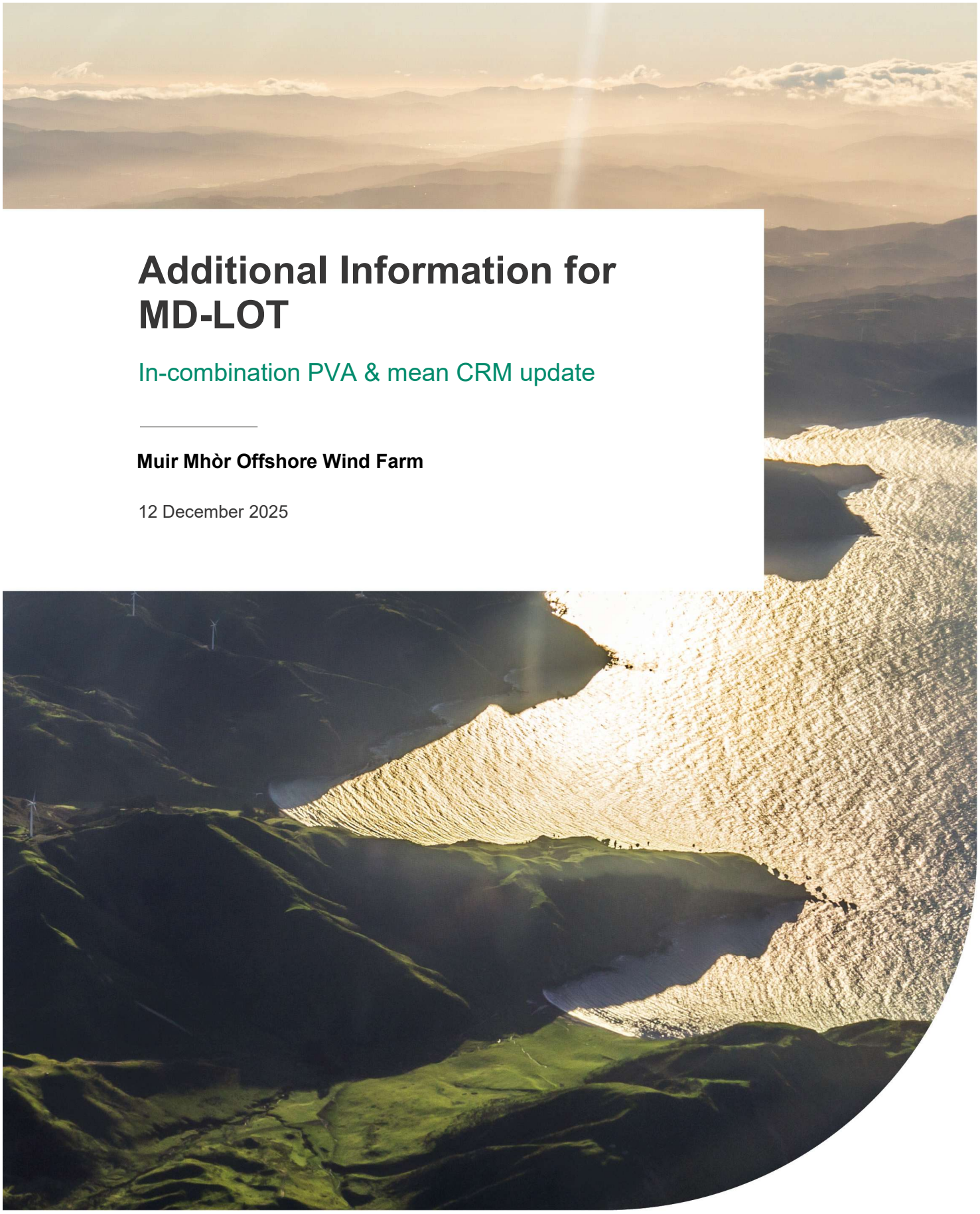
MUIR MHÒR
OFFSHORE WIND FARM

A joint venture between Fred. Olsen Seawind & Vattenfall

# Additional Information Report



# Additional Information for MD-LOT

## In-combination PVA & mean CRM update

**Muir Mhòr Offshore Wind Farm**

12 December 2025

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# Document history

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# Contents

# 1. Context

Three offshore wind projects (Muir Mhòr, Ossian and Caledonia) submitted Additional Information (AI) to Marine Directorate-Licensing Operations Team (MD-LOT) in autumn 2025. The three projects provided updated Population Viability Analyses (PVA) of predicted impacts on Special Protected Areas (SPA) qualifying features in their respective submitted AIs based on the most recently publicly available information. This, however, did not include updated predicted impacts from all three projects in-combination with other reasonably foreseeable plans and projects. The reason for this is that these predicted impacts were not available to each project at the time of their respective Additional Information submissions.

MD-LOT advised that, in order to complete an in-combination Appropriate Assessment, PVAs for the predicted impacts from the three projects combined with other reasonably foreseeable plans and projects would be required. In consultation with NatureScot and MD-LOT, the SPA qualifying features requiring a PVA to inform the Appropriate Assessments were identified following a PVA screening exercise agreed with NatureScot (Section 2.1). The results detailed in this submission are provided to ensure that MD-LOT have the information required to draw conclusions within each projects Appropriate Assessment (AA).

NatureScot responded to the provision of Additional Information:

"*We highlight important omissions from the Additional Information which, in our view, are likely to be required by Marine Directorate to carry out an Appropriate Assessment, and for future in-combination assessments:*

*We strongly recommend that mean collision mortality estimates are sought from the Applicant. From a preliminary assessment of our own, we advise there may be minor numerical differences between the use of median collision mortality estimate rates compared to our preferred use of monthly mean collision mortality estimates. This difference in approach when taken through to the Appropriate Assessment, could have implications for compensation requirements in terms of predicted mortalities. In addition, the use of mean collision estimate rates will enable future applicants conducting cumulative/in-combination impact assessments to derive seasonal/annual estimates directly from monthly estimates, improving certainty and consistency between projects*."

The collision risk modelling results were provided in the EIAR (Muir Mhòr Offshore Wind Farm Environmental Impact Assessment Report. Volume 3, Appendix 11.2: Offshore Ornithology Collision Risk Modelling Technical Report). Following NatureScot guidance (Guidance Note 2) MRSea was used to estimate the aerial densities of species where there were more than 10 observations. These values were used as inputs to the sCRM used to predict collisions from the Proposed Development. Some MRSea outputs were based on very small sample sizes resulting in some of the upper confidence intervals were tending towards infinity (see Muir Mhòr Offshore Wind Farm Environmental Impact Assessment Report. Volume 3, Appendix 11.6: Offshore Ornithology Density and Abundance Report). These resulted in outputs from the sCRM of mean predicted impacts that were sufficiently large that they also approached infinity. Consequently, in order to provide meaningful predicted collision values the median was used as the central tendency in the data. The mean was not an appropriate summary statistic to apply in this instance, as the output CRM was not normally distributed with long right tails. In order to provide consistent outputs, median values were used throughout, even where the mean value was not infinite.

The alternative approach was to use design-based density estimation as the input to the sCRM and the results from these analyses are provided in Muir Mhòr Offshore Wind Farm Environmental Impact Assessment Report. Volume 3, Appendix 11.6: Offshore Ornithology Density and Abundance Report. These were also applied to the sCRM and median results were provided in Muir Mhòr Offshore Wind Farm Environmental Impact Assessment Report. Volume 3, Appendix 11.2: Offshore Ornithology Collision Risk Modelling Technical Report. These values were provided, but not used for impact assessment, so that NatureScot guidance, and advice, on estimation of aerial densities using MRSea was followed.

# 2. In-combination PVA

## 2.1. Approach to screening SPA qualifying features

A screening approach was discussed and agreed with NatureScot to determine which SPA qualifying features needed a PVA to inform the Appropriate Assessment to be completed by the competent authority (MD-LOT). A four step approach using a PVA screening tool was agreed with NatureScot:

1. Collate all SPA features with connectivity and predicted impacts from at least one of the Muir Mhòr, Ossian and Caledonia projects;
2. Include only SPA qualifying features with connectivity with two or more of the Muir Mhòr, Ossian and Caledonia projects;
3. Include only SPA qualifying features where the predicted in-combination impacts exceeded a change in adult survival of 0.02% points (as recommended in NatureScot Guidance Note 11); and
4. Include only SPA qualifying features where an Adverse Effect on Site Integrity has been concluded, and compensation is proposed, by at least one of the Muir Mhòr, Ossian and Caledonia projects.

Step 1 in this approach identified 67 SPA features (Table 5.5) which were reduced to 32 SPA features by Step 2, as the other 35 SPA features were only predicted to be impacted by one of the Muir Mhòr, Ossian or Caledonia projects, meaning that any PVAs included in the respective projects' autumn 2025 AI submissions remain valid.

Applying Step 3 removed a further SPA qualifying feature, as the total in-combination predicted impact did not result in a predicted change in adult survival or 0.02 percentage points or more.

Finally, it is not possible to conclude no Adverse Effect on Site Integrity in-combination if one (or more) of the Muir Mhòr, Ossian or Caledonia projects alone have already concluded an Adverse Effect on Site Integrity (and are proposing compensation for that SPA qualifying feature) within their respective project Reports to Informa Appropriate Assessments (RIAAs). Consequently, fifteen SPA qualifying features were removed due to an existing Adverse Effect on Site Integrity (and proposed compensation) from one, or more, of Muir Mhòr, Ossian or Caledonia.

The PVA Screening tool is provided as Annex A for reference.

## 2.2. Consultation with NatureScot

NatureScot provided feedback on a draft PVA screening tool [email 16 December 2025] which noted four key elements:

1. Four SPA features with connectivity to more than one of the three projects had been excluded erroneously;
2. The razorbill feature at the West Westray SPA was included in Step 2 erroneously;
3. SPA population sizes for some features appeared to be inconsistent with the proposed approach; and
4. Several SPA features where one of the projects had already determined that no Adverse Effect on Site Integrity could not be excluded should have been included in PVAs for the other project but with compensated numbers removed.

Each of these four points are considered in more detail below.

### 2.2.1. SPA feature connectivity

Kittiwakes at West Westray SPA have been added to the PVA selection tool. This species is included in Step 1 and Step 2 but excluded at Step 3 as Muir Mhor have predicted an in-combination adverse effect and are proposing compensation.

Kittiwake at Cape Wrath SPA has been added to the remaining steps of the PVA selection tool and a PVA for this feature will be run and results provided.

Puffin at Coquet Island and Farne Islands SPAs were added to the PVA selection tool. Both features will have a PVA completed and the results provided.

### 2.2.2. Razorbill feature of the West Westray SPA

This feature should have been screened out of the PVA selection tool at Step 2, as only the Caledonia project was predicting impacts to this feature.

### 2.2.3. SPA feature population sizes

NatureScot noted that the source for the kittiwake feature at the Copinsay SPA was incorrect and the correct source was the SMP database, however there was no issue with the population size used. This correction is noted.

NatureScot noted that the population size used for the kittiwake feature of the Marwick Head SPA was larger than the value from the Ossian RIAA. The smaller population size from the Ossian Additional Information addendum (1,812 individuals) will be used in an updated PVA.

NatureScot noted that the population size for the puffin feature of the Forth Islands SPA was larger than the value from the Ossian RIAA. As Ossian did not update their assessment of this feature in their Additional Information addendum, the smaller of the two values, agreed with NatureScot, between the two addenda values used by Muir Mhòr and Caledonia was used (90,291 individuals).

### 2.2.4. Excluded compensated values from in-combination PVAs

NatureScot noted that some of the SPA features where compensation was being progressed by Muir Mhòr, Ossian or Caledonia were being assessed in PVAs that included the compensated predicted impacts. It was discussed and agreed with NatureScot [meeting with Muir Mhòr only on 17 December 2025] that this would progress as is, albeit at risk. However, the approach taken in these assessments was confirmed as the correct approach to use to inform the Appropriate Assessments by MD-LOT [email 19 December 2025].

## 2.3. Screening results

The screening process described above resulted in 16 SPA qualifying features requiring a PVA to inform MD-LOT's Appropriate Assessment. These are shown in Table 2.1. The predicted impacts from each of the three projects requiring an Appropriate Assessment and the predicted impacts from other, consented, projects and the predicted change in adult survival rate is shown in Table 5.6.

**Table 2.1: List of SPA qualifying features requiring PVA.**

| Species | SPA |
|---|---|
| Gannet | Fair Isle |
| Gannet | Hermaness, Saxa Vord and Valla Field |
| Gannet | North Rona and Sula Sgeir |
| Gannet | Noss |
| Gannet | Sule Skerry and Sule Stack |
| Kittiwake | Cape Wrath |
| Kittiwake | Copinsay |
| Kittiwake | Fair Isle |
| Kittiwake | Marwick Head |

| Species | SPA |
|---|---|
| Kittiwake | Rousay |
| Puffin | Coquet Island |
| Puffin | Fair Isle |
| Puffin | Forth Islands |
| Puffin | Hoy |
| Puffin | North Caithness Cliffs |
| Puffin | Farne Islands |

## 2.4. PVA models

PVA input parameters (Table 5.7) were based on NatureScot guidance and starting population sizes were based on published information agreed with NatureScot.

Models were run using the Natural England and JNCC seabird PVA tool (Searle *et al.* 2019).

Combined impacts from Muir Mhòr, Ossian and Caledonia were collated and summed from published AI reports and where relevant, original RIAA documents for the relevant projects. Predicted in-combination impacts were estimated using the in-combination values collated by Royal Haskoning DHV [version dated 3rd April 2025] on behalf of the North East and East Ornithology Group (a collective of 12 ScotWind offshore wind farm developers) with predicted impacts removed from SPA qualifying features that were already proposed to be compensated by the consented projects.

Outputs were provided as Microsoft Excel compatible files describing the inputs and outputs for each model run for each SPA qualifying feature. Files were provided to allow MD-LOT to reach conclusions in their Appropriate Assessment so no presentation or interpretation is presented here.

# 3. Updated mean Collision Risk Model (CRM) results

## 3.1. Response to NatureScot comment

While the EIAR (and associated technical appendices) did not provide all of the potential combinations of density estimation and CRM output summary statistics, the MRSea analyses was discussed with NatureScot. The resulting use of MRSea and median CRM outputs were the compromise used in the impact assessment, as use of MRSea and mean CRM outputs for all species was not possible.

Comparing median and mean outputs from the CRM from different density inputs is shown in Table 3.1. The results in this table show that the predicted collision mortalities used in the impact assessment (the median using model-based analyses) were larger than the mean value for kittiwake, albeit only slightly.

Predicted mean herring gull and great black-backed gull collisions were infinity, so could not be used for the assessment. The alternative to using the median value was to use design-based analyses to generate aerial densities. The mean values from the CRM using design-based analyses were much smaller than the median values used in the assessment.

Median predicted impacts to gannet from MRSea based aerial density inputs were slightly smaller than the mean value used in the assessment. This was also the case when the median value used in the assessment is compared with the mean value derived from design-based aerial density inputs.

**Table 3.1: Predicted annual collision mortality for four key species. Cell shaded grey were those used in the impact assessment.**

| | | | Annual predicted collision mortality | |
|---|---|---|---|---|
| **Species** | **Aerial density input analysis method** | **Turbine scenario** | **Median** | **Mean** |
| Kittiwake | Model-based | Scenario 1 | 69.4 | 64.3 |
| Herring gull | Model-based | Scenario 1 | 4.5 | Infinity |
| Herring gull | Design-based | Scenario 1 | 0.00 | 1.84 |
| Great black-backed gull | Model/design-based | Scenario 1 | 17.4 | Infinity |
| Great black-backed gull | Design-based | Scenario 1 | 4.7 | 6.9 |
| Gannet | Model/design-based | Scenario 1 | 12.6 | 18.2 |
| Gannet | Design-based | Scenario 1 | 11.6 | 16.8 |

These results show that the predicted impacts used in the impact assessment were precautionary with the exception of gannet.

The mean predicted impact to gannets was apportioned to SPAs and compared to the median predicted impacts (Table 3.2). This showed the mean predicted annual impact were very slightly larger than the median values, of between 0.056 and 1.622 individual adults.

Table 3.2: Apportioned predicted collision impacts to adult gannet SPA populations by season.Mean, median and the difference between these.

| | Mean CRM impacts | | | | Median CRM impacts | | | | Difference between median and mean | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPA | Breeding | Autumn migration | Spring migration | Annual | Breeding | Autumn migration | Spring migration | Annual | Breeding | Autumn migration | Spring migration | Annual |
| Fair Isle | 0.103 | 0.029 | 0.009 | 0.141 | 0.143 | 0.055 | 0.011 | 0.209 | 0.04 | 0.026 | 0.002 | 0.068 |
| Flamborough and Filey Coast | 0.191 | 0.1 | 0.026 | 0.317 | 0.265 | 0.187 | 0.032 | 0.485 | 0.074 | 0.087 | 0.006 | 0.168 |
| Forth Islands | 2.947 | 0.504 | 0.13 | 3.581 | 4.091 | 0.948 | 0.164 | 5.203 | 1.144 | 0.444 | 0.034 | 1.622 |
| Hermaness, Saxa Vord and Valla Field | 0.237 | 0.176 | 0.057 | 0.47 | 0.33 | 0.332 | 0.072 | 0.733 | 0.093 | 0.156 | 0.015 | 0.263 |
| North Rona and Sula Sgeir | 0.085 | 0.008 | 0 | 0.093 | 0.118 | 0.016 | 0 | 0.134 | 0.033 | 0.008 | 0 | 0.041 |
| Noss | 0.164 | 0.071 | 0.023 | 0.258 | 0.227 | 0.133 | 0.029 | 0.389 | 0.063 | 0.062 | 0.006 | 0.131 |
| St Kilda | 0.267 | 0.054 | 0 | 0.321 | 0.371 | 0.101 | 0 | 0.472 | 0.104 | 0.047 | 0 | 0.151 |
| Sule Skerry and Sule Stack | 0.136 | 0.004 | 0 | 0.14 | 0.188 | 0.008 | 0 | 0.196 | 0.052 | 0.004 | 0 | 0.056 |

The difference in the predicted impact on adult gannets from SPAs was compared to the population size of gannets, as used in the RIAA (Table 3.3). This showed that the slightly larger predicted impacts derived by using mean values did not result in an increase that was important relative to population size, with increases between 0.0001% of the population (St. Kilda SPA) and 0.0011% (Forth Islands SPA).

**Table 3.3: Difference between median and mean annual predicted collision impacts to gannet SPA populations and the difference relative to the SPA population size.**

| SPA | Annual | SPA population size | Annual difference relative to population size |
|---|---|---|---|
| Fair Isle | 0.068 | 9,654 | 0.0007% |
| Flamborough and Filey Coast | 0.168 | 30,466 | 0.0006% |
| Forth Islands | 1.622 | 150,518 | 0.0011% |
| Hermaness, Saxa Vord and Valla Field | 0.263 | 59,124 | 0.0004% |
| North Rona and Sula Sgeir | 0.041 | 18,990 | 0.0002% |
| Noss | 0.131 | 24,670 | 0.0005% |
| St Kilda | 0.151 | 120,580 | 0.0001% |
| Sule Skerry and Sule Stack | 0.056 | 18,130 | 0.0003% |

The approach taken was the only available solution to address NatureScot Guidance Note 2 to estimate aerial densities. It is noted that NatureScot Guidance Note 8 (collision risk modelling) does not stipulate which summary statistics should be used from the outputs from the sCRM. We note that the Joint advice note from the Statutory Nature Conservation Bodies (SNCBs) regarding bird collision risk modelling for offshore wind developments (August 2024) recommends, “Mean collision estimates and associated 95% confidence limits should be presented in tabular form, as generated by the sCRM tool (Caneco & Humphries 2022)”. However, this guidance was not available for the EIAR. The median was used because the mean approached infinity for some species and the data were not normally distributed.

The very slightly larger predicted impacts to gannet SPA populations derived using mean values were so small that the conclusions of the RIAA and level of compensation needed would not be importantly affected.

# 4. References

Caneco, B. and Humphries, G. 2022. HiDef Aerial Surveying stochLAB. [Online]. GitHub - MarineScotlandScience/stochLAB: The stochastic collision risk model toolbox [Accessed 12/12/2025]

Searle, K., Mobbs, D., Daunt, F. & Butler, A. 2019. A Population Viability Analysis modelling tool for seabird species. Centre for Ecology & Hydrology report for Natural England. Natural England Commissioned Report NECR274.

# 5. Annex A: SPA screening tables

**Table 5.5: List of 67 SPA qualifying features screened at the start of the assessment & total annual predicted impacts (using high displacement mortality rates from NatureScot Guidance Note 8) from each project (from Additional Information submissions).**

| Species | SPA | Muir Mhòr impact | Ossian impact | Caledonia impact |
|---|---|---|---|---|
| Gannet | Fair Isle | 0.5 | 1.0 | 0.7 |
| Gannet | Flamborough and Filey Coast | 1.4 | 4.4 | 0.4 |
| Gannet | Forth Islands | 12.2 | 58.0 | 7.9 |
| Gannet | Hermaness, Saxa Vord and Valla Field | 2.2 | 3.8 | 1.2 |
| Gannet | North Rona and Sula Sgeir | 0.3 | 0.8 | 0.4 |
| Gannet | Noss | 1.1 | 2.1 | 0.9 |
| Gannet | St Kilda | 1.1 | 2.6 | 0.0 |
| Gannet | Sule Skerry and Sule Stack | 0.4 | 0.9 | 0.9 |
| Guillemot | Buchan Ness to Collieston Coast | 177.0 | 73.7 | 13.3 |
| Guillemot | Calf of Eday | | | |
| Guillemot | Copinsay | | | |
| Guillemot | East Caithness Cliffs | | | |
| Guillemot | Fair Isle | | | |
| Guillemot | Farne Islands | | | |
| Guillemot | Forth Islands | | | |
| Guillemot | Fowlsheugh | | | |
| Guillemot | Hoy | | | |
| Guillemot | Marwick Head | | | |
| Guillemot | North Caithness Cliffs | | | |
| Guillemot | Rousay | | | |
| Guillemot | St Abb's Head to Fast Castle | | | |
| Guillemot | Sule Skerry and Sule Stack | | | |
| Guillemot | Troup, Pennan and Lion's Heads | 107.2 | 54.1 | 34.1 |
| Guillemot | West Westray | | | |
| Kittiwake | Buchan Ness to Collieston Coast | 11.5 | 6.5 | 2.8 |
| Kittiwake | Calf of Eday | | | |
| Kittiwake | Cape Wrath | 0.2 | 0.0 | 0.2 |
| Kittiwake | Copinsay | 0.0 | 0.1 | 0.1 |
| Kittiwake | East Caithness Cliffs | 4.3 | 4.3 | 18.0 |
| Kittiwake | Fair Isle | 0.1 | 0.1 | 0.0 |
| Kittiwake | Farne Islands | 0.6 | 2.1 | 0.1 |

| Species | SPA | Muir Mhòr impact | Ossian impact | Caledonia impact |
|---|---|---|---|---|
| Kittiwake | Flamborough and Filey Coast | | | |
| Kittiwake | Forth Islands | 1.1 | 1.9 | 0.4 |
| Kittiwake | Foula | | | |
| Kittiwake | Fowlsheugh | 7.1 | 9.4 | 2.1 |
| Kittiwake | Handa | | | |
| Kittiwake | Hermaness, Saxa Vord and Valla Field | | | |
| Kittiwake | Hoy | | | |
| Kittiwake | Marwick Head | 0.1 | 0.1 | 0.2 |
| Kittiwake | North Caithness Cliffs | 0.9 | 0.8 | 2.5 |
| Kittiwake | North Rona and Sula Sgeir | | | |
| Kittiwake | Noss | | | |
| Kittiwake | Rousay | 0.1 | 0.1 | 0.1 |
| Kittiwake | Shiant Isles | | | |
| Kittiwake | St Abb's Head to Fast Castle | 0.8 | 2.7 | 0.3 |
| Kittiwake | Sumburgh Head | | | |
| Kittiwake | Troup, Pennan and Lion's Heads | 6.0 | 3.5 | 7.9 |
| Kittiwake | West Westray | 0.5 | 0.0 | 0.7 |
| Puffin | Cape Wrath | | | |
| Puffin | Coquet Island | 4.0 | 5.0 | 0.0 |
| Puffin | Fair Isle | 0.7 | 0.0 | 1.9 |
| Puffin | Farne Islands | 10.6 | 12.1 | 0.0 |
| Puffin | Forth Islands | 11.0 | 11.5 | 19.0 |
| Puffin | Foula | | | |
| Puffin | Hoy | 0.1 | 0.0 | 0.3 |
| Puffin | North Caithness Cliffs | 0.4 | 0.0 | 1.7 |
| Puffin | North Rona and Sula Sgeir | | | |
| Puffin | Noss | | | |
| Puffin | Sule Skerry and Sule Stack | | | |
| Razorbill | East Caithness Cliffs | | | |
| Razorbill | Fair Isle | | | |
| Razorbill | Forth Islands | | | |
| Razorbill | Fowlsheugh | 10.4 | 4.5 | 0.0 |
| Razorbill | North Caithness Cliffs | | | |
| Razorbill | St Abb's Head to Fast Castle | | | |
| Razorbill | Troup, Pennan and Lion's Heads | 4.4 | 0.9 | 3.0 |
| Razorbill | West Westray | | | |

Table 5.6: Final 16 SPA qualifying features requiring a PVA to inform the Appropriate Assessment. Breeding adults = population size (individuals) of each SPA feature. Impacts from Muir Mhòr, Ossian, Caledonia and all other projects are the predicted annual mortalities from each source. Change in adult survival is the predicted percentage point change in annual adult survival.

| Species | SPA | Breeding population (adults) | Muir Mhor impact | Ossian impact | Caledonia impact | All others impact | Total impact | % change in adult survival |
|---|---|---|---|---|---|---|---|---|
| Gannet | Fair Isle | 9,654 | 0.5 | 1.0 | 0.7 | 11.3 | 13.6 | 0.141 |
| Gannet | Hermaness, Saxa Vord and Valla Field | 39,606 | 2.2 | 3.8 | 1.2 | 68.7 | 75.8 | 0.191 |
| Gannet | North Rona and Sula Sgeir | 18,990 | 0.3 | 0.8 | 0.4 | 5.2 | 6.7 | 0.035 |
| Gannet | Noss | 24,670 | 1.1 | 2.1 | 0.9 | 35.8 | 39.9 | 0.162 |
| Gannet | Sule Skerry and Sule Stack | 15,648 | 0.4 | 0.9 | 0.9 | 32.6 | 34.8 | 0.222 |
| Kittiwake | Cape Wrath | 6,656 | 0.2 | 0.0 | 0.2 | 4.4 | 4.8 | 0.072 |
| Kittiwake | Copinsay | 592 | 0.0 | 0.1 | 0.1 | 3.8 | 4.0 | 0.680 |
| Kittiwake | Fair Isle | 896 | 0.1 | 0.1 | 0.0 | 4.2 | 4.4 | 0.490 |
| Kittiwake | Marwick Head | 1,812 | 0.1 | 0.1 | 0.2 | 3.4 | 3.8 | 0.207 |
| Kittiwake | Rousay | 660 | 0.1 | 0.1 | 0.1 | 9.4 | 9.7 | 1.473 |
| Puffin | Coquet Island | 50,058 | 4.0 | 5.0 | 0.0 | 52.0 | 61.0 | 0.122 |
| Puffin | Fair Isle | 13,332 | 0.7 | 0.0 | 1.9 | 9.5 | 12.1 | 0.091 |
| Puffin | Farne Islands | 87,504 | 10.6 | 12.1 | 0.0 | 161.5 | 184.1 | 0.210 |
| Puffin | Forth Islands | 90,291 | 11.0 | 11.5 | 19.0 | 344.1 | 385.6 | 0.427 |
| Puffin | Hoy | 722 | 0.1 | 0.0 | 0.3 | 3.1 | 3.5 | 0.484 |
| Puffin | North Caithness Cliffs | 5,438 | 0.4 | 0.0 | 1.7 | 51.9 | 54.0 | 0.992 |

Table 5.7: Input parameters used in PVA runs. Sources follow NatureScot guidance.

| Species | Guillemot | Razorbill | Kittiwake | Puffin | Gannet |
|---|---|---|---|---|---|
| Simulations | 5000 | 5000 | 5000 | 5000 | 5000 |
| Seed | 52 | 52 | 52 | 52 | 52 |
| Burn-in (years) | 10 | 10 | 10 | 10 | 10 |
| Age first breeding (years) | 6 | 5 | 4 | 5 | 5 |
| Maximum brood size | 1 | 1 | 2 | 1 | 1 |
| Productivity rate (chicks per pair) | 0.629 | 0.57 | 0.69 | 0.617 | 0.698 |
| Productivity SD | 0.174 | 0.247 | 0.296 | 0.151 | 0.071 |
| Annual adult survival (SD) | 0.939 (0.015) | 0.895 (0.067) | 0.854 (0.051) | 0.906 (0.083) | 0.919 (0.042) |
| Survival years 0 - 1 | 0.560 (0.013) | 0.630 (0.209) | 0.790 (0.051) | 0.709 (0.022) | 0.424 (0.007) |
| Survival years 1 - 2 | 0.792 (0.034) | 0.630 (0.209) | 0.854 (0.051) | 0.709 (0.022) | 0.829 (0.004) |
| Survival years 2 - 3 | 0.917 (0.022) | 0.895 (0.067) | 0.854 (0.051) | 0.709 (0.022) | 0.891 (0.003) |
| Survival years 3 - 4 | 0.939 (0.015) | 0.895 (0.067) | 0.854 (0.051) | 0.760 (0.019) | 0.895 (0.003) |
| Survival years 4 - 5 | 0.939 (0.015) | 0.895 (0.067) | | 0.805 (0.017) | 0.919 (0.042) |
| Survival years 5 - 6 | 0.939 (0.015) | | | | |
| Impact assumed start year | 2032 | 2032 | 2032 | 2032 | 2032 |
| Impact assumed end year | 2081 | 2081 | 2081 | 2081 | 2081 |

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