
**Code:** UKCAL-CWF-CON-EIA-RPT-00007-7B37

# Volume 7B Proposed Development (Offshore) Appendices

Appendix 6-3 Offshore Ornithology Collision Risk Modelling Technical Report

Annex 1 Collision Risk Modelling Results (Caledonia OWF)

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OCEAN WINDS

# Volume 7B Appendix 6-3 Annex 1 Collision Risk Modelling Results (Caledonia OWF)

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# Table of Contents

# List of Tables

# Acronyms and Abbreviations

| | |
|---|---|
| **CI** | Confidence Interval |
| **CRM** | Collision Risk Modelling |
| **HAT** | Highest Astronomical Tide |
| **km** | Kilometre |
| **m** | Metre |
| **NAF** | Nocturnal Activity Factor |
| **OWF** | Offshore Wind Farm |
| **rpm** | Revolutions Per Minute |
| **SD** | Standard Deviation |
| **WTG** | Wind Turbine Generator |

# 1 Introduction

1.1.1.1 The results of Collision Risk Modelling (CRM) for the Caledonia Offshore Wind Farm (OWF) (i.e., the Caledonia North Site and Caledonia South Site), are presented within this annex. Three Wind Turbine Generator (WTG) options have been modelled using both the deterministic and stochastic basic Band (2012[1]) model, Option 2. The full CRM methodology is outlined in Volume 7B, Appendix 6-3: Offshore Ornithology Collision Risk Modelling Technical Report.

1.1.1.2 The WTG parameters used within the CRM for the Caledonia OWF are presented in Table 1-1, with further information presented in Section 2.6 of Volume 7B, Appendix 6-3: Offshore Ornithology Collision Risk Modelling Technical Report. Estimated collisions are presented in Section 2.

Table 1-1: OWF and WTG parameters used for CRM for the Caledonia OWF.

| Parameter | WTG 1 | WTG 2 | | WTG 3 |
|---|---|---|---|---|
| | Fixed | Fixed | Floating | Fixed |
| Number of WTGs | 140 | 62 | 29 | 84 |
| Latitude (degrees) | 58.19 | 58.19 | 58.19 | 58.19 |
| Width (km) | 44.0 | 44.0 | 44.0 | 44.0 |
| Tidal offset (m) | 2.19 | 2.19 | 0 | 2.19 |
| Number of blades | 3 | 3 | 3 | 3 |
| Rotor radius (m) | 118 | 155 | 145 | 155 |
| Air gap relative to HAT (m) | 32.81 | 32.81 | 35 | 32.81 |
| Blade width (m) | 7.50 | 7.50 | 7.50 | 7.50 |
| Average pitch (°) | 2 | 2 | 2 | 2 |
| Average pitch SD (°) | No data (assumed 0) | No data (assumed 0) | No data (assumed 0) | No data (assumed 0) |
| Rotation speed (rpm) | 8.4 | 8.4 | 8.4 | 8.4 |
| Rotation speed SD (rpm) | No data (assumed 0) | No data (assumed 0) | No data (assumed 0) | No data (assumed 0) |

# 2 Results

## 2.1 Overview

2.1.1.1 CRM outputs for the three WTG scenarios for the Caledonia OWF (i.e., the Caledonia North Site and Caledonia South Site) have been presented in the following sections for five species:

- Kittiwake (*Rissa tridactyla*) (Section 2.2);
- Great blacked-back gull (*Larus marinus*) (Section 2.3);
- Herring gull (*Larus argentatus*) (Section 2.4);
- Great skua (*Stercorarius skua*) (Section 2.5); and
- Gannet (*Morus bassanus*) (Sections 2.6, 2.7 and 2.8).

2.1.1.2 For gannet, an Applicant Approach was assessed in addition to the Guidance Approach. For the Applicant Approach, a macro-avoidance rate of 70% was applied to the monthly gannet CRM results; however, the macro-avoidance rate was only applied to the CRM results in the non-breeding season for the Guidance Approach. This accounts for the potential overestimation of impacts due to double counting of gannets that are likely to be displaced. Further information can be found in Volume 7B, Appendix 6-3: Offshore Ornithology Collision Risk Modelling Technical Report. The CRM results for gannet, without applying the macro-avoidance correction factor, are presented in Section 2.8.

## 2.2 Kittiwake

Table 2-1: Estimated monthly collisions for kittiwake in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the deterministic Band (2012[1]) model.

| Scenario | NAF (%) | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | 25 | 0.43 | 0.68 | 0.62 | 6.38 | 9.52 | 24.34 | 16.41 | 7.65 | 1.60 | 1.80 | 3.20 | 0.47 | **73.08** |
| | 50 | 0.59 | 0.87 | 0.74 | 7.30 | 10.46 | 26.17 | 17.80 | 8.59 | 1.89 | 2.24 | 4.27 | 0.65 | **81.57** |
| WTG 2 | 25 | 0.30 | 0.48 | 0.43 | 4.48 | 6.68 | 17.08 | 11.51 | 5.37 | 1.13 | 1.26 | 2.24 | 0.33 | **51.28** |
| | 50 | 0.41 | 0.61 | 0.52 | 5.12 | 7.34 | 18.36 | 12.49 | 6.03 | 1.32 | 1.57 | 2.99 | 0.46 | **57.23** |
| WTG 3 | 25 | 0.28 | 0.44 | 0.40 | 4.16 | 6.21 | 15.88 | 10.70 | 4.99 | 1.05 | 1.17 | 2.08 | 0.30 | **47.68** |
| | 50 | 0.38 | 0.57 | 0.48 | 4.76 | 6.82 | 17.07 | 11.61 | 5.60 | 1.23 | 1.46 | 2.78 | 0.43 | **53.21** |

Table 2-2: Estimated monthly collisions for kittiwake in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the stochastic Band (2012[1]) model.

| Scenario | CI | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | Mean | 0.44 | 0.67 | 0.59 | 6.11 | 8.47 | 21.95 | 14.86 | 6.94 | 1.53 | 1.73 | 3.25 | 0.48 | **67.01** |
| | 2.5% | 0.10 | 0.11 | 0.16 | 1.45 | 3.32 | 5.61 | 4.41 | 3.71 | 0.64 | 0.67 | 1.09 | 0.13 | **21.40** |
| | 97.5% | 0.92 | 1.38 | 1.12 | 12.52 | 14.61 | 43.10 | 28.16 | 10.97 | 2.66 | 3.06 | 5.85 | 0.94 | **125.28** |
| WTG 2 | Mean | 0.31 | 0.47 | 0.41 | 4.17 | 6.11 | 15.47 | 10.53 | 4.96 | 1.06 | 1.23 | 2.27 | 0.35 | **47.34** |
| | 2.5% | 0.06 | 0.08 | 0.12 | 0.63 | 2.34 | 4.38 | 2.71 | 2.60 | 0.45 | 0.48 | 0.76 | 0.09 | **14.71** |
| | 97.5% | 0.62 | 0.96 | 0.77 | 8.56 | 10.63 | 29.30 | 19.85 | 7.63 | 1.81 | 2.12 | 4.28 | 0.67 | **87.19** |
| WTG 3 | Mean | 0.29 | 0.45 | 0.39 | 3.97 | 5.59 | 14.70 | 9.79 | 4.63 | 0.99 | 1.15 | 2.10 | 0.33 | **44.38** |
| | 2.5% | 0.07 | 0.06 | 0.12 | 0.68 | 2.16 | 3.98 | 2.44 | 2.39 | 0.35 | 0.50 | 0.73 | 0.10 | **13.57** |
| | 97.5% | 0.59 | 0.93 | 0.75 | 8.13 | 9.60 | 27.36 | 18.59 | 7.51 | 1.76 | 1.97 | 3.81 | 0.63 | **81.63** |

## 2.3 Great Black-Backed Gull

Table 2-3: Estimated monthly collisions for great black-backed gull in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the deterministic Band (2012[1]) model.

| Scenario | NAF (%) | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | 25 | 2.92 | 1.82 | 0 | 0 | 0 | 0 | 0 | 0 | 1.12 | 0.79 | 3.45 | 0.86 | **10.96** |
| | 50 | 3.99 | 2.33 | 0 | 0 | 0 | 0 | 0 | 0 | 1.32 | 0.99 | 4.61 | 1.20 | **14.44** |
| WTG 2 | 25 | 2.09 | 1.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0.80 | 0.57 | 2.47 | 0.61 | **7.84** |
| | 50 | 2.86 | 1.67 | 0 | 0 | 0 | 0 | 0 | 0 | 0.94 | 0.71 | 3.29 | 0.86 | **10.32** |
| WTG 3 | 25 | 1.94 | 1.21 | 0 | 0 | 0 | 0 | 0 | 0 | 0.75 | 0.53 | 2.30 | 0.57 | **7.30** |
| | 50 | 2.66 | 1.55 | 0 | 0 | 0 | 0 | 0 | 0 | 0.88 | 0.66 | 3.07 | 0.80 | **9.61** |

Table 2-4: Estimated monthly collisions for great black-backed gull in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the stochastic Band (2012[1]) model.

| Scenario | CI | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | Mean | 3.99 | 2.39 | 0 | 0 | 0 | 0 | 0 | 0 | 1.61 | 1.11 | 4.65 | 1.24 | **14.98** |
| | 2.5% | 1.11 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 0.11 | 0.98 | 0.23 | **2.87** |
| | 97.5% | 8.28 | 5.32 | 0 | 0 | 0 | 0 | 0 | 0 | 3.87 | 2.66 | 9.84 | 2.84 | **32.81** |
| WTG 2 | Mean | 2.79 | 1.71 | 0 | 0 | 0 | 0 | 0 | 0 | 1.11 | 0.78 | 3.34 | 0.86 | **10.59** |
| | 2.5% | 0.70 | 0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0.08 | 0.08 | 0.74 | 0.13 | **1.98** |
| | 97.5% | 5.60 | 3.68 | 0 | 0 | 0 | 0 | 0 | 0 | 2.70 | 1.75 | 6.53 | 1.83 | **22.10** |
| WTG 3 | Mean | 2.69 | 1.63 | 0 | 0 | 0 | 0 | 0 | 0 | 1.04 | 0.73 | 3.09 | 0.81 | **9.98** |
| | 2.5% | 0.77 | 0.18 | 0 | 0 | 0 | 0 | 0 | 0 | 0.09 | 0.07 | 0.64 | 0.10 | **1.86** |
| | 97.5% | 5.31 | 3.54 | 0 | 0 | 0 | 0 | 0 | 0 | 2.42 | 1.67 | 6.19 | 1.85 | **20.99** |

## 2.4 Herring Gull

Table 2-5: Estimated monthly collisions for herring gull in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the deterministic Band (2012[1]) model.

| Scenario | NAF (%) | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | 25 | 0.19 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0.24 | 0.23 | 0.60 | 0.74 | **2.19** |
| | 50 | 0.26 | 0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0.28 | 0.28 | 0.79 | 1.03 | **2.91** |
| WTG 2 | 25 | 0.14 | 0.14 | 0 | 0 | 0 | 0 | 0 | 0 | 0.17 | 0.16 | 0.42 | 0.53 | **1.56** |
| | 50 | 0.19 | 0.18 | 0 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0.20 | 0.56 | 0.74 | **2.07** |
| WTG 3 | 25 | 0.13 | 0.13 | 0 | 0 | 0 | 0 | 0 | 0 | 0.16 | 0.15 | 0.39 | 0.49 | **1.45** |
| | 50 | 0.18 | 0.17 | 0 | 0 | 0 | 0 | 0 | 0 | 0.19 | 0.19 | 0.53 | 0.69 | **1.93** |

Table 2-6: Estimated monthly collisions for herring gull in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the stochastic Band (2012[1]) model.

| Scenario | CI | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | Mean | 0.30 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0.36 | 0.33 | 0.79 | 1.04 | **3.12** |
| | 2.5% | 0.01 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0.02 | 0.02 | 0.08 | 0.07 | **0.23** |
| | 97.5% | 0.82 | 0.79 | 0 | 0 | 0 | 0 | 0 | 0 | 0.92 | 0.81 | 1.90 | 2.72 | **7.95** |
| WTG 2 | Mean | 0.22 | 0.21 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 | 0.25 | 0.57 | 0.78 | **2.27** |
| | 2.5% | 0.01 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0.02 | 0.02 | 0.05 | 0.08 | **0.19** |
| | 97.5% | 0.60 | 0.56 | 0 | 0 | 0 | 0 | 0 | 0 | 0.65 | 0.65 | 1.40 | 1.95 | **5.81** |
| WTG 3 | Mean | 0.20 | 0.20 | 0 | 0 | 0 | 0 | 0 | 0 | 0.23 | 0.22 | 0.54 | 0.69 | **2.08** |
| | 2.5% | 0.02 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0.01 | 0.02 | 0.05 | 0.04 | **0.15** |
| | 97.5% | 0.53 | 0.49 | 0 | 0 | 0 | 0 | 0 | 0 | 0.57 | 0.57 | 1.34 | 1.68 | **5.17** |

## 2.5 Great Skua

Table 2-7: Estimated monthly collisions for great skua in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the deterministic Band (2012[1]) model.

| Scenario | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | 0 | 0 | 0 | 0 | 0.02 | 0.02 | 0.02 | 0.09 | 0 | 0 | 0 | 0 | **0.15** |
| WTG 2 | 0 | 0 | 0 | 0 | 0.01 | 0.01 | 0.01 | 0.06 | 0 | 0 | 0 | 0 | **0.11** |
| WTG 3 | 0 | 0 | 0 | 0 | 0.01 | 0.01 | 0.01 | 0.06 | 0 | 0 | 0 | 0 | **0.10** |

Table 2-8: Estimated monthly collisions for great skua in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the stochastic Band (2012[1]) model.

| Scenario | CI | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | Mean | 0 | 0 | 0 | 0 | 0.02 | 0.02 | 0.02 | 0.08 | 0 | 0 | 0 | 0 | **0.15** |
| | 2.5% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0 | **0.02** |
| | 97.5% | 0 | 0 | 0 | 0 | 0.05 | 0.05 | 0.05 | 0.17 | 0 | 0 | 0 | 0 | **0.33** |
| WTG 2 | Mean | 0 | 0 | 0 | 0 | 0.02 | 0.02 | 0.02 | 0.06 | 0 | 0 | 0 | 0 | **0.11** |
| | 2.5% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0 | **0.01** |
| | 97.5% | 0 | 0 | 0 | 0 | 0.04 | 0.04 | 0.04 | 0.12 | 0 | 0 | 0 | 0 | **0.23** |
| WTG 3 | Mean | 0 | 0 | 0 | 0 | 0.02 | 0.02 | 0.01 | 0.05 | 0 | 0 | 0 | 0 | **0.10** |
| | 2.5% | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0 | **0.01** |
| | 97.5% | 0 | 0 | 0 | 0 | 0.04 | 0.04 | 0.03 | 0.12 | 0 | 0 | 0 | 0 | **0.22** |

## 2.6 Gannet (Guidance Approach)

Table 2-9: Estimated monthly collisions for gannet in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the deterministic Band (2012[1]) model for the Guidance Approach.

| Scenario | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | 0.01 | 0.02 | 0.04 | 0.47 | 0.09 | 6.75 | 1.32 | 1.29 | 2.46 | 0.52 | 0.09 | 0.03 | **13.09** |
| WTG 2 | 0.01 | 0.01 | 0.03 | 0.35 | 0.07 | 5.00 | 0.97 | 0.95 | 1.82 | 0.39 | 0.07 | 0.02 | **9.68** |
| WTG 3 | 0.01 | 0.01 | 0.03 | 0.32 | 0.06 | 4.67 | 0.91 | 0.89 | 1.70 | 0.36 | 0.06 | 0.02 | **9.05** |

Table 2-10: Estimated monthly collisions for gannet in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the stochastic Band (2012[1]) model for the Guidance Approach.

| Scenario | CI | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | Mean | 0.02 | 0.02 | 0.06 | 0.48 | 0.11 | 6.81 | 1.27 | 1.24 | 2.41 | 0.50 | 0.09 | 0.03 | **13.02** |
| | 2.5% | 0 | 0 | 0 | 0.03 | 0.01 | 0.79 | 0.23 | 0.24 | 0.44 | 0.09 | 0.02 | 0 | **1.85** |
| | 97.5% | 0.06 | 0.06 | 0.20 | 1.46 | 0.36 | 19.42 | 3.29 | 3.04 | 6.37 | 1.24 | 0.26 | 0.12 | **35.89** |
| WTG 2 | Mean | 0.01 | 0.01 | 0.04 | 0.38 | 0.09 | 5.21 | 0.99 | 0.97 | 1.83 | 0.39 | 0.07 | 0.03 | **10.02** |
| | 2.5% | 0 | 0 | 0 | 0.03 | 0 | 0.51 | 0.18 | 0.20 | 0.32 | 0.07 | 0.01 | 0 | **1.33** |
| | 97.5% | 0.05 | 0.05 | 0.14 | 1.13 | 0.29 | 15.42 | 2.59 | 2.31 | 4.68 | 0.97 | 0.18 | 0.09 | **27.90** |
| WTG 3 | Mean | 0.01 | 0.01 | 0.04 | 0.36 | 0.08 | 4.96 | 0.94 | 0.91 | 1.75 | 0.37 | 0.06 | 0.02 | **9.51** |
| | 2.5% | 0 | 0 | 0 | 0.03 | 0 | 0.45 | 0.16 | 0.19 | 0.32 | 0.08 | 0.01 | 0 | **1.25** |
| | 97.5% | 0.05 | 0.05 | 0.14 | 1.16 | 0.27 | 14.45 | 2.38 | 2.16 | 4.29 | 0.88 | 0.18 | 0.08 | **26.09** |

## 2.7 Gannet (Applicant Approach)

Table 2-11: Estimated monthly collisions for gannet in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the deterministic Band (2012[1]) model for the Applicant Approach.

| Scenario | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | 0.01 | 0.02 | 0.02 | 0.14 | 0.03 | 2.03 | 0.40 | 0.39 | 0.74 | 0.52 | 0.09 | 0.03 | **4.41** |
| WTG 2 | 0.01 | 0.01 | 0.02 | 0.10 | 0.02 | 1.50 | 0.29 | 0.29 | 0.55 | 0.39 | 0.07 | 0.02 | **3.26** |
| WTG 3 | 0.01 | 0.01 | 0.01 | 0.10 | 0.02 | 1.40 | 0.27 | 0.27 | 0.51 | 0.36 | 0.06 | 0.02 | **3.04** |

Table 2-12: Estimated monthly collisions for gannet in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the stochastic Band (2012[1]) model for the Applicant Approach.

| Scenario | CI | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | Mean | 0.02 | 0.02 | 0.03 | 0.14 | 0.03 | 2.04 | 0.38 | 0.37 | 0.72 | 0.50 | 0.09 | 0.03 | **4.38** |
| | 2.5% | 0 | 0 | 0 | 0.01 | 0 | 0.24 | 0.07 | 0.07 | 0.13 | 0.09 | 0.02 | 0 | **0.63** |
| | 97.5% | 0.06 | 0.06 | 0.09 | 0.44 | 0.11 | 5.83 | 0.99 | 0.91 | 1.91 | 1.24 | 0.26 | 0.12 | **12.02** |
| WTG 2 | Mean | 0.01 | 0.01 | 0.02 | 0.12 | 0.03 | 1.56 | 0.30 | 0.29 | 0.55 | 0.39 | 0.07 | 0.03 | **3.37** |
| | 2.5% | 0 | 0 | 0 | 0.01 | 0 | 0.15 | 0.06 | 0.06 | 0.10 | 0.07 | 0.01 | 0 | **0.46** |
| | 97.5% | 0.05 | 0.05 | 0.07 | 0.34 | 0.09 | 4.63 | 0.78 | 0.69 | 1.40 | 0.97 | 0.18 | 0.09 | **9.32** |
| WTG 3 | Mean | 0.01 | 0.01 | 0.02 | 0.11 | 0.02 | 1.49 | 0.28 | 0.27 | 0.52 | 0.37 | 0.06 | 0.02 | **3.20** |
| | 2.5% | 0 | 0 | 0 | 0.01 | 0 | 0.14 | 0.05 | 0.06 | 0.10 | 0.08 | 0.01 | 0 | **0.44** |
| | 97.5% | 0.05 | 0.05 | 0.06 | 0.35 | 0.08 | 4.33 | 0.72 | 0.65 | 1.29 | 0.88 | 0.18 | 0.08 | **8.71** |

## 2.8 Gannet (excluding macro-avoidance)

Table 2-13: Estimated monthly collisions for gannet in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the deterministic Band (2012[1]) model excluding macro-avoidance correction factor.

| Scenario | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | 0.05 | 0.05 | 0.07 | 0.47 | 0.09 | 6.75 | 1.32 | 1.29 | 2.46 | 1.75 | 0.30 | 0.09 | **14.68** |
| WTG 2 | 0.04 | 0.04 | 0.05 | 0.35 | 0.07 | 5.00 | 0.97 | 0.95 | 1.82 | 1.29 | 0.22 | 0.07 | **10.86** |
| WTG 3 | 0.03 | 0.04 | 0.05 | 0.32 | 0.06 | 4.67 | 0.91 | 0.89 | 1.70 | 1.21 | 0.21 | 0.06 | **10.15** |

Table 2-14: Estimated monthly collisions for gannet in the Caledonia OWF for the three WTG scenarios (WTG 1, WTG 2 and WTG 3) using the stochastic Band (2012[1]) model excluding macro-avoidance correction factor.

| Scenario | CI | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WTG 1 | Mean | 0.06 | 0.06 | 0.09 | 0.48 | 0.11 | 6.81 | 1.27 | 1.24 | 2.41 | 1.67 | 0.29 | 0.11 | **14.59** |
| | 2.5% | 0 | 0 | 0 | 0.03 | 0.01 | 0.79 | 0.23 | 0.24 | 0.44 | 0.31 | 0.05 | 0.01 | **2.11** |
| | 97.5% | 0.21 | 0.21 | 0.31 | 1.46 | 0.36 | 19.42 | 3.29 | 3.04 | 6.37 | 4.15 | 0.86 | 0.39 | **40.07** |
| WTG 2 | Mean | 0.04 | 0.05 | 0.07 | 0.38 | 0.09 | 5.21 | 0.99 | 0.97 | 1.83 | 1.30 | 0.23 | 0.08 | **11.24** |
| | 2.5% | 0 | 0 | 0 | 0.03 | 0 | 0.51 | 0.18 | 0.20 | 0.32 | 0.24 | 0.04 | 0 | **1.53** |
| | 97.5% | 0.16 | 0.17 | 0.22 | 1.13 | 0.29 | 15.42 | 2.59 | 2.31 | 4.68 | 3.22 | 0.60 | 0.29 | **31.08** |
| WTG 3 | Mean | 0.04 | 0.05 | 0.06 | 0.36 | 0.08 | 4.96 | 0.94 | 0.91 | 1.75 | 1.22 | 0.22 | 0.08 | **10.66** |
| | 2.5% | 0 | 0 | 0 | 0.03 | 0 | 0.45 | 0.16 | 0.19 | 0.32 | 0.27 | 0.04 | 0 | **1.47** |
| | 97.5% | 0.16 | 0.15 | 0.21 | 1.16 | 0.27 | 14.45 | 2.38 | 2.16 | 4.29 | 2.93 | 0.58 | 0.26 | **29.02** |

# 3 References

[1] Band, W. (2012) 'Using a Collision Risk Model to Assess Bird Collision Risks for Offshore Wind Farms'. Report by BTO. Report for The Crown Estate

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