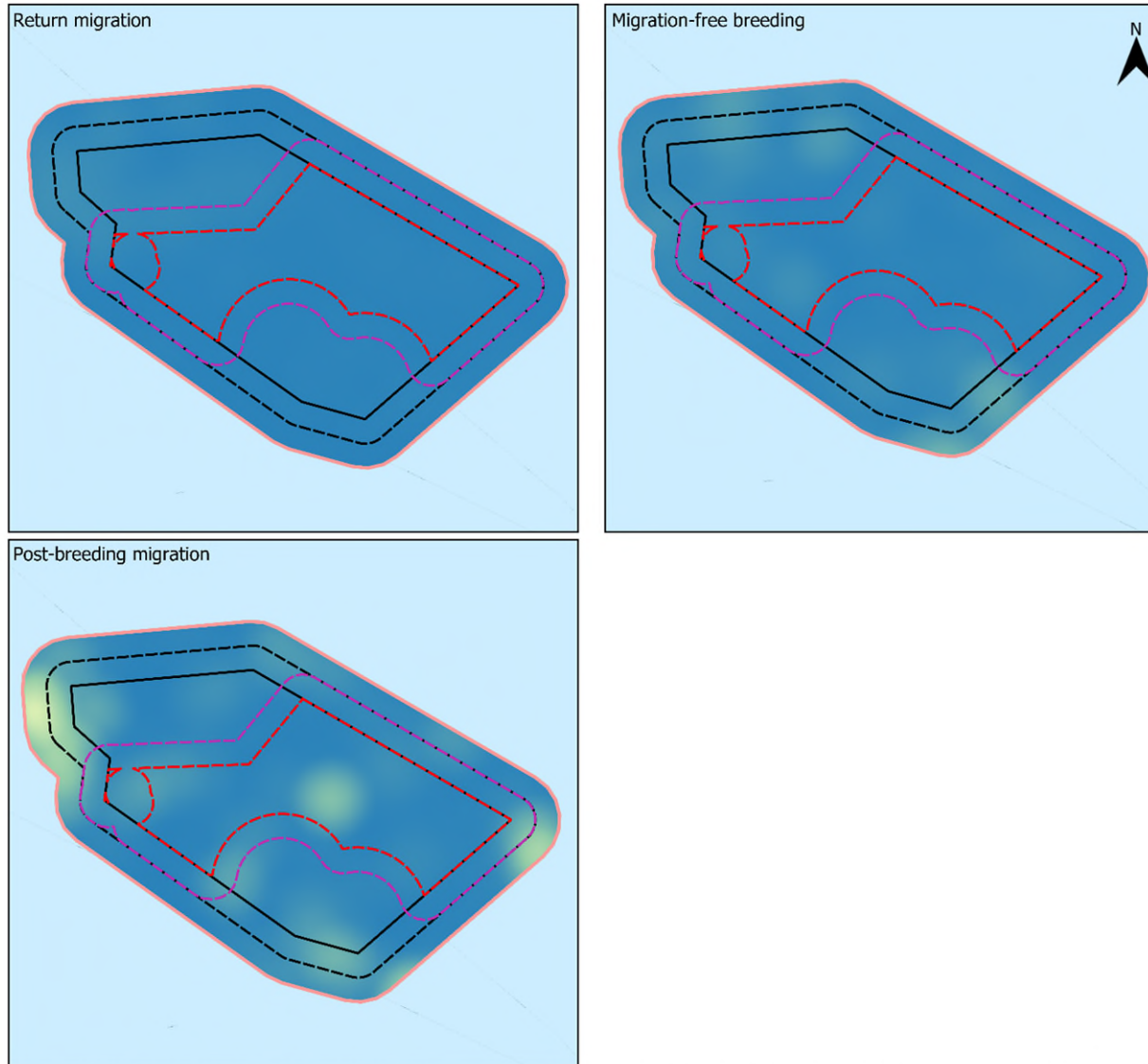
# Hornsea 4



APEM Group

Hornsea Four RFI#5 P11936

Kittiwake seasonal heatmap for Scenario 13 plus 2km buffer



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 13 revised array area
- Scenario 13 plus 2 km buffer
- Kittiwake relative density
- 1,042
- 3

**Notes**

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0 10 20 km

0 100 200 km

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Figure Reference: P11936 kittiwake relative density heatmap for Scenario 13 plus 2 km buffer © This drawing and its content are the copyright of APEM Ltd. and may not be reproduced or amended except by prior written permission.

**Figure 66 Protective provision Scenario 13 kittiwake seasonal heatmap plus 2km buffer.**

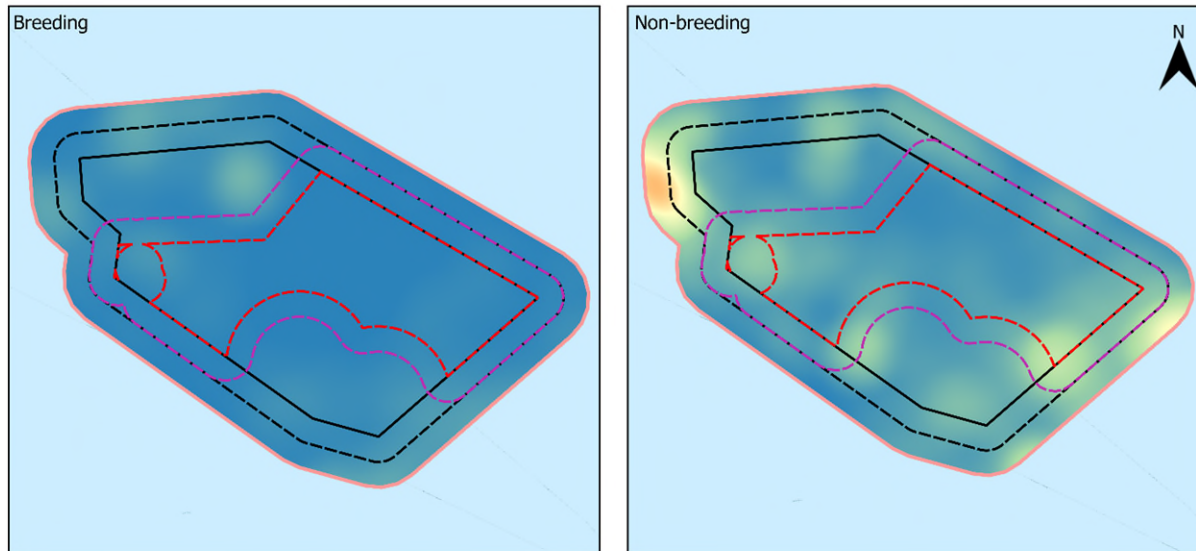
# Hornsea 4



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Hornsea Four RFI#5 P11936

**Guillemot seasonal heatmap for Scenario 13 plus 2km buffer**



**Legend**

- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 13 revised array area
- Scenario 13 plus 2 km buffer
- Guillemot relative density
- 2,057
- 53



**Notes**

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0 10 20 km

0 100 200 km

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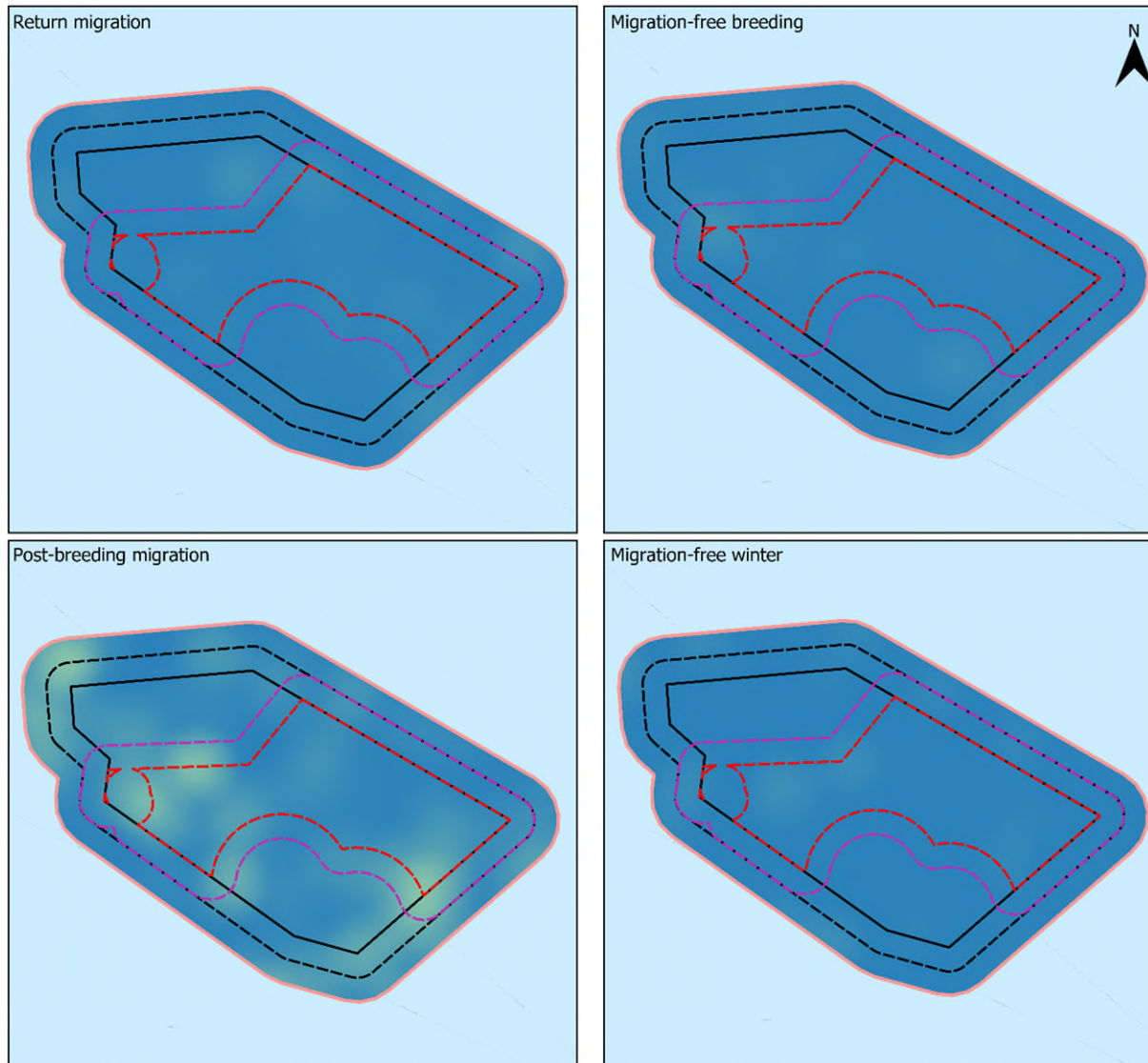


Figure Reference: P11936 guillemot relative density heatmap for Scenario 13 plus 2 km buffer

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**Figure 67 Protective provision Scenario 13 guillemot seasonal heatmap plus 2km buffer.**

**Razorbill seasonal heatmap for Scenario 13 plus 2km buffer**



**Legend**

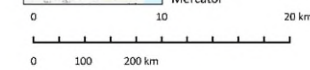
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 13 revised array area
- Scenario 13 plus 2 km buffer
- Razorbill relative density
- 411
- 1



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Figure Reference: P11936 razorbill relative density heatmap for Scenario 13 plus 2 km buffer

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**Figure 68 Protective provision Scenario 13 razorbill seasonal heatmap plus 2km buffer.**

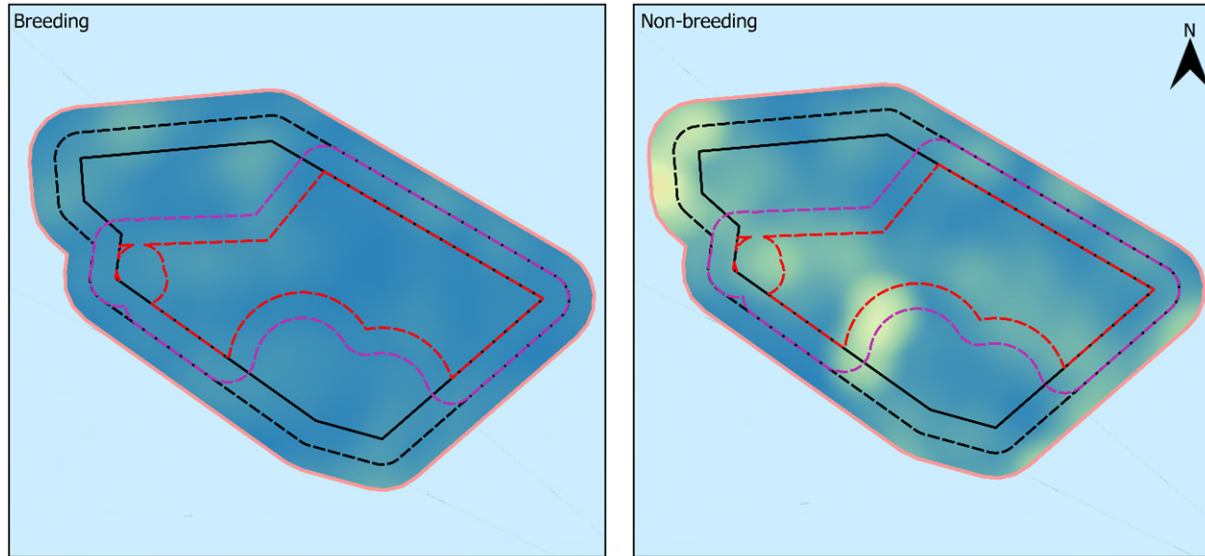
# Hornsea 4



**APEM** Group

Hornsea Four RFI#5 P11936

**Guillemot/ razorbill seasonal heatmap for Scenario 13 plus 2km buffer**



**Legend**

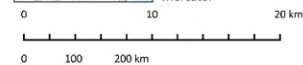
- Array Area
- Array Area plus 2 km buffer
- Array Area plus 4 km buffer
- Scenario 13 revised array area
- Scenario 13 plus 2 km buffer
- Guillemot/ razorbill relative density
- 164
- 1



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Figure Reference: P11936 guillemot\_razorbill relative density heatmap for Scenario 13 plus 2 km buffer

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**Figure 69 Protective provision Scenario 13 unidentified auk species seasonal heatmap plus 2km buffer.**

## Appendix B. Gannet monthly MRSea flying density estimates for the modelled protective provision scenarios.

**Table 1 Hornsea Four gannet monthly density estimates for the protective provision scenarios**

Month	Flying densities						
	Scenario 1	Scenario 2	Scenario 5	Scenario 6	Scenario 8	Scenario 9	Scenario 13
<b>Jan</b>	0.032	0.025	0.027	0.027	0.029	0.035	0.043
<b>Feb</b>	0.032	0.032	0.025	0.024	0.022	0.024	0.014
<b>Mar</b>	0.220	0.182	0.209	0.212	0.217	0.229	0.330
<b>Apr</b>	0.065	0.063	0.068	0.068	0.065	0.081	0.071
<b>May</b>	0.129	0.087	0.067	0.064	0.058	0.109	0.078
<b>Jun</b>	0.483	0.438	0.432	0.489	0.428	0.484	0.427
<b>Jul</b>	0.513	0.450	0.471	0.472	0.492	0.554	0.625
<b>Aug</b>	0.324	0.402	0.406	0.410	0.434	0.309	0.329
<b>Sep</b>	0.181	0.157	0.155	0.151	0.154	0.189	0.199
<b>Oct</b>	0.191	0.167	0.140	0.143	0.191	0.165	0.236
<b>Nov</b>	0.552	0.649	0.699	0.693	0.754	0.603	0.669
<b>Dec</b>	0.168	0.147	0.204	0.193	0.161	0.124	0.166
<b>Annual</b>	2.891	2.797	2.902	2.946	3.006	2.907	3.186

## Appendix C. Gannet monthly design-based abundance estimates for the modelled protective provision scenarios.

Table 2 Gannet all behaviours abundance estimates for Protective Provision Scenario 1 array area plus 2km buffer.

Survey	Raw count	Abundance	Apportionment	Apportioned total	Density
<b>Apr-16</b>	3	30	0.00	30.00	0.06
<b>May-16</b>	36	360	0.00	360.00	0.68
<b>Jun-16</b>	134	1339	0.00	1339.00	2.53
<b>Jul-16</b>	31	310	0.00	310.00	0.59
<b>Aug-16</b>	12	120	0.00	120.00	0.23
<b>Sep-16</b>	26	259	0.00	259.00	0.49
<b>Oct-16</b>	77	769	20.00	789.00	1.49
<b>Nov-16</b>	47	467	0.00	467.00	0.88
<b>Dec-16</b>	36	357	0.00	357.00	0.68
<b>Jan-17</b>	0	0	0.00	0.00	0.00
<b>Feb-17</b>	2	20	0.00	20.00	0.04
<b>Mar-17</b>	18	180	0.00	180.00	0.34
<b>Apr-17</b>	6	60	0.00	60.00	0.11
<b>May-17</b>	7	70	0.00	70.00	0.13
<b>Jun-17</b>	6	60	0.00	60.00	0.11
<b>Jul-17</b>	43	429	0.00	429.00	0.81
<b>Aug-17</b>	40	400	0.00	400.00	0.76
<b>Sep-17</b>	20	200	0.00	200.00	0.38
<b>Oct-17</b>	18	172	0.00	172.00	0.33
<b>Nov-17</b>	59	589	0.00	589.00	1.11
<b>Dec-17</b>	25	250	0.00	250.00	0.47
<b>Jan-18</b>	6	60	0.00	60.00	0.11
<b>Feb-18</b>	0	0	0.00	0.00	0.00
<b>Mar-18</b>	12	120	0.00	120.00	0.23



**Table 3 Gannet all behaviours abundance estimates for Protective Provision Scenario 2 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Density
<b>Apr-16</b>	3	30	0.00	30.00	0.05
<b>May-16</b>	57	571	0.00	571.00	0.87
<b>Jun-16</b>	142	1423	0.00	1423.00	2.17
<b>Jul-16</b>	44	441	0.00	441.00	0.67
<b>Aug-16</b>	19	191	0.00	191.00	0.29
<b>Sep-16</b>	26	260	0.00	260.00	0.40
<b>Oct-16</b>	84	842	20.00	862.00	1.32
<b>Nov-16</b>	54	540	0.00	540.00	0.82
<b>Dec-16</b>	37	381	0.00	381.00	0.58
<b>Jan-17</b>	0	0	0.00	0.00	0.00
<b>Feb-17</b>	3	30	0.00	30.00	0.05
<b>Mar-17</b>	31	311	0.00	311.00	0.47
<b>Apr-17</b>	7	70	0.00	70.00	0.11
<b>May-17</b>	9	90	0.00	90.00	0.14
<b>Jun-17</b>	10	100	0.00	100.00	0.15
<b>Jul-17</b>	44	441	0.00	441.00	0.67
<b>Aug-17</b>	52	522	0.00	522.00	0.80
<b>Sep-17</b>	26	261	0.00	261.00	0.40
<b>Oct-17</b>	21	211	0.00	211.00	0.32
<b>Nov-17</b>	71	710	0.00	710.00	1.08
<b>Dec-17</b>	40	401	0.00	401.00	0.61
<b>Jan-18</b>	7	70	0.00	70.00	0.11
<b>Feb-18</b>	1	10	0.00	10.00	0.02
<b>Mar-18</b>	13	131	0.00	131.00	0.20

**Table 4 Gannet all behaviours abundance estimates for Protective Provision Scenario 5 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Density
<b>Apr-16</b>	3	30	0.00	30.00	0.05
<b>May-16</b>	57	570	0.00	570.00	0.88
<b>Jun-16</b>	135	1350	0.00	1350.00	2.09
<b>Jul-16</b>	44	440	0.00	440.00	0.68
<b>Aug-16</b>	18	180	0.00	180.00	0.28
<b>Sep-16</b>	26	259	0.00	259.00	0.40
<b>Oct-16</b>	84	840	20.00	860.00	1.33
<b>Nov-16</b>	54	539	0.00	539.00	0.84
<b>Dec-16</b>	37	381	0.00	381.00	0.59
<b>Jan-17</b>	0	0	0.00	0.00	0.00
<b>Feb-17</b>	3	30	0.00	30.00	0.05
<b>Mar-17</b>	31	313	0.00	313.00	0.49
<b>Apr-17</b>	7	70	0.00	70.00	0.11
<b>May-17</b>	9	90	0.00	90.00	0.14
<b>Jun-17</b>	9	90	0.00	90.00	0.14
<b>Jul-17</b>	43	430	0.00	430.00	0.67
<b>Aug-17</b>	52	521	0.00	521.00	0.81
<b>Sep-17</b>	26	260	0.00	260.00	0.40
<b>Oct-17</b>	21	214	0.00	214.00	0.33
<b>Nov-17</b>	71	709	0.00	709.00	1.10
<b>Dec-17</b>	41	410	0.00	410.00	0.64
<b>Jan-18</b>	7	70	0.00	70.00	0.11
<b>Feb-18</b>	1	10	0.00	10.00	0.02
<b>Mar-18</b>	13	131	0.00	131.00	0.20

**Table 5 Gannet all behaviours abundance estimates for Protective Provision Scenario 6 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Density
<b>Apr-16</b>	3	30	0.00	30.00	0.05
<b>May-16</b>	55	547	0.00	547.00	0.88
<b>Jun-16</b>	130	1293	0.00	1293.00	2.07
<b>Jul-16</b>	44	438	0.00	438.00	0.70
<b>Aug-16</b>	14	139	0.00	139.00	0.22
<b>Sep-16</b>	25	248	0.00	248.00	0.40
<b>Oct-16</b>	84	835	20.00	855.00	1.37
<b>Nov-16</b>	54	536	0.00	536.00	0.86
<b>Dec-16</b>	35	358	0.00	358.00	0.57
<b>Jan-17</b>	0	0	0.00	0.00	0.00
<b>Feb-17</b>	2	20	0.00	20.00	0.03
<b>Mar-17</b>	31	311	0.00	311.00	0.50
<b>Apr-17</b>	7	70	0.00	70.00	0.11
<b>May-17</b>	9	90	0.00	90.00	0.14
<b>Jun-17</b>	9	89	0.00	89.00	0.14
<b>Jul-17</b>	42	418	0.00	418.00	0.67
<b>Aug-17</b>	52	518	0.00	518.00	0.83
<b>Sep-17</b>	26	259	0.00	259.00	0.42
<b>Oct-17</b>	17	173	0.00	173.00	0.28
<b>Nov-17</b>	68	676	0.00	676.00	1.08
<b>Dec-17</b>	41	408	0.00	408.00	0.65
<b>Jan-18</b>	7	70	0.00	70.00	0.11
<b>Feb-18</b>	1	10	0.00	10.00	0.02
<b>Mar-18</b>	13	131	0.00	131.00	0.21

**Table 6 Gannet all behaviours abundance estimates for Protective Provision Scenario 8 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Density
<b>Apr-16</b>	3	30	0.00	30.00	0.05
<b>May-16</b>	42	420	0.00	420.00	0.77
<b>Jun-16</b>	92	920	0.00	920.00	1.68
<b>Jul-16</b>	44	440	0.00	440.00	0.81
<b>Aug-16</b>	14	140	0.00	140.00	0.26
<b>Sep-16</b>	24	240	0.00	240.00	0.44
<b>Oct-16</b>	80	800	20.00	820.00	1.50
<b>Nov-16</b>	46	460	0.00	460.00	0.84
<b>Dec-16</b>	20	207	0.00	207.00	0.38
<b>Jan-17</b>	0	0	0.00	0.00	0.00
<b>Feb-17</b>	2	20	0.00	20.00	0.04
<b>Mar-17</b>	29	290	0.00	290.00	0.53
<b>Apr-17</b>	5	50	0.00	50.00	0.09
<b>May-17</b>	9	90	0.00	90.00	0.16
<b>Jun-17</b>	9	90	0.00	90.00	0.16
<b>Jul-17</b>	39	390	0.00	390.00	0.71
<b>Aug-17</b>	51	511	0.00	511.00	0.94
<b>Sep-17</b>	24	240	0.00	240.00	0.44
<b>Oct-17</b>	13	135	0.00	135.00	0.25
<b>Nov-17</b>	59	589	0.00	589.00	1.08
<b>Dec-17</b>	18	180	0.00	180.00	0.33
<b>Jan-18</b>	7	70	0.00	70.00	0.13
<b>Feb-18</b>	1	10	0.00	10.00	0.02
<b>Mar-18</b>	13	130	0.00	130.00	0.24

**Table 7 Gannet all behaviours abundance estimates for Protective Provision Scenario 9 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Density
<b>Apr-16</b>	3	30	0.00	30.00	0.06
<b>May-16</b>	36	360	0.00	360.00	0.69
<b>Jun-16</b>	133	1331	0.00	1331.00	2.57
<b>Jul-16</b>	31	310	0.00	310.00	0.60
<b>Aug-16</b>	12	120	0.00	120.00	0.23
<b>Sep-16</b>	26	259	0.00	259.00	0.50
<b>Oct-16</b>	76	760	20.00	780.00	1.50
<b>Nov-16</b>	47	468	0.00	468.00	0.90
<b>Dec-16</b>	36	357	0.00	357.00	0.69
<b>Jan-17</b>	0	0	0.00	0.00	0.00
<b>Feb-17</b>	2	20	0.00	20.00	0.04
<b>Mar-17</b>	18	180	0.00	180.00	0.35
<b>Apr-17</b>	6	60	0.00	60.00	0.12
<b>May-17</b>	7	70	0.00	70.00	0.13
<b>Jun-17</b>	6	60	0.00	60.00	0.12
<b>Jul-17</b>	43	430	0.00	430.00	0.83
<b>Aug-17</b>	40	401	0.00	401.00	0.77
<b>Sep-17</b>	19	190	0.00	190.00	0.37
<b>Oct-17</b>	18	173	0.00	173.00	0.33
<b>Nov-17</b>	59	590	0.00	590.00	1.14
<b>Dec-17</b>	23	230	0.00	230.00	0.44
<b>Jan-18</b>	6	60	0.00	60.00	0.12
<b>Feb-18</b>	0	0	0.00	0.00	0.00
<b>Mar-18</b>	12	120	0.00	120.00	0.23

**Table 8 Gannet all behaviours abundance estimates for Protective Provision Scenario 13 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Density
<b>Apr-16</b>	3	30	0.00	30.00	0.07
<b>May-16</b>	21	210	0.00	210.00	0.51
<b>Jun-16</b>	83	828	0.00	828.00	2.02
<b>Jul-16</b>	31	309	0.00	309.00	0.75
<b>Aug-16</b>	7	70	0.00	70.00	0.17
<b>Sep-16</b>	24	239	0.00	239.00	0.58
<b>Oct-16</b>	72	719	20.00	739.00	1.80
<b>Nov-16</b>	39	388	0.00	388.00	0.95
<b>Dec-16</b>	19	188	0.00	188.00	0.46
<b>Jan-17</b>	0	0	0.00	0.00	0.00
<b>Feb-17</b>	1	10	0.00	10.00	0.02
<b>Mar-17</b>	16	159	0.00	159.00	0.39
<b>Apr-17</b>	4	40	0.00	40.00	0.10
<b>May-17</b>	7	70	0.00	70.00	0.17
<b>Jun-17</b>	5	50	0.00	50.00	0.12
<b>Jul-17</b>	38	378	0.00	378.00	0.92
<b>Aug-17</b>	39	390	0.00	390.00	0.95
<b>Sep-17</b>	18	179	0.00	179.00	0.44
<b>Oct-17</b>	10	100	0.00	100.00	0.24
<b>Nov-17</b>	47	468	0.00	468.00	1.14
<b>Dec-17</b>	1	10	0.00	10.00	0.02
<b>Jan-18</b>	6	60	0.00	60.00	0.15
<b>Feb-18</b>	0	0	0.00	0.00	0.00
<b>Mar-18</b>	12	120	0.00	120.00	0.29

## Appendix D. Kittiwake monthly MRSea flying density estimates for the modelled protective provision scenarios.

Table 9 Hornsea Four kittiwake monthly density estimates for the protective provision scenarios

Month	Flying density						
	Scenario 1	Scenario 2	Scenario 5	Scenario 6	Scenario 8	Scenario 9	Scenario 13
<b>Jan</b>	0.356	0.293	0.354	0.351	0.331	0.450	0.469
<b>Feb</b>	0.321	0.304	0.319	0.332	0.323	0.355	0.369
<b>Mar</b>	0.249	0.379	0.398	0.404	0.422	0.259	0.255
<b>Apr</b>	0.345	0.948	1.052	1.075	1.186	0.276	0.323
<b>May</b>	1.358	1.648	1.905	1.975	2.145	1.203	1.597
<b>Jun</b>	2.036	1.624	1.488	1.479	1.418	1.989	1.850
<b>Jul</b>	0.741	0.764	0.766	0.769	0.810	0.750	0.765
<b>Aug</b>	1.308	2.557	2.658	2.677	3.339	1.885	2.101
<b>Sep</b>	0.383	0.279	0.223	0.209	0.175	0.332	0.269
<b>Oct</b>	0.133	0.130	0.131	0.131	0.159	0.133	0.172
<b>Nov</b>	0.360	0.380	0.395	0.392	0.398	0.359	0.389
<b>Dec</b>	1.007	0.919	1.147	1.096	0.984	0.757	0.908
<b>Annual</b>	8.596	10.223	10.835	10.891	11.691	8.749	9.466

## Appendix E. Guillemot monthly MRSea abundance estimates for the modelled protective provision scenarios

Table 10 Guillemot all behaviours abundance estimates for Protective Provision Scenario 1 array area plus 2km buffer.

Survey	Abundance	Lower CI	Upper CI	Apportionment	Corrected total	Density
<b>Apr-16</b>	1100.98	549.94	2252.29	108.07	1548.32	4.40
<b>May-16</b>	4402.82	2881.13	6900.39	296.91	6066.21	17.23
<b>Jun-16</b>	5083.26	3214.34	8380.26	238.39	6817.21	19.36
<b>Jul-16</b>	5324.73	3868.47	7476.53	208.69	7188.46	20.42
<b>Aug-16</b>	7128.68	4328.84	11712.11	167.28	9565.01	27.17
<b>Sep-16</b>	13948.79	9425.65	21057.51	607.59	19083.42	54.21
<b>Oct-16</b>	6242.25	4266.16	9219.64	551.76	8890.03	25.25
<b>Nov-16</b>	2204.93	1486.73	3310.87	67.26	2958.70	8.40
<b>Dec-16</b>	1178.05	843.50	1645.34	59.01	1621.78	4.61
<b>Jan-17</b>	2456.25	1908.67	3204.57	52.05	3264.60	9.27
<b>Feb-17</b>	3125.48	2352.97	4256.78	168.35	4266.45	12.12
<b>Mar-17</b>	4443.46	2054.29	9888.82	365.09	5941.61	16.88
<b>Apr-17</b>	785.93	367.06	1729.74	141.17	1198.71	3.40
<b>May-17</b>	3289.93	2016.34	5568.73	259.29	4521.78	12.84
<b>Jun-17</b>	681.89	355.37	1323.83	69.16	947.52	2.69
<b>Jul-17</b>	3184.32	2230.74	4606.22	128.74	4328.50	12.29
<b>Aug-17</b>	22319.70	14928.93	33847.85	1807.34	31627.34	89.84
<b>Sep-17</b>	1883.93	787.16	5056.79	207.20	2673.95	7.60
<b>Oct-17</b>	888.11	650.54	1220.07	76.22	1197.95	3.40
<b>Nov-17</b>	10138.16	6380.59	16300.19	572.04	13955.75	39.64
<b>Dec-17</b>	3739.06	2345.61	6243.77	165.38	5094.43	14.47
<b>Jan-18</b>	1671.72	991.88	2895.19	249.25	2405.24	6.83
<b>Feb-18</b>	2284.38	1782.14	2953.84	93.73	3052.68	8.67
<b>Mar-18</b>	1063.69	786.58	1423.03	44.18	1429.45	4.06



**Table 11 Guillemot all behaviours abundance estimates for Protective Provision Scenario 2 array area plus 2km buffer.**

Survey	Abundance	Lower CI	Upper CI	Apportionment	Corrected total	Density
<b>Apr-16</b>	1340.30	698.39	2625.71	137.90	1899.96	4.13
<b>May-16</b>	5702.23	3543.03	9460.75	512.51	8048.85	17.50
<b>Jun-16</b>	6478.97	4255.95	10304.24	471.20	8927.07	19.41
<b>Jul-16</b>	7299.98	5471.96	9881.87	307.86	9901.31	21.52
<b>Aug-16</b>	7669.46	4701.20	12481.16	246.67	10378.04	22.56
<b>Sep-16</b>	15185.17	10111.43	23407.72	570.88	20656.18	44.91
<b>Oct-16</b>	7698.63	5431.81	11047.56	747.07	11028.81	23.98
<b>Nov-16</b>	2581.32	1674.90	4069.25	78.58	3463.63	7.53
<b>Dec-16</b>	1286.89	903.79	1841.31	70.84	1779.99	3.87
<b>Jan-17</b>	2695.80	2069.00	3570.36	52.91	3578.41	7.78
<b>Feb-17</b>	3520.85	2657.46	4753.72	177.25	4779.57	10.39
<b>Mar-17</b>	6387.09	2980.86	13871.97	496.09	8647.80	18.80
<b>Apr-17</b>	1164.80	571.78	2429.56	221.69	1789.00	3.89
<b>May-17</b>	4469.99	2746.17	7645.65	332.46	6087.44	13.23
<b>Jun-17</b>	766.48	401.47	1482.33	56.68	1024.98	2.23
<b>Jul-17</b>	3373.28	2331.35	4936.20	128.79	4573.07	9.94
<b>Aug-17</b>	37534.04	26791.11	53414.22	2391.07	52338.31	113.78
<b>Sep-17</b>	2450.20	1041.65	6348.57	302.58	3541.26	7.70
<b>Oct-17</b>	1031.97	753.04	1420.45	70.61	1367.09	2.97
<b>Nov-17</b>	16528.20	10646.00	26135.41	731.82	22459.60	48.83
<b>Dec-17</b>	5329.69	3532.48	8318.18	223.25	7238.65	15.74
<b>Jan-18</b>	1991.48	1208.01	3369.62	294.18	2859.04	6.22
<b>Feb-18</b>	2511.34	1943.08	3278.82	105.32	3323.86	7.23
<b>Mar-18</b>	1252.65	913.26	1706.45	52.63	1685.38	3.66

**Table 12 Guillemot all behaviours abundance estimates for Protective Provision Scenario 5 array area plus 2km buffer.**

Survey	Abundance	Lower CI	Upper CI	Apportionment	Corrected total	Density
<b>Apr-16</b>	1327.39	694.35	2586.66	132.91	1869.51	4.63
<b>May-16</b>	5583.50	3452.88	9302.25	502.84	7879.93	19.53
<b>Jun-16</b>	6306.39	4144.61	10032.72	470.13	8697.78	21.56
<b>Jul-16</b>	7177.22	5382.71	9707.82	306.86	9740.23	24.14
<b>Aug-16</b>	7428.80	4550.11	12101.29	245.59	10061.13	24.94
<b>Sep-16</b>	14727.75	9776.39	22779.83	567.94	20052.64	49.70
<b>Oct-16</b>	7517.55	5313.32	10778.39	745.04	10789.42	26.74
<b>Nov-16</b>	2527.01	1637.16	3989.89	61.80	3375.48	8.37
<b>Dec-16</b>	1258.00	882.55	1802.93	70.82	1742.09	4.32
<b>Jan-17</b>	2649.78	2032.15	3512.47	52.94	3523.51	8.73
<b>Feb-17</b>	3443.28	2598.84	4649.94	167.82	4664.86	11.56
<b>Mar-17</b>	6347.10	2957.09	13802.37	460.18	8577.38	21.26
<b>Apr-17</b>	1136.37	558.24	2367.45	218.71	1746.00	4.33
<b>May-17</b>	4396.38	2704.33	7517.16	314.43	5969.12	14.79
<b>Jun-17</b>	731.94	379.78	1428.30	37.67	953.44	2.36
<b>Jul-17</b>	3257.94	2234.25	4796.42	108.91	4396.41	10.90
<b>Aug-17</b>	37263.11	26634.76	52955.34	2386.90	51977.65	128.82
<b>Sep-17</b>	2448.67	1041.57	6319.13	313.08	3554.10	8.81
<b>Oct-17</b>	1014.57	738.86	1398.95	71.25	1347.06	3.34
<b>Nov-17</b>	16403.04	10550.71	25968.80	730.63	22293.90	55.25
<b>Dec-17</b>	5250.43	3490.81	8169.41	212.75	7121.02	17.65
<b>Jan-18</b>	1965.52	1187.99	3335.64	293.04	2828.27	7.01
<b>Feb-18</b>	2450.61	1893.18	3205.07	104.83	3242.62	8.04
<b>Mar-18</b>	1223.65	889.76	1671.18	52.47	1647.12	4.08

**Table 13 Guillemot all behaviours abundance estimates for Protective Provision Scenario 6 array area plus 2km buffer.**

Survey	Abundance	Lower CI	Upper CI	Apportionment	Corrected total	Density
<b>Apr-16</b>	1299.19	683.80	2507.72	132.16	1831.08	4.66
<b>May-16</b>	5363.67	3301.12	8976.37	469.59	7552.04	19.21
<b>Jun-16</b>	6019.07	3960.38	9573.88	457.86	8316.13	21.16
<b>Jul-16</b>	6963.27	5229.66	9394.41	295.91	9450.32	24.04
<b>Aug-16</b>	7241.00	4450.36	11741.85	244.51	9813.51	24.97
<b>Sep-16</b>	14234.08	9469.55	21972.52	564.65	19401.14	49.36
<b>Oct-16</b>	7230.22	5120.86	10353.21	721.62	10382.99	26.41
<b>Nov-16</b>	2429.74	1568.98	3850.51	62.13	3248.32	8.26
<b>Dec-16</b>	1197.27	838.01	1720.96	60.01	1648.29	4.19
<b>Jan-17</b>	2543.82	1948.02	3378.30	52.64	3384.12	8.61
<b>Feb-17</b>	3258.02	2463.59	4388.74	156.85	4408.30	11.21
<b>Mar-17</b>	6236.87	2893.94	13606.25	457.97	8435.12	21.46
<b>Apr-17</b>	1105.68	544.61	2296.36	218.97	1705.24	4.34
<b>May-17</b>	4287.70	2642.29	7319.37	289.50	5789.36	14.73
<b>Jun-17</b>	696.82	361.97	1359.91	37.35	912.96	2.32
<b>Jul-17</b>	3122.21	2129.42	4616.97	99.20	4206.03	10.70
<b>Aug-17</b>	36564.77	26268.73	51656.26	2378.23	51050.78	129.87
<b>Sep-17</b>	2441.97	1040.44	6266.85	304.84	3534.15	8.99
<b>Oct-17</b>	982.02	713.47	1356.87	70.24	1308.36	3.33
<b>Nov-17</b>	16141.34	10373.22	25581.03	725.33	21938.03	55.81
<b>Dec-17</b>	5116.67	3429.55	7881.52	211.69	6944.75	17.67
<b>Jan-18</b>	1917.33	1155.65	3263.04	292.49	2765.66	7.04
<b>Feb-18</b>	2335.52	1800.27	3061.90	104.23	3094.65	7.87
<b>Mar-18</b>	1167.05	847.79	1595.88	51.63	1570.15	3.99

**Table 14 Guillemot all behaviours abundance estimates for Protective Provision Scenario 8 array area plus 2km buffer.**

Survey	Abundance	Lower CI	Upper CI	Apportionment	Corrected total	Density
<b>Apr-16</b>	1195.65	644.17	2219.15	108.54	1673.50	4.82
<b>May-16</b>	4504.31	2712.46	7697.83	428.97	6372.24	18.34
<b>Jun-16</b>	4911.93	3269.81	7754.04	428.94	6862.73	19.75
<b>Jul-16</b>	6153.30	4657.15	8198.75	276.86	8379.55	24.12
<b>Aug-16</b>	6473.18	4030.39	10311.24	225.94	8782.54	25.27
<b>Sep-16</b>	12340.80	8271.39	18934.31	435.35	16749.53	48.20
<b>Oct-16</b>	6138.78	4413.21	8679.37	713.24	8943.07	25.74
<b>Nov-16</b>	2076.79	1324.32	3338.53	52.67	2774.38	7.98
<b>Dec-16</b>	975.65	678.58	1414.79	51.00	1345.94	3.87
<b>Jan-17</b>	2161.74	1646.56	2890.67	52.09	2883.04	8.30
<b>Feb-17</b>	2580.98	1973.54	3417.31	108.00	3471.06	9.99
<b>Mar-17</b>	5824.31	2666.16	12839.54	335.93	7733.86	22.26
<b>Apr-17</b>	995.98	497.42	2033.19	172.47	1498.50	4.31
<b>May-17</b>	3884.66	2413.65	6581.66	273.04	5250.17	15.11
<b>Jun-17</b>	551.99	287.25	1080.76	17.71	710.10	2.04
<b>Jul-17</b>	2608.10	1733.68	3937.32	99.07	3535.07	10.17
<b>Aug-17</b>	33948.47	24879.52	46756.56	2149.63	47320.91	136.18
<b>Sep-17</b>	2406.78	1030.86	6063.02	257.90	3478.59	10.01
<b>Oct-17</b>	863.25	621.09	1203.20	69.82	1160.39	3.34
<b>Nov-17</b>	15145.40	9698.80	24097.76	727.16	20631.26	59.37
<b>Dec-17</b>	4613.90	3196.28	6790.48	160.36	6210.32	17.87
<b>Jan-18</b>	1737.48	1034.98	2989.17	283.21	2538.63	7.31
<b>Feb-18</b>	1912.45	1461.83	2532.42	88.15	2510.32	7.22
<b>Mar-18</b>	953.57	689.86	1310.08	50.11	1288.58	3.71

**Table 15 Guillemot all behaviours abundance estimates for Protective Provision Scenario 9 array area plus 2km buffer.**

Survey	Abundance	Lower CI	Upper CI	Apportionment	Corrected total	Density
<b>Apr-16</b>	1091.71	547.21	2216.60	105.29	1535.85	5.15
<b>May-16</b>	4246.02	2777.71	6661.68	296.91	5863.60	19.65
<b>Jun-16</b>	4855.72	3086.43	7967.44	238.17	6542.19	21.93
<b>Jul-16</b>	5190.09	3778.66	7263.91	208.68	7013.00	23.51
<b>Aug-16</b>	6921.66	4213.19	11345.72	167.27	9293.60	31.15
<b>Sep-16</b>	13549.98	9157.61	20468.98	565.22	18505.02	62.03
<b>Oct-16</b>	6040.15	4157.44	8857.35	532.23	8599.69	28.83
<b>Nov-16</b>	2154.71	1455.16	3229.59	67.23	2892.92	9.70
<b>Dec-16</b>	1148.72	824.87	1599.92	59.01	1583.33	5.31
<b>Jan-17</b>	2416.02	1878.92	3150.22	52.06	3212.27	10.77
<b>Feb-17</b>	3034.80	2292.68	4114.03	168.24	4145.59	13.90
<b>Mar-17</b>	4401.23	2033.20	9797.76	366.13	5886.17	19.73
<b>Apr-17</b>	761.49	356.87	1666.60	140.68	1166.06	3.91
<b>May-17</b>	3223.91	1984.76	5434.19	259.01	4435.80	14.87
<b>Jun-17</b>	638.68	331.08	1247.56	59.06	876.12	2.94
<b>Jul-17</b>	3077.55	2145.28	4469.82	128.70	4188.53	14.04
<b>Aug-17</b>	21973.31	14731.87	33215.64	1809.29	31175.80	104.50
<b>Sep-17</b>	1881.80	786.51	5035.64	198.34	2661.36	8.92
<b>Oct-17</b>	873.37	639.13	1200.91	75.56	1181.51	3.96
<b>Nov-17</b>	9998.01	6282.30	16097.07	572.86	13773.58	46.17
<b>Dec-17</b>	3657.38	2307.93	6062.64	165.85	4988.23	16.72
<b>Jan-18</b>	1650.34	977.22	2863.59	248.97	2381.88	7.98
<b>Feb-18</b>	2222.33	1735.06	2872.83	93.70	2972.56	9.96
<b>Mar-18</b>	1028.81	760.54	1376.17	43.91	1383.02	4.64

**Table 16 Guillemot all behaviours abundance estimates for Protective Provision Scenario 13 array area plus 2km buffer.**

Survey	Abundance	Lower CI	Upper CI	Apportionment	Corrected total	Density
<b>Apr-16</b>	947.84	493.30	1812.15	79.04	1314.16	6.03
<b>May-16</b>	3056.23	1952.91	4910.40	212.67	4179.21	19.17
<b>Jun-16</b>	3298.53	2106.60	5432.84	196.30	4491.56	20.60
<b>Jul-16</b>	4051.29	2969.55	5592.08	178.79	5504.51	25.25
<b>Aug-16</b>	5734.52	3547.92	9190.97	147.60	7711.45	35.37
<b>Sep-16</b>	10724.76	7330.86	16023.45	431.07	14625.29	67.08
<b>Oct-16</b>	4490.75	3145.96	6504.36	500.47	6528.33	29.94
<b>Nov-16</b>	1653.11	1106.56	2503.22	42.97	2209.06	10.13
<b>Dec-16</b>	839.17	600.86	1175.76	40.00	1152.59	5.29
<b>Jan-17</b>	1884.81	1458.75	2474.18	50.87	2520.17	11.56
<b>Feb-17</b>	2099.98	1612.48	2784.67	98.91	2844.14	13.04
<b>Mar-17</b>	3842.48	1720.88	8772.28	206.66	4936.50	22.64
<b>Apr-17</b>	593.71	282.99	1272.59	89.67	877.76	4.03
<b>May-17</b>	2642.64	1654.70	4377.13	199.81	3607.15	16.54
<b>Jun-17</b>	425.63	217.70	848.47	20.00	564.36	2.59
<b>Jul-17</b>	2317.10	1551.39	3476.94	98.98	3156.57	14.48
<b>Aug-17</b>	18413.61	12835.17	26602.67	1555.55	26176.15	120.05
<b>Sep-17</b>	1838.69	775.80	4752.20	153.17	2600.42	11.93
<b>Oct-17</b>	705.68	507.98	984.96	75.12	977.01	4.48
<b>Nov-17</b>	8626.44	5343.28	14074.92	565.73	11962.19	54.86
<b>Dec-17</b>	2946.57	1974.32	4544.52	99.51	3962.71	18.17
<b>Jan-18</b>	1398.00	805.38	2485.49	238.01	2063.49	9.46
<b>Feb-18</b>	1626.83	1256.53	2130.66	76.57	2168.74	9.95
<b>Mar-18</b>	731.58	538.58	982.18	40.97	987.33	4.53

## Appendix F. Razorbill monthly design-based abundance estimates for the modelled protective provision scenarios

**Table 17** Razorbill all behaviours abundance estimates for Protective Provision Scenario 1 array area plus 2km buffer.

Survey	Raw count	Abundance	Apportionment	Apportioned total	Corrected total	Density
<b>Apr-16</b>	8	80	11.11	91.11	106.54	0.30
<b>May-16</b>	3	30	1.98	31.98	38.73	0.11
<b>Jun-16</b>	14	140	9.01	149.01	180.45	0.51
<b>Jul-16</b>	3	30	1.31	31.31	37.91	0.11
<b>Aug-16</b>	4	40	1.09	41.09	49.76	0.14
<b>Sep-16</b>	309	3076	108.03	3184.03	3855.86	10.95
<b>Oct-16</b>	28	280	46.22	326.22	376.07	1.07
<b>Nov-16</b>	15	149	22.69	171.69	195.26	0.55
<b>Dec-16</b>	2	20	0.99	20.99	25.42	0.07
<b>Jan-17</b>	38	379	7.95	386.95	468.60	1.33
<b>Feb-17</b>	3	30	1.58	31.58	38.25	0.11
<b>Mar-17</b>	20	200	24.91	224.91	261.14	0.74
<b>Apr-17</b>	19	190	26.66	216.66	249.91	0.71
<b>May-17</b>	31	310	25.30	335.30	389.96	1.11
<b>Jun-17</b>	0	0	0.00	0.00	0.00	0.00
<b>Jul-17</b>	1	10	0.39	10.39	12.59	0.04
<b>Aug-17</b>	302	3022	252.55	3274.55	3965.47	11.26
<b>Sep-17</b>	31	310	43.72	353.72	407.96	1.16
<b>Oct-17</b>	8	76	9.78	85.78	89.02	0.25
<b>Nov-17</b>	50	499	26.87	525.87	633.81	1.80
<b>Dec-17</b>	5	50	2.16	52.16	63.17	0.18
<b>Jan-18</b>	5	50	10.24	60.24	72.95	0.21
<b>Feb-18</b>	25	250	15.35	265.35	308.87	0.88
<b>Mar-18</b>	16	160	5.82	165.82	200.81	0.57

**Table 18 Razorbill all behaviours abundance estimates for Protective Provision Scenario 2 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Corrected total	Density
<b>Apr-16</b>	11	110	14.04	124.04	146.42	0.32
<b>May-16</b>	3	30	2.26	32.26	39.07	0.08
<b>Jun-16</b>	20	200	14.88	214.88	260.22	0.57
<b>Jul-16</b>	7	70	3.14	73.14	86.37	0.19
<b>Aug-16</b>	5	50	1.81	51.81	62.74	0.14
<b>Sep-16</b>	302	3023	99.03	3122.03	3780.78	8.22
<b>Oct-16</b>	44	441	49.92	490.92	575.85	1.25
<b>Nov-16</b>	19	190	21.34	211.34	243.74	0.53
<b>Dec-16</b>	2	21	1.16	22.16	26.83	0.06
<b>Jan-17</b>	40	401	7.09	408.09	492.09	1.07
<b>Feb-17</b>	7	70	2.69	72.69	83.81	0.18
<b>Mar-17</b>	41	411	34.29	445.29	516.86	1.12
<b>Apr-17</b>	20	200	32.55	232.55	269.56	0.59
<b>May-17</b>	41	411	32.05	443.05	511.98	1.11
<b>Jun-17</b>	1	10	1.66	11.66	14.12	0.03
<b>Jul-17</b>	1	10	0.38	10.38	12.57	0.03
<b>Aug-17</b>	366	3673	263.40	3936.40	4766.98	10.36
<b>Sep-17</b>	42	421	66.38	487.38	559.47	1.22
<b>Oct-17</b>	23	231	19.39	250.39	254.84	0.55
<b>Nov-17</b>	52	520	38.08	558.08	665.86	1.45
<b>Dec-17</b>	6	60	2.53	62.53	75.72	0.16
<b>Jan-18</b>	5	50	10.14	60.14	72.83	0.16
<b>Feb-18</b>	27	271	13.42	284.42	331.43	0.72
<b>Mar-18</b>	18	181	6.80	187.80	227.42	0.49



**Table 19 Razorbill all behaviours abundance estimates for Protective Provision Scenario 5 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Corrected total	Density
<b>Apr-16</b>	11	110	15.84	125.84	148.59	0.37
<b>May-16</b>	3	30	2.28	32.28	39.10	0.10
<b>Jun-16</b>	20	200	14.94	214.94	260.29	0.65
<b>Jul-16</b>	7	70	3.14	73.14	86.37	0.21
<b>Aug-16</b>	5	50	1.84	51.84	62.78	0.16
<b>Sep-16</b>	272	2714	90.02	2804.02	3395.67	8.42
<b>Oct-16</b>	44	440	49.94	489.94	574.66	1.42
<b>Nov-16</b>	19	190	8.12	198.12	230.55	0.57
<b>Dec-16</b>	2	21	1.18	22.18	26.85	0.07
<b>Jan-17</b>	39	390	7.06	397.06	478.73	1.19
<b>Feb-17</b>	6	60	2.11	62.11	71.00	0.18
<b>Mar-17</b>	42	424	33.23	457.23	530.98	1.32
<b>Apr-17</b>	20	200	34.99	234.99	272.51	0.68
<b>May-17</b>	41	410	30.72	440.72	509.16	1.26
<b>Jun-17</b>	1	10	1.22	11.22	13.58	0.03
<b>Jul-17</b>	1	10	0.32	10.32	12.50	0.03
<b>Aug-17</b>	361	3616	262.41	3878.41	4696.76	11.64
<b>Sep-17</b>	40	400	64.34	464.34	531.57	1.32
<b>Oct-17</b>	23	235	20.75	255.75	259.22	0.64
<b>Nov-17</b>	52	519	38.27	557.27	664.87	1.65
<b>Dec-17</b>	6	60	2.44	62.44	75.61	0.19
<b>Jan-18</b>	5	50	10.13	60.13	72.81	0.18
<b>Feb-18</b>	26	260	13.82	273.82	319.76	0.79
<b>Mar-18</b>	18	182	6.94	188.94	228.81	0.57

**Table 20 Razorbill all behaviours abundance estimates for Protective Provision Scenario 6 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Corrected total	Density
<b>Apr-16</b>	11	110	16.14	126.14	148.95	0.38
<b>May-16</b>	3	30	2.33	32.33	39.15	0.10
<b>Jun-16</b>	20	199	15.13	214.13	259.31	0.66
<b>Jul-16</b>	7	70	3.09	73.09	86.30	0.22
<b>Aug-16</b>	5	50	1.87	51.87	62.82	0.16
<b>Sep-16</b>	262	2600	89.27	2689.27	3256.71	8.29
<b>Oct-16</b>	44	437	49.34	486.34	571.50	1.45
<b>Nov-16</b>	17	169	7.79	176.79	204.71	0.52
<b>Dec-16</b>	2	20	0.99	20.99	25.42	0.06
<b>Jan-17</b>	39	388	7.36	395.36	476.67	1.21
<b>Feb-17</b>	6	60	2.09	62.09	70.97	0.18
<b>Mar-17</b>	42	422	33.42	455.42	527.79	1.34
<b>Apr-17</b>	19	189	34.91	223.91	259.09	0.66
<b>May-17</b>	34	338	24.37	362.37	414.49	1.05
<b>Jun-17</b>	1	10	1.39	11.39	13.80	0.04
<b>Jul-17</b>	1	10	0.30	10.30	12.47	0.03
<b>Aug-17</b>	355	3537	258.76	3795.76	4596.67	11.69
<b>Sep-17</b>	39	388	62.23	450.23	514.70	1.31
<b>Oct-17</b>	23	234	21.76	255.76	259.24	0.66
<b>Nov-17</b>	52	517	39.56	556.56	664.02	1.69
<b>Dec-17</b>	6	60	2.47	62.47	75.66	0.19
<b>Jan-18</b>	5	50	10.30	60.30	73.02	0.19
<b>Feb-18</b>	26	258	14.39	272.39	319.20	0.81
<b>Mar-18</b>	18	181	7.72	188.72	228.54	0.58

**Table 21 Razorbill all behaviours abundance estimates for Protective Provision Scenario 8 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Corrected total	Density
<b>Apr-16</b>	10	100	8.63	108.63	131.55	0.38
<b>May-16</b>	0	0	0.00	0.00	0.00	0.00
<b>Jun-16</b>	20	200	17.23	217.23	263.06	0.76
<b>Jul-16</b>	7	70	3.14	73.14	86.33	0.25
<b>Aug-16</b>	5	50	1.80	51.80	62.73	0.18
<b>Sep-16</b>	198	1981	63.39	2044.39	2475.76	7.12
<b>Oct-16</b>	43	430	51.18	481.18	564.05	1.62
<b>Nov-16</b>	16	160	7.24	167.24	193.15	0.56
<b>Dec-16</b>	0	0	0.00	0.00	0.00	0.00
<b>Jan-17</b>	37	370	7.91	377.91	455.54	1.31
<b>Feb-17</b>	6	60	1.95	61.95	70.81	0.20
<b>Mar-17</b>	35	350	23.40	373.40	430.22	1.24
<b>Apr-17</b>	11	110	22.95	132.95	148.70	0.43
<b>May-17</b>	30	300	22.05	322.05	365.70	1.05
<b>Jun-17</b>	1	10	0.81	10.81	13.09	0.04
<b>Jul-17</b>	1	10	0.35	10.35	12.53	0.04
<b>Aug-17</b>	350	3507	263.69	3770.69	4566.31	13.14
<b>Sep-17</b>	36	360	71.46	431.46	488.74	1.41
<b>Oct-17</b>	23	239	24.18	263.18	268.93	0.77
<b>Nov-17</b>	52	519	41.73	560.73	669.07	1.93
<b>Dec-17</b>	2	20	0.91	20.91	25.32	0.07
<b>Jan-18</b>	5	50	11.32	61.32	74.26	0.21
<b>Feb-18</b>	17	170	10.46	180.46	209.00	0.60
<b>Mar-18</b>	18	180	9.13	189.13	229.03	0.66

**Table 22 Razorbill all behaviours abundance estimates for Protective Provision Scenario 9 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Corrected total	Density
<b>Apr-16</b>	8	80	12.05	92.05	107.48	0.36
<b>May-16</b>	3	30	1.98	31.98	38.73	0.13
<b>Jun-16</b>	14	140	9.19	149.19	180.67	0.61
<b>Jul-16</b>	3	30	1.32	31.32	37.92	0.13
<b>Aug-16</b>	4	40	1.10	41.10	49.77	0.17
<b>Sep-16</b>	302	3011	101.73	3112.73	3769.52	12.64
<b>Oct-16</b>	28	280	45.80	325.80	375.55	1.26
<b>Nov-16</b>	15	149	22.72	171.72	195.30	0.65
<b>Dec-16</b>	2	20	0.99	20.99	25.42	0.09
<b>Jan-17</b>	38	379	7.94	386.94	468.59	1.57
<b>Feb-17</b>	3	30	1.69	31.69	38.38	0.13
<b>Mar-17</b>	19	190	23.87	213.87	247.78	0.83
<b>Apr-17</b>	19	190	27.10	217.10	250.44	0.84
<b>May-17</b>	31	310	25.51	335.51	390.22	1.31
<b>Jun-17</b>	0	0	0.00	0.00	0.00	0.00
<b>Jul-17</b>	1	10	0.41	10.41	12.60	0.04
<b>Aug-17</b>	302	3027	254.87	3281.87	3974.35	13.32
<b>Sep-17</b>	30	300	42.91	342.91	394.71	1.32
<b>Oct-17</b>	8	77	10.44	87.44	89.68	0.30
<b>Nov-17</b>	50	500	27.06	527.06	635.25	2.13
<b>Dec-17</b>	5	50	2.19	52.19	63.20	0.21
<b>Jan-18</b>	5	50	10.50	60.50	73.27	0.25
<b>Feb-18</b>	25	250	15.37	265.37	308.89	1.04
<b>Mar-18</b>	16	160	6.09	166.09	201.13	0.67

**Table 23 Razorbill all behaviours abundance estimates for Protective Provision Scenario 13 array area plus 2km buffer.**

Survey	Raw count	Abundance	Apportionment	Apportioned total	Corrected total	Density
<b>Apr-16</b>	7	70	4.88	74.88	90.68	0.42
<b>May-16</b>	0	0	0.00	0.00	0.00	0.00
<b>Jun-16</b>	14	140	12.24	152.24	184.37	0.85
<b>Jul-16</b>	3	30	1.21	31.21	37.80	0.17
<b>Aug-16</b>	4	40	1.07	41.07	49.73	0.23
<b>Sep-16</b>	198	1971	65.69	2036.69	2466.44	11.31
<b>Oct-16</b>	27	269	46.28	315.28	364.02	1.67
<b>Nov-16</b>	12	119	6.97	125.97	144.27	0.66
<b>Dec-16</b>	0	0	0.00	0.00	0.00	0.00
<b>Jan-17</b>	35	348	9.13	357.13	432.48	1.98
<b>Feb-17</b>	2	20	1.04	21.04	25.48	0.12
<b>Mar-17</b>	13	130	13.34	143.34	162.69	0.75
<b>Apr-17</b>	10	100	20.33	120.33	132.83	0.61
<b>May-17</b>	20	199	16.13	215.13	245.85	1.13
<b>Jun-17</b>	0	0	0.00	0.00	0.00	0.00
<b>Jul-17</b>	1	10	0.38	10.38	12.57	0.06
<b>Aug-17</b>	286	2859	265.62	3124.62	3783.92	17.35
<b>Sep-17</b>	24	239	49.29	288.29	325.49	1.49
<b>Oct-17</b>	8	80	14.88	94.88	97.16	0.45
<b>Nov-17</b>	50	498	32.18	530.18	639.03	2.93
<b>Dec-17</b>	1	10	0.49	10.49	12.71	0.06
<b>Jan-18</b>	5	50	11.99	61.99	75.07	0.34
<b>Feb-18</b>	15	150	12.43	162.43	186.48	0.86
<b>Mar-18</b>	16	160	9.03	169.03	204.69	0.94

## Appendix G. Collision risk modelling input parameters and EIA level monthly results for gannet

Table 24 Hornsea Four gannet monthly collision risk comparison of protective provision scenario predicted collision impacts (EIA) following Natural England's preferred parameters at the end of Examination

Month	End of Examination	Scenario 1			Scenario 2			Scenario 5			Scenario 6			Scenario 8			Scenario 9			Scenario 13		
		Predicted Collisions (BO2)	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference
Jan	0.2	0.2	0.0	26%	0.2	0.0	0%	0.2	0.0	7%	0.2	0.0	9%	0.2	0.0	16%	0.2	0.1	38%	0.3	0.1	70%
Feb	0.2	0.2	0.0	-4%	0.2	0.0	-6%	0.2	-0.1	-26%	0.1	-0.1	-29%	0.1	-0.1	-36%	0.2	-0.1	-28%	0.1	-0.1	-59%
Mar	1.4	1.7	0.3	22%	1.4	0.0	1%	1.6	0.2	16%	1.6	0.2	18%	1.7	0.3	21%	1.8	0.4	27%	2.5	1.2	84%
Apr	0.5	0.5	0.0	3%	0.5	0.0	-1%	0.6	0.0	8%	0.6	0.0	7%	0.5	0.0	4%	0.7	0.2	29%	0.6	0.1	13%
May	0.9	1.2	0.3	35%	0.8	-0.1	-9%	0.6	-0.3	-30%	0.6	-0.3	-33%	0.5	-0.3	-40%	1.0	0.1	13%	0.7	-0.2	-19%
Jun	4.2	4.4	0.3	7%	4.0	-0.1	-3%	4.0	-0.2	-5%	4.5	0.3	8%	3.9	-0.2	-5%	4.4	0.3	7%	3.9	-0.2	-6%
Jul	4.2	4.8	0.6	15%	4.2	0.0	0%	4.4	0.2	5%	4.4	0.2	5%	4.6	0.4	10%	5.2	1.0	24%	5.8	1.6	39%
Aug	3.4	2.8	-0.6	-18%	3.5	0.1	2%	3.5	0.1	3%	3.6	0.1	4%	3.8	0.4	10%	2.7	-0.7	-22%	2.9	-0.6	-17%
Sep	1.2	1.4	0.2	16%	1.2	0.0	1%	1.2	0.0	-1%	1.2	0.0	-3%	1.2	0.0	-1%	1.5	0.3	21%	1.5	0.3	28%
Oct	1.2	1.4	0.2	14%	1.2	0.0	0%	1.0	-0.2	-17%	1.0	-0.2	-15%	1.4	0.2	14%	1.2	0.0	-1%	1.7	0.5	41%
Nov	4.0	3.5	-0.6	-14%	4.1	0.0	1%	4.4	0.3	9%	4.3	0.3	8%	4.7	0.7	17%	3.8	-0.3	-6%	4.2	0.2	4%
Dec	0.9	1.0	0.1	8%	0.9	-0.1	-6%	1.2	0.3	31%	1.2	0.2	24%	1.0	0.0	3%	0.7	-0.2	-20%	1.0	0.1	7%
Annual	22.3	23.1	0.812	4%	22.1	-0.148	-1%	22.8	0.5	2%	23.3	1.0	4%	23.6	1.3	6%	23.3	1.0	4%	25.2	2.9	13%

Table 25 Hornsea Four gannet monthly collision risk comparison of protective provision scenario predicted collision impacts (EIA) following Natural England's Annex 1: Interim guidance on collision risk modelling and avoidance rates

Month	RFI#4 Results	Scenario 1			Scenario 2			Scenario 5			Scenario 6			Scenario 8			Scenario 9			Scenario 13		
		Predicted Collisions (BO2)	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference
Jan	4.5	5.7	1.2	26%	4.5	0.0	0%	4.8	0.3	7%	4.9	0.4	9%	5.3	0.7	16%	6.3	1.7	38%	7.7	3.2	70%
Feb	0.1	0.1	0.0	-4%	0.1	0.0	-6%	0.1	0.0	-26%	0.1	0.0	-29%	0.1	0.0	-36%	0.1	0.0	-28%	0.1	-0.1	-59%
Mar	0.7	0.9	0.2	22%	0.8	0.0	1%	0.9	0.1	16%	0.9	0.1	18%	0.9	0.2	21%	1.0	0.2	27%	1.4	0.6	84%
Apr	0.3	0.3	0.0	3%	0.3	0.0	-1%	0.3	0.0	8%	0.3	0.0	7%	0.3	0.0	4%	0.4	0.1	29%	0.3	0.0	13%
May	0.9	1.2	0.3	35%	0.8	-0.1	-9%	0.6	-0.3	-30%	0.6	-0.3	-33%	0.6	-0.4	-40%	1.1	0.1	13%	0.8	-0.2	-19%
Jun	2.5	2.6	0.2	7%	2.4	-0.1	-3%	2.4	-0.1	-5%	2.7	0.2	8%	2.3	-0.1	-5%	2.6	0.2	7%	2.3	-0.1	-6%
Jul	2.5	2.8	0.4	15%	2.5	0.0	0%	2.6	0.1	5%	2.6	0.1	5%	2.7	0.2	10%	3.0	0.6	24%	3.4	1.0	39%
Aug	2.0	1.6	-0.4	-18%	2.0	0.0	2%	2.0	0.1	3%	2.1	0.1	4%	2.2	0.2	10%	1.5	-0.4	-22%	1.6	-0.3	-17%
Sep	0.7	0.8	0.1	16%	0.7	0.0	1%	0.7	0.0	-1%	0.7	0.0	-3%	0.7	0.0	-1%	0.8	0.1	21%	0.9	0.2	28%
Oct	0.6	0.7	0.1	14%	0.6	0.0	0%	0.5	-0.1	-17%	0.5	-0.1	-15%	0.7	0.1	14%	0.6	0.0	-1%	0.9	0.3	41%
Nov	2.0	1.7	-0.3	-14%	2.0	0.0	1%	2.2	0.2	9%	2.2	0.2	8%	2.4	0.3	17%	1.9	-0.1	-6%	2.1	0.1	4%
Dec	0.4	0.5	0.0	8%	0.4	0.0	-6%	0.6	0.1	31%	0.6	0.1	24%	0.5	0.0	3%	0.4	-0.1	-20%	0.5	0.0	7%
Annual	17.3	19.1	1.8	10%	17.2	-0.1	-1%	17.7	0.4	2%	18.1	0.8	5%	18.6	1.3	7%	19.7	2.4	14%	22.0	4.6	27%

## Appendix H. Collision risk modelling input parameters and EIA level monthly results for kittiwake

Table 26 Hornsea Four kittiwake monthly collision risk comparison of protective provision scenario predicted collision impacts (EIA) following Natural England's preferred parameters at the end of Examination

Month	End of Examination	Scenario 1			Scenario 2			Scenario 5			Scenario 6			Scenario 8			Scenario 9			Scenario 13			
		Predicted Collisions (BO2)	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change
Jan		2.3	2.8	0.5	22%	2.3	0.0	0%	2.8	0.5	21%	2.7	0.5	20%	2.6	0.3	13%	3.5	1.2	54%	3.7	1.4	61%
Feb		2.3	2.4	0.1	4%	2.3	0.0	-1%	2.4	0.1	4%	2.5	0.2	8%	2.4	0.1	5%	2.6	0.4	15%	2.7	0.5	20%
Mar		3.3	2.2	-1.1	-34%	3.3	0.0	1%	3.5	0.2	6%	3.5	0.3	8%	3.7	0.4	13%	2.3	-1.0	-31%	2.2	-1.1	-32%
Apr		8.4	3.1	-5.3	-63%	8.4	0.1	1%	9.4	1.0	12%	9.6	1.2	14%	10.5	2.2	26%	2.5	-5.9	-71%	2.9	-5.5	-66%
May		15.8	13.1	-2.7	-17%	15.9	0.1	1%	18.4	2.6	16%	19.0	3.3	21%	20.7	4.9	31%	11.6	-4.2	-27%	15.4	-0.4	-3%
Jun		15.8	19.2	3.4	22%	15.4	-0.5	-3%	14.1	-1.8	-11%	14.0	-1.8	-12%	13.4	-2.4	-15%	18.8	3.0	19%	17.5	1.7	11%
Jul		7.4	7.1	-0.3	-4%	7.4	-0.1	-1%	7.4	-0.1	-1%	7.4	0.0	0%	7.8	0.4	5%	7.2	-0.2	-3%	7.4	-0.1	-1%
Aug		23.8	12.2	-11.6	-49%	23.8	0.0	0%	24.7	0.9	4%	24.9	1.1	5%	31.1	7.3	31%	17.5	-6.2	-26%	19.5	-4.2	-18%
Sep		2.5	3.3	0.8	30%	2.4	-0.1	-6%	1.9	-0.6	-25%	1.8	-0.7	-29%	1.5	-1.0	-41%	2.9	0.3	13%	2.3	-0.2	-9%
Oct		1.1	1.1	0.0	2%	1.1	0.0	0%	1.1	0.0	0%	1.1	0.0	1%	1.4	0.2	23%	1.1	0.0	2%	1.5	0.4	32%
Nov		2.9	2.8	-0.1	-5%	2.9	0.0	0%	3.0	0.1	4%	3.0	0.1	3%	3.1	0.1	5%	2.8	-0.2	-5%	3.0	0.1	3%
Dec		7.4	7.7	0.4	5%	7.1	-0.3	-4%	8.8	1.5	20%	8.4	1.1	15%	7.6	0.2	3%	5.8	-1.5	-21%	7.0	-0.4	-5%
Annual		92.9	77.0	-15.9	-17%	92.2	-0.8	-1%	97.4	4.5	5%	98.0	5.1	5%	105.7	12.7	14%	78.6	-14.3	-15%	85.1	-7.9	-8%



Table 27 Hornsea Four kittiwake monthly collision risk comparison of protective provision scenario predicted collision impacts (EIA) following Natural England's Annex 1: Interim guidance on collision risk modelling and avoidance rates

Month	RFI#4 Results	Scenario 1			Scenario 2			Scenario 5			Scenario 6			Scenario 8			Scenario 9			Scenario 13		
		Predicted Collisions (BO2)	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference	% change	Predicted Collisions	Difference
Jan	1.3	1.5	0.3	22%	1.3	0.0	0%	1.5	0.3	21%	1.5	0.3	20%	1.4	0.2	13%	1.9	0.7	54%	2.0	0.8	61%
Feb	1.3	1.3	0.1	4%	1.3	0.0	-1%	1.3	0.1	4%	1.4	0.1	8%	1.4	0.1	5%	1.5	0.2	15%	1.5	0.3	20%
Mar	1.9	1.3	-0.6	-34%	1.9	0.0	1%	2.0	0.1	6%	2.1	0.1	8%	2.1	0.2	13%	1.3	-0.6	-31%	1.3	-0.6	-32%
Apr	5.3	1.9	-3.4	-63%	5.3	0.0	1%	5.9	0.6	12%	6.1	0.8	14%	6.7	1.4	26%	1.6	-3.7	-71%	1.8	-3.5	-66%
May	9.6	7.9	-1.6	-17%	9.6	0.1	1%	11.1	1.6	16%	11.6	2.0	21%	12.5	3.0	31%	7.0	-2.5	-27%	9.3	-0.2	-3%
Jun	9.6	11.7	2.1	22%	9.3	-0.3	-3%	8.5	-1.1	-11%	8.5	-1.1	-12%	8.1	-1.5	-15%	11.4	1.8	19%	10.6	1.0	11%
Jul	4.5	4.3	-0.2	-4%	4.5	0.0	-1%	4.5	0.0	-1%	4.5	0.0	0%	4.7	0.2	5%	4.4	-0.1	-3%	4.5	0.0	-1%
Aug	14.0	7.2	-6.9	-49%	14.0	0.0	0%	14.6	0.6	4%	14.7	0.7	5%	18.3	4.3	31%	10.3	-3.7	-26%	11.5	-2.5	-18%
Sep	1.9	2.4	0.6	30%	1.7	-0.1	-6%	1.4	-0.5	-25%	1.3	-0.5	-29%	1.1	-0.8	-41%	2.1	0.2	13%	1.7	-0.2	-9%
Oct	0.6	0.7	0.0	2%	0.6	0.0	0%	0.6	0.0	0%	0.6	0.0	1%	0.8	0.1	23%	0.7	0.0	2%	0.8	0.2	32%
Nov	1.6	1.6	-0.1	-5%	1.6	0.0	0%	1.7	0.1	4%	1.7	0.1	3%	1.7	0.1	5%	1.6	-0.1	-5%	1.7	0.0	3%
Dec	4.2	4.5	0.2	5%	4.1	-0.2	-4%	5.1	0.8	20%	4.9	0.6	15%	4.4	0.1	3%	3.4	-0.9	-21%	4.0	-0.2	-5%
Annual	55.8	46.3	-9.5	-17%	55.4	-0.5	-1%	58.4	2.6	5%	58.8	2.9	5%	63.3	7.5	13%	47.1	-8.7	-16%	50.9	-5.0	-9%

## Appendix I. Seasonal FFC Apportionment displacement matrices for gannet using Applicant’s approach

Table 28 Gannet Applicant’s approach return migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
30	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
40	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
50	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	9
60	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
70	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
80	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	15
90	0	0	0	1	1	1	2	3	5	7	9	10	12	14	15	17
100	0	0	0	1	1	1	2	4	6	8	9	11	13	15	17	19

Table 29 Gannet Applicant’s approach migration-free breeding displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
<b>10</b>	0	1	1	2	2	3	5	11	16	22	27	32	38	43	49	54
<b>20</b>	0	1	2	3	4	5	11	22	32	43	54	65	76	87	97	108
<b>30</b>	0	2	3	5	6	8	16	32	49	65	81	97	114	130	146	162
<b>40</b>	0	2	4	6	9	11	22	43	65	87	108	130	151	173	195	216
<b>50</b>	0	3	5	8	11	14	27	54	81	108	135	162	189	216	243	271
<b>60</b>	0	3	6	10	13	16	32	65	97	130	162	195	227	260	292	325
<b>70</b>	0	4	8	11	15	19	38	76	114	151	189	227	265	303	341	379
<b>80</b>	0	4	9	13	17	22	43	87	130	173	216	260	303	346	390	433
<b>90</b>	0	5	10	15	19	24	49	97	146	195	243	292	341	390	438	487
<b>100</b>	0	5	11	16	22	27	54	108	162	216	271	325	379	433	487	541

Table 30 Gannet Applicant's approach post-breeding migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
20	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
30	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
40	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
50	0	0	0	1	1	1	2	3	5	7	8	10	12	13	15	17
60	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
70	0	0	0	1	1	1	2	5	7	9	12	14	16	19	21	23
80	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
90	0	0	1	1	1	2	3	6	9	12	15	18	21	24	27	30
100	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33

Table 31 Gannet Applicant’s approach annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
<b>10</b>	0	1	1	2	2	3	6	12	18	24	30	36	42	47	53	59
<b>20</b>	0	1	2	4	5	6	12	24	36	47	59	71	83	95	107	119
<b>30</b>	0	2	4	5	7	9	18	36	53	71	89	107	125	142	160	178
<b>40</b>	0	2	5	7	9	12	24	47	71	95	119	142	166	190	214	237
<b>50</b>	0	3	6	9	12	15	30	59	89	119	148	178	208	237	267	297
<b>60</b>	0	4	7	11	14	18	36	71	107	142	178	214	249	285	320	356
<b>70</b>	0	4	8	12	17	21	42	83	125	166	208	249	291	332	374	415
<b>80</b>	0	5	9	14	19	24	47	95	142	190	237	285	332	380	427	475
<b>90</b>	0	5	11	16	21	27	53	107	160	214	267	320	374	427	481	534
<b>100</b>	0	6	12	18	24	30	59	119	178	237	297	356	415	475	534	593

Table 32 Gannet Applicant's approach return migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
30	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
40	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
50	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12
60	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
70	0	0	0	1	1	1	2	3	5	7	9	10	12	14	15	17
80	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	19
90	0	0	0	1	1	1	2	4	7	9	11	13	15	18	20	22
100	0	0	0	1	1	1	2	5	7	10	12	15	17	19	22	24

Table 33 Gannet Applicant's approach migration-free breeding displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
<b>10</b>	0	1	1	2	2	3	6	12	18	24	30	36	42	48	54	60
<b>20</b>	0	1	2	4	5	6	12	24	36	48	60	71	83	95	107	119
<b>30</b>	0	2	4	5	7	9	18	36	54	71	89	107	125	143	161	179
<b>40</b>	0	2	5	7	10	12	24	48	71	95	119	143	167	190	214	238
<b>50</b>	0	3	6	9	12	15	30	60	89	119	149	179	208	238	268	298
<b>60</b>	0	4	7	11	14	18	36	71	107	143	179	214	250	286	321	357
<b>70</b>	0	4	8	12	17	21	42	83	125	167	208	250	292	333	375	417
<b>80</b>	0	5	10	14	19	24	48	95	143	190	238	286	333	381	429	476
<b>90</b>	0	5	11	16	21	27	54	107	161	214	268	321	375	429	482	536
<b>100</b>	0	6	12	18	24	30	60	119	179	238	298	357	417	476	536	595

Table 34 Gannet Applicant’s approach post-breeding migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
20	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
30	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
40	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	15
50	0	0	0	1	1	1	2	4	6	8	10	11	13	15	17	19
60	0	0	0	1	1	1	2	5	7	9	11	14	16	18	21	23
70	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
80	0	0	1	1	1	2	3	6	9	12	15	18	21	24	27	30
90	0	0	1	1	1	2	3	7	10	14	17	21	24	27	31	34
100	0	0	1	1	2	2	4	8	11	15	19	23	27	30	34	38



Table 35 Gannet Applicant's approach annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
10	0	1	1	2	3	3	7	13	20	26	33	39	46	53	59	66
20	0	1	3	4	5	7	13	26	39	53	66	79	92	105	118	132
30	0	2	4	6	8	10	20	39	59	79	99	118	138	158	178	197
40	0	3	5	8	11	13	26	53	79	105	132	158	184	210	237	263
50	0	3	7	10	13	16	33	66	99	132	164	197	230	263	296	329
60	0	4	8	12	16	20	39	79	118	158	197	237	276	316	355	395
70	0	5	9	14	18	23	46	92	138	184	230	276	322	368	414	460
80	0	5	11	16	21	26	53	105	158	210	263	316	368	421	474	526
90	0	6	12	18	24	30	59	118	178	237	296	355	414	474	533	592
100	0	7	13	20	26	33	66	132	197	263	329	395	460	526	592	658

Table 36 Gannet Applicant's approach return migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
30	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
40	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
50	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12
60	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
70	0	0	0	1	1	1	2	3	5	7	9	10	12	14	16	17
80	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
90	0	0	0	1	1	1	2	4	7	9	11	13	16	18	20	22
100	0	0	0	1	1	1	2	5	7	10	12	15	17	20	22	25

Table 37 Gannet Applicant’s approach migration-free breeding displacement matrix for Protective Provision Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
10	0	1	1	2	2	3	6	11	17	23	29	34	40	46	52	57
20	0	1	2	3	5	6	11	23	34	46	57	69	80	92	103	115
30	0	2	3	5	7	9	17	34	52	69	86	103	120	137	155	172
40	0	2	5	7	9	11	23	46	69	92	115	137	160	183	206	229
50	0	3	6	9	11	14	29	57	86	115	143	172	200	229	258	286
60	0	3	7	10	14	17	34	69	103	137	172	206	240	275	309	344
70	0	4	8	12	16	20	40	80	120	160	200	240	281	321	361	401
80	0	5	9	14	18	23	46	92	137	183	229	275	321	366	412	458
90	0	5	10	15	21	26	52	103	155	206	258	309	361	412	464	515
100	0	6	11	17	23	29	57	115	172	229	286	344	401	458	515	573

Table 38 Gannet Applicant's approach post-breeding migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
20	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
30	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
40	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	15
50	0	0	0	1	1	1	2	4	6	8	10	11	13	15	17	19
60	0	0	0	1	1	1	2	5	7	9	11	14	16	18	21	23
70	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
80	0	0	1	1	1	2	3	6	9	12	15	18	21	24	27	30
90	0	0	1	1	1	2	3	7	10	14	17	21	24	27	31	34
100	0	0	1	1	2	2	4	8	11	15	19	23	27	30	34	38

Table 39 Gannet Applicant’s approach annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	3	4	4	5	6	6
10	0	1	1	2	3	3	6	13	19	25	32	38	44	51	57	64
20	0	1	3	4	5	6	13	25	38	51	64	76	89	102	114	127
30	0	2	4	6	8	10	19	38	57	76	95	114	133	152	172	191
40	0	3	5	8	10	13	25	51	76	102	127	152	178	203	229	254
50	0	3	6	10	13	16	32	64	95	127	159	191	222	254	286	318
60	0	4	8	11	15	19	38	76	114	152	191	229	267	305	343	381
70	0	4	9	13	18	22	44	89	133	178	222	267	311	356	400	445
80	0	5	10	15	20	25	51	102	152	203	254	305	356	407	457	508
90	0	6	11	17	23	29	57	114	172	229	286	343	400	457	515	572
100	0	6	13	19	25	32	64	127	191	254	318	381	445	508	572	635

Table 40 Gannet Applicant's approach return migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
30	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
40	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
50	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12
60	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14
70	0	0	0	1	1	1	2	3	5	7	8	10	12	13	15	17
80	0	0	0	1	1	1	2	4	6	8	10	11	13	15	17	19
90	0	0	0	1	1	1	2	4	6	9	11	13	15	17	19	21
100	0	0	0	1	1	1	2	5	7	10	12	14	17	19	21	24

Table 41 Gannet Applicant’s approach migration-free breeding displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	6
10	0	1	1	2	2	3	6	11	17	22	28	33	39	44	50	55
20	0	1	2	3	4	6	11	22	33	44	55	66	78	89	100	111
30	0	2	3	5	7	8	17	33	50	66	83	100	116	133	150	166
40	0	2	4	7	9	11	22	44	66	89	111	133	155	177	199	222
50	0	3	6	8	11	14	28	55	83	111	139	166	194	222	249	277
60	0	3	7	10	13	17	33	66	100	133	166	199	233	266	299	332
70	0	4	8	12	16	19	39	78	116	155	194	233	272	310	349	388
80	0	4	9	13	18	22	44	89	133	177	222	266	310	355	399	443
90	0	5	10	15	20	25	50	100	150	199	249	299	349	399	449	499
100	0	6	11	17	22	28	55	111	166	222	277	332	388	443	499	554

Table 42 Gannet Applicant’s approach post-breeding migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
20	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
30	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
40	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
50	0	0	0	1	1	1	2	4	6	7	9	11	13	15	17	19
60	0	0	0	1	1	1	2	4	7	9	11	13	16	18	20	22
70	0	0	1	1	1	1	3	5	8	10	13	16	18	21	23	26
80	0	0	1	1	1	1	3	6	9	12	15	18	21	24	27	30
90	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33
100	0	0	1	1	1	2	4	7	11	15	19	22	26	30	33	37



Table 43 Gannet Applicant's approach annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	6
10	0	1	1	2	2	3	6	12	18	25	31	37	43	49	55	62
20	0	1	2	4	5	6	12	25	37	49	62	74	86	98	111	123
30	0	2	4	6	7	9	18	37	55	74	92	111	129	148	166	185
40	0	2	5	7	10	12	25	49	74	98	123	148	172	197	221	246
50	0	3	6	9	12	15	31	62	92	123	154	185	215	246	277	308
60	0	4	7	11	15	18	37	74	111	148	185	221	258	295	332	369
70	0	4	9	13	17	22	43	86	129	172	215	258	301	344	388	431
80	0	5	10	15	20	25	49	98	148	197	246	295	344	394	443	492
90	0	6	11	17	22	28	55	111	166	221	277	332	388	443	498	554
100	0	6	12	18	25	31	62	123	185	246	308	369	431	492	554	615

Table 44 Gannet Applicant's approach return migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	4
40	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
60	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
90	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15

Table 45 Gannet Applicant’s approach migration-free breeding displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	4
10	0	0	1	1	2	2	4	9	13	18	22	26	31	35	39	44
20	0	1	2	3	4	4	9	18	26	35	44	53	61	70	79	88
30	0	1	3	4	5	7	13	26	39	53	66	79	92	105	118	131
40	0	2	4	5	7	9	18	35	53	70	88	105	123	140	158	175
50	0	2	4	7	9	11	22	44	66	88	109	131	153	175	197	219
60	0	3	5	8	11	13	26	53	79	105	131	158	184	210	236	263
70	0	3	6	9	12	15	31	61	92	123	153	184	215	245	276	307
80	0	4	7	11	14	18	35	70	105	140	175	210	245	280	315	350
90	0	4	8	12	16	20	39	79	118	158	197	236	276	315	355	394
100	0	4	9	13	18	22	44	88	131	175	219	263	307	350	394	438

Table 46 Gannet Applicant's approach post-breeding migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
20	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
30	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
40	0	0	0	0	1	1	1	3	4	5	7	8	10	11	12	14
50	0	0	0	1	1	1	2	3	5	7	9	10	12	14	15	17
60	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	21
70	0	0	0	1	1	1	2	5	7	10	12	14	17	19	22	24
80	0	0	1	1	1	1	3	5	8	11	14	16	19	22	25	27
90	0	0	1	1	1	2	3	6	9	12	15	18	22	25	28	31
100	0	0	1	1	1	2	3	7	10	14	17	21	24	27	31	34

Table 47 Gannet Applicant's approach annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
10	0	0	1	1	2	2	5	10	15	19	24	29	34	39	44	49
20	0	1	2	3	4	5	10	19	29	39	49	58	68	78	88	97
30	0	1	3	4	6	7	15	29	44	58	73	88	102	117	131	146
40	0	2	4	6	8	10	19	39	58	78	97	117	136	156	175	195
50	0	2	5	7	10	12	24	49	73	97	122	146	170	195	219	243
60	0	3	6	9	12	15	29	58	88	117	146	175	204	234	263	292
70	0	3	7	10	14	17	34	68	102	136	170	204	238	273	307	341
80	0	4	8	12	16	19	39	78	117	156	195	234	273	311	350	389
90	0	4	9	13	18	22	44	88	131	175	219	263	307	350	394	438
100	0	5	10	15	19	24	49	97	146	195	243	292	341	389	438	487

Table 48 Gannet Applicant's approach return migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	2
20	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
30	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
40	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
50	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
60	0	0	0	0	0	1	1	2	3	4	5	7	8	9	10	11
70	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
80	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
90	0	0	0	0	1	1	2	3	5	7	8	10	12	13	15	16
100	0	0	0	1	1	1	2	4	5	7	9	11	13	15	16	18

Table 49 Gannet Applicant’s approach migration-free breeding displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
10	0	1	1	2	2	3	5	11	16	22	27	32	38	43	48	54
20	0	1	2	3	4	5	11	22	32	43	54	65	75	86	97	108
30	0	2	3	5	6	8	16	32	48	65	81	97	113	129	145	162
40	0	2	4	6	9	11	22	43	65	86	108	129	151	172	194	216
50	0	3	5	8	11	13	27	54	81	108	135	162	189	216	242	269
60	0	3	6	10	13	16	32	65	97	129	162	194	226	259	291	323
70	0	4	8	11	15	19	38	75	113	151	189	226	264	302	339	377
80	0	4	9	13	17	22	43	86	129	172	216	259	302	345	388	431
90	0	5	10	15	19	24	48	97	145	194	242	291	339	388	436	485
100	0	5	11	16	22	27	54	108	162	216	269	323	377	431	485	539

Table 50 Gannet Applicant's approach post-breeding migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
20	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
30	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
40	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
50	0	0	0	0	1	1	2	3	5	7	8	10	12	13	15	17
60	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
70	0	0	0	1	1	1	2	5	7	9	12	14	16	19	21	23
80	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
90	0	0	1	1	1	1	3	6	9	12	15	18	21	24	27	30
100	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33



# Hornsea 4



Table 51 Gannet Applicant's approach annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
10	0	1	1	2	2	3	6	12	18	24	30	35	41	47	53	59
20	0	1	2	4	5	6	12	24	35	47	59	71	83	94	106	118
30	0	2	4	5	7	9	18	35	53	71	89	106	124	142	159	177
40	0	2	5	7	9	12	24	47	71	94	118	142	165	189	213	236
50	0	3	6	9	12	15	30	59	89	118	148	177	207	236	266	295
60	0	4	7	11	14	18	35	71	106	142	177	213	248	283	319	354
70	0	4	8	12	17	21	41	83	124	165	207	248	289	331	372	413
80	0	5	9	14	19	24	47	94	142	189	236	283	331	378	425	472
90	0	5	11	16	21	27	53	106	159	213	266	319	372	425	478	531
100	0	6	12	18	24	30	59	118	177	236	295	354	413	472	531	590

Table 52 Gannet Applicant's approach return migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2
30	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
40	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
50	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
60	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
70	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
80	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
90	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
100	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10

Table 53 Gannet Applicant’s approach migration-free breeding displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
10	0	0	1	1	1	2	4	7	11	15	19	22	26	30	34	37
20	0	1	1	2	3	4	7	15	22	30	37	45	52	60	67	75
30	0	1	2	3	4	6	11	22	34	45	56	67	78	89	101	112
40	0	1	3	4	6	7	15	30	45	60	75	89	104	119	134	149
50	0	2	4	6	7	9	19	37	56	75	93	112	130	149	168	186
60	0	2	4	7	9	11	22	45	67	89	112	134	157	179	201	224
70	0	3	5	8	10	13	26	52	78	104	130	157	183	209	235	261
80	0	3	6	9	12	15	30	60	89	119	149	179	209	239	268	298
90	0	3	7	10	13	17	34	67	101	134	168	201	235	268	302	335
100	0	4	7	11	15	19	37	75	112	149	186	224	261	298	335	373

Table 54 Gannet Applicant's approach post-breeding migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
20	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
30	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
40	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
50	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
60	0	0	0	1	1	1	2	4	5	7	9	11	12	14	16	18
70	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
80	0	0	0	1	1	1	2	5	7	9	12	14	16	19	21	23
90	0	0	1	1	1	1	3	5	8	11	13	16	18	21	24	26
100	0	0	1	1	1	1	3	6	9	12	15	18	20	23	26	29

Table 55 Gannet Applicant's approach annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
10	0	0	1	1	2	2	4	8	12	16	21	25	29	33	37	41
20	0	1	2	2	3	4	8	16	25	33	41	49	58	66	74	82
30	0	1	2	4	5	6	12	25	37	49	62	74	86	99	111	123
40	0	2	3	5	7	8	16	33	49	66	82	99	115	132	148	165
50	0	2	4	6	8	10	21	41	62	82	103	123	144	165	185	206
60	0	2	5	7	10	12	25	49	74	99	123	148	173	198	222	247
70	0	3	6	9	12	14	29	58	86	115	144	173	202	230	259	288
80	0	3	7	10	13	16	33	66	99	132	165	198	230	263	296	329
90	0	4	7	11	15	19	37	74	111	148	185	222	259	296	333	370
100	0	4	8	12	16	21	41	82	123	165	206	247	288	329	370	412

Appendix J. Seasonal FFC Apportionment displacement matrices for gannet using Natural England’s apportioning approach.

Table 56 Gannet Natural England’s apportioning approach return migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
30	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
40	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
50	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	9
60	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
70	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
80	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	15
90	0	0	0	1	1	1	2	3	5	7	9	10	12	14	15	17
100	0	0	0	1	1	1	2	4	6	8	9	11	13	15	17	19

Table 57 Gannet Natural England’s apportioning approach breeding displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
10	0	1	2	2	3	4	8	16	24	32	40	48	56	64	72	80
20	0	2	3	5	6	8	16	32	48	64	80	96	112	128	144	160
30	0	2	5	7	10	12	24	48	72	96	120	144	168	192	216	240
40	0	3	6	10	13	16	32	64	96	128	160	192	224	256	288	320
50	0	4	8	12	16	20	40	80	120	160	200	240	280	320	360	400
60	0	5	10	14	19	24	48	96	144	192	240	288	336	384	432	480
70	0	6	11	17	22	28	56	112	168	224	280	336	392	448	504	560
80	0	6	13	19	26	32	64	128	192	256	320	384	448	512	576	640
90	0	7	14	22	29	36	72	144	216	288	360	432	504	576	648	720
100	0	8	16	24	32	40	80	160	240	320	400	480	560	640	720	800

Table 58 Gannet Natural England’s apportioning approach post-breeding migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
20	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
30	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
40	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
50	0	0	0	1	1	1	2	3	5	7	8	10	12	13	15	17
60	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
70	0	0	0	1	1	1	2	5	7	9	12	14	16	19	21	23
80	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
90	0	0	1	1	1	2	3	6	9	12	15	18	21	24	27	30
100	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33



# Hornsea 4



Table 59 Gannet Natural England’s apportioning approach annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
10	0	1	2	3	3	4	9	17	26	34	43	51	60	68	77	85
20	0	2	3	5	7	9	17	34	51	68	85	102	119	136	153	170
30	0	3	5	8	10	13	26	51	77	102	128	153	179	205	230	256
40	0	3	7	10	14	17	34	68	102	136	170	205	239	273	307	341
50	0	4	9	13	17	21	43	85	128	170	213	256	298	341	383	426
60	0	5	10	15	20	26	51	102	153	205	256	307	358	409	460	511
70	0	6	12	18	24	30	60	119	179	239	298	358	418	477	537	597
80	0	7	14	20	27	34	68	136	205	273	341	409	477	545	614	682
90	0	8	15	23	31	38	77	153	230	307	383	460	537	614	690	767
100	0	9	17	26	34	43	85	170	256	341	426	511	597	682	767	852

Table 60 Gannet Natural England’s apportioning approach return migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
30	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
40	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
50	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12
60	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
70	0	0	0	1	1	1	2	3	5	7	9	10	12	14	15	17
80	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	19
90	0	0	0	1	1	1	2	4	7	9	11	13	15	18	20	22
100	0	0	0	1	1	1	2	5	7	10	12	15	17	19	22	24

# Hornsea 4



Table 61 Gannet Natural England’s apportioning approach breeding displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
10	0	1	2	3	4	4	9	18	26	35	44	53	62	70	79	88
20	0	2	4	5	7	9	18	35	53	70	88	106	123	141	158	176
30	0	3	5	8	11	13	26	53	79	106	132	158	185	211	238	264
40	0	4	7	11	14	18	35	70	106	141	176	211	246	282	317	352
50	0	4	9	13	18	22	44	88	132	176	220	264	308	352	396	440
60	0	5	11	16	21	26	53	106	158	211	264	317	370	422	475	528
70	0	6	12	18	25	31	62	123	185	246	308	370	431	493	554	616
80	0	7	14	21	28	35	70	141	211	282	352	422	493	563	634	704
90	0	8	16	24	32	40	79	158	238	317	396	475	554	634	713	792
100	0	9	18	26	35	44	88	176	264	352	440	528	616	704	792	880

Table 62 Gannet Natural England’s apportioning approach post-breeding migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
20	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
30	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
40	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	15
50	0	0	0	1	1	1	2	4	6	8	10	11	13	15	17	19
60	0	0	0	1	1	1	2	5	7	9	11	14	16	18	21	23
70	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
80	0	0	1	1	1	2	3	6	9	12	15	18	21	24	27	30
90	0	0	1	1	1	2	3	7	10	14	17	21	24	27	31	34
100	0	0	1	1	2	2	4	8	11	15	19	23	27	30	34	38

Table 63 Gannet Natural England’s apportioning approach annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	4	5	6	7	8	8	9
10	0	1	2	3	4	5	9	19	28	38	47	57	66	75	85	94
20	0	2	4	6	8	9	19	38	57	75	94	113	132	151	170	188
30	0	3	6	8	11	14	28	57	85	113	141	170	198	226	254	283
40	0	4	8	11	15	19	38	75	113	151	188	226	264	302	339	377
50	0	5	9	14	19	24	47	94	141	188	236	283	330	377	424	471
60	0	6	11	17	23	28	57	113	170	226	283	339	396	452	509	565
70	0	7	13	20	26	33	66	132	198	264	330	396	462	528	594	660
80	0	8	15	23	30	38	75	151	226	302	377	452	528	603	679	754
90	0	8	17	25	34	42	85	170	254	339	424	509	594	679	763	848
100	0	9	19	28	38	47	94	188	283	377	471	565	660	754	848	942

Table 64 Gannet Natural England’s apportioning approach return migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
30	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
40	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
50	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12
60	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
70	0	0	0	1	1	1	2	3	5	7	9	10	12	14	16	17
80	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
90	0	0	0	1	1	1	2	4	7	9	11	13	16	18	20	22
100	0	0	0	1	1	1	2	5	7	10	12	15	17	20	22	25

# Hornsea 4



Table 65 Gannet Natural England’s apportioning approach breeding displacement matrix for Protective Provision Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	8
10	0	1	2	3	3	4	8	17	25	34	42	51	59	68	76	85
20	0	2	3	5	7	8	17	34	51	68	85	102	119	135	152	169
30	0	3	5	8	10	13	25	51	76	102	127	152	178	203	229	254
40	0	3	7	10	14	17	34	68	102	135	169	203	237	271	305	339
50	0	4	8	13	17	21	42	85	127	169	212	254	296	339	381	423
60	0	5	10	15	20	25	51	102	152	203	254	305	356	406	457	508
70	0	6	12	18	24	30	59	119	178	237	296	356	415	474	533	593
80	0	7	14	20	27	34	68	135	203	271	339	406	474	542	609	677
90	0	8	15	23	30	38	76	152	229	305	381	457	533	609	686	762
100	0	8	17	25	34	42	85	169	254	339	423	508	593	677	762	846

Table 66 Gannet Natural England’s apportioning approach post-breeding migration displacement matrix for Protective Provision  
Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
20	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
30	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
40	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	15
50	0	0	0	1	1	1	2	4	6	8	10	11	13	15	17	19
60	0	0	0	1	1	1	2	5	7	9	11	14	16	18	21	23
70	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
80	0	0	1	1	1	2	3	6	9	12	15	18	21	24	27	30
90	0	0	1	1	1	2	3	7	10	14	17	21	24	27	31	34
100	0	0	1	1	2	2	4	8	11	15	19	23	27	30	34	38



Table 67 Gannet Natural England’s apportioning approach annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
10	0	1	2	3	4	5	9	18	27	36	45	55	64	73	82	91
20	0	2	4	5	7	9	18	36	55	73	91	109	127	145	164	182
30	0	3	5	8	11	14	27	55	82	109	136	164	191	218	245	273
40	0	4	7	11	15	18	36	73	109	145	182	218	255	291	327	364
50	0	5	9	14	18	23	45	91	136	182	227	273	318	364	409	455
60	0	5	11	16	22	27	55	109	164	218	273	327	382	436	491	545
70	0	6	13	19	25	32	64	127	191	255	318	382	445	509	573	636
80	0	7	15	22	29	36	73	145	218	291	364	436	509	582	655	727
90	0	8	16	25	33	41	82	164	245	327	409	491	573	655	736	818
100	0	9	18	27	36	45	91	182	273	364	455	545	636	727	818	909

Table 68 Gannet Natural England’s apportioning approach return migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
20	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
30	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
40	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
50	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12
60	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14
70	0	0	0	1	1	1	2	3	5	7	8	10	12	13	15	17
80	0	0	0	1	1	1	2	4	6	8	10	11	13	15	17	19
90	0	0	0	1	1	1	2	4	6	9	11	13	15	17	19	21
100	0	0	0	1	1	1	2	5	7	10	12	14	17	19	21	24

# Hornsea 4



Table 69 Gannet Natural England’s apportioning approach breeding displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	2	3	4	5	6	7	7	8
10	0	1	2	2	3	4	8	16	25	33	41	49	57	66	74	82
20	0	2	3	5	7	8	16	33	49	66	82	98	115	131	147	164
30	0	2	5	7	10	12	25	49	74	98	123	147	172	197	221	246
40	0	3	7	10	13	16	33	66	98	131	164	197	229	262	295	328
50	0	4	8	12	16	20	41	82	123	164	205	246	287	328	369	410
60	0	5	10	15	20	25	49	98	147	197	246	295	344	393	442	492
70	0	6	11	17	23	29	57	115	172	229	287	344	401	459	516	574
80	0	7	13	20	26	33	66	131	197	262	328	393	459	524	590	655
90	0	7	15	22	29	37	74	147	221	295	369	442	516	590	664	737
100	0	8	16	25	33	41	82	164	246	328	410	492	574	655	737	819

Table 70 Gannet Natural England’s apportioning approach post-breeding migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
20	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
30	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
40	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
50	0	0	0	1	1	1	2	4	6	7	9	11	13	15	17	19
60	0	0	0	1	1	1	2	4	7	9	11	13	16	18	20	22
70	0	0	1	1	1	1	3	5	8	10	13	16	18	21	23	26
80	0	0	1	1	1	1	3	6	9	12	15	18	21	24	27	30
90	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33
100	0	0	1	1	1	2	4	7	11	15	19	22	26	30	33	37

Table 71 Gannet Natural England’s apportioning approach annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
10	0	1	2	3	4	4	9	18	26	35	44	53	62	70	79	88
20	0	2	4	5	7	9	18	35	53	70	88	106	123	141	158	176
30	0	3	5	8	11	13	26	53	79	106	132	158	185	211	238	264
40	0	4	7	11	14	18	35	70	106	141	176	211	246	282	317	352
50	0	4	9	13	18	22	44	88	132	176	220	264	308	352	396	440
60	0	5	11	16	21	26	53	106	158	211	264	317	370	423	475	528
70	0	6	12	18	25	31	62	123	185	246	308	370	431	493	555	616
80	0	7	14	21	28	35	70	141	211	282	352	423	493	563	634	704
90	0	8	16	24	32	40	79	158	238	317	396	475	555	634	713	792
100	0	9	18	26	35	44	88	176	264	352	440	528	616	704	792	880

Table 72 Gannet Natural England’s apportioning approach return migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	4
40	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
60	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
90	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15

Table 73 Gannet Natural England’s apportioning approach breeding displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	6
10	0	1	1	2	3	3	6	13	19	26	32	39	45	52	58	65
20	0	1	3	4	5	6	13	26	39	52	65	78	91	104	117	129
30	0	2	4	6	8	10	19	39	58	78	97	117	136	155	175	194
40	0	3	5	8	10	13	26	52	78	104	129	155	181	207	233	259
50	0	3	6	10	13	16	32	65	97	129	162	194	227	259	291	324
60	0	4	8	12	16	19	39	78	117	155	194	233	272	311	350	388
70	0	5	9	14	18	23	45	91	136	181	227	272	317	363	408	453
80	0	5	10	16	21	26	52	104	155	207	259	311	363	414	466	518
90	0	6	12	17	23	29	58	117	175	233	291	350	408	466	524	583
100	0	6	13	19	26	32	65	129	194	259	324	388	453	518	583	647

Table 74 Gannet Natural England’s apportioning approach post-breeding migration displacement matrix for Protective Provision  
Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
20	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
30	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
40	0	0	0	0	1	1	1	3	4	5	7	8	10	11	12	14
50	0	0	0	1	1	1	2	3	5	7	9	10	12	14	15	17
60	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	21
70	0	0	0	1	1	1	2	5	7	10	12	14	17	19	22	24
80	0	0	1	1	1	1	3	5	8	11	14	16	19	22	25	27
90	0	0	1	1	1	2	3	6	9	12	15	18	22	25	28	31
100	0	0	1	1	1	2	3	7	10	14	17	21	24	27	31	34



Table 75 Gannet Natural England’s apportioning approach annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	3	4	5	6	6	7
10	0	1	1	2	3	3	7	14	21	28	35	42	49	56	63	70
20	0	1	3	4	6	7	14	28	42	56	70	84	97	111	125	139
30	0	2	4	6	8	10	21	42	63	84	104	125	146	167	188	209
40	0	3	6	8	11	14	28	56	84	111	139	167	195	223	251	278
50	0	3	7	10	14	17	35	70	104	139	174	209	244	278	313	348
60	0	4	8	13	17	21	42	84	125	167	209	251	292	334	376	418
70	0	5	10	15	19	24	49	97	146	195	244	292	341	390	439	487
80	0	6	11	17	22	28	56	111	167	223	278	334	390	446	501	557
90	0	6	13	19	25	31	63	125	188	251	313	376	439	501	564	627
100	0	7	14	21	28	35	70	139	209	278	348	418	487	557	627	696

Table 76 Gannet Natural England’s apportioning approach return migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	2
20	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
30	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
40	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
50	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
60	0	0	0	0	0	1	1	2	3	4	5	7	8	9	10	11
70	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
80	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
90	0	0	0	0	1	1	2	3	5	7	8	10	12	13	15	16
100	0	0	0	1	1	1	2	4	5	7	9	11	13	15	16	18

# Hornsea 4



Table 77 Gannet Natural England’s apportioning approach breeding displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
10	0	1	2	2	3	4	8	16	24	32	40	48	56	64	72	80
20	0	2	3	5	6	8	16	32	48	64	80	96	112	127	143	159
30	0	2	5	7	10	12	24	48	72	96	120	143	167	191	215	239
40	0	3	6	10	13	16	32	64	96	127	159	191	223	255	287	319
50	0	4	8	12	16	20	40	80	120	159	199	239	279	319	359	398
60	0	5	10	14	19	24	48	96	143	191	239	287	335	382	430	478
70	0	6	11	17	22	28	56	112	167	223	279	335	390	446	502	558
80	0	6	13	19	25	32	64	127	191	255	319	382	446	510	574	637
90	0	7	14	22	29	36	72	143	215	287	359	430	502	574	645	717
100	0	8	16	24	32	40	80	159	239	319	398	478	558	637	717	797

Table 78 Gannet Natural England’s apportioning approach post-breeding migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
20	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
30	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
40	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
50	0	0	0	0	1	1	2	3	5	7	8	10	12	13	15	17
60	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
70	0	0	0	1	1	1	2	5	7	9	12	14	16	19	21	23
80	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
90	0	0	1	1	1	1	3	6	9	12	15	18	21	24	27	30
100	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33

# Hornsea 4



Table 79 Gannet Natural England’s apportioning approach annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	8
10	0	1	2	3	3	4	8	17	25	34	42	51	59	68	76	85
20	0	2	3	5	7	8	17	34	51	68	85	102	119	136	153	170
30	0	3	5	8	10	13	25	51	76	102	127	153	178	204	229	254
40	0	3	7	10	14	17	34	68	102	136	170	204	237	271	305	339
50	0	4	8	13	17	21	42	85	127	170	212	254	297	339	382	424
60	0	5	10	15	20	25	51	102	153	204	254	305	356	407	458	509
70	0	6	12	18	24	30	59	119	178	237	297	356	416	475	534	594
80	0	7	14	20	27	34	68	136	204	271	339	407	475	543	611	679
90	0	8	15	23	31	38	76	153	229	305	382	458	534	611	687	763
100	0	8	17	25	34	42	85	170	254	339	424	509	594	679	763	848

Table 80 Gannet Natural England’s apportioning approach return migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2
30	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
40	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
50	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
60	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
70	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
80	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
90	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
100	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10

# Hornsea 4



Table 81 Gannet Natural England’s apportioning approach breeding displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	6
10	0	1	1	2	2	3	6	11	17	22	28	33	39	44	50	55
20	0	1	2	3	4	6	11	22	33	44	55	66	77	88	99	110
30	0	2	3	5	7	8	17	33	50	66	83	99	116	132	149	165
40	0	2	4	7	9	11	22	44	66	88	110	132	154	176	198	220
50	0	3	6	8	11	14	28	55	83	110	138	165	193	220	248	276
60	0	3	7	10	13	17	33	66	99	132	165	198	231	264	298	331
70	0	4	8	12	15	19	39	77	116	154	193	231	270	309	347	386
80	0	4	9	13	18	22	44	88	132	176	220	264	309	353	397	441
90	0	5	10	15	20	25	50	99	149	198	248	298	347	397	446	496
100	0	6	11	17	22	28	55	110	165	220	276	331	386	441	496	551

Table 82 Gannet Natural England’s apportioning approach post-breeding migration displacement matrix for Protective Provision  
Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
20	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
30	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
40	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
50	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
60	0	0	0	1	1	1	2	4	5	7	9	11	12	14	16	18
70	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
80	0	0	0	1	1	1	2	5	7	9	12	14	16	19	21	23
90	0	0	1	1	1	1	3	5	8	11	13	16	18	21	24	26
100	0	0	1	1	1	1	3	6	9	12	15	18	20	23	26	29



Table 83 Gannet Natural England’s apportioning approach annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
10	0	1	1	2	2	3	6	12	18	24	29	35	41	47	53	59
20	0	1	2	4	5	6	12	24	35	47	59	71	83	94	106	118
30	0	2	4	5	7	9	18	35	53	71	88	106	124	142	159	177
40	0	2	5	7	9	12	24	47	71	94	118	142	165	189	212	236
50	0	3	6	9	12	15	29	59	88	118	147	177	206	236	265	295
60	0	4	7	11	14	18	35	71	106	142	177	212	248	283	319	354
70	0	4	8	12	17	21	41	83	124	165	206	248	289	330	372	413
80	0	5	9	14	19	24	47	94	142	189	236	283	330	378	425	472
90	0	5	11	16	21	27	53	106	159	212	265	319	372	425	478	531
100	0	6	12	18	24	29	59	118	177	236	295	354	413	472	531	590

Appendix K. Seasonal FFC Apportionment displacement matrices for guillemot using Applicant’s apportionment and weighted mean approach.

Table 84 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	1	1	1	2	4	7	11	15	18	22	26	29	33	37
<b>10</b>	0	4	7	11	15	18	37	73	110	147	183	220	256	293	330	366
<b>20</b>	0	7	15	22	29	37	73	147	220	293	366	440	513	586	659	733
<b>30</b>	0	11	22	33	44	55	110	220	330	440	549	659	769	879	989	1,099
<b>40</b>	0	15	29	44	59	73	147	293	440	586	733	879	1,026	1,172	1,319	1,465
<b>50</b>	0	18	37	55	73	92	183	366	549	733	916	1,099	1,282	1,465	1,648	1,832
<b>60</b>	0	22	44	66	88	110	220	440	659	879	1,099	1,319	1,539	1,758	1,978	2,198
<b>70</b>	0	26	51	77	103	128	256	513	769	1,026	1,282	1,539	1,795	2,051	2,308	2,564
<b>80</b>	0	29	59	88	117	147	293	586	879	1,172	1,465	1,758	2,051	2,345	2,638	2,931
<b>90</b>	0	33	66	99	132	165	330	659	989	1,319	1,648	1,978	2,308	2,638	2,967	3,297
<b>100</b>	0	37	73	110	147	183	366	733	1,099	1,465	1,832	2,198	2,564	2,931	3,297	3,663

Table 85 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	1	2	4	6	7	9	11	13	15	17	18
10	0	2	4	6	7	9	18	37	55	74	92	111	129	148	166	185
20	0	4	7	11	15	18	37	74	111	148	185	222	259	295	332	369
30	0	6	11	17	22	28	55	111	166	222	277	332	388	443	499	554
40	0	7	15	22	30	37	74	148	222	295	369	443	517	591	665	739
50	0	9	18	28	37	46	92	185	277	369	462	554	646	739	831	923
60	0	11	22	33	44	55	111	222	332	443	554	665	776	886	997	1,108
70	0	13	26	39	52	65	129	259	388	517	646	776	905	1,034	1,163	1,293
80	0	15	30	44	59	74	148	295	443	591	739	886	1,034	1,182	1,330	1,477
90	0	17	33	50	66	83	166	332	499	665	831	997	1,163	1,330	1,496	1,662
100	0	18	37	55	74	92	185	369	554	739	923	1,108	1,293	1,477	1,662	1,847

Table 86 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	6	11	17	22	28	33	39	44	50	55
10	0	6	11	17	22	28	55	110	165	220	276	331	386	441	496	551
20	0	11	22	33	44	55	110	220	331	441	551	661	771	882	992	1,102
30	0	17	33	50	66	83	165	331	496	661	827	992	1,157	1,322	1,488	1,653
40	0	22	44	66	88	110	220	441	661	882	1,102	1,322	1,543	1,763	1,984	2,204
50	0	28	55	83	110	138	276	551	827	1,102	1,378	1,653	1,929	2,204	2,480	2,755
60	0	33	66	99	132	165	331	661	992	1,322	1,653	1,984	2,314	2,645	2,975	3,306
70	0	39	77	116	154	193	386	771	1,157	1,543	1,929	2,314	2,700	3,086	3,471	3,857
80	0	44	88	132	176	220	441	882	1,322	1,763	2,204	2,645	3,086	3,526	3,967	4,408
90	0	50	99	149	198	248	496	992	1,488	1,984	2,480	2,975	3,471	3,967	4,463	4,959
100	0	55	110	165	220	276	551	1,102	1,653	2,204	2,755	3,306	3,857	4,408	4,959	5,510

Table 87 Guillemot Applicant's breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	5	10	16	21	26	31	36	41	47	52
10	0	5	10	16	21	26	52	104	155	207	259	311	362	414	466	518
20	0	10	21	31	41	52	104	207	311	414	518	621	725	828	932	1,035
30	0	16	31	47	62	78	155	311	466	621	776	932	1,087	1,242	1,397	1,553
40	0	21	41	62	83	104	207	414	621	828	1,035	1,242	1,449	1,656	1,863	2,070
50	0	26	52	78	104	129	259	518	776	1,035	1,294	1,553	1,811	2,070	2,329	2,588
60	0	31	62	93	124	155	311	621	932	1,242	1,553	1,863	2,174	2,484	2,795	3,105
70	0	36	72	109	145	181	362	725	1,087	1,449	1,811	2,174	2,536	2,898	3,260	3,623
80	0	41	83	124	166	207	414	828	1,242	1,656	2,070	2,484	2,898	3,312	3,726	4,140
90	0	47	93	140	186	233	466	932	1,397	1,863	2,329	2,795	3,260	3,726	4,192	4,658
100	0	52	104	155	207	259	518	1,035	1,553	2,070	2,588	3,105	3,623	4,140	4,658	5,175

Table 88 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	11	13	16	18	21	24	26
10	0	3	5	8	11	13	26	53	79	105	132	158	184	211	237	263
20	0	5	11	16	21	26	53	105	158	211	263	316	368	421	474	526
30	0	8	16	24	32	39	79	158	237	316	395	474	553	632	711	790
40	0	11	21	32	42	53	105	211	316	421	526	632	737	842	948	1,053
50	0	13	26	39	53	66	132	263	395	526	658	790	921	1,053	1,184	1,316
60	0	16	32	47	63	79	158	316	474	632	790	948	1,105	1,263	1,421	1,579
70	0	18	37	55	74	92	184	368	553	737	921	1,105	1,290	1,474	1,658	1,842
80	0	21	42	63	84	105	211	421	632	842	1,053	1,263	1,474	1,685	1,895	2,106
90	0	24	47	71	95	118	237	474	711	948	1,184	1,421	1,658	1,895	2,132	2,369
100	0	26	53	79	105	132	263	526	790	1,053	1,316	1,579	1,842	2,106	2,369	2,632

Table 89 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	2	3	4	8	16	23	31	39	47	55	62	70	78
10	0	8	16	23	31	39	78	156	234	312	390	468	547	625	703	781
20	0	16	31	47	62	78	156	312	468	625	781	937	1,093	1,249	1,405	1,561
30	0	23	47	70	94	117	234	468	703	937	1,171	1,405	1,640	1,874	2,108	2,342
40	0	31	62	94	125	156	312	625	937	1,249	1,561	1,874	2,186	2,498	2,811	3,123
50	0	39	78	117	156	195	390	781	1,171	1,561	1,952	2,342	2,733	3,123	3,513	3,904
60	0	47	94	141	187	234	468	937	1,405	1,874	2,342	2,811	3,279	3,748	4,216	4,684
70	0	55	109	164	219	273	547	1,093	1,640	2,186	2,733	3,279	3,826	4,372	4,919	5,465
80	0	62	125	187	250	312	625	1,249	1,874	2,498	3,123	3,748	4,372	4,997	5,621	6,246
90	0	70	141	211	281	351	703	1,405	2,108	2,811	3,513	4,216	4,919	5,621	6,324	7,027
100	0	78	156	234	312	390	781	1,561	2,342	3,123	3,904	4,684	5,465	6,246	7,027	7,807

# Hornsea 4



Table 90 Guillemot Applicant's breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	5	10	15	20	26	31	36	41	46	51
10	0	5	10	15	20	26	51	102	153	204	256	307	358	409	460	511
20	0	10	20	31	41	51	102	204	307	409	511	613	715	818	920	1,022
30	0	15	31	46	61	77	153	307	460	613	767	920	1,073	1,227	1,380	1,533
40	0	20	41	61	82	102	204	409	613	818	1,022	1,227	1,431	1,635	1,840	2,044
50	0	26	51	77	102	128	256	511	767	1,022	1,278	1,533	1,789	2,044	2,300	2,555
60	0	31	61	92	123	153	307	613	920	1,227	1,533	1,840	2,146	2,453	2,760	3,066
70	0	36	72	107	143	179	358	715	1,073	1,431	1,789	2,146	2,504	2,862	3,220	3,577
80	0	41	82	123	164	204	409	818	1,227	1,635	2,044	2,453	2,862	3,271	3,680	4,088
90	0	46	92	138	184	230	460	920	1,380	1,840	2,300	2,760	3,220	3,680	4,140	4,600
100	0	51	102	153	204	256	511	1,022	1,533	2,044	2,555	3,066	3,577	4,088	4,600	5,111



# Hornsea 4



Table 91 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	10	13	16	18	21	23	26
10	0	3	5	8	10	13	26	52	78	104	130	156	182	208	234	260
20	0	5	10	16	21	26	52	104	156	208	260	312	363	415	467	519
30	0	8	16	23	31	39	78	156	234	312	389	467	545	623	701	779
40	0	10	21	31	42	52	104	208	312	415	519	623	727	831	935	1,038
50	0	13	26	39	52	65	130	260	389	519	649	779	909	1,038	1,168	1,298
60	0	16	31	47	62	78	156	312	467	623	779	935	1,090	1,246	1,402	1,558
70	0	18	36	55	73	91	182	363	545	727	909	1,090	1,272	1,454	1,636	1,817
80	0	21	42	62	83	104	208	415	623	831	1,038	1,246	1,454	1,662	1,869	2,077
90	0	23	47	70	93	117	234	467	701	935	1,168	1,402	1,636	1,869	2,103	2,337
100	0	26	52	78	104	130	260	519	779	1,038	1,298	1,558	1,817	2,077	2,337	2,596

Table 92 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	2	3	4	8	15	23	31	39	46	54	62	69	77
10	0	8	15	23	31	39	77	154	231	308	385	462	539	617	694	771
20	0	15	31	46	62	77	154	308	462	617	771	925	1,079	1,233	1,387	1,541
30	0	23	46	69	92	116	231	462	694	925	1,156	1,387	1,618	1,850	2,081	2,312
40	0	31	62	92	123	154	308	617	925	1,233	1,541	1,850	2,158	2,466	2,774	3,083
50	0	39	77	116	154	193	385	771	1,156	1,541	1,927	2,312	2,697	3,083	3,468	3,853
60	0	46	92	139	185	231	462	925	1,387	1,850	2,312	2,774	3,237	3,699	4,162	4,624
70	0	54	108	162	216	270	539	1,079	1,618	2,158	2,697	3,237	3,776	4,316	4,855	5,395
80	0	62	123	185	247	308	617	1,233	1,850	2,466	3,083	3,699	4,316	4,932	5,549	6,165
90	0	69	139	208	277	347	694	1,387	2,081	2,774	3,468	4,162	4,855	5,549	6,242	6,936
100	0	77	154	231	308	385	771	1,541	2,312	3,083	3,853	4,624	5,395	6,165	6,936	7,707

# Hornsea 4



Table 93 Guillemot Applicant's breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	5	10	15	20	25	30	35	40	45	50
10	0	5	10	15	20	25	50	100	150	200	250	299	349	399	449	499
20	0	10	20	30	40	50	100	200	299	399	499	599	699	798	898	998
30	0	15	30	45	60	75	150	299	449	599	749	898	1,048	1,198	1,347	1,497
40	0	20	40	60	80	100	200	399	599	798	998	1,198	1,397	1,597	1,796	1,996
50	0	25	50	75	100	125	250	499	749	998	1,248	1,497	1,747	1,996	2,246	2,495
60	0	30	60	90	120	150	299	599	898	1,198	1,497	1,796	2,096	2,395	2,695	2,994
70	0	35	70	105	140	175	349	699	1,048	1,397	1,747	2,096	2,445	2,794	3,144	3,493
80	0	40	80	120	160	200	399	798	1,198	1,597	1,996	2,395	2,794	3,194	3,593	3,992
90	0	45	90	135	180	225	449	898	1,347	1,796	2,246	2,695	3,144	3,593	4,042	4,491
100	0	50	100	150	200	250	499	998	1,497	1,996	2,495	2,994	3,493	3,992	4,491	4,990

# Hornsea 4



Table 94 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	10	13	15	18	20	23	25
10	0	3	5	8	10	13	25	51	76	101	127	152	177	203	228	254
20	0	5	10	15	20	25	51	101	152	203	254	304	355	406	456	507
30	0	8	15	23	30	38	76	152	228	304	380	456	532	608	684	761
40	0	10	20	30	41	51	101	203	304	406	507	608	710	811	913	1,014
50	0	13	25	38	51	63	127	254	380	507	634	761	887	1,014	1,141	1,268
60	0	15	30	46	61	76	152	304	456	608	761	913	1,065	1,217	1,369	1,521
70	0	18	35	53	71	89	177	355	532	710	887	1,065	1,242	1,420	1,597	1,775
80	0	20	41	61	81	101	203	406	608	811	1,014	1,217	1,420	1,622	1,825	2,028
90	0	23	46	68	91	114	228	456	684	913	1,141	1,369	1,597	1,825	2,053	2,282
100	0	25	51	76	101	127	254	507	761	1,014	1,268	1,521	1,775	2,028	2,282	2,535

# Hornsea 4



Table 95 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	2	3	4	8	15	23	30	38	45	53	60	68	75
10	0	8	15	23	30	38	75	151	226	301	376	452	527	602	677	753
20	0	15	30	45	60	75	151	301	452	602	753	903	1,054	1,204	1,355	1,505
30	0	23	45	68	90	113	226	452	677	903	1,129	1,355	1,580	1,806	2,032	2,258
40	0	30	60	90	120	151	301	602	903	1,204	1,505	1,806	2,107	2,408	2,709	3,010
50	0	38	75	113	151	188	376	753	1,129	1,505	1,881	2,258	2,634	3,010	3,386	3,763
60	0	45	90	135	181	226	452	903	1,355	1,806	2,258	2,709	3,161	3,612	4,064	4,515
70	0	53	105	158	211	263	527	1,054	1,580	2,107	2,634	3,161	3,687	4,214	4,741	5,268
80	0	60	120	181	241	301	602	1,204	1,806	2,408	3,010	3,612	4,214	4,816	5,418	6,020
90	0	68	135	203	271	339	677	1,355	2,032	2,709	3,386	4,064	4,741	5,418	6,095	6,773
100	0	75	151	226	301	376	753	1,505	2,258	3,010	3,763	4,515	5,268	6,020	6,773	7,525

# Hornsea 4



Table 96 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	4	9	13	18	22	27	31	36	40	45
10	0	4	9	13	18	22	45	90	135	180	225	270	315	360	405	450
20	0	9	18	27	36	45	90	180	270	360	450	539	629	719	809	899
30	0	13	27	40	54	67	135	270	405	539	674	809	944	1,079	1,214	1,349
40	0	18	36	54	72	90	180	360	539	719	899	1,079	1,259	1,439	1,618	1,798
50	0	22	45	67	90	112	225	450	674	899	1,124	1,349	1,573	1,798	2,023	2,248
60	0	27	54	81	108	135	270	539	809	1,079	1,349	1,618	1,888	2,158	2,428	2,697
70	0	31	63	94	126	157	315	629	944	1,259	1,573	1,888	2,203	2,518	2,832	3,147
80	0	36	72	108	144	180	360	719	1,079	1,439	1,798	2,158	2,518	2,877	3,237	3,597
90	0	40	81	121	162	202	405	809	1,214	1,618	2,023	2,428	2,832	3,237	3,641	4,046
100	0	45	90	135	180	225	450	899	1,349	1,798	2,248	2,697	3,147	3,597	4,046	4,496

# Hornsea 4



Table 97 Guillemot Applicant's non-breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	1	2	5	7	9	11	14	16	18	21	23
10	0	2	5	7	9	11	23	46	69	92	115	138	160	183	206	229
20	0	5	9	14	18	23	46	92	138	183	229	275	321	367	413	458
30	0	7	14	21	28	34	69	138	206	275	344	413	481	550	619	688
40	0	9	18	28	37	46	92	183	275	367	458	550	642	733	825	917
50	0	11	23	34	46	57	115	229	344	458	573	688	802	917	1,031	1,146
60	0	14	28	41	55	69	138	275	413	550	688	825	963	1,100	1,238	1,375
70	0	16	32	48	64	80	160	321	481	642	802	963	1,123	1,284	1,444	1,604
80	0	18	37	55	73	92	183	367	550	733	917	1,100	1,284	1,467	1,650	1,834
90	0	21	41	62	83	103	206	413	619	825	1,031	1,238	1,444	1,650	1,857	2,063
100	0	23	46	69	92	115	229	458	688	917	1,146	1,375	1,604	1,834	2,063	2,292

# Hornsea 4



Table 98 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	3	3	7	14	20	27	34	41	48	54	61	68
10	0	7	14	20	27	34	68	136	204	272	339	407	475	543	611	679
20	0	14	27	41	54	68	136	272	407	543	679	815	950	1,086	1,222	1,358
30	0	20	41	61	81	102	204	407	611	815	1,018	1,222	1,425	1,629	1,833	2,036
40	0	27	54	81	109	136	272	543	815	1,086	1,358	1,629	1,901	2,172	2,444	2,715
50	0	34	68	102	136	170	339	679	1,018	1,358	1,697	2,036	2,376	2,715	3,054	3,394
60	0	41	81	122	163	204	407	815	1,222	1,629	2,036	2,444	2,851	3,258	3,665	4,073
70	0	48	95	143	190	238	475	950	1,425	1,901	2,376	2,851	3,326	3,801	4,276	4,751
80	0	54	109	163	217	272	543	1,086	1,629	2,172	2,715	3,258	3,801	4,344	4,887	5,430
90	0	61	122	183	244	305	611	1,222	1,833	2,444	3,054	3,665	4,276	4,887	5,498	6,109
100	0	68	136	204	272	339	679	1,358	2,036	2,715	3,394	4,073	4,751	5,430	6,109	6,788



# Hornsea 4



Table 99 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	2	4	7	11	14	18	22	25	29	32	36
10	0	4	7	11	14	18	36	72	108	144	180	216	252	288	324	360
20	0	7	14	22	29	36	72	144	216	288	360	432	504	576	648	720
30	0	11	22	32	43	54	108	216	324	432	540	648	756	864	972	1,080
40	0	14	29	43	58	72	144	288	432	576	720	864	1,008	1,152	1,296	1,440
50	0	18	36	54	72	90	180	360	540	720	900	1,080	1,260	1,440	1,619	1,799
60	0	22	43	65	86	108	216	432	648	864	1,080	1,296	1,512	1,727	1,943	2,159
70	0	25	50	76	101	126	252	504	756	1,008	1,260	1,512	1,763	2,015	2,267	2,519
80	0	29	58	86	115	144	288	576	864	1,152	1,440	1,727	2,015	2,303	2,591	2,879
90	0	32	65	97	130	162	324	648	972	1,296	1,619	1,943	2,267	2,591	2,915	3,239
100	0	36	72	108	144	180	360	720	1,080	1,440	1,799	2,159	2,519	2,879	3,239	3,599

# Hornsea 4



Table 100 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	1	2	4	5	7	9	11	13	14	16	18
10	0	2	4	5	7	9	18	36	54	72	90	109	127	145	163	181
20	0	4	7	11	14	18	36	72	109	145	181	217	253	289	326	362
30	0	5	11	16	22	27	54	109	163	217	271	326	380	434	488	543
40	0	7	14	22	29	36	72	145	217	289	362	434	507	579	651	724
50	0	9	18	27	36	45	90	181	271	362	452	543	633	724	814	905
60	0	11	22	33	43	54	109	217	326	434	543	651	760	868	977	1,085
70	0	13	25	38	51	63	127	253	380	507	633	760	886	1,013	1,140	1,266
80	0	14	29	43	58	72	145	289	434	579	724	868	1,013	1,158	1,303	1,447
90	0	16	33	49	65	81	163	326	488	651	814	977	1,140	1,303	1,465	1,628
100	0	18	36	54	72	90	181	362	543	724	905	1,085	1,266	1,447	1,628	1,809

Table 101 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	5	11	16	22	27	32	38	43	49	54
10	0	5	11	16	22	27	54	108	162	216	270	324	379	433	487	541
20	0	11	22	32	43	54	108	216	324	433	541	649	757	865	973	1,082
30	0	16	32	49	65	81	162	324	487	649	811	973	1,136	1,298	1,460	1,622
40	0	22	43	65	87	108	216	433	649	865	1,082	1,298	1,514	1,731	1,947	2,163
50	0	27	54	81	108	135	270	541	811	1,082	1,352	1,622	1,893	2,163	2,434	2,704
60	0	32	65	97	130	162	324	649	973	1,298	1,622	1,947	2,271	2,596	2,920	3,245
70	0	38	76	114	151	189	379	757	1,136	1,514	1,893	2,271	2,650	3,028	3,407	3,786
80	0	43	87	130	173	216	433	865	1,298	1,731	2,163	2,596	3,028	3,461	3,894	4,326
90	0	49	97	146	195	243	487	973	1,460	1,947	2,434	2,920	3,407	3,894	4,380	4,867
100	0	54	108	162	216	270	541	1,082	1,622	2,163	2,704	3,245	3,786	4,326	4,867	5,408

# Hornsea 4



Table 102 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	6	9	12	15	17	20	23	26	29
10	0	3	6	9	12	15	29	58	87	117	146	175	204	233	262	291
20	0	6	12	17	23	29	58	117	175	233	291	350	408	466	524	583
30	0	9	17	26	35	44	87	175	262	350	437	524	612	699	787	874
40	0	12	23	35	47	58	117	233	350	466	583	699	816	932	1,049	1,165
50	0	15	29	44	58	73	146	291	437	583	728	874	1,020	1,165	1,311	1,457
60	0	17	35	52	70	87	175	350	524	699	874	1,049	1,223	1,398	1,573	1,748
70	0	20	41	61	82	102	204	408	612	816	1,020	1,223	1,427	1,631	1,835	2,039
80	0	23	47	70	93	117	233	466	699	932	1,165	1,398	1,631	1,864	2,097	2,330
90	0	26	52	79	105	131	262	524	787	1,049	1,311	1,573	1,835	2,097	2,360	2,622
100	0	29	58	87	117	146	291	583	874	1,165	1,457	1,748	2,039	2,330	2,622	2,913

Table 103 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
10	0	1	3	4	6	7	15	29	44	59	74	88	103	118	132	147
20	0	3	6	9	12	15	29	59	88	118	147	176	206	235	265	294
30	0	4	9	13	18	22	44	88	132	176	221	265	309	353	397	441
40	0	6	12	18	24	29	59	118	176	235	294	353	412	471	529	588
50	0	7	15	22	29	37	74	147	221	294	368	441	515	588	662	735
60	0	9	18	26	35	44	88	176	265	353	441	529	618	706	794	882
70	0	10	21	31	41	51	103	206	309	412	515	618	721	824	927	1,030
80	0	12	24	35	47	59	118	235	353	471	588	706	824	941	1,059	1,177
90	0	13	26	40	53	66	132	265	397	529	662	794	927	1,059	1,191	1,324
100	0	15	29	44	59	74	147	294	441	588	735	882	1,030	1,177	1,324	1,471

# Hornsea 4



Table 104 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer using weighted mean approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	4	9	13	18	22	26	31	35	39	44
10	0	4	9	13	18	22	44	88	132	175	219	263	307	351	395	438
20	0	9	18	26	35	44	88	175	263	351	438	526	614	701	789	877
30	0	13	26	39	53	66	132	263	395	526	658	789	921	1,052	1,184	1,315
40	0	18	35	53	70	88	175	351	526	701	877	1,052	1,227	1,403	1,578	1,754
50	0	22	44	66	88	110	219	438	658	877	1,096	1,315	1,534	1,754	1,973	2,192
60	0	26	53	79	105	132	263	526	789	1,052	1,315	1,578	1,841	2,104	2,367	2,630
70	0	31	61	92	123	153	307	614	921	1,227	1,534	1,841	2,148	2,455	2,762	3,069
80	0	35	70	105	140	175	351	701	1,052	1,403	1,754	2,104	2,455	2,806	3,156	3,507
90	0	39	79	118	158	197	395	789	1,184	1,578	1,973	2,367	2,762	3,156	3,551	3,945
100	0	44	88	132	175	219	438	877	1,315	1,754	2,192	2,630	3,069	3,507	3,945	4,384

## Appendix L. Seasonal FFC Apportionment displacement matrices for guillemot using Applicant’s apportionment and mean peak abundance

Table 105 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	1	1	1	2	4	7	11	15	18	22	26	29	33	37
<b>10</b>	0	4	7	11	15	18	37	73	110	147	183	220	256	293	330	366
<b>20</b>	0	7	15	22	29	37	73	147	220	293	366	440	513	586	659	733
<b>30</b>	0	11	22	33	44	55	110	220	330	440	549	659	769	879	989	1,099
<b>40</b>	0	15	29	44	59	73	147	293	440	586	733	879	1,026	1,172	1,319	1,465
<b>50</b>	0	18	37	55	73	92	183	366	549	733	916	1,099	1,282	1,465	1,648	1,832
<b>60</b>	0	22	44	66	88	110	220	440	659	879	1,099	1,319	1,539	1,758	1,978	2,198
<b>70</b>	0	26	51	77	103	128	256	513	769	1,026	1,282	1,539	1,795	2,051	2,308	2,564
<b>80</b>	0	29	59	88	117	147	293	586	879	1,172	1,465	1,758	2,051	2,345	2,638	2,931
<b>90</b>	0	33	66	99	132	165	330	659	989	1,319	1,648	1,978	2,308	2,638	2,967	3,297
<b>100</b>	0	37	73	110	147	183	366	733	1,099	1,465	1,832	2,198	2,564	2,931	3,297	3,663

# Hornsea 4



Table 106 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33
<b>10</b>	0	3	7	10	13	17	33	67	100	133	166	200	233	266	299	333
<b>20</b>	0	7	13	20	27	33	67	133	200	266	333	399	466	532	599	665
<b>30</b>	0	10	20	30	40	50	100	200	299	399	499	599	698	798	898	998
<b>40</b>	0	13	27	40	53	67	133	266	399	532	665	798	931	1,064	1,197	1,330
<b>50</b>	0	17	33	50	67	83	166	333	499	665	831	998	1,164	1,330	1,496	1,663
<b>60</b>	0	20	40	60	80	100	200	399	599	798	998	1,197	1,397	1,596	1,796	1,995
<b>70</b>	0	23	47	70	93	116	233	466	698	931	1,164	1,397	1,630	1,862	2,095	2,328
<b>80</b>	0	27	53	80	106	133	266	532	798	1,064	1,330	1,596	1,862	2,128	2,394	2,660
<b>90</b>	0	30	60	90	120	150	299	599	898	1,197	1,496	1,796	2,095	2,394	2,694	2,993
<b>100</b>	0	33	67	100	133	166	333	665	998	1,330	1,663	1,995	2,328	2,660	2,993	3,326



Table 107 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	3	3	7	14	21	28	35	42	49	56	63	70
10	0	7	14	21	28	35	70	140	210	280	349	419	489	559	629	699
20	0	14	28	42	56	70	140	280	419	559	699	839	978	1,118	1,258	1,398
30	0	21	42	63	84	105	210	419	629	839	1,048	1,258	1,468	1,677	1,887	2,097
40	0	28	56	84	112	140	280	559	839	1,118	1,398	1,677	1,957	2,236	2,516	2,796
50	0	35	70	105	140	175	349	699	1,048	1,398	1,747	2,097	2,446	2,796	3,145	3,494
60	0	42	84	126	168	210	419	839	1,258	1,677	2,097	2,516	2,935	3,355	3,774	4,193
70	0	49	98	147	196	245	489	978	1,468	1,957	2,446	2,935	3,425	3,914	4,403	4,892
80	0	56	112	168	224	280	559	1,118	1,677	2,236	2,796	3,355	3,914	4,473	5,032	5,591
90	0	63	126	189	252	314	629	1,258	1,887	2,516	3,145	3,774	4,403	5,032	5,661	6,290
100	0	70	140	210	280	349	699	1,398	2,097	2,796	3,494	4,193	4,892	5,591	6,290	6,989

Table 108 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	5	10	16	21	26	31	36	41	47	52
10	0	5	10	16	21	26	52	104	155	207	259	311	362	414	466	518
20	0	10	21	31	41	52	104	207	311	414	518	621	725	828	932	1,035
30	0	16	31	47	62	78	155	311	466	621	776	932	1,087	1,242	1,397	1,553
40	0	21	41	62	83	104	207	414	621	828	1,035	1,242	1,449	1,656	1,863	2,070
50	0	26	52	78	104	129	259	518	776	1,035	1,294	1,553	1,811	2,070	2,329	2,588
60	0	31	62	93	124	155	311	621	932	1,242	1,553	1,863	2,174	2,484	2,795	3,105
70	0	36	72	109	145	181	362	725	1,087	1,449	1,811	2,174	2,536	2,898	3,260	3,623
80	0	41	83	124	166	207	414	828	1,242	1,656	2,070	2,484	2,898	3,312	3,726	4,140
90	0	47	93	140	186	233	466	932	1,397	1,863	2,329	2,795	3,260	3,726	4,192	4,658
100	0	52	104	155	207	259	518	1,035	1,553	2,070	2,588	3,105	3,623	4,140	4,658	5,175

Table 109 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	5	10	14	19	24	29	34	38	43	48
10	0	5	10	14	19	24	48	96	144	191	239	287	335	383	431	479
20	0	10	19	29	38	48	96	191	287	383	479	574	670	766	862	957
30	0	14	29	43	57	72	144	287	431	574	718	862	1,005	1,149	1,292	1,436
40	0	19	38	57	77	96	191	383	574	766	957	1,149	1,340	1,532	1,723	1,915
50	0	24	48	72	96	120	239	479	718	957	1,197	1,436	1,675	1,915	2,154	2,393
60	0	29	57	86	115	144	287	574	862	1,149	1,436	1,723	2,010	2,298	2,585	2,872
70	0	34	67	101	134	168	335	670	1,005	1,340	1,675	2,010	2,346	2,681	3,016	3,351
80	0	38	77	115	153	191	383	766	1,149	1,532	1,915	2,298	2,681	3,064	3,447	3,829
90	0	43	86	129	172	215	431	862	1,292	1,723	2,154	2,585	3,016	3,447	3,877	4,308
100	0	48	96	144	191	239	479	957	1,436	1,915	2,393	2,872	3,351	3,829	4,308	4,787

**Table 110 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer using mean peak abundance approach.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>10</b>	0	10	20	30	40	50	100	199	299	398	498	598	697	797	897	996
<b>20</b>	0	20	40	60	80	100	199	398	598	797	996	1,195	1,395	1,594	1,793	1,992
<b>30</b>	0	30	60	90	120	149	299	598	897	1,195	1,494	1,793	2,092	2,391	2,690	2,989
<b>40</b>	0	40	80	120	159	199	398	797	1,195	1,594	1,992	2,391	2,789	3,188	3,586	3,985
<b>50</b>	0	50	100	149	199	249	498	996	1,494	1,992	2,491	2,989	3,487	3,985	4,483	4,981
<b>60</b>	0	60	120	179	239	299	598	1,195	1,793	2,391	2,989	3,586	4,184	4,782	5,380	5,977
<b>70</b>	0	70	139	209	279	349	697	1,395	2,092	2,789	3,487	4,184	4,881	5,579	6,276	6,973
<b>80</b>	0	80	159	239	319	398	797	1,594	2,391	3,188	3,985	4,782	5,579	6,376	7,173	7,970
<b>90</b>	0	90	179	269	359	448	897	1,793	2,690	3,586	4,483	5,380	6,276	7,173	8,069	8,966
<b>100</b>	0	100	199	299	398	498	996	1,992	2,989	3,985	4,981	5,977	6,973	7,970	8,966	9,962

Table 111 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	5	10	15	20	26	31	36	41	46	51
10	0	5	10	15	20	26	51	102	153	204	256	307	358	409	460	511
20	0	10	20	31	41	51	102	204	307	409	511	613	715	818	920	1,022
30	0	15	31	46	61	77	153	307	460	613	767	920	1,073	1,227	1,380	1,533
40	0	20	41	61	82	102	204	409	613	818	1,022	1,227	1,431	1,635	1,840	2,044
50	0	26	51	77	102	128	256	511	767	1,022	1,278	1,533	1,789	2,044	2,300	2,555
60	0	31	61	92	123	153	307	613	920	1,227	1,533	1,840	2,146	2,453	2,760	3,066
70	0	36	72	107	143	179	358	715	1,073	1,431	1,789	2,146	2,504	2,862	3,220	3,577
80	0	41	82	123	164	204	409	818	1,227	1,635	2,044	2,453	2,862	3,271	3,680	4,088
90	0	46	92	138	184	230	460	920	1,380	1,840	2,300	2,760	3,220	3,680	4,140	4,600
100	0	51	102	153	204	256	511	1,022	1,533	2,044	2,555	3,066	3,577	4,088	4,600	5,111

Table 112 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	5	9	14	19	24	28	33	38	43	47
10	0	5	9	14	19	24	47	94	142	189	236	283	331	378	425	472
20	0	9	19	28	38	47	94	189	283	378	472	567	661	756	850	945
30	0	14	28	43	57	71	142	283	425	567	709	850	992	1,134	1,275	1,417
40	0	19	38	57	76	94	189	378	567	756	945	1,134	1,323	1,512	1,701	1,889
50	0	24	47	71	94	118	236	472	709	945	1,181	1,417	1,653	1,889	2,126	2,362
60	0	28	57	85	113	142	283	567	850	1,134	1,417	1,701	1,984	2,267	2,551	2,834
70	0	33	66	99	132	165	331	661	992	1,323	1,653	1,984	2,315	2,645	2,976	3,307
80	0	38	76	113	151	189	378	756	1,134	1,512	1,889	2,267	2,645	3,023	3,401	3,779
90	0	43	85	128	170	213	425	850	1,275	1,701	2,126	2,551	2,976	3,401	3,826	4,251
100	0	47	94	142	189	236	472	945	1,417	1,889	2,362	2,834	3,307	3,779	4,251	4,724

Table 113 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	10	20	30	39	49	59	69	79	89	98
10	0	10	20	30	39	49	98	197	295	393	492	590	688	787	885	983
20	0	20	39	59	79	98	197	393	590	787	983	1,180	1,377	1,573	1,770	1,967
30	0	30	59	89	118	148	295	590	885	1,180	1,475	1,770	2,065	2,360	2,655	2,950
40	0	39	79	118	157	197	393	787	1,180	1,573	1,967	2,360	2,754	3,147	3,540	3,934
50	0	49	98	148	197	246	492	983	1,475	1,967	2,459	2,950	3,442	3,934	4,425	4,917
60	0	59	118	177	236	295	590	1,180	1,770	2,360	2,950	3,540	4,130	4,720	5,310	5,901
70	0	69	138	207	275	344	688	1,377	2,065	2,754	3,442	4,130	4,819	5,507	6,196	6,884
80	0	79	157	236	315	393	787	1,573	2,360	3,147	3,934	4,720	5,507	6,294	7,081	7,867
90	0	89	177	266	354	443	885	1,770	2,655	3,540	4,425	5,310	6,196	7,081	7,966	8,851
100	0	98	197	295	393	492	983	1,967	2,950	3,934	4,917	5,901	6,884	7,867	8,851	9,834

# Hornsea 4



Table 114 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	5	10	15	20	25	30	35	40	45	50
10	0	5	10	15	20	25	50	100	150	200	250	299	349	399	449	499
20	0	10	20	30	40	50	100	200	299	399	499	599	699	798	898	998
30	0	15	30	45	60	75	150	299	449	599	749	898	1,048	1,198	1,347	1,497
40	0	20	40	60	80	100	200	399	599	798	998	1,198	1,397	1,597	1,796	1,996
50	0	25	50	75	100	125	250	499	749	998	1,248	1,497	1,747	1,996	2,246	2,495
60	0	30	60	90	120	150	299	599	898	1,198	1,497	1,796	2,096	2,395	2,695	2,994
70	0	35	70	105	140	175	349	699	1,048	1,397	1,747	2,096	2,445	2,794	3,144	3,493
80	0	40	80	120	160	200	399	798	1,198	1,597	1,996	2,395	2,794	3,194	3,593	3,992
90	0	45	90	135	180	225	449	898	1,347	1,796	2,246	2,695	3,144	3,593	4,042	4,491
100	0	50	100	150	200	250	499	998	1,497	1,996	2,495	2,994	3,493	3,992	4,491	4,990



Table 115 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	5	9	14	18	23	28	32	37	42	46
10	0	5	9	14	18	23	46	92	139	185	231	277	323	370	416	462
20	0	9	18	28	37	46	92	185	277	370	462	554	647	739	832	924
30	0	14	28	42	55	69	139	277	416	554	693	832	970	1,109	1,247	1,386
40	0	18	37	55	74	92	185	370	554	739	924	1,109	1,294	1,478	1,663	1,848
50	0	23	46	69	92	116	231	462	693	924	1,155	1,386	1,617	1,848	2,079	2,310
60	0	28	55	83	111	139	277	554	832	1,109	1,386	1,663	1,940	2,218	2,495	2,772
70	0	32	65	97	129	162	323	647	970	1,294	1,617	1,940	2,264	2,587	2,911	3,234
80	0	37	74	111	148	185	370	739	1,109	1,478	1,848	2,218	2,587	2,957	3,326	3,696
90	0	42	83	125	166	208	416	832	1,247	1,663	2,079	2,495	2,911	3,326	3,742	4,158
100	0	46	92	139	185	231	462	924	1,386	1,848	2,310	2,772	3,234	3,696	4,158	4,620

Table 116 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	10	19	29	38	48	58	67	77	86	96
10	0	10	19	29	38	48	96	192	288	384	481	577	673	769	865	961
20	0	19	38	58	77	96	192	384	577	769	961	1,153	1,345	1,538	1,730	1,922
30	0	29	58	86	115	144	288	577	865	1,153	1,442	1,730	2,018	2,306	2,595	2,883
40	0	38	77	115	154	192	384	769	1,153	1,538	1,922	2,306	2,691	3,075	3,460	3,844
50	0	48	96	144	192	240	481	961	1,442	1,922	2,403	2,883	3,364	3,844	4,325	4,805
60	0	58	115	173	231	288	577	1,153	1,730	2,306	2,883	3,460	4,036	4,613	5,189	5,766
70	0	67	135	202	269	336	673	1,345	2,018	2,691	3,364	4,036	4,709	5,382	6,054	6,727
80	0	77	154	231	308	384	769	1,538	2,306	3,075	3,844	4,613	5,382	6,150	6,919	7,688
90	0	86	173	259	346	432	865	1,730	2,595	3,460	4,325	5,189	6,054	6,919	7,784	8,649
100	0	96	192	288	384	481	961	1,922	2,883	3,844	4,805	5,766	6,727	7,688	8,649	9,610

Table 117 Guillemot Applicant's t breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	2	2	4	9	13	18	22	27	31	36	40	45
10	0	4	9	13	18	22	45	90	135	180	225	270	315	360	405	450
20	0	9	18	27	36	45	90	180	270	360	450	539	629	719	809	899
30	0	13	27	40	54	67	135	270	405	539	674	809	944	1,079	1,214	1,349
40	0	18	36	54	72	90	180	360	539	719	899	1,079	1,259	1,439	1,618	1,798
50	0	22	45	67	90	112	225	450	674	899	1,124	1,349	1,573	1,798	2,023	2,248
60	0	27	54	81	108	135	270	539	809	1,079	1,349	1,618	1,888	2,158	2,428	2,697
70	0	31	63	94	126	157	315	629	944	1,259	1,573	1,888	2,203	2,518	2,832	3,147
80	0	36	72	108	144	180	360	719	1,079	1,439	1,798	2,158	2,518	2,877	3,237	3,597
90	0	40	81	121	162	202	405	809	1,214	1,618	2,023	2,428	2,832	3,237	3,641	4,046
100	0	45	90	135	180	225	450	899	1,349	1,798	2,248	2,697	3,147	3,597	4,046	4,496

**Table 118 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer using mean peak abundance approach.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	1	1	2	2	4	8	13	17	21	25	29	34	38	42
<b>10</b>	0	4	8	13	17	21	42	84	126	168	210	252	294	336	378	420
<b>20</b>	0	8	17	25	34	42	84	168	252	336	420	504	588	672	756	840
<b>30</b>	0	13	25	38	50	63	126	252	378	504	630	756	882	1,008	1,134	1,260
<b>40</b>	0	17	34	50	67	84	168	336	504	672	840	1,008	1,176	1,345	1,513	1,681
<b>50</b>	0	21	42	63	84	105	210	420	630	840	1,050	1,260	1,471	1,681	1,891	2,101
<b>60</b>	0	25	50	76	101	126	252	504	756	1,008	1,260	1,513	1,765	2,017	2,269	2,521
<b>70</b>	0	29	59	88	118	147	294	588	882	1,176	1,471	1,765	2,059	2,353	2,647	2,941
<b>80</b>	0	34	67	101	134	168	336	672	1,008	1,345	1,681	2,017	2,353	2,689	3,025	3,361
<b>90</b>	0	38	76	113	151	189	378	756	1,134	1,513	1,891	2,269	2,647	3,025	3,403	3,781
<b>100</b>	0	42	84	126	168	210	420	840	1,260	1,681	2,101	2,521	2,941	3,361	3,781	4,202

Table 119 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	3	4	9	17	26	35	43	52	61	70	78	87
10	0	9	17	26	35	43	87	174	261	348	435	522	609	696	783	870
20	0	17	35	52	70	87	174	348	522	696	870	1,044	1,218	1,392	1,566	1,739
30	0	26	52	78	104	130	261	522	783	1,044	1,305	1,566	1,826	2,087	2,348	2,609
40	0	35	70	104	139	174	348	696	1,044	1,392	1,739	2,087	2,435	2,783	3,131	3,479
50	0	43	87	130	174	217	435	870	1,305	1,739	2,174	2,609	3,044	3,479	3,914	4,349
60	0	52	104	157	209	261	522	1,044	1,566	2,087	2,609	3,131	3,653	4,175	4,697	5,218
70	0	61	122	183	244	304	609	1,218	1,826	2,435	3,044	3,653	4,262	4,870	5,479	6,088
80	0	70	139	209	278	348	696	1,392	2,087	2,783	3,479	4,175	4,870	5,566	6,262	6,958
90	0	78	157	235	313	391	783	1,566	2,348	3,131	3,914	4,697	5,479	6,262	7,045	7,828
100	0	87	174	261	348	435	870	1,739	2,609	3,479	4,349	5,218	6,088	6,958	7,828	8,697

# Hornsea 4



Table 120 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	2	4	7	11	14	18	22	25	29	32	36
10	0	4	7	11	14	18	36	72	108	144	180	216	252	288	324	360
20	0	7	14	22	29	36	72	144	216	288	360	432	504	576	648	720
30	0	11	22	32	43	54	108	216	324	432	540	648	756	864	972	1,080
40	0	14	29	43	58	72	144	288	432	576	720	864	1,008	1,152	1,296	1,440
50	0	18	36	54	72	90	180	360	540	720	900	1,080	1,260	1,440	1,619	1,799
60	0	22	43	65	86	108	216	432	648	864	1,080	1,296	1,512	1,727	1,943	2,159
70	0	25	50	76	101	126	252	504	756	1,008	1,260	1,512	1,763	2,015	2,267	2,519
80	0	29	58	86	115	144	288	576	864	1,152	1,440	1,727	2,015	2,303	2,591	2,879
90	0	32	65	97	130	162	324	648	972	1,296	1,619	1,943	2,267	2,591	2,915	3,239
100	0	36	72	108	144	180	360	720	1,080	1,440	1,799	2,159	2,519	2,879	3,239	3,599

**Table 121 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer using mean peak abundance approach.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	1	1	1	2	3	7	10	13	16	20	23	26	29	33
<b>10</b>	0	3	7	10	13	16	33	65	98	130	163	195	228	261	293	326
<b>20</b>	0	7	13	20	26	33	65	130	195	261	326	391	456	521	586	652
<b>30</b>	0	10	20	29	39	49	98	195	293	391	489	586	684	782	880	977
<b>40</b>	0	13	26	39	52	65	130	261	391	521	652	782	912	1,043	1,173	1,303
<b>50</b>	0	16	33	49	65	81	163	326	489	652	814	977	1,140	1,303	1,466	1,629
<b>60</b>	0	20	39	59	78	98	195	391	586	782	977	1,173	1,368	1,564	1,759	1,955
<b>70</b>	0	23	46	68	91	114	228	456	684	912	1,140	1,368	1,596	1,824	2,053	2,281
<b>80</b>	0	26	52	78	104	130	261	521	782	1,043	1,303	1,564	1,824	2,085	2,346	2,606
<b>90</b>	0	29	59	88	117	147	293	586	880	1,173	1,466	1,759	2,053	2,346	2,639	2,932
<b>100</b>	0	33	65	98	130	163	326	652	977	1,303	1,629	1,955	2,281	2,606	2,932	3,258

Table 122 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	3	3	7	14	21	27	34	41	48	55	62	69
10	0	7	14	21	27	34	69	137	206	274	343	411	480	549	617	686
20	0	14	27	41	55	69	137	274	411	549	686	823	960	1,097	1,234	1,371
30	0	21	41	62	82	103	206	411	617	823	1,029	1,234	1,440	1,646	1,851	2,057
40	0	27	55	82	110	137	274	549	823	1,097	1,371	1,646	1,920	2,194	2,468	2,743
50	0	34	69	103	137	171	343	686	1,029	1,371	1,714	2,057	2,400	2,743	3,086	3,428
60	0	41	82	123	165	206	411	823	1,234	1,646	2,057	2,468	2,880	3,291	3,703	4,114
70	0	48	96	144	192	240	480	960	1,440	1,920	2,400	2,880	3,360	3,840	4,320	4,800
80	0	55	110	165	219	274	549	1,097	1,646	2,194	2,743	3,291	3,840	4,388	4,937	5,485
90	0	62	123	185	247	309	617	1,234	1,851	2,468	3,086	3,703	4,320	4,937	5,554	6,171
100	0	69	137	206	274	343	686	1,371	2,057	2,743	3,428	4,114	4,800	5,485	6,171	6,857



# Hornsea 4



Table 123 Guillemot Applicant’s breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	6	9	12	15	17	20	23	26	29
10	0	3	6	9	12	15	29	58	87	117	146	175	204	233	262	291
20	0	6	12	17	23	29	58	117	175	233	291	350	408	466	524	583
30	0	9	17	26	35	44	87	175	262	350	437	524	612	699	787	874
40	0	12	23	35	47	58	117	233	350	466	583	699	816	932	1,049	1,165
50	0	15	29	44	58	73	146	291	437	583	728	874	1,020	1,165	1,311	1,457
60	0	17	35	52	70	87	175	350	524	699	874	1,049	1,223	1,398	1,573	1,748
70	0	20	41	61	82	102	204	408	612	816	1,020	1,223	1,427	1,631	1,835	2,039
80	0	23	47	70	93	117	233	466	699	932	1,165	1,398	1,631	1,864	2,097	2,330
90	0	26	52	79	105	131	262	524	787	1,049	1,311	1,573	1,835	2,097	2,360	2,622
100	0	29	58	87	117	146	291	583	874	1,165	1,457	1,748	2,039	2,330	2,622	2,913

Table 124 Guillemot Applicant’s non-breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
10	0	3	5	8	11	13	27	54	80	107	134	161	187	214	241	268
20	0	5	11	16	21	27	54	107	161	214	268	321	375	428	482	535
30	0	8	16	24	32	40	80	161	241	321	401	482	562	642	722	803
40	0	11	21	32	43	54	107	214	321	428	535	642	749	856	963	1,070
50	0	13	27	40	54	67	134	268	401	535	669	803	936	1,070	1,204	1,338
60	0	16	32	48	64	80	161	321	482	642	803	963	1,124	1,284	1,445	1,605
70	0	19	37	56	75	94	187	375	562	749	936	1,124	1,311	1,498	1,686	1,873
80	0	21	43	64	86	107	214	428	642	856	1,070	1,284	1,498	1,712	1,926	2,141
90	0	24	48	72	96	120	241	482	722	963	1,204	1,445	1,686	1,926	2,167	2,408
100	0	27	54	80	107	134	268	535	803	1,070	1,338	1,605	1,873	2,141	2,408	2,676

Table 125 Guillemot Applicant’s annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer using mean peak abundance approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	6	11	17	22	28	34	39	45	50	56
10	0	6	11	17	22	28	56	112	168	224	279	335	391	447	503	559
20	0	11	22	34	45	56	112	224	335	447	559	671	782	894	1,006	1,118
30	0	17	34	50	67	84	168	335	503	671	838	1,006	1,174	1,341	1,509	1,677
40	0	22	45	67	89	112	224	447	671	894	1,118	1,341	1,565	1,788	2,012	2,235
50	0	28	56	84	112	140	279	559	838	1,118	1,397	1,677	1,956	2,235	2,515	2,794
60	0	34	67	101	134	168	335	671	1,006	1,341	1,677	2,012	2,347	2,683	3,018	3,353
70	0	39	78	117	156	196	391	782	1,174	1,565	1,956	2,347	2,738	3,130	3,521	3,912
80	0	45	89	134	179	224	447	894	1,341	1,788	2,235	2,683	3,130	3,577	4,024	4,471
90	0	50	101	151	201	251	503	1,006	1,509	2,012	2,515	3,018	3,521	4,024	4,527	5,030
100	0	56	112	168	224	279	559	1,118	1,677	2,235	2,794	3,353	3,912	4,471	5,030	5,589

Appendix M. Seasonal FFC Apportionment displacement matrices for guillemot using Natural England’s standard apportioning approach.

Table 126 Guillemot Natural England’s standard apportioning approach breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	1	2	3	3	7	13	20	26	33	39	46	53	59	66
<b>10</b>	0	7	13	20	26	33	66	131	197	263	328	394	460	525	591	657
<b>20</b>	0	13	26	39	53	66	131	263	394	525	657	788	919	1,050	1,182	1,313
<b>30</b>	0	20	39	59	79	98	197	394	591	788	985	1,182	1,379	1,576	1,773	1,970
<b>40</b>	0	26	53	79	105	131	263	525	788	1,050	1,313	1,576	1,838	2,101	2,363	2,626
<b>50</b>	0	33	66	98	131	164	328	657	985	1,313	1,641	1,970	2,298	2,626	2,954	3,283
<b>60</b>	0	39	79	118	158	197	394	788	1,182	1,576	1,970	2,363	2,757	3,151	3,545	3,939
<b>70</b>	0	46	92	138	184	230	460	919	1,379	1,838	2,298	2,757	3,217	3,676	4,136	4,596
<b>80</b>	0	53	105	158	210	263	525	1,050	1,576	2,101	2,626	3,151	3,676	4,202	4,727	5,252
<b>90</b>	0	59	118	177	236	295	591	1,182	1,773	2,363	2,954	3,545	4,136	4,727	5,318	5,909
<b>100</b>	0	66	131	197	263	328	657	1,313	1,970	2,626	3,283	3,939	4,596	5,252	5,909	6,565

Table 127 Guillemot Natural England’s standard apportioning approach non-breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
10	0	1	2	3	4	6	11	22	34	45	56	67	78	89	101	112
20	0	2	4	7	9	11	22	45	67	89	112	134	157	179	201	224
30	0	3	7	10	13	17	34	67	101	134	168	201	235	268	302	335
40	0	4	9	13	18	22	45	89	134	179	224	268	313	358	403	447
50	0	6	11	17	22	28	56	112	168	224	280	335	391	447	503	559
60	0	7	13	20	27	34	67	134	201	268	335	403	470	537	604	671
70	0	8	16	23	31	39	78	157	235	313	391	470	548	626	704	783
80	0	9	18	27	36	45	89	179	268	358	447	537	626	716	805	895
90	0	10	20	30	40	50	101	201	302	403	503	604	704	805	906	1,006
100	0	11	22	34	45	56	112	224	335	447	559	671	783	895	1,006	1,118

Table 128 Guillemot Natural England’s standard apportioning approach annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	2	3	4	8	15	23	31	38	46	54	61	69	77
10	0	8	15	23	31	38	77	154	230	307	384	461	538	615	691	768
20	0	15	31	46	61	77	154	307	461	615	768	922	1,076	1,229	1,383	1,537
30	0	23	46	69	92	115	230	461	691	922	1,152	1,383	1,613	1,844	2,074	2,305
40	0	31	61	92	123	154	307	615	922	1,229	1,537	1,844	2,151	2,459	2,766	3,073
50	0	38	77	115	154	192	384	768	1,152	1,537	1,921	2,305	2,689	3,073	3,457	3,842
60	0	46	92	138	184	230	461	922	1,383	1,844	2,305	2,766	3,227	3,688	4,149	4,610
70	0	54	108	161	215	269	538	1,076	1,613	2,151	2,689	3,227	3,765	4,303	4,840	5,378
80	0	61	123	184	246	307	615	1,229	1,844	2,459	3,073	3,688	4,303	4,917	5,532	6,147
90	0	69	138	207	277	346	691	1,383	2,074	2,766	3,457	4,149	4,840	5,532	6,223	6,915
100	0	77	154	230	307	384	768	1,537	2,305	3,073	3,842	4,610	5,378	6,147	6,915	7,683

**Table 129 Guillemot Natural England’s standard apportioning approach breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	3	4	5	9	19	28	37	46	56	65	74	83	93
<b>10</b>	0	9	19	28	37	46	93	185	278	371	464	556	649	742	835	927
<b>20</b>	0	19	37	56	74	93	185	371	556	742	927	1,113	1,298	1,484	1,669	1,855
<b>30</b>	0	28	56	83	111	139	278	556	835	1,113	1,391	1,669	1,948	2,226	2,504	2,782
<b>40</b>	0	37	74	111	148	185	371	742	1,113	1,484	1,855	2,226	2,597	2,968	3,339	3,710
<b>50</b>	0	46	93	139	185	232	464	927	1,391	1,855	2,319	2,782	3,246	3,710	4,174	4,637
<b>60</b>	0	56	111	167	223	278	556	1,113	1,669	2,226	2,782	3,339	3,895	4,452	5,008	5,565
<b>70</b>	0	65	130	195	260	325	649	1,298	1,948	2,597	3,246	3,895	4,545	5,194	5,843	6,492
<b>80</b>	0	74	148	223	297	371	742	1,484	2,226	2,968	3,710	4,452	5,194	5,936	6,678	7,420
<b>90</b>	0	83	167	250	334	417	835	1,669	2,504	3,339	4,174	5,008	5,843	6,678	7,512	8,347
<b>100</b>	0	93	185	278	371	464	927	1,855	2,782	3,710	4,637	5,565	6,492	7,420	8,347	9,275

Table 130 Guillemot Natural England’s standard apportioning approach non-breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	1	2	3	5	6	8	10	11	13	14	16
10	0	2	3	5	6	8	16	32	48	64	80	97	113	129	145	161
20	0	3	6	10	13	16	32	64	97	129	161	193	225	258	290	322
30	0	5	10	14	19	24	48	97	145	193	241	290	338	386	435	483
40	0	6	13	19	26	32	64	129	193	258	322	386	451	515	579	644
50	0	8	16	24	32	40	80	161	241	322	402	483	563	644	724	805
60	0	10	19	29	39	48	97	193	290	386	483	579	676	773	869	966
70	0	11	23	34	45	56	113	225	338	451	563	676	789	901	1,014	1,127
80	0	13	26	39	52	64	129	258	386	515	644	773	901	1,030	1,159	1,288
90	0	14	29	43	58	72	145	290	435	579	724	869	1,014	1,159	1,304	1,449
100	0	16	32	48	64	80	161	322	483	644	805	966	1,127	1,288	1,449	1,610



**Table 131 Guillemot Natural England’s standard apportioning approach annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	3	4	5	11	22	33	44	54	65	76	87	98	109
<b>10</b>	0	11	22	33	44	54	109	218	327	435	544	653	762	871	980	1,088
<b>20</b>	0	22	44	65	87	109	218	435	653	871	1,088	1,306	1,524	1,741	1,959	2,177
<b>30</b>	0	33	65	98	131	163	327	653	980	1,306	1,633	1,959	2,286	2,612	2,939	3,265
<b>40</b>	0	44	87	131	174	218	435	871	1,306	1,741	2,177	2,612	3,048	3,483	3,918	4,354
<b>50</b>	0	54	109	163	218	272	544	1,088	1,633	2,177	2,721	3,265	3,809	4,354	4,898	5,442
<b>60</b>	0	65	131	196	261	327	653	1,306	1,959	2,612	3,265	3,918	4,571	5,224	5,877	6,530
<b>70</b>	0	76	152	229	305	381	762	1,524	2,286	3,048	3,809	4,571	5,333	6,095	6,857	7,619
<b>80</b>	0	87	174	261	348	435	871	1,741	2,612	3,483	4,354	5,224	6,095	6,966	7,837	8,707
<b>90</b>	0	98	196	294	392	490	980	1,959	2,939	3,918	4,898	5,877	6,857	7,837	8,816	9,796
<b>100</b>	0	109	218	327	435	544	1,088	2,177	3,265	4,354	5,442	6,530	7,619	8,707	9,796	10,884

**Table 132 Guillemot Natural England’s standard apportioning approach breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	3	4	5	9	18	27	37	46	55	64	73	82	92
<b>10</b>	0	9	18	27	37	46	92	183	275	366	458	550	641	733	824	916
<b>20</b>	0	18	37	55	73	92	183	366	550	733	916	1,099	1,282	1,465	1,649	1,832
<b>30</b>	0	27	55	82	110	137	275	550	824	1,099	1,374	1,649	1,923	2,198	2,473	2,748
<b>40</b>	0	37	73	110	147	183	366	733	1,099	1,465	1,832	2,198	2,564	2,931	3,297	3,664
<b>50</b>	0	46	92	137	183	229	458	916	1,374	1,832	2,290	2,748	3,206	3,664	4,121	4,579
<b>60</b>	0	55	110	165	220	275	550	1,099	1,649	2,198	2,748	3,297	3,847	4,396	4,946	5,495
<b>70</b>	0	64	128	192	256	321	641	1,282	1,923	2,564	3,206	3,847	4,488	5,129	5,770	6,411
<b>80</b>	0	73	147	220	293	366	733	1,465	2,198	2,931	3,664	4,396	5,129	5,862	6,594	7,327
<b>90</b>	0	82	165	247	330	412	824	1,649	2,473	3,297	4,121	4,946	5,770	6,594	7,419	8,243
<b>100</b>	0	92	183	275	366	458	916	1,832	2,748	3,664	4,579	5,495	6,411	7,327	8,243	9,159

**Table 133 Guillemot Natural England’s standard apportioning approach non-breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	0	0	1	1	2	3	5	6	8	10	11	13	14	16
<b>10</b>	0	2	3	5	6	8	16	32	48	64	79	95	111	127	143	159
<b>20</b>	0	3	6	10	13	16	32	64	95	127	159	191	222	254	286	318
<b>30</b>	0	5	10	14	19	24	48	95	143	191	238	286	334	381	429	476
<b>40</b>	0	6	13	19	25	32	64	127	191	254	318	381	445	508	572	635
<b>50</b>	0	8	16	24	32	40	79	159	238	318	397	476	556	635	715	794
<b>60</b>	0	10	19	29	38	48	95	191	286	381	476	572	667	762	858	953
<b>70</b>	0	11	22	33	44	56	111	222	334	445	556	667	778	889	1,001	1,112
<b>80</b>	0	13	25	38	51	64	127	254	381	508	635	762	889	1,016	1,144	1,271
<b>90</b>	0	14	29	43	57	71	143	286	429	572	715	858	1,001	1,144	1,286	1,429
<b>100</b>	0	16	32	48	64	79	159	318	476	635	794	953	1,112	1,271	1,429	1,588

**Table 134 Guillemot Natural England’s standard apportioning approach annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	3	4	5	11	21	32	43	54	64	75	86	97	107
<b>10</b>	0	11	21	32	43	54	107	215	322	430	537	645	752	860	967	1,075
<b>20</b>	0	21	43	64	86	107	215	430	645	860	1,075	1,290	1,505	1,720	1,934	2,149
<b>30</b>	0	32	64	97	129	161	322	645	967	1,290	1,612	1,934	2,257	2,579	2,902	3,224
<b>40</b>	0	43	86	129	172	215	430	860	1,290	1,720	2,149	2,579	3,009	3,439	3,869	4,299
<b>50</b>	0	54	107	161	215	269	537	1,075	1,612	2,149	2,687	3,224	3,761	4,299	4,836	5,374
<b>60</b>	0	64	129	193	258	322	645	1,290	1,934	2,579	3,224	3,869	4,514	5,159	5,803	6,448
<b>70</b>	0	75	150	226	301	376	752	1,505	2,257	3,009	3,761	4,514	5,266	6,018	6,771	7,523
<b>80</b>	0	86	172	258	344	430	860	1,720	2,579	3,439	4,299	5,159	6,018	6,878	7,738	8,598
<b>90</b>	0	97	193	290	387	484	967	1,934	2,902	3,869	4,836	5,803	6,771	7,738	8,705	9,672
<b>100</b>	0	107	215	322	430	537	1,075	2,149	3,224	4,299	5,374	6,448	7,523	8,598	9,672	10,747

Table 135 Guillemot Natural England’s standard apportioning approach breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	4	9	18	27	36	45	54	63	72	80	89
10	0	9	18	27	36	45	89	179	268	358	447	537	626	715	805	894
20	0	18	36	54	72	89	179	358	537	715	894	1,073	1,252	1,431	1,610	1,789
30	0	27	54	80	107	134	268	537	805	1,073	1,341	1,610	1,878	2,146	2,415	2,683
40	0	36	72	107	143	179	358	715	1,073	1,431	1,789	2,146	2,504	2,862	3,219	3,577
50	0	45	89	134	179	224	447	894	1,341	1,789	2,236	2,683	3,130	3,577	4,024	4,471
60	0	54	107	161	215	268	537	1,073	1,610	2,146	2,683	3,219	3,756	4,293	4,829	5,366
70	0	63	125	188	250	313	626	1,252	1,878	2,504	3,130	3,756	4,382	5,008	5,634	6,260
80	0	72	143	215	286	358	715	1,431	2,146	2,862	3,577	4,293	5,008	5,723	6,439	7,154
90	0	80	161	241	322	402	805	1,610	2,415	3,219	4,024	4,829	5,634	6,439	7,244	8,048
100	0	89	179	268	358	447	894	1,789	2,683	3,577	4,471	5,366	6,260	7,154	8,048	8,943

Table 136 Guillemot Natural England’s standard apportioning approach non-breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	16
10	0	2	3	5	6	8	16	31	47	62	78	93	109	124	140	155
20	0	3	6	9	12	16	31	62	93	124	155	186	217	249	280	311
30	0	5	9	14	19	23	47	93	140	186	233	280	326	373	419	466
40	0	6	12	19	25	31	62	124	186	249	311	373	435	497	559	621
50	0	8	16	23	31	39	78	155	233	311	388	466	544	621	699	777
60	0	9	19	28	37	47	93	186	280	373	466	559	652	746	839	932
70	0	11	22	33	43	54	109	217	326	435	544	652	761	870	979	1,087
80	0	12	25	37	50	62	124	249	373	497	621	746	870	994	1,118	1,243
90	0	14	28	42	56	70	140	280	419	559	699	839	979	1,118	1,258	1,398
100	0	16	31	47	62	78	155	311	466	621	777	932	1,087	1,243	1,398	1,553

Table 137 Guillemot Natural England’s standard apportioning approach annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	10	21	31	42	52	63	73	84	94	105
10	0	10	21	31	42	52	105	210	315	420	525	630	735	840	945	1,050
20	0	21	42	63	84	105	210	420	630	840	1,050	1,260	1,469	1,679	1,889	2,099
30	0	31	63	94	126	157	315	630	945	1,260	1,574	1,889	2,204	2,519	2,834	3,149
40	0	42	84	126	168	210	420	840	1,260	1,679	2,099	2,519	2,939	3,359	3,779	4,198
50	0	52	105	157	210	262	525	1,050	1,574	2,099	2,624	3,149	3,674	4,198	4,723	5,248
60	0	63	126	189	252	315	630	1,260	1,889	2,519	3,149	3,779	4,408	5,038	5,668	6,298
70	0	73	147	220	294	367	735	1,469	2,204	2,939	3,674	4,408	5,143	5,878	6,613	7,347
80	0	84	168	252	336	420	840	1,679	2,519	3,359	4,198	5,038	5,878	6,718	7,557	8,397
90	0	94	189	283	378	472	945	1,889	2,834	3,779	4,723	5,668	6,613	7,557	8,502	9,447
100	0	105	210	315	420	525	1,050	2,099	3,149	4,198	5,248	6,298	7,347	8,397	9,447	10,496

**Table 138 Guillemot Natural England’s standard apportioning approach breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	2	3	4	8	16	24	32	40	48	56	64	73	81
<b>10</b>	0	8	16	24	32	40	81	161	242	322	403	483	564	645	725	806
<b>20</b>	0	16	32	48	64	81	161	322	483	645	806	967	1,128	1,289	1,450	1,611
<b>30</b>	0	24	48	73	97	121	242	483	725	967	1,209	1,450	1,692	1,934	2,175	2,417
<b>40</b>	0	32	64	97	129	161	322	645	967	1,289	1,611	1,934	2,256	2,578	2,900	3,223
<b>50</b>	0	40	81	121	161	201	403	806	1,209	1,611	2,014	2,417	2,820	3,223	3,626	4,028
<b>60</b>	0	48	97	145	193	242	483	967	1,450	1,934	2,417	2,900	3,384	3,867	4,351	4,834
<b>70</b>	0	56	113	169	226	282	564	1,128	1,692	2,256	2,820	3,384	3,948	4,512	5,076	5,640
<b>80</b>	0	64	129	193	258	322	645	1,289	1,934	2,578	3,223	3,867	4,512	5,156	5,801	6,445
<b>90</b>	0	73	145	218	290	363	725	1,450	2,175	2,900	3,626	4,351	5,076	5,801	6,526	7,251
<b>100</b>	0	81	161	242	322	403	806	1,611	2,417	3,223	4,028	4,834	5,640	6,445	7,251	8,057



**Table 139 Guillemot Natural England’s standard apportioning approach non-breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	0	0	0	1	1	1	3	4	6	7	8	10	11	13	14
<b>10</b>	0	1	3	4	6	7	14	28	42	57	71	85	99	113	127	141
<b>20</b>	0	3	6	8	11	14	28	57	85	113	141	170	198	226	254	283
<b>30</b>	0	4	8	13	17	21	42	85	127	170	212	254	297	339	381	424
<b>40</b>	0	6	11	17	23	28	57	113	170	226	283	339	396	452	509	565
<b>50</b>	0	7	14	21	28	35	71	141	212	283	353	424	494	565	636	706
<b>60</b>	0	8	17	25	34	42	85	170	254	339	424	509	593	678	763	848
<b>70</b>	0	10	20	30	40	49	99	198	297	396	494	593	692	791	890	989
<b>80</b>	0	11	23	34	45	57	113	226	339	452	565	678	791	904	1,017	1,130
<b>90</b>	0	13	25	38	51	64	127	254	381	509	636	763	890	1,017	1,144	1,271
<b>100</b>	0	14	28	42	57	71	141	283	424	565	706	848	989	1,130	1,271	1,413

Table 140 Guillemot Natural England’s standard apportioning approach annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	9	19	28	38	47	57	66	76	85	95
10	0	9	19	28	38	47	95	189	284	379	473	568	663	758	852	947
20	0	19	38	57	76	95	189	379	568	758	947	1,136	1,326	1,515	1,705	1,894
30	0	28	57	85	114	142	284	568	852	1,136	1,420	1,705	1,989	2,273	2,557	2,841
40	0	38	76	114	152	189	379	758	1,136	1,515	1,894	2,273	2,651	3,030	3,409	3,788
50	0	47	95	142	189	237	473	947	1,420	1,894	2,367	2,841	3,314	3,788	4,261	4,735
60	0	57	114	170	227	284	568	1,136	1,705	2,273	2,841	3,409	3,977	4,545	5,114	5,682
70	0	66	133	199	265	331	663	1,326	1,989	2,651	3,314	3,977	4,640	5,303	5,966	6,629
80	0	76	152	227	303	379	758	1,515	2,273	3,030	3,788	4,545	5,303	6,060	6,818	7,576
90	0	85	170	256	341	426	852	1,705	2,557	3,409	4,261	5,114	5,966	6,818	7,670	8,523
100	0	95	189	284	379	473	947	1,894	2,841	3,788	4,735	5,682	6,629	7,576	8,523	9,469

**Table 141 Guillemot Natural England’s standard apportioning approach breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	1	2	3	3	6	13	19	26	32	39	45	52	58	64
<b>10</b>	0	6	13	19	26	32	64	129	193	258	322	387	451	516	580	645
<b>20</b>	0	13	26	39	52	64	129	258	387	516	645	774	903	1,032	1,161	1,290
<b>30</b>	0	19	39	58	77	97	193	387	580	774	967	1,161	1,354	1,548	1,741	1,935
<b>40</b>	0	26	52	77	103	129	258	516	774	1,032	1,290	1,548	1,806	2,064	2,322	2,580
<b>50</b>	0	32	64	97	129	161	322	645	967	1,290	1,612	1,935	2,257	2,580	2,902	3,225
<b>60</b>	0	39	77	116	155	193	387	774	1,161	1,548	1,935	2,322	2,709	3,096	3,483	3,870
<b>70</b>	0	45	90	135	181	226	451	903	1,354	1,806	2,257	2,709	3,160	3,612	4,063	4,515
<b>80</b>	0	52	103	155	206	258	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160
<b>90</b>	0	58	116	174	232	290	580	1,161	1,741	2,322	2,902	3,483	4,063	4,644	5,224	5,805
<b>100</b>	0	64	129	193	258	322	645	1,290	1,935	2,580	3,225	3,870	4,515	5,160	5,805	6,450

Table 142 Guillemot Natural England’s standard apportioning approach non-breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	1	1	2	3	4	5	7	8	9	10	11
10	0	1	2	3	4	5	11	22	33	44	55	66	77	88	99	110
20	0	2	4	7	9	11	22	44	66	88	110	131	153	175	197	219
30	0	3	7	10	13	16	33	66	99	131	164	197	230	263	296	329
40	0	4	9	13	18	22	44	88	131	175	219	263	307	351	394	438
50	0	5	11	16	22	27	55	110	164	219	274	329	383	438	493	548
60	0	7	13	20	26	33	66	131	197	263	329	394	460	526	592	657
70	0	8	15	23	31	38	77	153	230	307	383	460	537	613	690	767
80	0	9	18	26	35	44	88	175	263	351	438	526	613	701	789	876
90	0	10	20	30	39	49	99	197	296	394	493	592	690	789	887	986
100	0	11	22	33	44	55	110	219	329	438	548	657	767	876	986	1,095

Table 143 Guillemot Natural England’s standard apportioning approach annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	2	3	4	8	15	23	30	38	45	53	60	68	75
10	0	8	15	23	30	38	75	151	226	302	377	453	528	604	679	755
20	0	15	30	45	60	75	151	302	453	604	755	905	1,056	1,207	1,358	1,509
30	0	23	45	68	91	113	226	453	679	905	1,132	1,358	1,584	1,811	2,037	2,264
40	0	30	60	91	121	151	302	604	905	1,207	1,509	1,811	2,113	2,414	2,716	3,018
50	0	38	75	113	151	189	377	755	1,132	1,509	1,886	2,264	2,641	3,018	3,395	3,773
60	0	45	91	136	181	226	453	905	1,358	1,811	2,264	2,716	3,169	3,622	4,074	4,527
70	0	53	106	158	211	264	528	1,056	1,584	2,113	2,641	3,169	3,697	4,225	4,753	5,282
80	0	60	121	181	241	302	604	1,207	1,811	2,414	3,018	3,622	4,225	4,829	5,432	6,036
90	0	68	136	204	272	340	679	1,358	2,037	2,716	3,395	4,074	4,753	5,432	6,111	6,791
100	0	75	151	226	302	377	755	1,509	2,264	3,018	3,773	4,527	5,282	6,036	6,791	7,545

# Hornsea 4



Table 144 Guillemot Natural England’s standard apportioning approach breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	5	10	16	21	26	31	37	42	47	52
10	0	5	10	16	21	26	52	104	157	209	261	313	365	418	470	522
20	0	10	21	31	42	52	104	209	313	418	522	626	731	835	940	1,044
30	0	16	31	47	63	78	157	313	470	626	783	940	1,096	1,253	1,410	1,566
40	0	21	42	63	84	104	209	418	626	835	1,044	1,253	1,462	1,671	1,879	2,088
50	0	26	52	78	104	131	261	522	783	1,044	1,305	1,566	1,827	2,088	2,349	2,610
60	0	31	63	94	125	157	313	626	940	1,253	1,566	1,879	2,193	2,506	2,819	3,132
70	0	37	73	110	146	183	365	731	1,096	1,462	1,827	2,193	2,558	2,923	3,289	3,654
80	0	42	84	125	167	209	418	835	1,253	1,671	2,088	2,506	2,923	3,341	3,759	4,176
90	0	47	94	141	188	235	470	940	1,410	1,879	2,349	2,819	3,289	3,759	4,229	4,698
100	0	52	104	157	209	261	522	1,044	1,566	2,088	2,610	3,132	3,654	4,176	4,698	5,221

Table 145 Guillemot Natural England’s standard apportioning approach non-breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
10	0	1	2	3	4	4	9	18	27	36	45	54	63	72	81	90
20	0	2	4	5	7	9	18	36	54	72	90	108	126	144	162	180
30	0	3	5	8	11	13	27	54	81	108	135	162	189	216	243	270
40	0	4	7	11	14	18	36	72	108	144	180	216	252	288	324	360
50	0	4	9	13	18	22	45	90	135	180	225	270	315	360	405	450
60	0	5	11	16	22	27	54	108	162	216	270	324	378	432	486	540
70	0	6	13	19	25	31	63	126	189	252	315	378	441	504	567	630
80	0	7	14	22	29	36	72	144	216	288	360	432	504	576	648	720
90	0	8	16	24	32	40	81	162	243	324	405	486	567	648	729	810
100	0	9	18	27	36	45	90	180	270	360	450	540	630	720	810	900

Table 146 Guillemot Natural England’s standard apportioning approach annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	6	12	18	24	31	37	43	49	55	61
10	0	6	12	18	24	31	61	122	184	245	306	367	428	490	551	612
20	0	12	24	37	49	61	122	245	367	490	612	734	857	979	1,102	1,224
30	0	18	37	55	73	92	184	367	551	734	918	1,102	1,285	1,469	1,652	1,836
40	0	24	49	73	98	122	245	490	734	979	1,224	1,469	1,714	1,958	2,203	2,448
50	0	31	61	92	122	153	306	612	918	1,224	1,530	1,836	2,142	2,448	2,754	3,060
60	0	37	73	110	147	184	367	734	1,102	1,469	1,836	2,203	2,570	2,938	3,305	3,672
70	0	43	86	129	171	214	428	857	1,285	1,714	2,142	2,570	2,999	3,427	3,856	4,284
80	0	49	98	147	196	245	490	979	1,469	1,958	2,448	2,938	3,427	3,917	4,407	4,896
90	0	55	110	165	220	275	551	1,102	1,652	2,203	2,754	3,305	3,856	4,407	4,957	5,508
100	0	61	122	184	245	306	612	1,224	1,836	2,448	3,060	3,672	4,284	4,896	5,508	6,120



## Appendix N. Seasonal FFC Apportionment displacement matrices for guillemot using Natural England’s bespoke apportionment scenario

Table 147 Guillemot breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	1	2	3	3	7	13	20	26	33	39	46	53	59	66
<b>10</b>	0	7	13	20	26	33	66	131	197	263	328	394	460	525	591	657
<b>20</b>	0	13	26	39	53	66	131	263	394	525	657	788	919	1,050	1,182	1,313
<b>30</b>	0	20	39	59	79	98	197	394	591	788	985	1,182	1,379	1,576	1,773	1,970
<b>40</b>	0	26	53	79	105	131	263	525	788	1,050	1,313	1,576	1,838	2,101	2,363	2,626
<b>50</b>	0	33	66	98	131	164	328	657	985	1,313	1,641	1,970	2,298	2,626	2,954	3,283
<b>60</b>	0	39	79	118	158	197	394	788	1,182	1,576	1,970	2,363	2,757	3,151	3,545	3,939
<b>70</b>	0	46	92	138	184	230	460	919	1,379	1,838	2,298	2,757	3,217	3,676	4,136	4,596
<b>80</b>	0	53	105	158	210	263	525	1,050	1,576	2,101	2,626	3,151	3,676	4,202	4,727	5,252
<b>90</b>	0	59	118	177	236	295	591	1,182	1,773	2,363	2,954	3,545	4,136	4,727	5,318	5,909
<b>100</b>	0	66	131	197	263	328	657	1,313	1,970	2,626	3,283	3,939	4,596	5,252	5,909	6,565

Table 148 Guillemot chick rearing/moult period displacement matrix for Protective Provision Scenario 1 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	2	3	5	6	8	15	30	46	61	76	91	106	122	137	152
10	0	15	30	46	61	76	152	304	456	609	761	913	1,065	1,217	1,369	1,521
20	0	30	61	91	122	152	304	609	913	1,217	1,521	1,826	2,130	2,434	2,738	3,043
30	0	46	91	137	183	228	456	913	1,369	1,826	2,282	2,738	3,195	3,651	4,108	4,564
40	0	61	122	183	243	304	609	1,217	1,826	2,434	3,043	3,651	4,260	4,868	5,477	6,085
50	0	76	152	228	304	380	761	1,521	2,282	3,043	3,803	4,564	5,325	6,085	6,846	7,607
60	0	91	183	274	365	456	913	1,826	2,738	3,651	4,564	5,477	6,390	7,302	8,215	9,128
70	0	106	213	319	426	532	1,065	2,130	3,195	4,260	5,325	6,390	7,454	8,519	9,584	10,649
80	0	122	243	365	487	609	1,217	2,434	3,651	4,868	6,085	7,302	8,519	9,736	10,954	12,171
90	0	137	274	411	548	685	1,369	2,738	4,108	5,477	6,846	8,215	9,584	10,954	12,323	13,692
100	0	152	304	456	609	761	1,521	3,043	4,564	6,085	7,607	9,128	10,649	12,171	13,692	15,213

Table 149 Guillemot non-breeding season displacement matrix for Protective Provision Scenario 1 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
10	0	1	1	2	2	3	5	10	15	20	25	30	35	40	45	50
20	0	1	2	3	4	5	10	20	30	40	50	60	71	81	91	101
30	0	2	3	5	6	8	15	30	45	60	76	91	106	121	136	151
40	0	2	4	6	8	10	20	40	60	81	101	121	141	161	181	201
50	0	3	5	8	10	13	25	50	76	101	126	151	176	201	227	252
60	0	3	6	9	12	15	30	60	91	121	151	181	212	242	272	302
70	0	4	7	11	14	18	35	71	106	141	176	212	247	282	317	353
80	0	4	8	12	16	20	40	81	121	161	201	242	282	322	363	403
90	0	5	9	14	18	23	45	91	136	181	227	272	317	363	408	453
100	0	5	10	15	20	25	50	101	151	201	252	302	353	403	453	504

Table 150 Guillemot annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	2	4	7	9	11	22	45	67	89	111	134	156	178	201	223
10	0	22	45	67	89	111	223	446	668	891	1,114	1,337	1,560	1,783	2,005	2,228
20	0	45	89	134	178	223	446	891	1,337	1,783	2,228	2,674	3,119	3,565	4,011	4,456
30	0	67	134	201	267	334	668	1,337	2,005	2,674	3,342	4,011	4,679	5,348	6,016	6,685
40	0	89	178	267	357	446	891	1,783	2,674	3,565	4,456	5,348	6,239	7,130	8,022	8,913
50	0	111	223	334	446	557	1,114	2,228	3,342	4,456	5,571	6,685	7,799	8,913	10,027	11,141
60	0	134	267	401	535	668	1,337	2,674	4,011	5,348	6,685	8,022	9,358	10,695	12,032	13,369
70	0	156	312	468	624	780	1,560	3,119	4,679	6,239	7,799	9,358	10,918	12,478	14,038	15,597
80	0	178	357	535	713	891	1,783	3,565	5,348	7,130	8,913	10,695	12,478	14,260	16,043	17,826
90	0	201	401	602	802	1,003	2,005	4,011	6,016	8,022	10,027	12,032	14,038	16,043	18,048	20,054
100	0	223	446	668	891	1,114	2,228	4,456	6,685	8,913	11,141	13,369	15,597	17,826	20,054	22,282

**Table 151 Guillemot breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer using Natural England’s bespoke apportioning approach.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	1	2	3	4	5	9	19	28	37	46	56	65	74	83	93
<b>10</b>	0	9	19	28	37	46	93	185	278	371	464	556	649	742	835	927
<b>20</b>	0	19	37	56	74	93	185	371	556	742	927	1,113	1,298	1,484	1,669	1,855
<b>30</b>	0	28	56	83	111	139	278	556	835	1,113	1,391	1,669	1,948	2,226	2,504	2,782
<b>40</b>	0	37	74	111	148	185	371	742	1,113	1,484	1,855	2,226	2,597	2,968	3,339	3,710
<b>50</b>	0	46	93	139	185	232	464	927	1,391	1,855	2,319	2,782	3,246	3,710	4,174	4,637
<b>60</b>	0	56	111	167	223	278	556	1,113	1,669	2,226	2,782	3,339	3,895	4,452	5,008	5,565
<b>70</b>	0	65	130	195	260	325	649	1,298	1,948	2,597	3,246	3,895	4,545	5,194	5,843	6,492
<b>80</b>	0	74	148	223	297	371	742	1,484	2,226	2,968	3,710	4,452	5,194	5,936	6,678	7,420
<b>90</b>	0	83	167	250	334	417	835	1,669	2,504	3,339	4,174	5,008	5,843	6,678	7,512	8,347
<b>100</b>	0	93	185	278	371	464	927	1,855	2,782	3,710	4,637	5,565	6,492	7,420	8,347	9,275

**Table 152 Guillemot chick rearing period displacement matrix for Protective Provision Scenario 2 plus 2km buffer using Natural England's bespoke apportioning approach.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	2	4	7	9	11	22	44	66	88	109	131	153	175	197	219
<b>10</b>	0	22	44	66	88	109	219	438	657	876	1,095	1,314	1,533	1,752	1,971	2,190
<b>20</b>	0	44	88	131	175	219	438	876	1,314	1,752	2,190	2,628	3,066	3,504	3,942	4,380
<b>30</b>	0	66	131	197	263	328	657	1,314	1,971	2,628	3,285	3,942	4,599	5,256	5,913	6,570
<b>40</b>	0	88	175	263	350	438	876	1,752	2,628	3,504	4,380	5,256	6,132	7,007	7,883	8,759
<b>50</b>	0	109	219	328	438	547	1,095	2,190	3,285	4,380	5,475	6,570	7,664	8,759	9,854	10,949
<b>60</b>	0	131	263	394	526	657	1,314	2,628	3,942	5,256	6,570	7,883	9,197	10,511	11,825	13,139
<b>70</b>	0	153	307	460	613	766	1,533	3,066	4,599	6,132	7,664	9,197	10,730	12,263	13,796	15,329
<b>80</b>	0	175	350	526	701	876	1,752	3,504	5,256	7,007	8,759	10,511	12,263	14,015	15,767	17,519
<b>90</b>	0	197	394	591	788	985	1,971	3,942	5,913	7,883	9,854	11,825	13,796	15,767	17,738	19,709
<b>100</b>	0	219	438	657	876	1,095	2,190	4,380	6,570	8,759	10,949	13,139	15,329	17,519	19,709	21,898

Table 153 Guillemot non-breeding season displacement matrix for Protective Provision Scenario 2 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
10	0	1	1	2	3	4	7	15	22	30	37	44	52	59	66	74
20	0	1	3	4	6	7	15	30	44	59	74	89	103	118	133	148
30	0	2	4	7	9	11	22	44	66	89	111	133	155	177	199	222
40	0	3	6	9	12	15	30	59	89	118	148	177	207	236	266	295
50	0	4	7	11	15	18	37	74	111	148	185	222	258	295	332	369
60	0	4	9	13	18	22	44	89	133	177	222	266	310	354	399	443
70	0	5	10	16	21	26	52	103	155	207	258	310	362	414	465	517
80	0	6	12	18	24	30	59	118	177	236	295	354	414	473	532	591
90	0	7	13	20	27	33	66	133	199	266	332	399	465	532	598	665
100	0	7	15	22	30	37	74	148	222	295	369	443	517	591	665	738

Table 154 Guillemot annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	3	6	10	13	16	32	64	96	128	160	191	223	255	287	319
10	0	32	64	96	128	160	319	638	957	1,276	1,596	1,915	2,234	2,553	2,872	3,191
20	0	64	128	191	255	319	638	1,276	1,915	2,553	3,191	3,829	4,468	5,106	5,744	6,382
30	0	96	191	287	383	479	957	1,915	2,872	3,829	4,787	5,744	6,701	7,659	8,616	9,573
40	0	128	255	383	511	638	1,276	2,553	3,829	5,106	6,382	7,659	8,935	10,212	11,488	12,765
50	0	160	319	479	638	798	1,596	3,191	4,787	6,382	7,978	9,573	11,169	12,765	14,360	15,956
60	0	191	383	574	766	957	1,915	3,829	5,744	7,659	9,573	11,488	13,403	15,317	17,232	19,147
70	0	223	447	670	894	1,117	2,234	4,468	6,701	8,935	11,169	13,403	15,637	17,870	20,104	22,338
80	0	255	511	766	1,021	1,276	2,553	5,106	7,659	10,212	12,765	15,317	17,870	20,423	22,976	25,529
90	0	287	574	862	1,149	1,436	2,872	5,744	8,616	11,488	14,360	17,232	20,104	22,976	25,848	28,720
100	0	319	638	957	1,276	1,596	3,191	6,382	9,573	12,765	15,956	19,147	22,338	25,529	28,720	31,911



# Hornsea 4



Table 155 Guillemot breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	9	18	27	37	46	55	64	73	82	92
10	0	9	18	27	37	46	92	183	275	366	458	550	641	733	824	916
20	0	18	37	55	73	92	183	366	550	733	916	1,099	1,282	1,465	1,649	1,832
30	0	27	55	82	110	137	275	550	824	1,099	1,374	1,649	1,923	2,198	2,473	2,748
40	0	37	73	110	147	183	366	733	1,099	1,465	1,832	2,198	2,564	2,931	3,297	3,664
50	0	46	92	137	183	229	458	916	1,374	1,832	2,290	2,748	3,206	3,664	4,121	4,579
60	0	55	110	165	220	275	550	1,099	1,649	2,198	2,748	3,297	3,847	4,396	4,946	5,495
70	0	64	128	192	256	321	641	1,282	1,923	2,564	3,206	3,847	4,488	5,129	5,770	6,411
80	0	73	147	220	293	366	733	1,465	2,198	2,931	3,664	4,396	5,129	5,862	6,594	7,327
90	0	82	165	247	330	412	824	1,649	2,473	3,297	4,121	4,946	5,770	6,594	7,419	8,243
100	0	92	183	275	366	458	916	1,832	2,748	3,664	4,579	5,495	6,411	7,327	8,243	9,159

**Table 156 Guillemot chick rearing period displacement matrix for Protective Provision Scenario 5 plus 2km buffer using Natural England’s bespoke apportioning approach.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	2	4	6	9	11	22	43	65	86	108	130	151	173	194	216
<b>10</b>	0	22	43	65	86	108	216	432	648	864	1,080	1,297	1,513	1,729	1,945	2,161
<b>20</b>	0	43	86	130	173	216	432	864	1,297	1,729	2,161	2,593	3,025	3,457	3,890	4,322
<b>30</b>	0	65	130	194	259	324	648	1,297	1,945	2,593	3,241	3,890	4,538	5,186	5,834	6,483
<b>40</b>	0	86	173	259	346	432	864	1,729	2,593	3,457	4,322	5,186	6,051	6,915	7,779	8,644
<b>50</b>	0	108	216	324	432	540	1,080	2,161	3,241	4,322	5,402	6,483	7,563	8,644	9,724	10,805
<b>60</b>	0	130	259	389	519	648	1,297	2,593	3,890	5,186	6,483	7,779	9,076	10,372	11,669	12,965
<b>70</b>	0	151	303	454	605	756	1,513	3,025	4,538	6,051	7,563	9,076	10,588	12,101	13,614	15,126
<b>80</b>	0	173	346	519	691	864	1,729	3,457	5,186	6,915	8,644	10,372	12,101	13,830	15,559	17,287
<b>90</b>	0	194	389	583	778	972	1,945	3,890	5,834	7,779	9,724	11,669	13,614	15,559	17,503	19,448
<b>100</b>	0	216	432	648	864	1,080	2,161	4,322	6,483	8,644	10,805	12,965	15,126	17,287	19,448	21,609

Table 157 Guillemot non-breeding season displacement matrix for Protective Provision Scenario 5 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
10	0	1	1	2	3	4	7	15	22	29	36	44	51	58	66	73
20	0	1	3	4	6	7	15	29	44	58	73	88	102	117	131	146
30	0	2	4	7	9	11	22	44	66	88	109	131	153	175	197	219
40	0	3	6	9	12	15	29	58	88	117	146	175	204	233	263	292
50	0	4	7	11	15	18	36	73	109	146	182	219	255	292	328	365
60	0	4	9	13	18	22	44	88	131	175	219	263	306	350	394	438
70	0	5	10	15	20	26	51	102	153	204	255	306	357	409	460	511
80	0	6	12	18	23	29	58	117	175	233	292	350	409	467	525	584
90	0	7	13	20	26	33	66	131	197	263	328	394	460	525	591	657
100	0	7	15	22	29	36	73	146	219	292	365	438	511	584	657	729

Table 158 Guillemot annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	3	6	9	13	16	31	63	94	126	157	189	220	252	283	315
10	0	31	63	94	126	157	315	630	945	1,260	1,575	1,890	2,205	2,520	2,835	3,150
20	0	63	126	189	252	315	630	1,260	1,890	2,520	3,150	3,780	4,410	5,040	5,670	6,299
30	0	94	189	283	378	472	945	1,890	2,835	3,780	4,725	5,670	6,614	7,559	8,504	9,449
40	0	126	252	378	504	630	1,260	2,520	3,780	5,040	6,299	7,559	8,819	10,079	11,339	12,599
50	0	157	315	472	630	787	1,575	3,150	4,725	6,299	7,874	9,449	11,024	12,599	14,174	15,749
60	0	189	378	567	756	945	1,890	3,780	5,670	7,559	9,449	11,339	13,229	15,119	17,009	18,898
70	0	220	441	661	882	1,102	2,205	4,410	6,614	8,819	11,024	13,229	15,434	17,639	19,843	22,048
80	0	252	504	756	1,008	1,260	2,520	5,040	7,559	10,079	12,599	15,119	17,639	20,158	22,678	25,198
90	0	283	567	850	1,134	1,417	2,835	5,670	8,504	11,339	14,174	17,009	19,843	22,678	25,513	28,348
100	0	315	630	945	1,260	1,575	3,150	6,299	9,449	12,599	15,749	18,898	22,048	25,198	28,348	31,497

# Hornsea 4



Table 159 Guillemot breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	4	9	18	27	36	45	54	63	72	80	89
10	0	9	18	27	36	45	89	179	268	358	447	537	626	715	805	894
20	0	18	36	54	72	89	179	358	537	715	894	1,073	1,252	1,431	1,610	1,789
30	0	27	54	80	107	134	268	537	805	1,073	1,341	1,610	1,878	2,146	2,415	2,683
40	0	36	72	107	143	179	358	715	1,073	1,431	1,789	2,146	2,504	2,862	3,219	3,577
50	0	45	89	134	179	224	447	894	1,341	1,789	2,236	2,683	3,130	3,577	4,024	4,471
60	0	54	107	161	215	268	537	1,073	1,610	2,146	2,683	3,219	3,756	4,293	4,829	5,366
70	0	63	125	188	250	313	626	1,252	1,878	2,504	3,130	3,756	4,382	5,008	5,634	6,260
80	0	72	143	215	286	358	715	1,431	2,146	2,862	3,577	4,293	5,008	5,723	6,439	7,154
90	0	80	161	241	322	402	805	1,610	2,415	3,219	4,024	4,829	5,634	6,439	7,244	8,048
100	0	89	179	268	358	447	894	1,789	2,683	3,577	4,471	5,366	6,260	7,154	8,048	8,943

**Table 160 Guillemot chick rearing period displacement matrix for Protective Provision Scenario 6 plus 2km buffer using Natural England's bespoke apportioning approach.**

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
<b>0</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>1</b>	0	2	4	6	8	11	21	42	63	85	106	127	148	169	190	211
<b>10</b>	0	21	42	63	85	106	211	423	634	845	1,057	1,268	1,479	1,691	1,902	2,114
<b>20</b>	0	42	85	127	169	211	423	845	1,268	1,691	2,114	2,536	2,959	3,382	3,804	4,227
<b>30</b>	0	63	127	190	254	317	634	1,268	1,902	2,536	3,170	3,804	4,438	5,073	5,707	6,341
<b>40</b>	0	85	169	254	338	423	845	1,691	2,536	3,382	4,227	5,073	5,918	6,763	7,609	8,454
<b>50</b>	0	106	211	317	423	528	1,057	2,114	3,170	4,227	5,284	6,341	7,397	8,454	9,511	10,568
<b>60</b>	0	127	254	380	507	634	1,268	2,536	3,804	5,073	6,341	7,609	8,877	10,145	11,413	12,681
<b>70</b>	0	148	296	444	592	740	1,479	2,959	4,438	5,918	7,397	8,877	10,356	11,836	13,315	14,795
<b>80</b>	0	169	338	507	676	845	1,691	3,382	5,073	6,763	8,454	10,145	11,836	13,527	15,218	16,908
<b>90</b>	0	190	380	571	761	951	1,902	3,804	5,707	7,609	9,511	11,413	13,315	15,218	17,120	19,022
<b>100</b>	0	211	423	634	845	1,057	2,114	4,227	6,341	8,454	10,568	12,681	14,795	16,908	19,022	21,136

Table 161 Guillemot non-breeding season displacement matrix for Protective Provision Scenario 6 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
10	0	1	1	2	3	4	7	14	21	29	36	43	50	57	64	71
20	0	1	3	4	6	7	14	29	43	57	71	86	100	114	128	143
30	0	2	4	6	9	11	21	43	64	86	107	128	150	171	192	214
40	0	3	6	9	11	14	29	57	86	114	143	171	200	228	257	285
50	0	4	7	11	14	18	36	71	107	143	178	214	249	285	321	356
60	0	4	9	13	17	21	43	86	128	171	214	257	299	342	385	428
70	0	5	10	15	20	25	50	100	150	200	249	299	349	399	449	499
80	0	6	11	17	23	29	57	114	171	228	285	342	399	456	513	570
90	0	6	13	19	26	32	64	128	192	257	321	385	449	513	577	641
100	0	7	14	21	29	36	71	143	214	285	356	428	499	570	641	713

Table 162 Guillemot annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	3	6	9	12	15	31	62	92	123	154	185	216	246	277	308
10	0	31	62	92	123	154	308	616	924	1,232	1,540	1,847	2,155	2,463	2,771	3,079
20	0	62	123	185	246	308	616	1,232	1,847	2,463	3,079	3,695	4,311	4,927	5,542	6,158
30	0	92	185	277	369	462	924	1,847	2,771	3,695	4,619	5,542	6,466	7,390	8,314	9,237
40	0	123	246	369	493	616	1,232	2,463	3,695	4,927	6,158	7,390	8,621	9,853	11,085	12,316
50	0	154	308	462	616	770	1,540	3,079	4,619	6,158	7,698	9,237	10,777	12,316	13,856	15,395
60	0	185	369	554	739	924	1,847	3,695	5,542	7,390	9,237	11,085	12,932	14,780	16,627	18,475
70	0	216	431	647	862	1,078	2,155	4,311	6,466	8,621	10,777	12,932	15,088	17,243	19,398	21,554
80	0	246	493	739	985	1,232	2,463	4,927	7,390	9,853	12,316	14,780	17,243	19,706	22,170	24,633
90	0	277	554	831	1,108	1,386	2,771	5,542	8,314	11,085	13,856	16,627	19,398	22,170	24,941	27,712
100	0	308	616	924	1,232	1,540	3,079	6,158	9,237	12,316	15,395	18,475	21,554	24,633	27,712	30,791



# Hornsea 4



Table 163 Guillemot breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer using Natural England's bespoke apportioning approach

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	2	3	4	8	16	24	32	40	48	56	64	73	81
10	0	8	16	24	32	40	81	161	242	322	403	483	564	645	725	806
20	0	16	32	48	64	81	161	322	483	645	806	967	1,128	1,289	1,450	1,611
30	0	24	48	73	97	121	242	483	725	967	1,209	1,450	1,692	1,934	2,175	2,417
40	0	32	64	97	129	161	322	645	967	1,289	1,611	1,934	2,256	2,578	2,900	3,223
50	0	40	81	121	161	201	403	806	1,209	1,611	2,014	2,417	2,820	3,223	3,626	4,028
60	0	48	97	145	193	242	483	967	1,450	1,934	2,417	2,900	3,384	3,867	4,351	4,834
70	0	56	113	169	226	282	564	1,128	1,692	2,256	2,820	3,384	3,948	4,512	5,076	5,640
80	0	64	129	193	258	322	645	1,289	1,934	2,578	3,223	3,867	4,512	5,156	5,801	6,445
90	0	73	145	218	290	363	725	1,450	2,175	2,900	3,626	4,351	5,076	5,801	6,526	7,251
100	0	81	161	242	322	403	806	1,611	2,417	3,223	4,028	4,834	5,640	6,445	7,251	8,057

Table 164 Guillemot chick rearing period displacement matrix for Protective Provision Scenario 8 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	2	4	6	8	10	19	38	58	77	96	115	135	154	173	192
10	0	19	38	58	77	96	192	384	577	769	961	1,153	1,345	1,538	1,730	1,922
20	0	38	77	115	154	192	384	769	1,153	1,538	1,922	2,307	2,691	3,075	3,460	3,844
30	0	58	115	173	231	288	577	1,153	1,730	2,307	2,883	3,460	4,036	4,613	5,190	5,766
40	0	77	154	231	308	384	769	1,538	2,307	3,075	3,844	4,613	5,382	6,151	6,920	7,688
50	0	96	192	288	384	481	961	1,922	2,883	3,844	4,805	5,766	6,727	7,688	8,650	9,611
60	0	115	231	346	461	577	1,153	2,307	3,460	4,613	5,766	6,920	8,073	9,226	10,379	11,533
70	0	135	269	404	538	673	1,345	2,691	4,036	5,382	6,727	8,073	9,418	10,764	12,109	13,455
80	0	154	308	461	615	769	1,538	3,075	4,613	6,151	7,688	9,226	10,764	12,302	13,839	15,377
90	0	173	346	519	692	865	1,730	3,460	5,190	6,920	8,650	10,379	12,109	13,839	15,569	17,299
100	0	192	384	577	769	961	1,922	3,844	5,766	7,688	9,611	11,533	13,455	15,377	17,299	19,221

# Hornsea 4



Table 165 Guillemot non-breeding season displacement matrix for Protective Provision Scenario 8 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
10	0	1	1	2	3	3	7	13	20	26	33	39	46	52	59	65
20	0	1	3	4	5	7	13	26	39	52	65	78	91	104	117	130
30	0	2	4	6	8	10	20	39	59	78	98	117	137	157	176	196
40	0	3	5	8	10	13	26	52	78	104	130	157	183	209	235	261
50	0	3	7	10	13	16	33	65	98	130	163	196	228	261	293	326
60	0	4	8	12	16	20	39	78	117	157	196	235	274	313	352	391
70	0	5	9	14	18	23	46	91	137	183	228	274	320	365	411	456
80	0	5	10	16	21	26	52	104	157	209	261	313	365	417	470	522
90	0	6	12	18	23	29	59	117	176	235	293	352	411	470	528	587
100	0	7	13	20	26	33	65	130	196	261	326	391	456	522	587	652

Table 166 Guillemot annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	3	6	8	11	14	28	56	84	112	140	168	196	223	251	279
10	0	28	56	84	112	140	279	559	838	1,117	1,396	1,676	1,955	2,234	2,514	2,793
20	0	56	112	168	223	279	559	1,117	1,676	2,234	2,793	3,352	3,910	4,469	5,027	5,586
30	0	84	168	251	335	419	838	1,676	2,514	3,352	4,189	5,027	5,865	6,703	7,541	8,379
40	0	112	223	335	447	559	1,117	2,234	3,352	4,469	5,586	6,703	7,820	8,938	10,055	11,172
50	0	140	279	419	559	698	1,396	2,793	4,189	5,586	6,982	8,379	9,775	11,172	12,568	13,965
60	0	168	335	503	670	838	1,676	3,352	5,027	6,703	8,379	10,055	11,731	13,406	15,082	16,758
70	0	196	391	587	782	978	1,955	3,910	5,865	7,820	9,775	11,731	13,686	15,641	17,596	19,551
80	0	223	447	670	894	1,117	2,234	4,469	6,703	8,938	11,172	13,406	15,641	17,875	20,110	22,344
90	0	251	503	754	1,005	1,257	2,514	5,027	7,541	10,055	12,568	15,082	17,596	20,110	22,623	25,137
100	0	279	559	838	1,117	1,396	2,793	5,586	8,379	11,172	13,965	16,758	19,551	22,344	25,137	27,930

# Hornsea 4



Table 167 Guillemot breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	3	3	6	13	19	26	32	39	45	52	58	64
10	0	6	13	19	26	32	64	129	193	258	322	387	451	516	580	645
20	0	13	26	39	52	64	129	258	387	516	645	774	903	1,032	1,161	1,290
30	0	19	39	58	77	97	193	387	580	774	967	1,161	1,354	1,548	1,741	1,935
40	0	26	52	77	103	129	258	516	774	1,032	1,290	1,548	1,806	2,064	2,322	2,580
50	0	32	64	97	129	161	322	645	967	1,290	1,612	1,935	2,257	2,580	2,902	3,225
60	0	39	77	116	155	193	387	774	1,161	1,548	1,935	2,322	2,709	3,096	3,483	3,870
70	0	45	90	135	181	226	451	903	1,354	1,806	2,257	2,709	3,160	3,612	4,063	4,515
80	0	52	103	155	206	258	516	1,032	1,548	2,064	2,580	3,096	3,612	4,128	4,644	5,160
90	0	58	116	174	232	290	580	1,161	1,741	2,322	2,902	3,483	4,063	4,644	5,224	5,805
100	0	64	129	193	258	322	645	1,290	1,935	2,580	3,225	3,870	4,515	5,160	5,805	6,450

Table 168 Guillemot chick rearing period displacement matrix for Protective Provision Scenario 9 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	3	4	6	7	15	30	45	60	75	89	104	119	134	149
10	0	15	30	45	60	75	149	298	447	596	745	894	1,043	1,192	1,341	1,490
20	0	30	60	89	119	149	298	596	894	1,192	1,490	1,789	2,087	2,385	2,683	2,981
30	0	45	89	134	179	224	447	894	1,341	1,789	2,236	2,683	3,130	3,577	4,024	4,471
40	0	60	119	179	238	298	596	1,192	1,789	2,385	2,981	3,577	4,173	4,769	5,366	5,962
50	0	75	149	224	298	373	745	1,490	2,236	2,981	3,726	4,471	5,216	5,962	6,707	7,452
60	0	89	179	268	358	447	894	1,789	2,683	3,577	4,471	5,366	6,260	7,154	8,048	8,943
70	0	104	209	313	417	522	1,043	2,087	3,130	4,173	5,216	6,260	7,303	8,346	9,390	10,433
80	0	119	238	358	477	596	1,192	2,385	3,577	4,769	5,962	7,154	8,346	9,539	10,731	11,923
90	0	134	268	402	537	671	1,341	2,683	4,024	5,366	6,707	8,048	9,390	10,731	12,072	13,414
100	0	149	298	447	596	745	1,490	2,981	4,471	5,962	7,452	8,943	10,433	11,923	13,414	14,904

Table 169 Guillemot non-breeding season displacement matrix for Protective Provision Scenario 9 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
10	0	0	1	1	2	2	5	10	15	20	25	30	35	39	44	49
20	0	1	2	3	4	5	10	20	30	39	49	59	69	79	89	99
30	0	1	3	4	6	7	15	30	44	59	74	89	104	118	133	148
40	0	2	4	6	8	10	20	39	59	79	99	118	138	158	178	197
50	0	2	5	7	10	12	25	49	74	99	123	148	173	197	222	247
60	0	3	6	9	12	15	30	59	89	118	148	178	207	237	266	296
70	0	3	7	10	14	17	35	69	104	138	173	207	242	276	311	345
80	0	4	8	12	16	20	39	79	118	158	197	237	276	316	355	395
90	0	4	9	13	18	22	44	89	133	178	222	266	311	355	400	444
100	0	5	10	15	20	25	49	99	148	197	247	296	345	395	444	493

Table 170 Guillemot annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	2	4	7	9	11	22	44	66	87	109	131	153	175	197	218
10	0	22	44	66	87	109	218	437	655	874	1,092	1,311	1,529	1,748	1,966	2,185
20	0	44	87	131	175	218	437	874	1,311	1,748	2,185	2,622	3,059	3,496	3,932	4,369
30	0	66	131	197	262	328	655	1,311	1,966	2,622	3,277	3,932	4,588	5,243	5,899	6,554
40	0	87	175	262	350	437	874	1,748	2,622	3,496	4,369	5,243	6,117	6,991	7,865	8,739
50	0	109	218	328	437	546	1,092	2,185	3,277	4,369	5,462	6,554	7,647	8,739	9,831	10,924
60	0	131	262	393	524	655	1,311	2,622	3,932	5,243	6,554	7,865	9,176	10,487	11,797	13,108
70	0	153	306	459	612	765	1,529	3,059	4,588	6,117	7,647	9,176	10,705	12,234	13,764	15,293
80	0	175	350	524	699	874	1,748	3,496	5,243	6,991	8,739	10,487	12,234	13,982	15,730	17,478
90	0	197	393	590	786	983	1,966	3,932	5,899	7,865	9,831	11,797	13,764	15,730	17,696	19,662
100	0	218	437	655	874	1,092	2,185	4,369	6,554	8,739	10,924	13,108	15,293	17,478	19,662	21,847



# Hornsea 4



Table 171 Guillemot breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	5	10	16	21	26	31	37	42	47	52
10	0	5	10	16	21	26	52	104	157	209	261	313	365	418	470	522
20	0	10	21	31	42	52	104	209	313	418	522	626	731	835	940	1,044
30	0	16	31	47	63	78	157	313	470	626	783	940	1,096	1,253	1,410	1,566
40	0	21	42	63	84	104	209	418	626	835	1,044	1,253	1,462	1,671	1,879	2,088
50	0	26	52	78	104	131	261	522	783	1,044	1,305	1,566	1,827	2,088	2,349	2,610
60	0	31	63	94	125	157	313	626	940	1,253	1,566	1,879	2,193	2,506	2,819	3,132
70	0	37	73	110	146	183	365	731	1,096	1,462	1,827	2,193	2,558	2,923	3,289	3,654
80	0	42	84	125	167	209	418	835	1,253	1,671	2,088	2,506	2,923	3,341	3,759	4,176
90	0	47	94	141	188	235	470	940	1,410	1,879	2,349	2,819	3,289	3,759	4,229	4,698
100	0	52	104	157	209	261	522	1,044	1,566	2,088	2,610	3,132	3,654	4,176	4,698	5,221

Table 172 Guillemot chick rearing period displacement matrix for Protective Provision Scenario 13 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	4	5	6	12	24	37	49	61	73	86	98	110	122
10	0	12	24	37	49	61	122	245	367	490	612	734	857	979	1,102	1,224
20	0	24	49	73	98	122	245	490	734	979	1,224	1,469	1,714	1,958	2,203	2,448
30	0	37	73	110	147	184	367	734	1,102	1,469	1,836	2,203	2,570	2,938	3,305	3,672
40	0	49	98	147	196	245	490	979	1,469	1,958	2,448	2,938	3,427	3,917	4,407	4,896
50	0	61	122	184	245	306	612	1,224	1,836	2,448	3,060	3,672	4,284	4,896	5,508	6,120
60	0	73	147	220	294	367	734	1,469	2,203	2,938	3,672	4,407	5,141	5,875	6,610	7,344
70	0	86	171	257	343	428	857	1,714	2,570	3,427	4,284	5,141	5,998	6,855	7,711	8,568
80	0	98	196	294	392	490	979	1,958	2,938	3,917	4,896	5,875	6,855	7,834	8,813	9,792
90	0	110	220	330	441	551	1,102	2,203	3,305	4,407	5,508	6,610	7,711	8,813	9,915	11,016
100	0	122	245	367	490	612	1,224	2,448	3,672	4,896	6,120	7,344	8,568	9,792	11,016	12,240

# Hornsea 4



Table 173 Guillemot non-breeding season displacement matrix for Protective Provision Scenario 13 plus 2km buffer using Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
10	0	0	1	1	2	2	4	8	12	16	20	24	29	33	37	41
20	0	1	2	2	3	4	8	16	24	33	41	49	57	65	73	82
30	0	1	2	4	5	6	12	24	37	49	61	73	86	98	110	122
40	0	2	3	5	7	8	16	33	49	65	82	98	114	130	147	163
50	0	2	4	6	8	10	20	41	61	82	102	122	143	163	183	204
60	0	2	5	7	10	12	24	49	73	98	122	147	171	196	220	245
70	0	3	6	9	11	14	29	57	86	114	143	171	200	228	257	285
80	0	3	7	10	13	16	33	65	98	130	163	196	228	261	294	326
90	0	4	7	11	15	18	37	73	110	147	183	220	257	294	330	367
100	0	4	8	12	16	20	41	82	122	163	204	245	285	326	367	408

# Hornsea 4



Table 174 Guillemot annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer using Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	2	4	5	7	9	18	36	54	71	89	107	125	143	161	179
10	0	18	36	54	71	89	179	357	536	715	893	1,072	1,251	1,429	1,608	1,787
20	0	36	71	107	143	179	357	715	1,072	1,429	1,787	2,144	2,502	2,859	3,216	3,574
30	0	54	107	161	214	268	536	1,072	1,608	2,144	2,680	3,216	3,752	4,288	4,825	5,361
40	0	71	143	214	286	357	715	1,429	2,144	2,859	3,574	4,288	5,003	5,718	6,433	7,147
50	0	89	179	268	357	447	893	1,787	2,680	3,574	4,467	5,361	6,254	7,147	8,041	8,934
60	0	107	214	322	429	536	1,072	2,144	3,216	4,288	5,361	6,433	7,505	8,577	9,649	10,721
70	0	125	250	375	500	625	1,251	2,502	3,752	5,003	6,254	7,505	8,756	10,006	11,257	12,508
80	0	143	286	429	572	715	1,429	2,859	4,288	5,718	7,147	8,577	10,006	11,436	12,865	14,295
90	0	161	322	482	643	804	1,608	3,216	4,825	6,433	8,041	9,649	11,257	12,865	14,474	16,082
100	0	179	357	536	715	893	1,787	3,574	5,361	7,147	8,934	10,721	12,508	14,295	16,082	17,869

Appendix O. Seasonal FFC Apportionment displacement matrices for razorbill using the Applicant’s mean peak approach.

Table 175 Razorbill return migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3
30	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
50	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
60	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
70	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
80	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11
90	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
100	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13

# Hornsea 4



Table 176 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2
10	0	0	0	0	1	1	2	3	5	6	8	10	11	13	14	16
20	0	0	1	1	1	2	3	6	10	13	16	19	22	25	29	32
30	0	0	1	1	2	2	5	10	14	19	24	29	33	38	43	48
40	0	1	1	2	3	3	6	13	19	25	32	38	45	51	57	64
50	0	1	2	2	3	4	8	16	24	32	40	48	56	64	72	80
60	0	1	2	3	4	5	10	19	29	38	48	57	67	76	86	95
70	0	1	2	3	4	6	11	22	33	45	56	67	78	89	100	111
80	0	1	3	4	5	6	13	25	38	51	64	76	89	102	115	127
90	0	1	3	4	6	7	14	29	43	57	72	86	100	115	129	143
100	0	2	3	5	6	8	16	32	48	64	80	95	111	127	143	159

Table 177 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
20	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	26
30	0	0	1	1	2	2	4	8	12	16	20	24	28	32	36	40
40	0	1	1	2	2	3	5	11	16	21	26	32	37	42	48	53
50	0	1	1	2	3	3	7	13	20	26	33	40	46	53	59	66
60	0	1	2	2	3	4	8	16	24	32	40	48	56	63	71	79
70	0	1	2	3	4	5	9	19	28	37	46	56	65	74	83	93
80	0	1	2	3	4	5	11	21	32	42	53	63	74	85	95	106
90	0	1	2	4	5	6	12	24	36	48	59	71	83	95	107	119
100	0	1	3	4	5	7	13	26	40	53	66	79	93	106	119	132

# Hornsea 4



Table 178 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11



# Hornsea 4



Table 179 Razorbill annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	6	9	13	16	19	22	25	28	32
20	0	1	1	2	3	3	6	13	19	25	32	38	44	51	57	63
30	0	1	2	3	4	5	9	19	28	38	47	57	66	76	85	95
40	0	1	3	4	5	6	13	25	38	51	63	76	88	101	114	126
50	0	2	3	5	6	8	16	32	47	63	79	95	111	126	142	158
60	0	2	4	6	8	9	19	38	57	76	95	114	133	152	171	189
70	0	2	4	7	9	11	22	44	66	88	111	133	155	177	199	221
80	0	3	5	8	10	13	25	51	76	101	126	152	177	202	227	253
90	0	3	6	9	11	14	28	57	85	114	142	171	199	227	256	284
100	0	3	6	9	13	16	32	63	95	126	158	189	221	253	284	316

Table 180 Razorbill return migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14

# Hornsea 4



Table 181 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
10	0	0	0	1	1	1	2	4	6	9	11	13	15	17	19	22
20	0	0	1	1	2	2	4	9	13	17	22	26	30	34	39	43
30	0	1	1	2	3	3	6	13	19	26	32	39	45	52	58	65
40	0	1	2	3	3	4	9	17	26	34	43	52	60	69	78	86
50	0	1	2	3	4	5	11	22	32	43	54	65	75	86	97	108
60	0	1	3	4	5	6	13	26	39	52	65	78	90	103	116	129
70	0	2	3	5	6	8	15	30	45	60	75	90	106	121	136	151
80	0	2	3	5	7	9	17	34	52	69	86	103	121	138	155	172
90	0	2	4	6	8	10	19	39	58	78	97	116	136	155	175	194
100	0	2	4	6	9	11	22	43	65	86	108	129	151	172	194	215

Table 182 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	14
20	0	0	1	1	1	1	3	6	9	12	14	17	20	23	26	29
30	0	0	1	1	2	2	4	9	13	17	22	26	30	35	39	43
40	0	1	1	2	2	3	6	12	17	23	29	35	40	46	52	58
50	0	1	1	2	3	4	7	14	22	29	36	43	51	58	65	72
60	0	1	2	3	3	4	9	17	26	35	43	52	61	69	78	87
70	0	1	2	3	4	5	10	20	30	40	51	61	71	81	91	101
80	0	1	2	3	5	6	12	23	35	46	58	69	81	92	104	116
90	0	1	3	4	5	6	13	26	39	52	65	78	91	104	117	130
100	0	1	3	4	6	7	14	29	43	58	72	87	101	116	130	144

# Hornsea 4



Table 183 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12

# Hornsea 4



Table 184 Razorbill annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
10	0	0	1	1	2	2	4	8	12	15	19	23	27	31	35	39
20	0	1	2	2	3	4	8	15	23	31	39	46	54	62	70	77
30	0	1	2	3	5	6	12	23	35	46	58	70	81	93	104	116
40	0	2	3	5	6	8	15	31	46	62	77	93	108	124	139	155
50	0	2	4	6	8	10	19	39	58	77	97	116	135	155	174	193
60	0	2	5	7	9	12	23	46	70	93	116	139	162	186	209	232
70	0	3	5	8	11	14	27	54	81	108	135	162	189	217	244	271
80	0	3	6	9	12	15	31	62	93	124	155	186	217	247	278	309
90	0	3	7	10	14	17	35	70	104	139	174	209	244	278	313	348
100	0	4	8	12	15	19	39	77	116	155	193	232	271	309	348	387

Table 185 Razorbill return migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	12
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	14

# Hornsea 4



Table 186 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
10	0	0	0	1	1	1	2	4	6	9	11	13	15	17	19	21
20	0	0	1	1	2	2	4	9	13	17	21	26	30	34	39	43
30	0	1	1	2	3	3	6	13	19	26	32	39	45	52	58	64
40	0	1	2	3	3	4	9	17	26	34	43	52	60	69	77	86
50	0	1	2	3	4	5	11	21	32	43	54	64	75	86	97	107
60	0	1	3	4	5	6	13	26	39	52	64	77	90	103	116	129
70	0	2	3	5	6	8	15	30	45	60	75	90	105	120	135	150
80	0	2	3	5	7	9	17	34	52	69	86	103	120	137	155	172
90	0	2	4	6	8	10	19	39	58	77	97	116	135	155	174	193
100	0	2	4	6	9	11	21	43	64	86	107	129	150	172	193	215



Table 187 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	10	11	12	14
20	0	0	1	1	1	1	3	5	8	11	14	16	19	22	25	27
30	0	0	1	1	2	2	4	8	12	16	21	25	29	33	37	41
40	0	1	1	2	2	3	5	11	16	22	27	33	38	44	49	55
50	0	1	1	2	3	3	7	14	21	27	34	41	48	55	62	68
60	0	1	2	2	3	4	8	16	25	33	41	49	57	66	74	82
70	0	1	2	3	4	5	10	19	29	38	48	57	67	77	86	96
80	0	1	2	3	4	5	11	22	33	44	55	66	77	88	98	109
90	0	1	2	4	5	6	12	25	37	49	62	74	86	98	111	123
100	0	1	3	4	5	7	14	27	41	55	68	82	96	109	123	137

Table 188 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12

# Hornsea 4



Table 189 Razorbill annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
10	0	0	1	1	2	2	4	8	11	15	19	23	26	30	34	38
20	0	1	2	2	3	4	8	15	23	30	38	45	53	60	68	76
30	0	1	2	3	5	6	11	23	34	45	57	68	79	91	102	113
40	0	2	3	5	6	8	15	30	45	60	76	91	106	121	136	151
50	0	2	4	6	8	9	19	38	57	76	95	113	132	151	170	189
60	0	2	5	7	9	11	23	45	68	91	113	136	159	181	204	227
70	0	3	5	8	11	13	26	53	79	106	132	159	185	212	238	265
80	0	3	6	9	12	15	30	60	91	121	151	181	212	242	272	302
90	0	3	7	10	14	17	34	68	102	136	170	204	238	272	306	340
100	0	4	8	11	15	19	38	76	113	151	189	227	265	302	340	378

Table 190 Razorbill return migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14

# Hornsea 4



Table 191 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2
10	0	0	0	1	1	1	2	4	6	8	9	11	13	15	17	19
20	0	0	1	1	2	2	4	8	11	15	19	23	26	30	34	38
30	0	1	1	2	2	3	6	11	17	23	28	34	39	45	51	56
40	0	1	2	2	3	4	8	15	23	30	38	45	53	60	68	75
50	0	1	2	3	4	5	9	19	28	38	47	56	66	75	85	94
60	0	1	2	3	5	6	11	23	34	45	56	68	79	90	102	113
70	0	1	3	4	5	7	13	26	39	53	66	79	92	105	118	132
80	0	2	3	5	6	8	15	30	45	60	75	90	105	120	135	150
90	0	2	3	5	7	8	17	34	51	68	85	102	118	135	152	169
100	0	2	4	6	8	9	19	38	56	75	94	113	132	150	169	188

Table 192 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
20	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
30	0	0	1	1	2	2	4	8	12	16	20	24	28	32	36	40
40	0	1	1	2	2	3	5	11	16	21	27	32	37	42	48	53
50	0	1	1	2	3	3	7	13	20	27	33	40	46	53	60	66
60	0	1	2	2	3	4	8	16	24	32	40	48	56	64	72	80
70	0	1	2	3	4	5	9	19	28	37	46	56	65	74	84	93
80	0	1	2	3	4	5	11	21	32	42	53	64	74	85	96	106
90	0	1	2	4	5	6	12	24	36	48	60	72	84	96	107	119
100	0	1	3	4	5	7	13	27	40	53	66	80	93	106	119	133

Table 193 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	8
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12

# Hornsea 4



Table 194 Razorbill annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	7	10	14	17	21	24	28	31	35
20	0	1	1	2	3	3	7	14	21	28	35	42	49	56	62	69
30	0	1	2	3	4	5	10	21	31	42	52	62	73	83	94	104
40	0	1	3	4	6	7	14	28	42	56	69	83	97	111	125	139
50	0	2	3	5	7	9	17	35	52	69	87	104	121	139	156	173
60	0	2	4	6	8	10	21	42	62	83	104	125	146	167	187	208
70	0	2	5	7	10	12	24	49	73	97	121	146	170	194	219	243
80	0	3	6	8	11	14	28	56	83	111	139	167	194	222	250	278
90	0	3	6	9	12	16	31	62	94	125	156	187	219	250	281	312
100	0	3	7	10	14	17	35	69	104	139	173	208	243	278	312	347



Table 195 Razorbill return migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	6	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	12

# Hornsea 4



Table 196 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	2
10	0	0	0	1	1	1	2	4	5	7	9	11	12	14	16	18
20	0	0	1	1	1	2	4	7	11	14	18	21	25	28	32	35
30	0	1	1	2	2	3	5	11	16	21	26	32	37	42	47	53
40	0	1	1	2	3	4	7	14	21	28	35	42	49	56	63	70
50	0	1	2	3	4	4	9	18	26	35	44	53	61	70	79	88
60	0	1	2	3	4	5	11	21	32	42	53	63	74	84	95	105
70	0	1	2	4	5	6	12	25	37	49	61	74	86	98	111	123
80	0	1	3	4	6	7	14	28	42	56	70	84	98	112	126	140
90	0	2	3	5	6	8	16	32	47	63	79	95	111	126	142	158
100	0	2	4	5	7	9	18	35	53	70	88	105	123	140	158	175

Table 197 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12
20	0	0	0	1	1	1	2	5	7	10	12	14	17	19	21	24
30	0	0	1	1	1	2	4	7	11	14	18	21	25	29	32	36
40	0	0	1	1	2	2	5	10	14	19	24	29	33	38	43	48
50	0	1	1	2	2	3	6	12	18	24	30	36	42	48	54	59
60	0	1	1	2	3	4	7	14	21	29	36	43	50	57	64	71
70	0	1	2	2	3	4	8	17	25	33	42	50	58	67	75	83
80	0	1	2	3	4	5	10	19	29	38	48	57	67	76	86	95
90	0	1	2	3	4	5	11	21	32	43	54	64	75	86	96	107
100	0	1	2	4	5	6	12	24	36	48	59	71	83	95	107	119

Table 198 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	7	7	8
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12

# Hornsea 4



Table 199 Razorbill annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	6	10	13	16	19	22	25	29	32
20	0	1	1	2	3	3	6	13	19	25	32	38	44	51	57	64
30	0	1	2	3	4	5	10	19	29	38	48	57	67	76	86	95
40	0	1	3	4	5	6	13	25	38	51	64	76	89	102	114	127
50	0	2	3	5	6	8	16	32	48	64	79	95	111	127	143	159
60	0	2	4	6	8	10	19	38	57	76	95	114	133	153	172	191
70	0	2	4	7	9	11	22	44	67	89	111	133	156	178	200	222
80	0	3	5	8	10	13	25	51	76	102	127	153	178	203	229	254
90	0	3	6	9	11	14	29	57	86	114	143	172	200	229	257	286
100	0	3	6	10	13	16	32	64	95	127	159	191	222	254	286	318

Table 200 Razorbill return migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3
30	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
50	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
60	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
70	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
80	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11
90	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
100	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13

# Hornsea 4



Table 201 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2
10	0	0	0	0	1	1	2	3	5	6	8	10	11	13	14	16
20	0	0	1	1	1	2	3	6	10	13	16	19	22	25	29	32
30	0	0	1	1	2	2	5	10	14	19	24	29	33	38	43	48
40	0	1	1	2	3	3	6	13	19	25	32	38	45	51	57	64
50	0	1	2	2	3	4	8	16	24	32	40	48	56	64	72	80
60	0	1	2	3	4	5	10	19	29	38	48	57	67	76	86	96
70	0	1	2	3	4	6	11	22	33	45	56	67	78	89	100	111
80	0	1	3	4	5	6	13	25	38	51	64	76	89	102	115	127
90	0	1	3	4	6	7	14	29	43	57	72	86	100	115	129	143
100	0	2	3	5	6	8	16	32	48	64	80	96	111	127	143	159

Table 202 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	9	10	12	13
20	0	0	1	1	1	1	3	5	8	10	13	16	18	21	24	26
30	0	0	1	1	2	2	4	8	12	16	20	24	27	31	35	39
40	0	1	1	2	2	3	5	10	16	21	26	31	37	42	47	52
50	0	1	1	2	3	3	7	13	20	26	33	39	46	52	59	65
60	0	1	2	2	3	4	8	16	24	31	39	47	55	63	71	79
70	0	1	2	3	4	5	9	18	27	37	46	55	64	73	82	92
80	0	1	2	3	4	5	10	21	31	42	52	63	73	84	94	105
90	0	1	2	4	5	6	12	24	35	47	59	71	82	94	106	118
100	0	1	3	4	5	7	13	26	39	52	65	79	92	105	118	131



# Hornsea 4



Table 203 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11

# Hornsea 4



Table 204 Razorbill annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	6	9	13	16	19	22	25	28	31
20	0	1	1	2	3	3	6	13	19	25	31	38	44	50	57	63
30	0	1	2	3	4	5	9	19	28	38	47	57	66	76	85	94
40	0	1	3	4	5	6	13	25	38	50	63	76	88	101	113	126
50	0	2	3	5	6	8	16	31	47	63	79	94	110	126	142	157
60	0	2	4	6	8	9	19	38	57	76	94	113	132	151	170	189
70	0	2	4	7	9	11	22	44	66	88	110	132	154	176	198	220
80	0	3	5	8	10	13	25	50	76	101	126	151	176	201	227	252
90	0	3	6	8	11	14	28	57	85	113	142	170	198	227	255	283
100	0	3	6	9	13	16	31	63	94	126	157	189	220	252	283	315

Table 205 Razorbill return migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
50	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	6
70	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
80	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
90	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11

# Hornsea 4



Table 206 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12
20	0	0	0	1	1	1	2	5	7	10	12	14	17	19	22	24
30	0	0	1	1	1	2	4	7	11	14	18	22	25	29	32	36
40	0	0	1	1	2	2	5	10	14	19	24	29	34	38	43	48
50	0	1	1	2	2	3	6	12	18	24	30	36	42	48	54	60
60	0	1	1	2	3	4	7	14	22	29	36	43	50	58	65	72
70	0	1	2	3	3	4	8	17	25	34	42	50	59	67	76	84
80	0	1	2	3	4	5	10	19	29	38	48	58	67	77	86	96
90	0	1	2	3	4	5	11	22	32	43	54	65	76	86	97	108
100	0	1	2	4	5	6	12	24	36	48	60	72	84	96	108	120

Table 207 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	3	4	5	6	7	8	10	11
20	0	0	0	1	1	1	2	4	6	8	11	13	15	17	19	21
30	0	0	1	1	1	2	3	6	10	13	16	19	22	25	29	32
40	0	0	1	1	2	2	4	8	13	17	21	25	30	34	38	42
50	0	1	1	2	2	3	5	11	16	21	26	32	37	42	48	53
60	0	1	1	2	3	3	6	13	19	25	32	38	44	51	57	63
70	0	1	1	2	3	4	7	15	22	30	37	44	52	59	67	74
80	0	1	2	3	3	4	8	17	25	34	42	51	59	68	76	84
90	0	1	2	3	4	5	10	19	29	38	48	57	67	76	86	95
100	0	1	2	3	4	5	11	21	32	42	53	63	74	84	95	106

# Hornsea 4



Table 208 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Applicant's mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
50	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	6
70	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
80	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
90	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11

# Hornsea 4



Table 209 Razorbill annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Applicant’s mean peak approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
10	0	0	0	1	1	1	2	5	7	10	12	15	17	20	22	25
20	0	0	1	1	2	2	5	10	15	20	25	30	35	40	44	49
30	0	1	1	2	3	4	7	15	22	30	37	44	52	59	67	74
40	0	1	2	3	4	5	10	20	30	40	49	59	69	79	89	99
50	0	1	2	4	5	6	12	25	37	49	62	74	87	99	111	124
60	0	1	3	4	6	7	15	30	44	59	74	89	104	119	133	148
70	0	2	3	5	7	9	17	35	52	69	87	104	121	138	156	173
80	0	2	4	6	8	10	20	40	59	79	99	119	138	158	178	198
90	0	2	4	7	9	11	22	44	67	89	111	133	156	178	200	222
100	0	2	5	7	10	12	25	49	74	99	124	148	173	198	222	247

Appendix P. Seasonal FFC Apportionment displacement matrices for razorbill using Natural England’s standard approach.

Table 210 Razorbill return migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England’s standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3
30	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
50	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
60	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
70	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
80	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11
90	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
100	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13



Table 211 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England’s standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
10	0	0	1	1	1	1	3	6	9	11	14	17	20	23	26	29
20	0	1	1	2	2	3	6	11	17	23	29	34	40	46	51	57
30	0	1	2	3	3	4	9	17	26	34	43	51	60	68	77	86
40	0	1	2	3	5	6	11	23	34	46	57	68	80	91	103	114
50	0	1	3	4	6	7	14	29	43	57	71	86	100	114	128	143
60	0	2	3	5	7	9	17	34	51	68	86	103	120	137	154	171
70	0	2	4	6	8	10	20	40	60	80	100	120	140	160	180	200
80	0	2	5	7	9	11	23	46	68	91	114	137	160	183	205	228
90	0	3	5	8	10	13	26	51	77	103	128	154	180	205	231	257
100	0	3	6	9	11	14	29	57	86	114	143	171	200	228	257	285

Table 212 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
20	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	26
30	0	0	1	1	2	2	4	8	12	16	20	24	28	32	36	40
40	0	1	1	2	2	3	5	11	16	21	26	32	37	42	48	53
50	0	1	1	2	3	3	7	13	20	26	33	40	46	53	59	66
60	0	1	2	2	3	4	8	16	24	32	40	48	56	63	71	79
70	0	1	2	3	4	5	9	19	28	37	46	56	65	74	83	93
80	0	1	2	3	4	5	11	21	32	42	53	63	74	85	95	106
90	0	1	2	4	5	6	12	24	36	48	59	71	83	95	107	119
100	0	1	3	4	5	7	13	26	40	53	66	79	93	106	119	132

Table 213 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11

# Hornsea 4



Table 214 Razorbill annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	4
10	0	0	1	1	2	2	4	9	13	18	22	27	31	35	40	44
20	0	1	2	3	4	4	9	18	27	35	44	53	62	71	80	88
30	0	1	3	4	5	7	13	27	40	53	66	80	93	106	119	133
40	0	2	4	5	7	9	18	35	53	71	88	106	124	141	159	177
50	0	2	4	7	9	11	22	44	66	88	110	133	155	177	199	221
60	0	3	5	8	11	13	27	53	80	106	133	159	186	212	239	265
70	0	3	6	9	12	15	31	62	93	124	155	186	217	247	278	309
80	0	4	7	11	14	18	35	71	106	141	177	212	247	283	318	354
90	0	4	8	12	16	20	40	80	119	159	199	239	278	318	358	398
100	0	4	9	13	18	22	44	88	133	177	221	265	309	354	398	442

Table 215 Razorbill return migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14

# Hornsea 4



Table 216 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
10	0	0	1	1	2	2	4	8	12	15	19	23	27	31	35	39
20	0	1	2	2	3	4	8	15	23	31	39	46	54	62	69	77
30	0	1	2	3	5	6	12	23	35	46	58	69	81	93	104	116
40	0	2	3	5	6	8	15	31	46	62	77	93	108	124	139	154
50	0	2	4	6	8	10	19	39	58	77	97	116	135	154	174	193
60	0	2	5	7	9	12	23	46	69	93	116	139	162	185	208	232
70	0	3	5	8	11	14	27	54	81	108	135	162	189	216	243	270
80	0	3	6	9	12	15	31	62	93	124	154	185	216	247	278	309
90	0	3	7	10	14	17	35	69	104	139	174	208	243	278	313	347
100	0	4	8	12	15	19	39	77	116	154	193	232	270	309	347	386

Table 217 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	14
20	0	0	1	1	1	1	3	6	9	12	14	17	20	23	26	29
30	0	0	1	1	2	2	4	9	13	17	22	26	30	35	39	43
40	0	1	1	2	2	3	6	12	17	23	29	35	40	46	52	58
50	0	1	1	2	3	4	7	14	22	29	36	43	51	58	65	72
60	0	1	2	3	3	4	9	17	26	35	43	52	61	69	78	87
70	0	1	2	3	4	5	10	20	30	40	51	61	71	81	91	101
80	0	1	2	3	5	6	12	23	35	46	58	69	81	92	104	116
90	0	1	3	4	5	7	13	26	39	52	65	78	91	104	117	130
100	0	1	3	4	6	7	14	29	43	58	72	87	101	116	130	144

Table 218 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12



# Hornsea 4



Table 219 Razorbill annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	6
10	0	1	1	2	2	3	6	11	17	22	28	33	39	45	50	56
20	0	1	2	3	4	6	11	22	33	45	56	67	78	89	100	111
30	0	2	3	5	7	8	17	33	50	67	84	100	117	134	150	167
40	0	2	4	7	9	11	22	45	67	89	111	134	156	178	201	223
50	0	3	6	8	11	14	28	56	84	111	139	167	195	223	251	279
60	0	3	7	10	13	17	33	67	100	134	167	201	234	268	301	334
70	0	4	8	12	16	20	39	78	117	156	195	234	273	312	351	390
80	0	4	9	13	18	22	45	89	134	178	223	268	312	357	401	446
90	0	5	10	15	20	25	50	100	150	201	251	301	351	401	451	502
100	0	6	11	17	22	28	56	111	167	223	279	334	390	446	502	557

Table 220 Razorbill return migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	12
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	14

# Hornsea 4



Table 221 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
10	0	0	1	1	2	2	4	8	12	15	19	23	27	31	35	38
20	0	1	2	2	3	4	8	15	23	31	38	46	54	62	69	77
30	0	1	2	3	5	6	12	23	35	46	58	69	81	92	104	115
40	0	2	3	5	6	8	15	31	46	62	77	92	108	123	139	154
50	0	2	4	6	8	10	19	38	58	77	96	115	135	154	173	192
60	0	2	5	7	9	12	23	46	69	92	115	139	162	185	208	231
70	0	3	5	8	11	13	27	54	81	108	135	162	189	215	242	269
80	0	3	6	9	12	15	31	62	92	123	154	185	215	246	277	308
90	0	3	7	10	14	17	35	69	104	139	173	208	242	277	312	346
100	0	4	8	12	15	19	38	77	115	154	192	231	269	308	346	385

Table 222 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	10	11	12	14
20	0	0	1	1	1	1	3	5	8	11	14	16	19	22	25	27
30	0	0	1	1	2	2	4	8	12	16	21	25	29	33	37	41
40	0	1	1	2	2	3	5	11	16	22	27	33	38	44	49	55
50	0	1	1	2	3	3	7	14	21	27	34	41	48	55	62	68
60	0	1	2	2	3	4	8	16	25	33	41	49	57	66	74	82
70	0	1	2	3	4	5	10	19	29	38	48	57	67	77	86	96
80	0	1	2	3	4	5	11	22	33	44	55	66	77	88	98	109
90	0	1	2	4	5	6	12	25	37	49	62	74	86	98	111	123
100	0	1	3	4	5	7	14	27	41	55	68	82	96	109	123	137

Table 223 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12

# Hornsea 4



Table 224 Razorbill annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
10	0	1	1	2	2	3	5	11	16	22	27	33	38	44	49	55
20	0	1	2	3	4	5	11	22	33	44	55	66	77	88	99	110
30	0	2	3	5	7	8	16	33	49	66	82	99	115	132	148	164
40	0	2	4	7	9	11	22	44	66	88	110	132	153	175	197	219
50	0	3	5	8	11	14	27	55	82	110	137	164	192	219	247	274
60	0	3	7	10	13	16	33	66	99	132	164	197	230	263	296	329
70	0	4	8	12	15	19	38	77	115	153	192	230	269	307	345	384
80	0	4	9	13	18	22	44	88	132	175	219	263	307	351	395	439
90	0	5	10	15	20	25	49	99	148	197	247	296	345	395	444	493
100	0	5	11	16	22	27	55	110	164	219	274	329	384	439	493	548

Table 225 Razorbill return migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14

# Hornsea 4



Table 226 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	7	10	13	17	20	24	27	30	34
20	0	1	1	2	3	3	7	13	20	27	34	40	47	54	61	67
30	0	1	2	3	4	5	10	20	30	40	51	61	71	81	91	101
40	0	1	3	4	5	7	13	27	40	54	67	81	94	108	121	135
50	0	2	3	5	7	8	17	34	51	67	84	101	118	135	152	168
60	0	2	4	6	8	10	20	40	61	81	101	121	141	162	182	202
70	0	2	5	7	9	12	24	47	71	94	118	141	165	189	212	236
80	0	3	5	8	11	13	27	54	81	108	135	162	189	216	243	270
90	0	3	6	9	12	15	30	61	91	121	152	182	212	243	273	303
100	0	3	7	10	13	17	34	67	101	135	168	202	236	270	303	337



Table 227 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
20	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
30	0	0	1	1	2	2	4	8	12	16	20	24	28	32	36	40
40	0	1	1	2	2	3	5	11	16	21	27	32	37	42	48	53
50	0	1	1	2	3	3	7	13	20	27	33	40	46	53	60	66
60	0	1	2	2	3	4	8	16	24	32	40	48	56	64	72	80
70	0	1	2	3	4	5	9	19	28	37	46	56	65	74	84	93
80	0	1	2	3	4	5	11	21	32	42	53	64	74	85	96	106
90	0	1	2	4	5	6	12	24	36	48	60	72	84	96	108	119
100	0	1	3	4	5	7	13	27	40	53	66	80	93	106	119	133

Table 228 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	7	7	8
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	5	6	7	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12

# Hornsea 4



Table 229 Razorbill annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
10	0	0	1	1	2	2	5	10	15	20	25	30	35	40	45	50
20	0	1	2	3	4	5	10	20	30	40	50	60	69	79	89	99
30	0	1	3	4	6	7	15	30	45	60	74	89	104	119	134	149
40	0	2	4	6	8	10	20	40	60	79	99	119	139	159	179	198
50	0	2	5	7	10	12	25	50	74	99	124	149	174	198	223	248
60	0	3	6	9	12	15	30	60	89	119	149	179	208	238	268	298
70	0	3	7	10	14	17	35	69	104	139	174	208	243	278	312	347
80	0	4	8	12	16	20	40	79	119	159	198	238	278	317	357	397
90	0	4	9	13	18	22	45	89	134	179	223	268	312	357	402	446
100	0	5	10	15	20	25	50	99	149	198	248	298	347	397	446	496

Table 230 Razorbill return migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	6	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	12

# Hornsea 4



Table 231 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	6	9	13	16	19	22	25	28	31
20	0	1	1	2	3	3	6	13	19	25	31	38	44	50	57	63
30	0	1	2	3	4	5	9	19	28	38	47	57	66	75	85	94
40	0	1	3	4	5	6	13	25	38	50	63	75	88	101	113	126
50	0	2	3	5	6	8	16	31	47	63	79	94	110	126	141	157
60	0	2	4	6	8	9	19	38	57	75	94	113	132	151	170	189
70	0	2	4	7	9	11	22	44	66	88	110	132	154	176	198	220
80	0	3	5	8	10	13	25	50	75	101	126	151	176	201	226	252
90	0	3	6	8	11	14	28	57	85	113	141	170	198	226	255	283
100	0	3	6	9	13	16	31	63	94	126	157	189	220	252	283	314

Table 232 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12
20	0	0	0	1	1	1	2	5	7	10	12	14	17	19	21	24
30	0	0	1	1	1	2	4	7	11	14	18	21	25	29	32	36
40	0	0	1	1	2	2	5	10	14	19	24	29	33	38	43	48
50	0	1	1	2	2	3	6	12	18	24	30	36	42	48	54	60
60	0	1	1	2	3	4	7	14	21	29	36	43	50	57	64	71
70	0	1	2	2	3	4	8	17	25	33	42	50	58	67	75	83
80	0	1	2	3	4	5	10	19	29	38	48	57	67	76	86	95
90	0	1	2	3	4	5	11	21	32	43	54	64	75	86	96	107
100	0	1	2	4	5	6	12	24	36	48	60	71	83	95	107	119

Table 233 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	7	7	8
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12

# Hornsea 4



Table 234 Razorbill annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
10	0	0	1	1	2	2	5	9	14	18	23	27	32	37	41	46
20	0	1	2	3	4	5	9	18	27	37	46	55	64	73	82	91
30	0	1	3	4	5	7	14	27	41	55	69	82	96	110	123	137
40	0	2	4	5	7	9	18	37	55	73	91	110	128	146	164	183
50	0	2	5	7	9	11	23	46	69	91	114	137	160	183	206	228
60	0	3	5	8	11	14	27	55	82	110	137	164	192	219	247	274
70	0	3	6	10	13	16	32	64	96	128	160	192	224	256	288	320
80	0	4	7	11	15	18	37	73	110	146	183	219	256	292	329	365
90	0	4	8	12	16	21	41	82	123	164	206	247	288	329	370	411
100	0	5	9	14	18	23	46	91	137	183	228	274	320	365	411	457



Table 235 Razorbill return migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3
30	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
50	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
60	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
70	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
80	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11
90	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
100	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13

Table 236 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England’s standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
10	0	0	1	1	1	1	3	6	9	11	14	17	20	23	26	29
20	0	1	1	2	2	3	6	11	17	23	29	34	40	46	51	57
30	0	1	2	3	3	4	9	17	26	34	43	51	60	69	77	86
40	0	1	2	3	5	6	11	23	34	46	57	69	80	91	103	114
50	0	1	3	4	6	7	14	29	43	57	71	86	100	114	128	143
60	0	2	3	5	7	9	17	34	51	69	86	103	120	137	154	171
70	0	2	4	6	8	10	20	40	60	80	100	120	140	160	180	200
80	0	2	5	7	9	11	23	46	69	91	114	137	160	183	206	228
90	0	3	5	8	10	13	26	51	77	103	128	154	180	206	231	257
100	0	3	6	9	11	14	29	57	86	114	143	171	200	228	257	285

Table 237 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	9	10	12	13
20	0	0	1	1	1	1	3	5	8	10	13	16	18	21	24	26
30	0	0	1	1	2	2	4	8	12	16	20	24	27	31	35	39
40	0	1	1	2	2	3	5	10	16	21	26	31	37	42	47	52
50	0	1	1	2	3	3	7	13	20	26	33	39	46	52	59	65
60	0	1	2	2	3	4	8	16	24	31	39	47	55	63	71	79
70	0	1	2	3	4	5	9	18	27	37	46	55	64	73	82	92
80	0	1	2	3	4	5	10	21	31	42	52	63	73	84	94	105
90	0	1	2	4	5	6	12	24	35	47	59	71	82	94	106	118
100	0	1	3	4	5	7	13	26	39	52	65	79	92	105	118	131

Table 238 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11

# Hornsea 4



Table 239 Razorbill annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	4
10	0	0	1	1	2	2	4	9	13	18	22	26	31	35	40	44
20	0	1	2	3	4	4	9	18	26	35	44	53	62	71	79	88
30	0	1	3	4	5	7	13	26	40	53	66	79	93	106	119	132
40	0	2	4	5	7	9	18	35	53	71	88	106	123	141	159	176
50	0	2	4	7	9	11	22	44	66	88	110	132	154	176	198	220
60	0	3	5	8	11	13	26	53	79	106	132	159	185	212	238	265
70	0	3	6	9	12	15	31	62	93	123	154	185	216	247	278	309
80	0	4	7	11	14	18	35	71	106	141	176	212	247	282	317	353
90	0	4	8	12	16	20	40	79	119	159	198	238	278	317	357	397
100	0	4	9	13	18	22	44	88	132	176	220	265	309	353	397	441

Table 240 Razorbill return migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
50	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	6
70	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
80	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
90	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11

Table 241 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England’s standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
10	0	0	0	1	1	1	2	4	6	9	11	13	15	17	19	22
20	0	0	1	1	2	2	4	9	13	17	22	26	30	34	39	43
30	0	1	1	2	3	3	6	13	19	26	32	39	45	52	58	65
40	0	1	2	3	3	4	9	17	26	34	43	52	60	69	77	86
50	0	1	2	3	4	5	11	22	32	43	54	65	75	86	97	108
60	0	1	3	4	5	6	13	26	39	52	65	77	90	103	116	129
70	0	2	3	5	6	8	15	30	45	60	75	90	105	120	136	151
80	0	2	3	5	7	9	17	34	52	69	86	103	120	138	155	172
90	0	2	4	6	8	10	19	39	58	77	97	116	136	155	174	194
100	0	2	4	6	9	11	22	43	65	86	108	129	151	172	194	215

Table 242 Razorbill post-breeding migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	3	4	5	6	7	8	10	11
20	0	0	0	1	1	1	2	4	6	8	11	13	15	17	19	21
30	0	0	1	1	1	2	3	6	10	13	16	19	22	25	29	32
40	0	0	1	1	2	2	4	8	13	17	21	25	30	34	38	42
50	0	1	1	2	2	3	5	11	16	21	26	32	37	42	48	53
60	0	1	1	2	3	3	6	13	19	25	32	38	44	51	57	63
70	0	1	1	2	3	4	7	15	22	30	37	44	52	59	67	74
80	0	1	2	3	3	4	8	17	25	34	42	51	59	68	76	85
90	0	1	2	3	4	5	10	19	29	38	48	57	67	76	86	95
100	0	1	2	3	4	5	11	21	32	42	53	63	74	85	95	106



Table 243 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England’s standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
50	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	6
70	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
80	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
90	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11

# Hornsea 4



Table 244 Razorbill annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's standard approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	7	10	14	17	21	24	27	31	34
20	0	1	1	2	3	3	7	14	21	27	34	41	48	55	62	68
30	0	1	2	3	4	5	10	21	31	41	51	62	72	82	92	103
40	0	1	3	4	5	7	14	27	41	55	68	82	96	110	123	137
50	0	2	3	5	7	9	17	34	51	68	86	103	120	137	154	171
60	0	2	4	6	8	10	21	41	62	82	103	123	144	164	185	205
70	0	2	5	7	10	12	24	48	72	96	120	144	168	192	216	240
80	0	3	5	8	11	14	27	55	82	110	137	164	192	219	246	274
90	0	3	6	9	12	15	31	62	92	123	154	185	216	246	277	308
100	0	3	7	10	14	17	34	68	103	137	171	205	240	274	308	342

## Appendix Q. Seasonal FFC Apportionment displacement matrices for razorbill using Natural England’s bespoke apportioning approach

Table 245 Razorbill return migration displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3
30	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
50	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
60	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
70	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
80	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11
90	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
100	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13

# Hornsea 4



Table 246 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
10	0	0	1	1	1	1	3	6	9	11	14	17	20	23	26	29
20	0	1	1	2	2	3	6	11	17	23	29	34	40	46	51	57
30	0	1	2	3	3	4	9	17	26	34	43	51	60	68	77	86
40	0	1	2	3	5	6	11	23	34	46	57	68	80	91	103	114
50	0	1	3	4	6	7	14	29	43	57	71	86	100	114	128	143
60	0	2	3	5	7	9	17	34	51	68	86	103	120	137	154	171
70	0	2	4	6	8	10	20	40	60	80	100	120	140	160	180	200
80	0	2	5	7	9	11	23	46	68	91	114	137	160	183	205	228
90	0	3	5	8	10	13	26	51	77	103	128	154	180	205	231	257
100	0	3	6	9	11	14	29	57	86	114	143	171	200	228	257	285

Table 247 Razorbill chick rearing/ moult displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	10	13	15	18	21	23	26
10	0	3	5	8	10	13	26	52	77	103	129	155	181	206	232	258
20	0	5	10	15	21	26	52	103	155	206	258	310	361	413	465	516
30	0	8	15	23	31	39	77	155	232	310	387	465	542	619	697	774
40	0	10	21	31	41	52	103	206	310	413	516	619	723	826	929	1,032
50	0	13	26	39	52	65	129	258	387	516	645	774	903	1,032	1,161	1,291
60	0	15	31	46	62	77	155	310	465	619	774	929	1,084	1,239	1,394	1,549
70	0	18	36	54	72	90	181	361	542	723	903	1,084	1,265	1,445	1,626	1,807
80	0	21	41	62	83	103	206	413	619	826	1,032	1,239	1,445	1,652	1,858	2,065
90	0	23	46	70	93	116	232	465	697	929	1,161	1,394	1,626	1,858	2,091	2,323
100	0	26	52	77	103	129	258	516	774	1,032	1,291	1,549	1,807	2,065	2,323	2,581

Table 248 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11

# Hornsea 4



Table 249 Razorbill annual displacement matrix for Protective Provision Scenario 1 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	6	9	12	14	17	20	23	26	29
10	0	3	6	9	12	14	29	58	87	116	145	173	202	231	260	289
20	0	6	12	17	23	29	58	116	173	231	289	347	405	463	520	578
30	0	9	17	26	35	43	87	173	260	347	434	520	607	694	781	867
40	0	12	23	35	46	58	116	231	347	463	578	694	809	925	1,041	1,156
50	0	14	29	43	58	72	145	289	434	578	723	867	1,012	1,156	1,301	1,445
60	0	17	35	52	69	87	173	347	520	694	867	1,041	1,214	1,388	1,561	1,734
70	0	20	40	61	81	101	202	405	607	809	1,012	1,214	1,416	1,619	1,821	2,024
80	0	23	46	69	93	116	231	463	694	925	1,156	1,388	1,619	1,850	2,081	2,313
90	0	26	52	78	104	130	260	520	781	1,041	1,301	1,561	1,821	2,081	2,342	2,602
100	0	29	58	87	116	145	289	578	867	1,156	1,445	1,734	2,024	2,313	2,602	2,891

Table 250 Razorbill return migration displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14



# Hornsea 4



Table 251 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
10	0	0	1	1	2	2	4	8	12	15	19	23	27	31	35	39
20	0	1	2	2	3	4	8	15	23	31	39	46	54	62	69	77
30	0	1	2	3	5	6	12	23	35	46	58	69	81	93	104	116
40	0	2	3	5	6	8	15	31	46	62	77	93	108	124	139	154
50	0	2	4	6	8	10	19	39	58	77	97	116	135	154	174	193
60	0	2	5	7	9	12	23	46	69	93	116	139	162	185	208	232
70	0	3	5	8	11	14	27	54	81	108	135	162	189	216	243	270
80	0	3	6	9	12	15	31	62	93	124	154	185	216	247	278	309
90	0	3	7	10	14	17	35	69	104	139	174	208	243	278	313	347
100	0	4	8	12	15	19	39	77	116	154	193	232	270	309	347	386

Table 252 Razorbill chick rearing/ moult displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	6	8	11	14	17	20	23	25	28
10	0	3	6	8	11	14	28	56	85	113	141	169	197	226	254	282
20	0	6	11	17	23	28	56	113	169	226	282	338	395	451	508	564
30	0	8	17	25	34	42	85	169	254	338	423	508	592	677	762	846
40	0	11	23	34	45	56	113	226	338	451	564	677	790	903	1,015	1,128
50	0	14	28	42	56	71	141	282	423	564	705	846	987	1,128	1,269	1,410
60	0	17	34	51	68	85	169	338	508	677	846	1,015	1,185	1,354	1,523	1,692
70	0	20	39	59	79	99	197	395	592	790	987	1,185	1,382	1,580	1,777	1,975
80	0	23	45	68	90	113	226	451	677	903	1,128	1,354	1,580	1,805	2,031	2,257
90	0	25	51	76	102	127	254	508	762	1,015	1,269	1,523	1,777	2,031	2,285	2,539
100	0	28	56	85	113	141	282	564	846	1,128	1,410	1,692	1,975	2,257	2,539	2,821

Table 253 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12

# Hornsea 4



Table 254 Razorbill annual displacement matrix for Protective Provision Scenario 2 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	2	3	6	10	13	16	19	23	26	29	32
10	0	3	6	10	13	16	32	65	97	129	162	194	226	259	291	323
20	0	6	13	19	26	32	65	129	194	259	323	388	453	517	582	647
30	0	10	19	29	39	49	97	194	291	388	485	582	679	776	873	970
40	0	13	26	39	52	65	129	259	388	517	647	776	905	1,035	1,164	1,293
50	0	16	32	49	65	81	162	323	485	647	808	970	1,132	1,293	1,455	1,617
60	0	19	39	58	78	97	194	388	582	776	970	1,164	1,358	1,552	1,746	1,940
70	0	23	45	68	91	113	226	453	679	905	1,132	1,358	1,585	1,811	2,037	2,264
80	0	26	52	78	103	129	259	517	776	1,035	1,293	1,552	1,811	2,070	2,328	2,587
90	0	29	58	87	116	146	291	582	873	1,164	1,455	1,746	2,037	2,328	2,619	2,910
100	0	32	65	97	129	162	323	647	970	1,293	1,617	1,940	2,264	2,587	2,910	3,234

Table 255 Razorbill return migration displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	12
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	14

# Hornsea 4



Table 256 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	2	2	2	3	3	3	4
10	0	0	1	1	2	2	4	8	12	15	19	23	27	31	35	38
20	0	1	2	2	3	4	8	15	23	31	38	46	54	62	69	77
30	0	1	2	3	5	6	12	23	35	46	58	69	81	92	104	115
40	0	2	3	5	6	8	15	31	46	62	77	92	108	123	139	154
50	0	2	4	6	8	10	19	38	58	77	96	115	135	154	173	192
60	0	2	5	7	9	12	23	46	69	92	115	139	162	185	208	231
70	0	3	5	8	11	13	27	54	81	108	135	162	189	215	242	269
80	0	3	6	9	12	15	31	62	92	123	154	185	215	246	277	308
90	0	3	7	10	14	17	35	69	104	139	173	208	242	277	312	346
100	0	4	8	12	15	19	38	77	115	154	192	231	269	308	346	385

Table 257 Razorbill chick rearing/ moult displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
10	0	3	5	8	11	13	27	53	80	107	134	160	187	214	240	267
20	0	5	11	16	21	27	53	107	160	214	267	320	374	427	481	534
30	0	8	16	24	32	40	80	160	240	320	401	481	561	641	721	801
40	0	11	21	32	43	53	107	214	320	427	534	641	748	855	961	1,068
50	0	13	27	40	53	67	134	267	401	534	668	801	935	1,068	1,202	1,335
60	0	16	32	48	64	80	160	320	481	641	801	961	1,122	1,282	1,442	1,602
70	0	19	37	56	75	93	187	374	561	748	935	1,122	1,309	1,495	1,682	1,869
80	0	21	43	64	85	107	214	427	641	855	1,068	1,282	1,495	1,709	1,923	2,136
90	0	24	48	72	96	120	240	481	721	961	1,202	1,442	1,682	1,923	2,163	2,403
100	0	27	53	80	107	134	267	534	801	1,068	1,335	1,602	1,869	2,136	2,403	2,671

Table 258 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	7	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12



# Hornsea 4



Table 259 Razorbill annual displacement matrix for Protective Provision Scenario 5 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	2	3	6	9	12	15	18	22	25	28	31
10	0	3	6	9	12	15	31	62	92	123	154	185	216	247	277	308
20	0	6	12	18	25	31	62	123	185	247	308	370	431	493	555	616
30	0	9	18	28	37	46	92	185	277	370	462	555	647	740	832	925
40	0	12	25	37	49	62	123	247	370	493	616	740	863	986	1,109	1,233
50	0	15	31	46	62	77	154	308	462	616	770	925	1,079	1,233	1,387	1,541
60	0	18	37	55	74	92	185	370	555	740	925	1,109	1,294	1,479	1,664	1,849
70	0	22	43	65	86	108	216	431	647	863	1,079	1,294	1,510	1,726	1,942	2,157
80	0	25	49	74	99	123	247	493	740	986	1,233	1,479	1,726	1,972	2,219	2,466
90	0	28	55	83	111	139	277	555	832	1,109	1,387	1,664	1,942	2,219	2,496	2,774
100	0	31	62	92	123	154	308	616	925	1,233	1,541	1,849	2,157	2,466	2,774	3,082

Table 260 Razorbill return migration displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
30	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
50	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
60	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
70	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
80	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
90	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
100	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14

# Hornsea 4



Table 261 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	7	10	13	17	20	24	27	30	34
20	0	1	1	2	3	3	7	13	20	27	34	40	47	54	61	67
30	0	1	2	3	4	5	10	20	30	40	51	61	71	81	91	101
40	0	1	3	4	5	7	13	27	40	54	67	81	94	108	121	135
50	0	2	3	5	7	8	17	34	51	67	84	101	118	135	152	168
60	0	2	4	6	8	10	20	40	61	81	101	121	141	162	182	202
70	0	2	5	7	9	12	24	47	71	94	118	141	165	189	212	236
80	0	3	5	8	11	13	27	54	81	108	135	162	189	216	243	270
90	0	3	6	9	12	15	30	61	91	121	152	182	212	243	273	303
100	0	3	7	10	13	17	34	67	101	135	168	202	236	270	303	337

Table 262 Razorbill chick rearing/ moult displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	10	13	16	18	21	23	26
10	0	3	5	8	10	13	26	52	78	104	130	155	181	207	233	259
20	0	5	10	16	21	26	52	104	155	207	259	311	363	415	466	518
30	0	8	16	23	31	39	78	155	233	311	389	466	544	622	700	777
40	0	10	21	31	41	52	104	207	311	415	518	622	726	829	933	1,037
50	0	13	26	39	52	65	130	259	389	518	648	777	907	1,037	1,166	1,296
60	0	16	31	47	62	78	155	311	466	622	777	933	1,088	1,244	1,399	1,555
70	0	18	36	54	73	91	181	363	544	726	907	1,088	1,270	1,451	1,633	1,814
80	0	21	41	62	83	104	207	415	622	829	1,037	1,244	1,451	1,659	1,866	2,073
90	0	23	47	70	93	117	233	466	700	933	1,166	1,399	1,633	1,866	2,099	2,332
100	0	26	52	78	104	130	259	518	777	1,037	1,296	1,555	1,814	2,073	2,332	2,592

Table 263 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
70	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	8
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
90	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12

# Hornsea 4



Table 264 Razorbill annual displacement matrix for Protective Provision Scenario 6 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	6	9	12	15	18	21	24	27	30
10	0	3	6	9	12	15	30	59	89	118	148	177	207	236	266	295
20	0	6	12	18	24	30	59	118	177	236	295	355	414	473	532	591
30	0	9	18	27	35	44	89	177	266	355	443	532	620	709	798	886
40	0	12	24	35	47	59	118	236	355	473	591	709	827	946	1,064	1,182
50	0	15	30	44	59	74	148	295	443	591	739	886	1,034	1,182	1,330	1,477
60	0	18	35	53	71	89	177	355	532	709	886	1,064	1,241	1,418	1,596	1,773
70	0	21	41	62	83	103	207	414	620	827	1,034	1,241	1,448	1,655	1,861	2,068
80	0	24	47	71	95	118	236	473	709	946	1,182	1,418	1,655	1,891	2,127	2,364
90	0	27	53	80	106	133	266	532	798	1,064	1,330	1,596	1,861	2,127	2,393	2,659
100	0	30	59	89	118	148	295	591	886	1,182	1,477	1,773	2,068	2,364	2,659	2,955

Table 265 Razorbill return migration displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	6	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	12

# Hornsea 4



Table 266 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
10	0	0	1	1	1	2	3	6	9	13	16	19	22	25	28	31
20	0	1	1	2	3	3	6	13	19	25	31	38	44	50	57	63
30	0	1	2	3	4	5	9	19	28	38	47	57	66	75	85	94
40	0	1	3	4	5	6	13	25	38	50	63	75	88	101	113	126
50	0	2	3	5	6	8	16	31	47	63	79	94	110	126	141	157
60	0	2	4	6	8	9	19	38	57	75	94	113	132	151	170	189
70	0	2	4	7	9	11	22	44	66	88	110	132	154	176	198	220
80	0	3	5	8	10	13	25	50	75	101	126	151	176	201	226	252
90	0	3	6	8	11	14	28	57	85	113	141	170	198	226	255	283
100	0	3	6	9	13	16	31	63	94	126	157	189	220	252	283	314



Table 267 Razorbill chick rearing/ moult displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	1	2	5	7	9	12	14	16	19	21	23
10	0	2	5	7	9	12	23	46	70	93	116	139	163	186	209	232
20	0	5	9	14	19	23	46	93	139	186	232	279	325	372	418	465
30	0	7	14	21	28	35	70	139	209	279	349	418	488	558	627	697
40	0	9	19	28	37	46	93	186	279	372	465	558	651	744	837	930
50	0	12	23	35	46	58	116	232	349	465	581	697	813	930	1,046	1,162
60	0	14	28	42	56	70	139	279	418	558	697	837	976	1,115	1,255	1,394
70	0	16	33	49	65	81	163	325	488	651	813	976	1,139	1,301	1,464	1,627
80	0	19	37	56	74	93	186	372	558	744	930	1,115	1,301	1,487	1,673	1,859
90	0	21	42	63	84	105	209	418	627	837	1,046	1,255	1,464	1,673	1,882	2,091
100	0	23	46	70	93	116	232	465	697	930	1,162	1,394	1,627	1,859	2,091	2,324

Table 268 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	4
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	4	4	5	6	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	7	7	8
80	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	9	10	11
100	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12

# Hornsea 4



Table 269 Razorbill annual displacement matrix for Protective Provision Scenario 8 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
10	0	3	5	8	11	13	27	53	80	106	133	160	186	213	240	266
20	0	5	11	16	21	27	53	106	160	213	266	319	373	426	479	532
30	0	8	16	24	32	40	80	160	240	319	399	479	559	639	719	798
40	0	11	21	32	43	53	106	213	319	426	532	639	745	852	958	1,065
50	0	13	27	40	53	67	133	266	399	532	665	798	932	1,065	1,198	1,331
60	0	16	32	48	64	80	160	319	479	639	798	958	1,118	1,278	1,437	1,597
70	0	19	37	56	75	93	186	373	559	745	932	1,118	1,304	1,491	1,677	1,863
80	0	21	43	64	85	106	213	426	639	852	1,065	1,278	1,491	1,703	1,916	2,129
90	0	24	48	72	96	120	240	479	719	958	1,198	1,437	1,677	1,916	2,156	2,395
100	0	27	53	80	106	133	266	532	798	1,065	1,331	1,597	1,863	2,129	2,395	2,662

Table 270 Razorbill return migration displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
20	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3
30	0	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4
40	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
50	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
60	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
70	0	0	0	0	0	0	1	2	3	4	5	6	6	7	8	9
80	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11
90	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
100	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13

# Hornsea 4



Table 271 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
10	0	0	1	1	1	1	3	6	9	11	14	17	20	23	26	29
20	0	1	1	2	2	3	6	11	17	23	29	34	40	46	51	57
30	0	1	2	3	3	4	9	17	26	34	43	51	60	69	77	86
40	0	1	2	3	5	6	11	23	34	46	57	69	80	91	103	114
50	0	1	3	4	6	7	14	29	43	57	71	86	100	114	128	143
60	0	2	3	5	7	9	17	34	51	69	86	103	120	137	154	171
70	0	2	4	6	8	10	20	40	60	80	100	120	140	160	180	200
80	0	2	5	7	9	11	23	46	69	91	114	137	160	183	206	228
90	0	3	5	8	10	13	26	51	77	103	128	154	180	206	231	257
100	0	3	6	9	11	14	29	57	86	114	143	171	200	228	257	285

# Hornsea 4



Table 272 Razorbill chick rearing/ moult displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	5	8	10	13	15	18	20	23	26
10	0	3	5	8	10	13	26	51	77	102	128	153	179	204	230	256
20	0	5	10	15	20	26	51	102	153	204	256	307	358	409	460	511
30	0	8	15	23	31	38	77	153	230	307	383	460	537	613	690	767
40	0	10	20	31	41	51	102	204	307	409	511	613	716	818	920	1,022
50	0	13	26	38	51	64	128	256	383	511	639	767	894	1,022	1,150	1,278
60	0	15	31	46	61	77	153	307	460	613	767	920	1,073	1,227	1,380	1,533
70	0	18	36	54	72	89	179	358	537	716	894	1,073	1,252	1,431	1,610	1,789
80	0	20	41	61	82	102	204	409	613	818	1,022	1,227	1,431	1,636	1,840	2,044
90	0	23	46	69	92	115	230	460	690	920	1,150	1,380	1,610	1,840	2,070	2,300
100	0	26	51	77	102	128	256	511	767	1,022	1,278	1,533	1,789	2,044	2,300	2,555

Table 273 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5
50	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	7
70	0	0	0	0	0	0	1	2	2	3	4	5	6	6	7	8
80	0	0	0	0	0	0	1	2	3	4	5	5	6	7	8	9
90	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11

# Hornsea 4



Table 274 Razorbill annual displacement matrix for Protective Provision Scenario 9 plus 2km buffer using the Natural England’s bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	3	6	9	11	14	17	20	23	26	29
10	0	3	6	9	11	14	29	57	86	115	143	172	201	229	258	287
20	0	6	11	17	23	29	57	115	172	229	287	344	401	458	516	573
30	0	9	17	26	34	43	86	172	258	344	430	516	602	688	774	860
40	0	11	23	34	46	57	115	229	344	458	573	688	802	917	1,032	1,146
50	0	14	29	43	57	72	143	287	430	573	716	860	1,003	1,146	1,289	1,433
60	0	17	34	52	69	86	172	344	516	688	860	1,032	1,203	1,375	1,547	1,719
70	0	20	40	60	80	100	201	401	602	802	1,003	1,203	1,404	1,605	1,805	2,006
80	0	23	46	69	92	115	229	458	688	917	1,146	1,375	1,605	1,834	2,063	2,292
90	0	26	52	77	103	129	258	516	774	1,032	1,289	1,547	1,805	2,063	2,321	2,579
100	0	29	57	86	115	143	287	573	860	1,146	1,433	1,719	2,006	2,292	2,579	2,865



Table 275 Razorbill return migration displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
50	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	6
70	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
80	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
90	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11

# Hornsea 4



Table 276 Razorbill migration-free breeding displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
10	0	0	0	1	1	1	2	4	6	9	11	13	15	17	19	22
20	0	0	1	1	2	2	4	9	13	17	22	26	30	34	39	43
30	0	1	1	2	3	3	6	13	19	26	32	39	45	52	58	65
40	0	1	2	3	3	4	9	17	26	34	43	52	60	69	77	86
50	0	1	2	3	4	5	11	22	32	43	54	65	75	86	97	108
60	0	1	3	4	5	6	13	26	39	52	65	77	90	103	116	129
70	0	2	3	5	6	8	15	30	45	60	75	90	105	120	136	151
80	0	2	3	5	7	9	17	34	52	69	86	103	120	138	155	172
90	0	2	4	6	8	10	19	39	58	77	97	116	136	155	174	194
100	0	2	4	6	9	11	22	43	65	86	108	129	151	172	194	215

Table 277 Razorbill chick rearing/ moult displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	1	2	4	6	8	10	12	14	17	19	21
10	0	2	4	6	8	10	21	41	62	83	103	124	144	165	186	206
20	0	4	8	12	17	21	41	83	124	165	206	248	289	330	371	413
30	0	6	12	19	25	31	62	124	186	248	309	371	433	495	557	619
40	0	8	17	25	33	41	83	165	248	330	413	495	578	660	743	825
50	0	10	21	31	41	52	103	206	309	413	516	619	722	825	928	1,031
60	0	12	25	37	50	62	124	248	371	495	619	743	866	990	1,114	1,238
70	0	14	29	43	58	72	144	289	433	578	722	866	1,011	1,155	1,299	1,444
80	0	17	33	50	66	83	165	330	495	660	825	990	1,155	1,320	1,485	1,650
90	0	19	37	56	74	93	186	371	557	743	928	1,114	1,299	1,485	1,671	1,856
100	0	21	41	62	83	103	206	413	619	825	1,031	1,238	1,444	1,650	1,856	2,063

Table 278 Razorbill migration-free winter displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
20	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
30	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
40	0	0	0	0	0	0	0	1	1	2	2	3	3	3	4	4
50	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
60	0	0	0	0	0	0	1	1	2	3	3	4	5	5	6	6
70	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
80	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
90	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
100	0	0	0	0	0	1	1	2	3	4	5	6	8	9	10	11

# Hornsea 4



Table 279 Razorbill annual displacement matrix for Protective Provision Scenario 13 plus 2km buffer using the Natural England's bespoke apportioning approach.

Displacement (%)	Mortality (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	1	1	2	5	7	9	11	14	16	18	21	23
10	0	2	5	7	9	11	23	46	69	92	115	138	161	184	207	230
20	0	5	9	14	18	23	46	92	138	184	230	276	322	368	414	460
30	0	7	14	21	28	34	69	138	207	276	345	414	483	552	621	690
40	0	9	18	28	37	46	92	184	276	368	460	552	644	736	828	920
50	0	11	23	34	46	57	115	230	345	460	575	690	805	920	1,035	1,150
60	0	14	28	41	55	69	138	276	414	552	690	828	966	1,104	1,242	1,380
70	0	16	32	48	64	80	161	322	483	644	805	966	1,127	1,288	1,449	1,609
80	0	18	37	55	74	92	184	368	552	736	920	1,104	1,288	1,472	1,655	1,839
90	0	21	41	62	83	103	207	414	621	828	1,035	1,242	1,449	1,655	1,862	2,069
100	0	23	46	69	92	115	230	460	690	920	1,150	1,380	1,609	1,839	2,069	2,299

