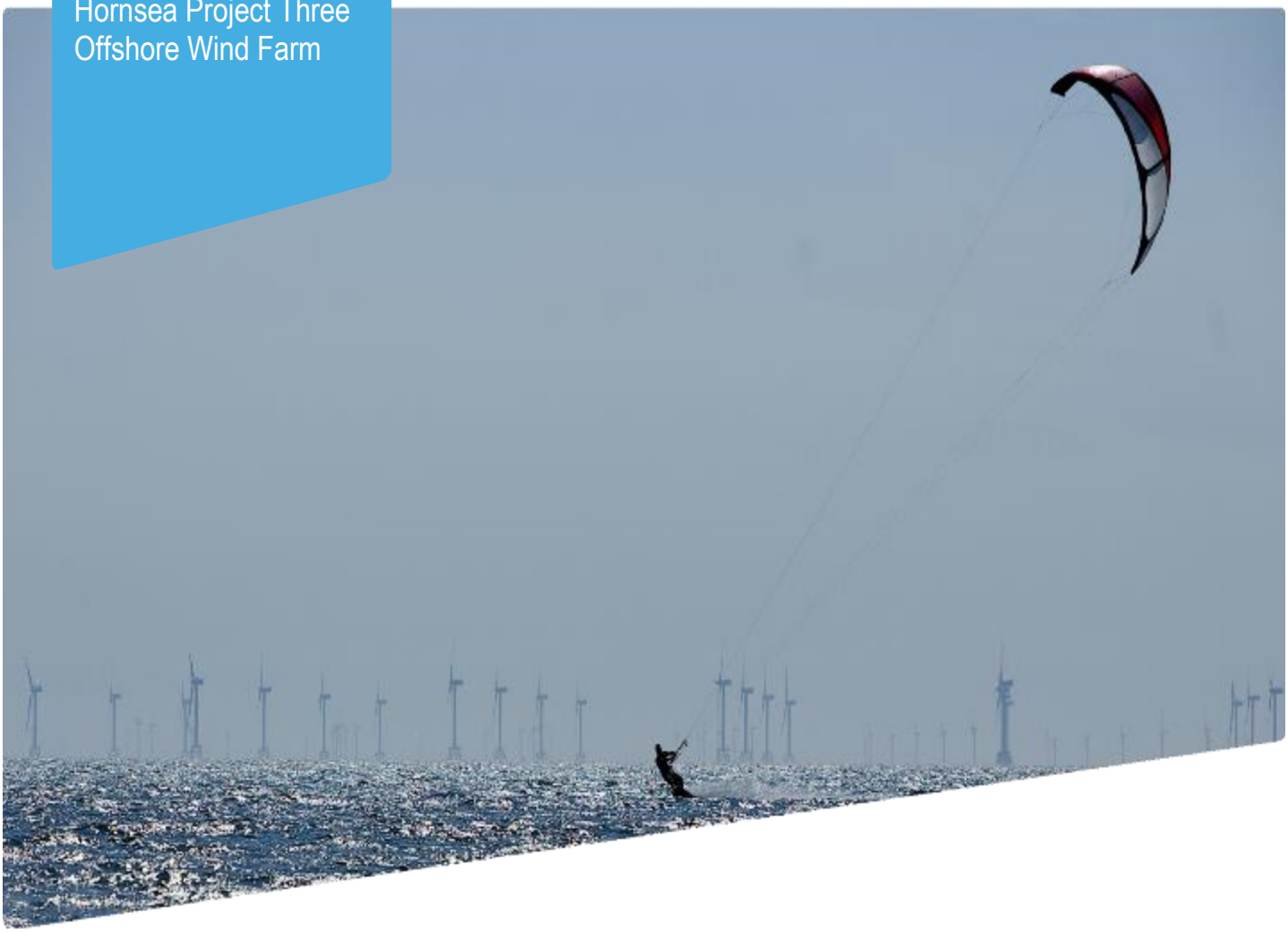
Hornsea Project Three
Offshore Wind Farm



# Hornsea Project Three

# Offshore Wind Farm

## Appendix 9 to Deadline I submission – Population Viability Analysis

**Date:** 7th November 2018

Hornsea 3
Offshore Wind Farm

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Front cover picture: Kite surfer near a UK offshore wind farm © Ørsted Hornsea Project Three (UK) Ltd., 2018.

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# 1. Introduction

1.1 Population Viability Analysis (PVA) is often used to identify the potential impacts on breeding seabird populations due to predicted impacts from offshore wind farms. PVA models were developed for the populations of key breeding interest features of the Flamborough and Filey Coast (FFC) pSPA during the application for the Hornsea Project Two offshore wind farm project and formed a key aspect of the evidence used in the HRA for that project (which was consented on 16th August 2016).

1.2 As none of the assumed values for all key model input parameters (including population size, survival rates and productivity) have changed since that Original PVA Model was produced and examined, it was considered appropriate to use it for the assessment of Hornsea Three. The only change made was to extrapolate model outputs to 35 years to reflect the design lifetime of Hornsea Three (c.f. 25 years for Hornsea Two). The validity of this approach was discussed with the model authors (M. Trinder pers. comm).

1.3 Natural England, however, have stated in their Relevant Representations (20th July 2018) that they believe these models are 'not suitable' to support the assessments undertaken for Hornsea Three. It is assumed that this is primarily in relation to one aspect of the model which relates to how unimpacted and impacted predictions of population trajectories are made with respect to one another. The Original PVA Model uses a "non-matched runs" approach, whereas Natural England now recommend a "matched runs" approach (the difference between these approaches is summarised below).

## Matched runs approach

1.4 In PVA, population projections are generated to explore the differences between a population free of any additional mortality caused by the operation of a wind farm (unimpacted) and the same population that is subject to different levels of predicted additional mortality (impacted). The Original PVA Model involves the model being run for unimpacted and impacted scenarios independently of one another but using demographic parameter values obtained from the same sample distribution using the same assumptions about the demographics of the populations. For each of these scenarios the model is simulated many times (for example 1,000 simulations), with the results of each simulation slightly different due to environmental and demographic stochasticity introduced by the modeller to reflect the variability in year to year rates of survival and productivity typically seen in the subject populations. The results of each individual simulation are then combined to calculate summary PVA outputs.

1.5 The matched runs approach uses a similar method, except that the unimpacted and impacted populations use identical sampled demographic parameter values for corresponding simulations and as such each population (impacted and unimpacted) should experience the same stochastic variations. Natural England highlight that this is the approach recommended by Cook and Robinson (2017).

1.6 In practice the difference between matched and non-matched model runs is considered to be slight, particularly where (as was the case with the Original PVA Model) the model is simulated many times to generate multiple predictions, with summary outputs then calculated. The Applicant has previously explained this to Natural England as part of EWG meetings (see the Ornithology EWG meeting minutes 27.02.2018 presented in Appendix D of Consultation Report Annex 1 - Evidence Plan (document 5.1.1)) including advice from the Original PVA Model author.

### Project lifetime

1.7 The Original PVA Model was conducted assuming a project lifetime of 25 years. However, the proposed lifetime for Hornsea Three is 35 years.

1.8 Two outputs from the Original PVA Model were considered in the assessment:

- Change in median population growth rate; and
- Counterfactual of population size.

1.9 Changes predicted in growth rate are not dependent on the length of time over which an impact will operate and therefore no extrapolation is required. In contrast, estimates of the counterfactual of population size, are dependent on the period over which they are calculated.

1.10 It is possible to obtain an approximate prediction for the output at 35 years through extrapolation of the values obtained after 5, 10, 15, 20 and 25 years (M. Trinder pers. comm.). This approach can be used for both the density independent and density dependent versions of the model, although the nonlinearity of the density dependent predictions reduces the degree of confidence which can be placed in this approach and therefore density dependent models were not extrapolated in the RIAA (document 5.2).

## 2. Updated PVA model

2.1 In response to the issues raised by Natural England, updated PVA modelling was commissioned by Ørsted and was undertaken by MacArthur Green. The methods and results of this modelling are attached at Annex A and are referred in this report as the 'Supplementary PVA Model'.

2.2 The Supplementary PVA Model uses the same assumptions for key demographic parameters including initial population size, annual adult survivorship and productivity. The model has, however, been run for 35 years in each case.

2.3 As requested by Natural England an approach using matched pairs of impacted and unimpacted simulations has been used. In addition, for comparison, an approach using non-matched runs (as in the Original PVA Model) has also been undertaken.

2.4 The following section summarises outputs for key species for both of these approaches and, for further comparison includes the outputs used in the RIAA (based on the extrapolation of the Original PVA Model) as submitted in the Hornsea Three application.

# 3. Comparison of PVA outputs

3.1 The RIAA (document 5.2) relied on PVA model outputs for three species: gannet, kittiwake and guillemot. The results for each of these species are summarised below. The PVA outputs calculated using a matched runs and non-matched runs approach are presented for each relevant species in the following sections using the impact magnitudes calculated in-combination for each species.

**Gannet**

3.2 Density independent PVA outputs from the Original PVA Model and the Supplementary PVA Model for gannet at FFC pSPA based on in-combination collision impacts of 125 birds (Tier 1 projects) and 200 birds (Tier 1 and 2 projects) are presented in Table 3.1 and Table 3.2 respectively.

Table 3.1: Comparison of PVA outputs for gannet assuming a mortality of 125 birds (In-combination impact from Tier 1 projects) and a 35 year project lifetime (demographic rate set 1)

| PVA outputs | Original PVA Model [1] | Supplementary PVA Model [2] | |
|---|---|---|---|
| | Non-matched runs | Non-matched runs | Matched runs |
| Counterfactual of population growth rate | - | 0.994 (0.994 – 0.994) | 0.994 (0.994 – 0.994) |
| Counterfactual of population size | 0.817 | 0.827 | 0.825 |

Table 3.2: Comparison of PVA outputs for gannet assuming a mortality of 200 birds (In-combination impact from Tier 1 and 2 projects) and a 35 year project lifetime (demographic rate set 1)

| PVA outputs | Original PVA Model [1] | Supplementary PVA Model [2] | |
|---|---|---|---|
| | Non-matched runs | Non-matched runs | Matched runs |
| Counterfactual of population growth rate | - | 0.991 (0.991 – 0.991) | 0.991 (0.991 – 0.991) |
| Counterfactual of population size | 0.713 | 0.737 | 0.734 |

3.3 For growth rate, there is no difference between the Supplementary PVA Model predictions using either non-matched or matched runs. In both cases the predicted growth rates are very similar to those that would arise in the absence of any impact.

[1] MacArthur Green (2015) results extrapolated to 35 years
[2] Annex 1

3.4 For population size after 35 years, again there is little difference between that predicted using the Supplementary PVA Model and very little difference between a matched or non-matched approach.

3.5 Neither of the models, nor model approaches, indicates that there is any likelihood of the gannet population at FFC pSPA declining over a period of 35 years. As such there is no indication of an adverse effect on the site integrity of FFC pSPA as a result of collision risk impacts on gannet.

**Kittiwake**

3.6 Density independent PVA outputs from the Original PVA modelling and the Supplementary PVA modelling for kittiwake at FFC pSPA based on in-combination collision impacts of 100 birds (Tier 1 projects) and 150 birds (Tier 1 and 2 projects) are presented in Table 3.3 and Table 3.4 respectively.

Table 3.3: Comparison of PVA outputs for kittiwake assuming a mortality of 100 birds (In-combination impact from Tier 1 projects) and a 35 year project lifetime (demographic rate set 1)

| PVA outputs | Original PVA Model [1] | Supplementary PVA Model [2] | |
|---|---|---|---|
| | Non-matched runs | Non-matched runs | Matched runs |
| Counterfactual of population growth rate | - | 0.999 (0.999 – 0.999) | 0.999 (0.999 – 0.999) |
| Counterfactual of population size | 0.969 | 0.962 | 0.962 |

Table 3.4: Comparison of PVA outputs for kittiwake assuming a mortality of 150 birds (In-combination impact from Tier 1 and 2 projects) and a 35 year project lifetime (demographic rate set 1)

| PVA outputs | Original PVA Model [1] | Supplementary PVA Model [2] | |
|---|---|---|---|
| | Non-matched runs | Non-matched runs | Matched runs |
| Counterfactual of population growth rate | - | 0.998 (0.998 – 0.998) | 0.998 (0.998 – 0.998) |
| Counterfactual of population size | 0.952 | 0.939 | 0.944 |

3.7 For growth rate, there is no difference between the Supplementary PVA Model predictions using either non-matched or matched runs. In both cases the predicted growth rates are very similar to those that would arise in the absence of any impact.

3.8 For population size after 35 years, again there is little difference between that predicted using the Supplementary PVA Model and very little difference between a matched or non-matched approach.

3.9 Neither of the models, nor model approaches, indicates that there is any likelihood of the gannet population at FFC pSPA declining over a period of 35 years. As such there is no indication of an adverse effect on the site integrity of FFC pSPA as a result of collision risk impacts on kittiwake.

**Guillemot**

3.10 The RIAA (document 5.2) predicted impact magnitudes of 36-181 adult guillemot for Tier 1 projects and 118-590 adult guillemot for Tier 1 and 2 projects due to displacement. The corresponding PVA metrics from the Original PVA modelling and the Supplementary PVA modelling for 50-200 birds and 100-600 birds are presented in Table 3.5 and Table 3.6 respectively.

Table 3.5: Comparison of PVA outputs for guillemot assuming a mortality of 50-200 birds (In-combination impact from Tier 1 projects) and a 35 year project lifetime (demographic rate set 1)

| PVA outputs | Impact magnitude | Original PVA Model [1] | Supplementary PVA Model [2] | |
|---|---|---|---|---|
| | | Non-matched runs | Non-matched runs | Matched runs |
| Counterfactual of population growth rate | 50 | - | 0.999 (0.999 – 1.000) | 0.999 (0.999 – 0.999) |
| | 200 | - | 0.998 (0.997 – 0.998) | 0.998 (0.998 – 0.998) |
| Counterfactual of population growth rate | 50 | 0.983 | 0.976 | 0.980 |
| | 200 | 0.921 | 0.918 | 0.921 |

Table 3.6: Comparison of PVA outputs for guillemot assuming a mortality of 100-600 birds (In-combination impact from Tier 1 and 2 projects) and a 35 year project lifetime (demographic rate set 1)

| PVA outputs | Impact magnitude | Original PVA Model [1] | Supplementary PVA Model [2] | |
|---|---|---|---|---|
| | | Non-matched runs | Non-matched runs | Matched runs |
| Counterfactual of population growth rate | 100 | - | 0.999 (0.998 – 0.999) | 0.999 (0.999 – 0.999) |
| | 600 | - | 0.993 (0.992 – 0.993) | 0.993 (0.993 – 0.993) |
| Counterfactual of population growth rate | 100 | 0.962 | 0.955 | 0.960 |
| | 600 | 0.770 | 0.782 | 0.782 |

3.11 For growth rate, there is no difference between the Supplementary PVA Model predictions using either non-matched or matched runs. In both cases the predicted growth rates are very similar to those that would arise in the absence of any impact.

3.12 For population size after 35 years, again there is little difference between that predicted using the Supplementary PVA Model and very little difference between a matched or non-matched approach.

3.13 Hornsea Three was considered to contribute no adult mortality to the overall in-combination total predicted for FFC pSPA with any mortality of guillemot considered to be immature or non-breeding birds. These birds may however still be associated with FFC pSPA (i.e. they may recruit into the colony once mature) and as such a sensitivity testing approach was employed to determine the sensitivity of the FFC pSPA population to additional mortality of immature birds.

3.14 The Original PVA modelling considered the effect of mortality of up to 1,600 adult per annum, which implies the mortality of approximately 1,116 immature birds. Although it was likely that this level of immature mortality would far exceed the in-combination immature mortality the PVA outputs associated with this impact scenario were used in the RIAA (document 5.2). Equivalent PVA outputs from the additional PVA modelling for this impact scenario are therefore included in Table 3.7.

Table 3.7: Comparison of PVA outputs for guillemot assuming a mortality of 1,600 birds and a 35 year project lifetime (demographic rate set 1)

| PVA outputs | Non-matched runs | Matched runs |
|---|---|---|
| Population growth rate | 0.981 (0.980 – 0.981) | 0.981 (0.981 – 0.981) |
| Counterfactual of population size | 0.514 | 0.517 |

3.15 Neither of the models, nor model approaches, indicates that there is any likelihood of the gannet population at FFC pSPA declining over a period of 35 years. As such there is no indication of an adverse effect on the site integrity of FFC pSPA as a result of displacement impacts on guillemot.

## Conclusion

3.16 The use of a matched runs approach in PVA makes no material difference to the outputs derived through modelling. In addition, the extrapolation approach applied in the RIAA (document 5.2) is considered to have provided PVA outputs that were not materially different to those predicted as part of Supplementary PVA modelling (Annex A). There are therefore no implications for the assessments conducted as part of the RIAA (document 5.2).

3.17 Table 3.8 presents a summary of the PVA outputs from Supplementary PVA modelling using a matched runs approach based on the in-combination impacts predicted in the RIAA (document 5.2). These outputs are considered to represent an update to those used to support the assessments conducted in the RIAA.

Table 3.8: PVA outputs from the Supplementary PVA Modelling using a matched runs approach for in-combination impacts predicted in the RIAA (document 5.2)

| Species | Impact | In-combination tiers | Impact magnitude | PVA impact scenario | Density independent | | Density dependent | | Implications for assessments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counterfactual of median population growth rate | Counterfactual of population size | Counterfactual of median population growth rate | Counterfactual of population size | |
| Gannet | Displacement | All | 14 | 25 | 0.999 (0.999 – 0.999) | 0.962 | 0.999 (0.999 – 0.999) | 0.976 | No change |
| | Collision | 1 | 119 | 125 | 0.994 (0.994 – 0.994) | 0.825 | 0.997 (0.996 – 0.997) | 0.883 | No change |
| | | All | 193 | 200 | 0.991 (0.991 – 0.991) | 0.734 | 0.994 (0.994 – 0.995) | 0.817 | No change |
| Kittiwake | Collision | 1 | 58 | 100 | 0.999 (0.999 – 0.999) | 0.962 | 1.000 (1.000 – 1.000) | 0.991 | No change |
| | | All | 119 | 150 | 0.998 (0.998 – 0.998) | 0.944 | 1.000 (1.000 – 1.000) | 0.985 | No change |
| Guillemot | Displacement (breeding season) | 1 | 36 | 50 | 0.999 (0.999 – 0.999) | 0.980 | 1.000 (1.000 – 1.000) | 0.991 | No change |
| | | | 181 | 200 | 0.998 (0.998 – 0.998) | 0.921 | 0.999 (0.999 – 0.999) | 0.965 | No change |
| | | All | 118 | 100 | 0.999 (0.999 – 0.999) | 0.960 | 1.000 (1.000 – 1.000) | 0.982 | No change |
| | | | 590 | 600 | 0.993 (0.993 – 0.993) | 0.782 | 0.997 (0.997 – 0.997) | 0.896 | No change |

## References

Cook, A.S.C.P. and Robinson, R. (2017). Towards a framework for quantifying the population-level consequences of anthropogenic pressures on the environment: The case of seabirds and windfarms. *Journal of Environmental Management.* 190, pp. 113-121.

MacArthur Green (2015). *MacArthur Green Seabird PBA Report.* [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/hornsea-offshore-wind-farm-zone-4-project-two/?ipcsection=docs (Accessed March 2018).

# Annex A

MacArthur Green

## Flamborough and Filey Coast pSPA

## Seabird PVA Report

## Supplementary matched run outputs 2018

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## CONTENTS

# 4. 1. Introduction

This report provides supplementary outputs from the population models of the Flamborough and Filey Coast pSPA seabird populations presented in Macarthur Green (2015). The model inputs (seabird population sizes and demographic rates) and structure are identical to those used previously, with one exception: the addition of a 'matched run' simulation approach, as requested by Natural England and advocated by Cook and Robinson (2017) and to extend the simulation period to 35 years. The outputs from the matched run are presented alongside those generated using the original code (non-matched runs).

To avoid unnecessary repetition, the details of the modelling and input parameters have not been included in this report, but can be found in MacArthur Green (2015).

# 5. 2. Methods

The population model is stochastic, so every run is different, depending on the randomly generated parameter values. In the original version of the model, a simulation was run for increasing levels of additional mortality, from zero to a maximum in excess of the range of potential mortalities (e.g. due to collision risk) to be investigated. The zero-level additional mortality run is used as the baseline against which the impact runs are then compared to derive counterfactual values of predicted change in population size. Hereafter this is referred to as a 'non-matched run' approach.

Following a request from Natural England, the model has been revised to incorporate a 'matched run' approach (Cook and Robinson 2017). In this formulation, at each level of additional mortality each iteration of the model (e.g. of 1,000 simulations) two parallel population projections are generated: baseline and impact. These two projections utilise an identical sequence of demographic rate values (survival and reproduction), differing only because the impact population is subject to additional mortality at each time step and the baseline one is not.

There are two further considerations with this approach which should be noted. The first is that in order for the survival rates to be directly comparable in both the baseline and impact simulations it was necessary to disable the inclusion of demographic stochasticity on survival. This was due to the method used to model survival. The number of individuals which survive from one time-step to the next is simulated in the model using a two-step process, corresponding to environmental stochasticity and demographic stochasticity, respectively. The sequence of annual survival rates is generated at the beginning of the simulation and represents environmental stochasticity (i.e. variations due to environmental effects with values drawn at random from a pre-defined probability distribution appropriate for the species being modelled). To incorporate demographic stochasticity (i.e. chance individual level variations), at each time step in the model the actual number of surviving individuals is calculated from that year's survival rate using a binomial process which determines the fate of each individual. A uniform random number between 0 and 1 is drawn for each individual. If this random number is less than or equal to that time step's survival rate the individual survives, and if it's greater then it dies. The effects of demographic stochasticity (i.e. chance) are enhanced for small populations (e.g. <1,000), but decrease to the point of undetectability as population size increases. For the current examples, the importance of demographic effects is typically small and this modification will have no bearing on the results. For smaller populations (e.g. up to a few thousand individuals) omitting

demographic stochasticity will reduce the range of projected outcomes (variance) and would therefore potentially reduce precaution.

The second aspect to note is that in simulations which include density dependence the reproductive rates for the baseline and impact runs will necessarily diverge, since the reproductive rate at each time step is calculated as a function of the population size and this aspect differs between the two runs. Thus, for density dependent runs only the survival rates are strictly matched.

In order to simplify comparison of the outputs obtained using the matched run and non-matched run methods the outputs from both are presented alongside each other. Only the counterfactuals of population size (CPS) and population growth rate (CPGR) are presented here. Each pair of figures was obtained using data from the same model run. Thus, for the matched run outputs the differences between the paired baseline and impacted populations are presented, while the non-matched run results were calculated by comparing the zero mortality simulation against each of the impact levels.

## 6. 3. Results

Figures A1_1.1 to A1_20.4 in Annex 1 provide graphical outputs. For each species both demographic rate sets were used (rate set 1 and 2) in both a density independent and density dependent formulation. The density dependent formulation is considered realistic (see MacArthur Green 2014 for an illustration and discussion of alternative density dependent strengths), but is only one of many possible density dependent models. The results of the density dependent model have been included alongside the density independent ones to provide a comprehensive comparison of the matched and non-matched runs approach. For each plot the matched run and non-matched run outputs are provided together (#.1 and #.2 for the matched and non-matched counterfactual of population size outputs and #.3 and #.4 for the matched and non-matched counterfactual of population growth rate outputs). Tables of the data underpinning these plots have also been provided, in Annex 2, and follow the same numbering system, from A2_1.1 to A2_20.4.

A summary of the counterfactuals of the population growth rate and population size for each species using each set of demographic rates, in both matched and non-matched forms, with and without density dependence operating is provided in Table 1.

The counterfactual of the population growth rate (presented in Figures as median (red line) and 95% confidence limits (dashed lines) indicates reductions at the maximum impact modelled of up to 2.3% for gannet, 1.8% for kittiwake, 1.9% for guillemot, 4.7% for razorbill and 2.6% for puffin (all in the absence of density dependence).

Density independent counterfactual of populations size were all larger than those for the density dependent equivalents, a reflection of the fact that the unregulated growth of the former means that much greater divergence can occur between impacted and non-impacted runs.

Table 1. Summary counterfactual outputs from the population models for matched run and non-matched run simulations at the maximum simulated annual additional adult mortality. The population growth rate was calculated between years 5 and 35 in each simulation, the counterfactuals of population size are those after 25 years (for comparison with the previous reporting) and 35 years. For analysis methods see text.

| Species | Maximum additional adult mortality | Demographic rate set | Model run (matched or non-matched) | Density dependence | Counterfactual of population growth rate (%) | Counterfactual of population size (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | 25 years | 35 years |
| Gannet | 500 | 1 | Matched | Off | 0.977 | 0.58 | 0.46 |
| | | | Non-matched | | 0.978 | 0.58 | 0.46 |
| | | | Matched | On | 0.985 | 0.66 | 0.58 |
| | | | Non-matched | | 0.985 | 0.66 | 0.58 |
| | | 2 | Matched | Off | 0.977 | 0.58 | 0.46 |
| | | | Non-matched | | 0.977 | 0.58 | 0.46 |
| | | | Matched | On | 0.985 | 0.66 | 0.58 |
| | | | Non-matched | | 0.985 | 0.66 | 0.58 |
| Kittiwake | 1,600 | 1 | Matched | Off | 0.982 | 0.65 | 0.54 |
| | | | Non-matched | | 0.982 | 0.65 | 0.54 |
| | | | Matched | On | 0.996 | 0.86 | 0.85 |
| | | | Non-matched | | 0.996 | 0.86 | 0.85 |
| | | 2 | Matched | Off | 0.982 | 0.65 | 0.54 |
| | | | Non-matched | | 0.981 | 0.64 | 0.52 |
| | | | Matched | On | 0.996 | 0.85 | 0.83 |
| | | | Non-matched | | 0.996 | 0.85 | 0.83 |
| Guillemot | 1,600 | 1 | Matched | Off | 0.981 | 0.63 | 0.52 |
| | | | Non-matched | | 0.981 | 0.62 | 0.51 |
| | | | Matched | On | 0.992 | 0.77 | 0.74 |
| | | | Non-matched | | 0.992 | 0.77 | 0.74 |
| | | 2 | Matched | Off | 0.981 | 0.63 | 0.52 |
| | | | Non-matched | | 0.981 | 0.63 | 0.51 |
| | | | Matched | On | 0.991 | 0.75 | 0.71 |
| | | | Non-matched | | 0.991 | 0.76 | 0.71 |
| Razorbill | 1,000 | 1 | Matched | Off | 0.953 | 0.31 | 0.19 |
| | | | Non-matched | | 0.953 | 0.31 | 0.19 |
| | | | Matched | On | 0.986 | 0.59 | 0.55 |
| | | | Non-matched | | 0.986 | 0.59 | 0.55 |

| Species | Maximum additional adult mortality | Demographic rate set | Model run (matched or non-matched) | Density dependence | Counterfactual of population growth rate (%) | Counterfactual of population size (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | 25 years | 35 years |
| Puffin | 50 | 2 | Matched | Off | 0.953 | 0.31 | 0.19 |
| | | | Non-matched | | 0.953 | 0.31 | 0.19 |
| | | | Matched | On | 0.959 | 0.35 | 0.24 |
| | | | Non-matched | | 0.96 | 0.35 | 0.24 |
| | | 1 | Matched | Off | 0.974 | 0.54 | 0.41 |
| | | | Non-matched | | 0.974 | 0.54 | 0.41 |
| | | | Matched | On | 0.993 | 0.77 | 0.75 |
| | | | Non-matched | | 0.993 | 0.77 | 0.75 |
| | | 2 | Matched | Off | 0.974 | 0.54 | 0.41 |
| | | | Non-matched | | 0.976 | 0.54 | 0.43 |
| | | | Matched | On | 0.981 | 0.60 | 0.51 |
| | | | Non-matched | | 0.981 | 0.61 | 0.51 |

# 7. 4. Discussion

It is apparent from the results presented here that, so long as a sufficiently large number of simulations is conducted, conclusions about the potential impacts of additional mortality derived from matrix population models typically used for assessing offshore wind farm effects are not dependent on whether or not a matched run approach has been used.

As modelled here, the matched run approach required the omission of demographic stochasticity, which reduces the degree of precaution in the models. While this is unlikely to be of concern for the current situation (chance plays a small role in large populations) it could affect the results for small populations. Although demographic stochasticity could be replicated across matched runs (i.e. the same 'chance' value could be applied), given the fact that non-matched runs generate identical average outputs and can incorporate demographic stochasticity without needing to apply the same chance effects, there is no merit in adopting a matched run approach.

Overall, the conclusions on population status in relation to additional impacts which would be derived from the population model are largely unaffected by the choice of whether to use matched or non-matched runs, especially when modelling a large population as is typically the case for seabirds, and when using a large number of replicate runs. Matched runs present smoother trends, while results from non-matched runs explicitly illustrate the consequences of uncertainty in input parameters, which is a further advantage of non-matched runs. The overall conclusion is that a non-matched runs approach is preferable to a matched-runs approach, because results are essentially the same but the non-matched runs approach provides better incorporation of stochasticity.

# 8. References

Cook, A.S.C.P. & Robinson, R.A. (2017). Towards a framework for quantifying the population-level consequences of anthropogenic pressures on the environment: The case of seabirds and windfarms. Journal of Environmental Management, 190, 113-121.

MacArthur Green (2014). Flamborough and Filey Coast pSPA Seabird PVA Final Report. Appendix X to the Response submitted for Deadline IV Application Reference: EN010033

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MacArthur Green. (2015). Flamborough and Filey Coast pSPA Seabird PVA Report. Appendix M to the Response submitted for Deadline II A Application Reference: EN010053

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# 9. ANNEX 1 – Figures

Key to figure numbers.

| Species | Density dependent | Rate set | Counterfactual of population size | | Counterfactual of population growth rate | |
|---|---|---|---|---|---|---|
| | | | Matched | Non-matched | Matched | Non-matched |
| Gannet | No | 1 | 1.1 | 1.2 | 1.3 | 1.4 |
| | Yes | 1 | 2.1 | 2.2 | 2.3 | 2.4 |
| | No | 2 | 3.1 | 3.2 | 3.3 | 3.4 |
| | Yes | 2 | 4.1 | 4.2 | 4.3 | 4.4 |
| Kittiwake | No | 1 | 5.1 | 5.2 | 5.3 | 5.4 |
| | Yes | 1 | 6.1 | 6.2 | 6.3 | 6.4 |
| | No | 2 | 7.1 | 7.2 | 7.3 | 7.4 |
| | Yes | 2 | 8.1 | 8.2 | 8.3 | 8.4 |
| Guillemot | No | 1 | 9.1 | 9.2 | 9.3 | 9.4 |
| | Yes | 1 | 10.1 | 10.2 | 10.3 | 10.4 |
| | No | 2 | 11.1 | 11.2 | 11.3 | 11.4 |
| | Yes | 2 | 12.1 | 12.2 | 12.3 | 12.4 |
| Razorbill | No | 1 | 13.1 | 13.2 | 13.3 | 13.4 |
| | Yes | 1 | 14.1 | 14.2 | 14.3 | 14.4 |
| | No | 2 | 15.1 | 15.2 | 15.3 | 15.4 |
| | Yes | 2 | 16.1 | 16.2 | 16.3 | 16.4 |
| Puffin | No | 1 | 17.1 | 17.2 | 17.3 | 17.4 |
| | Yes | 1 | 18.1 | 18.2 | 18.3 | 18.4 |
| | No | 2 | 19.1 | 19.2 | 19.3 | 19.4 |
| | Yes | 2 | 20.1 | 20.2 | 20.3 | 20.4 |

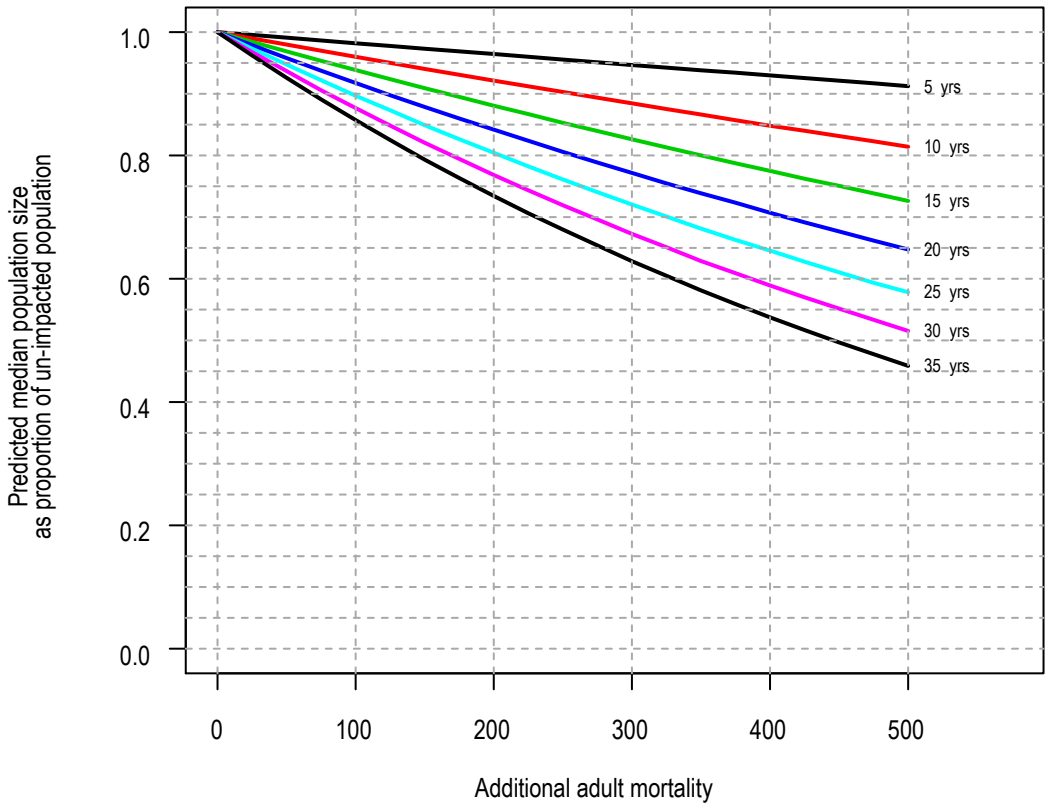


Figure A1_1.1. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

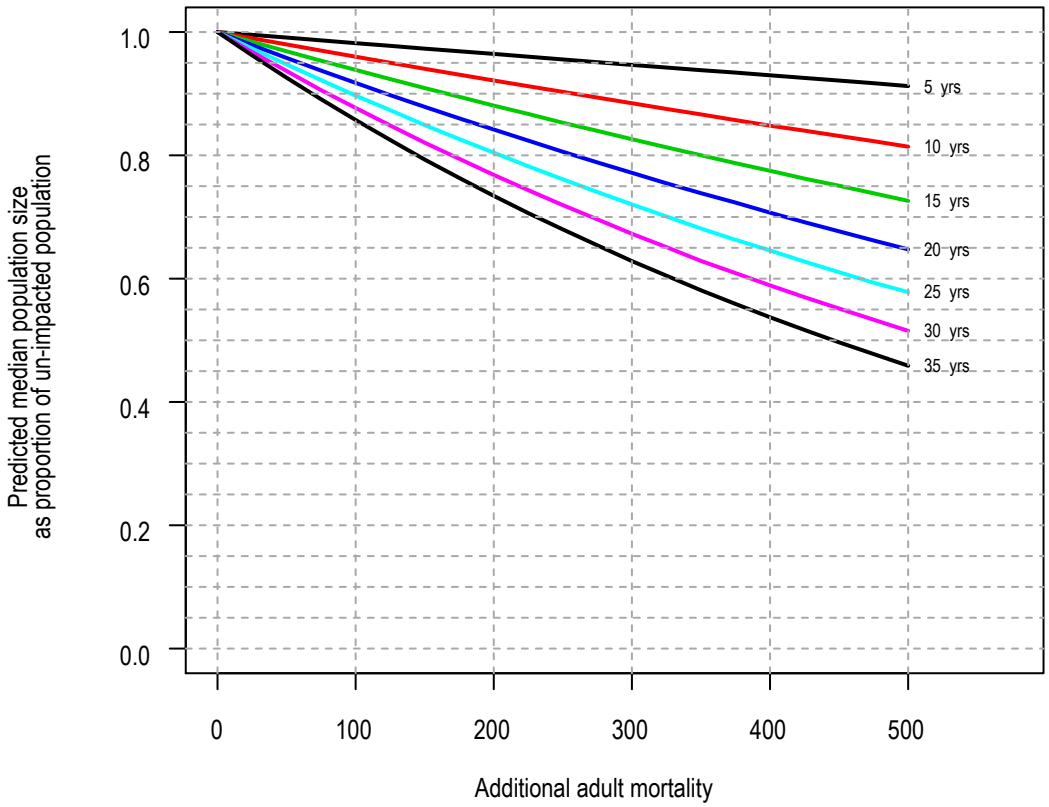


Figure A1_1.2. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

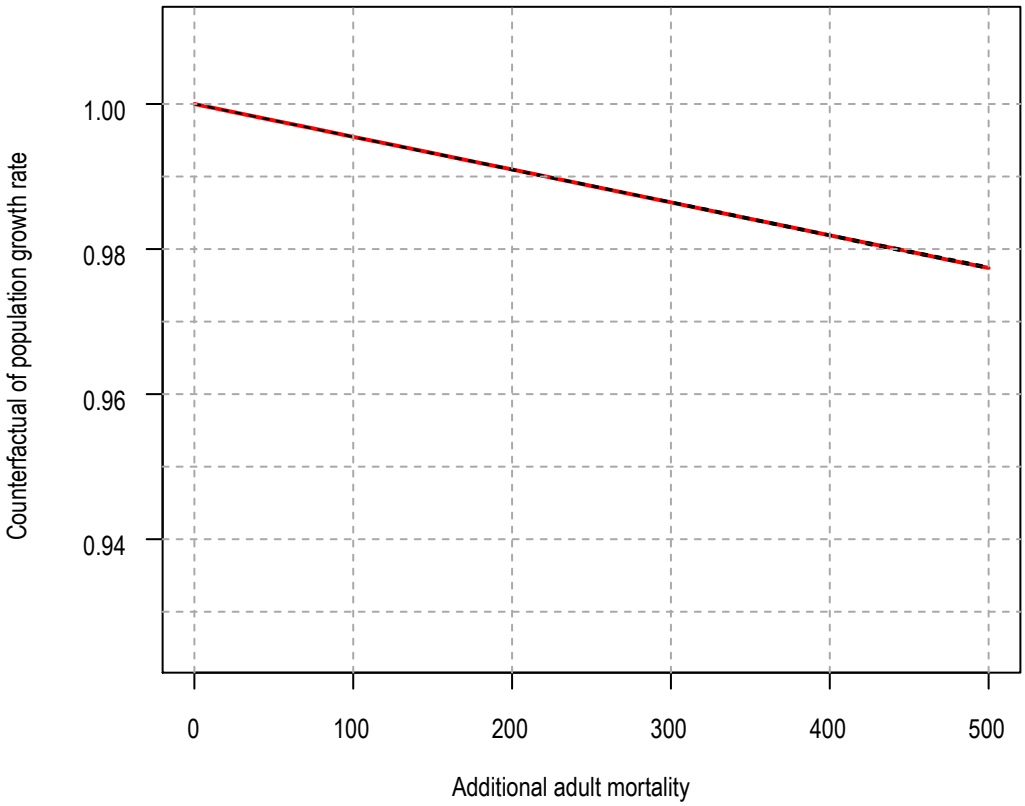


Figure A1_1.3. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations, red line (median), dashed lines (95% c.i.).

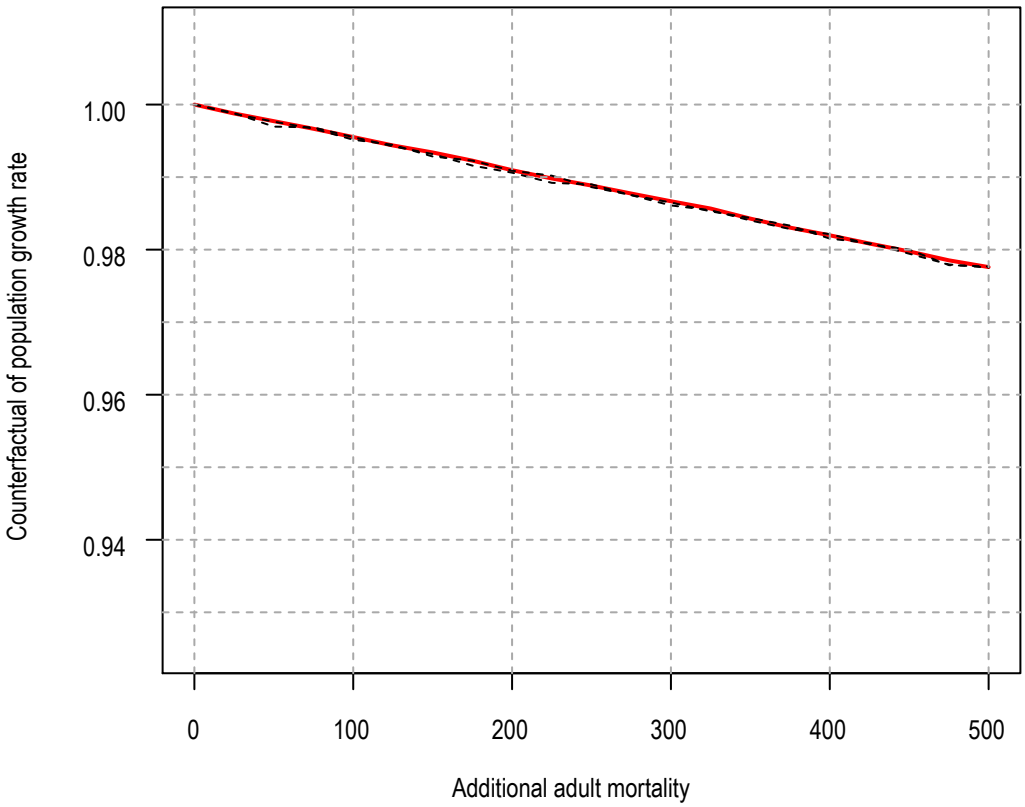


Figure A1_1.4. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

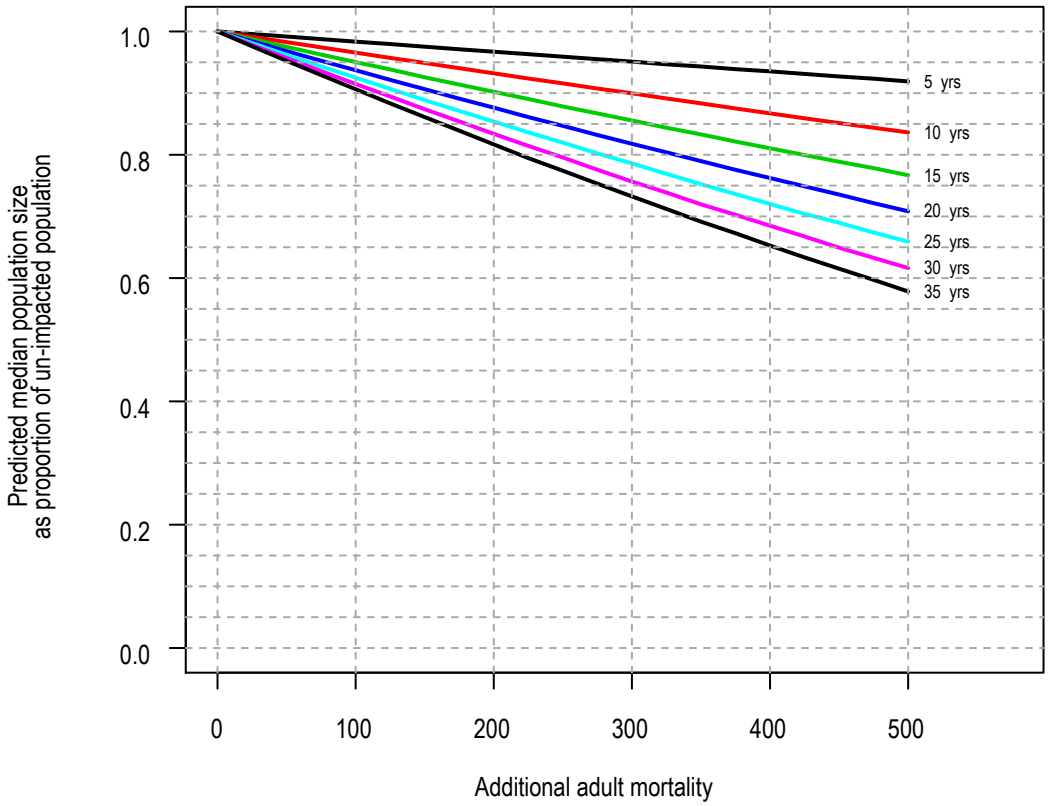


Figure A1_2.1. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

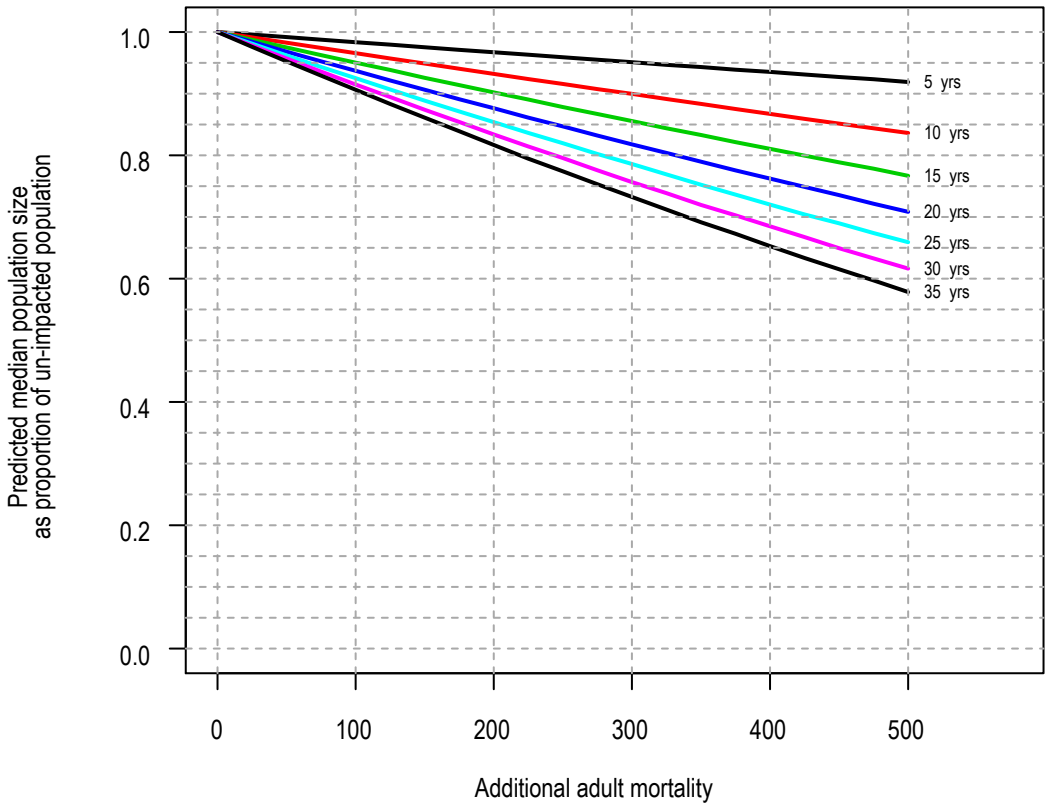


Figure A1_2.2. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

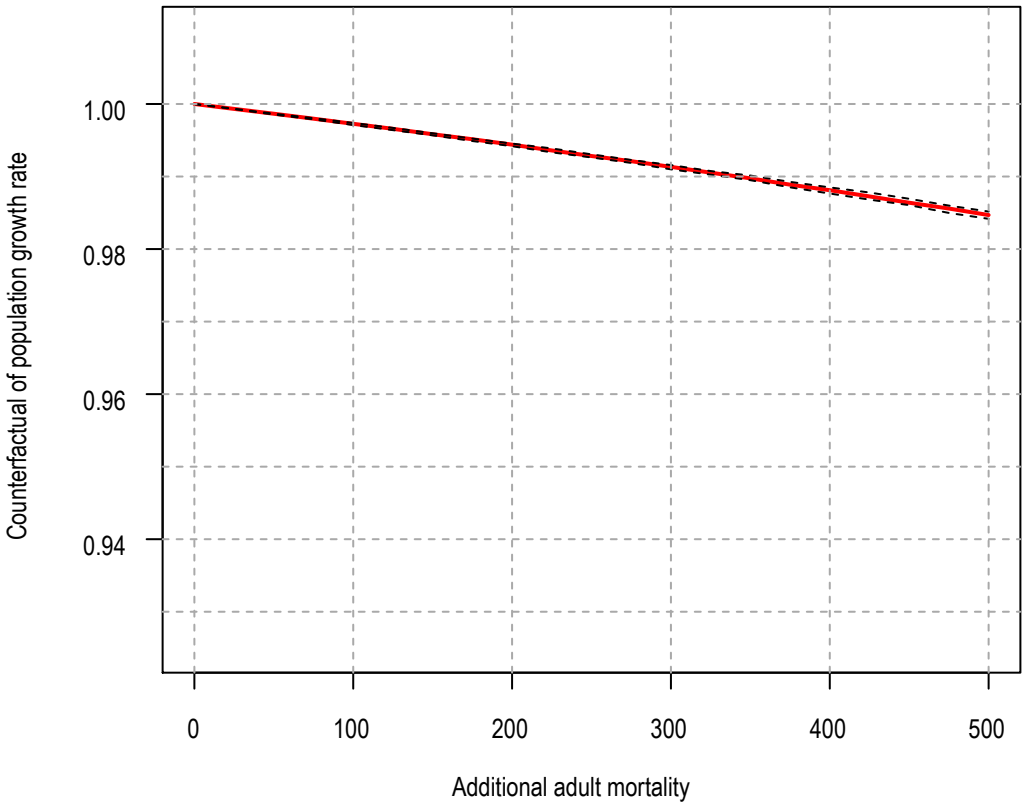


Figure A1_2.3. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

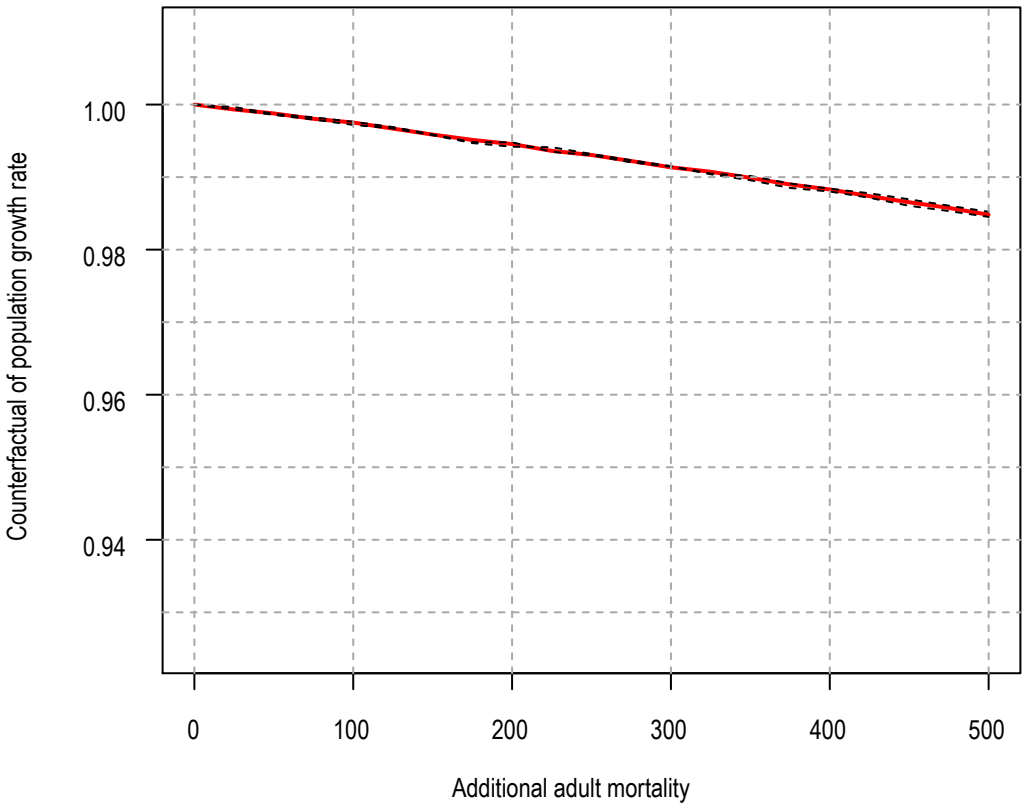


Figure A1_2.4. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

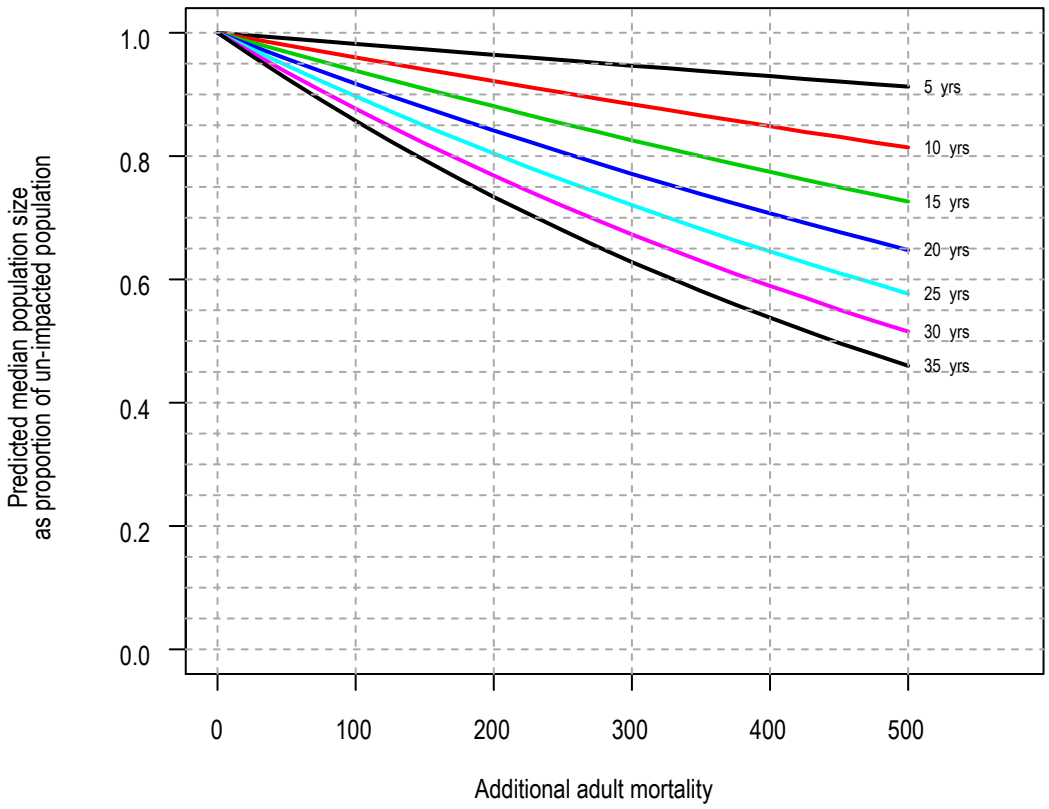


Figure A1_3.1. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

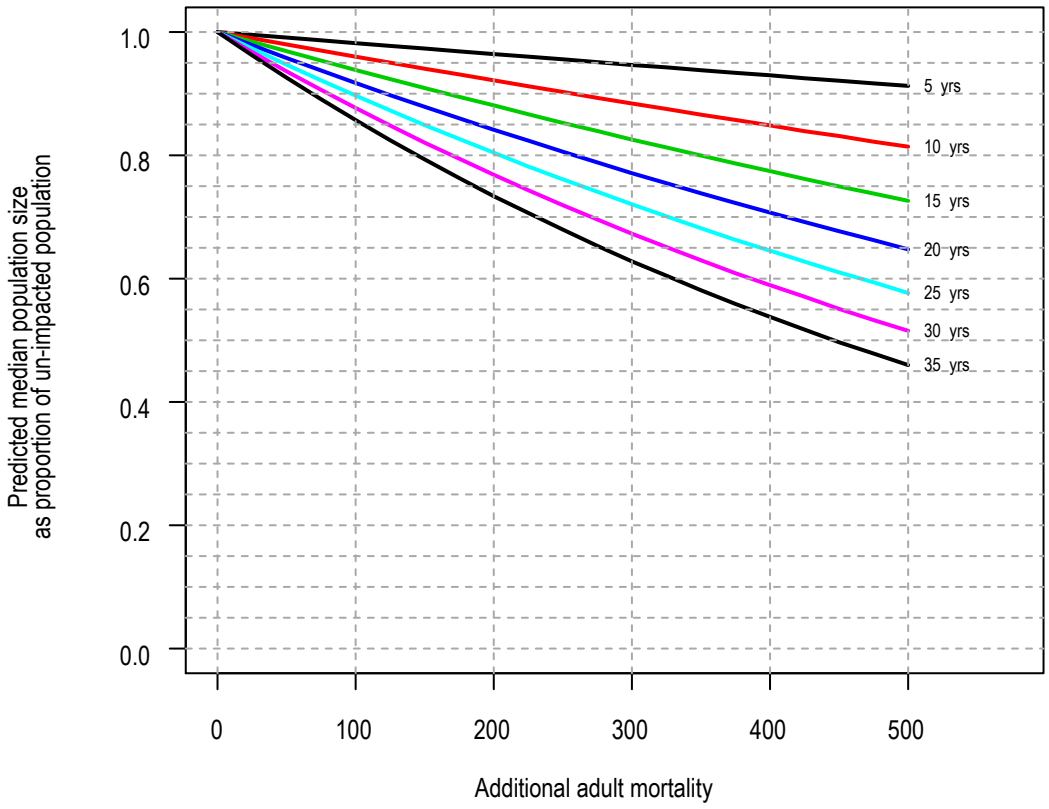


Figure A1_3.2. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

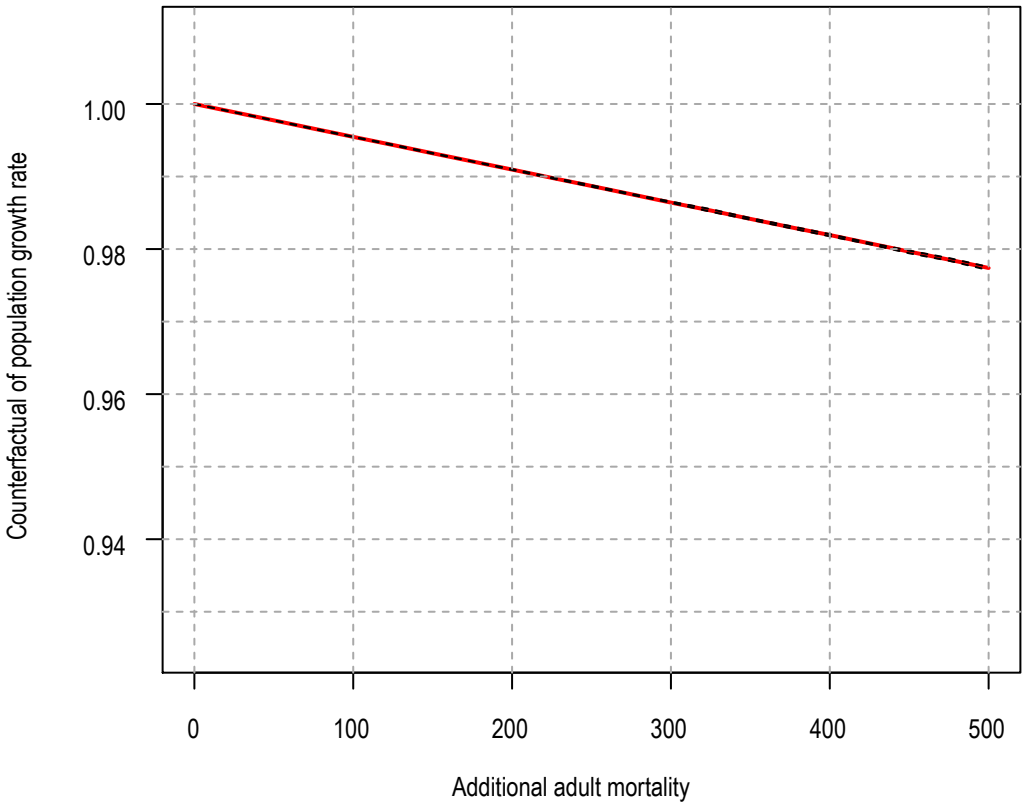


Figure A1_3.3. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

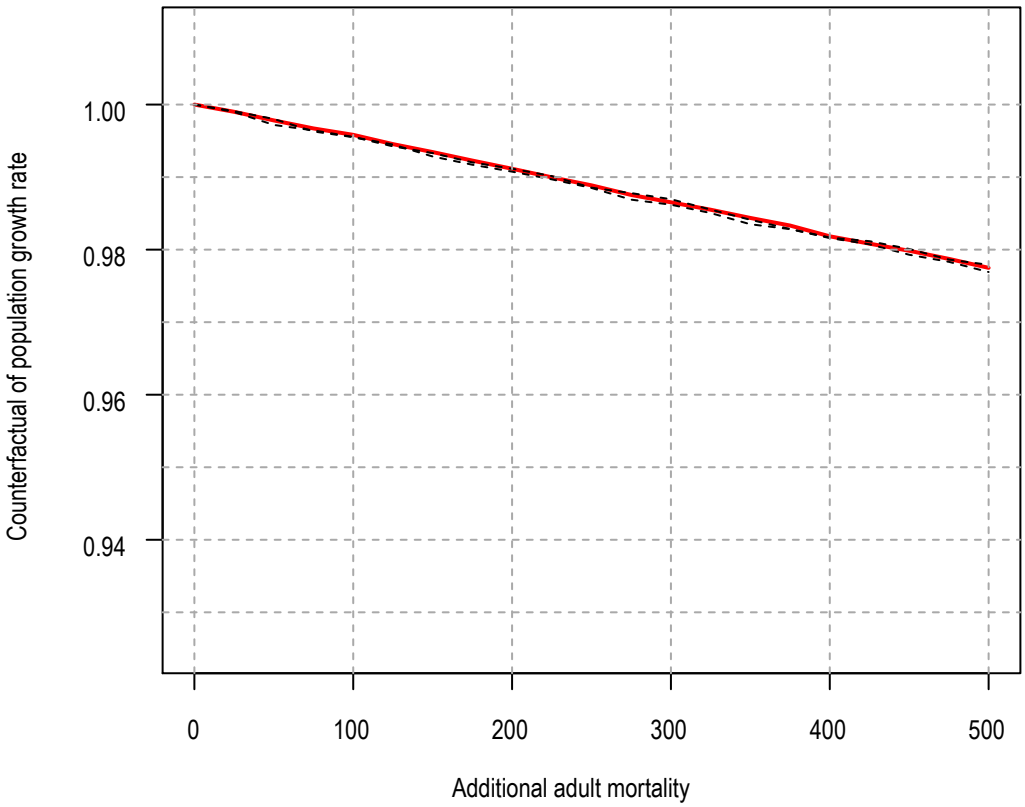


Figure A1_3.4. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

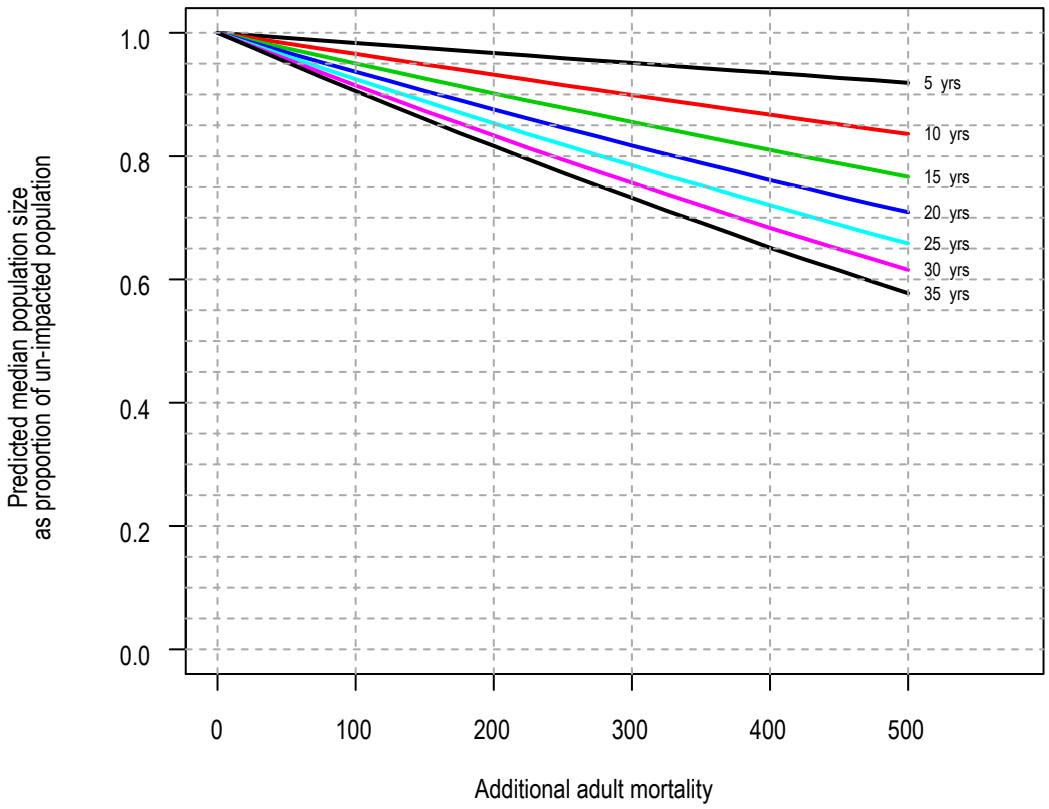


Figure A1_4.1. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

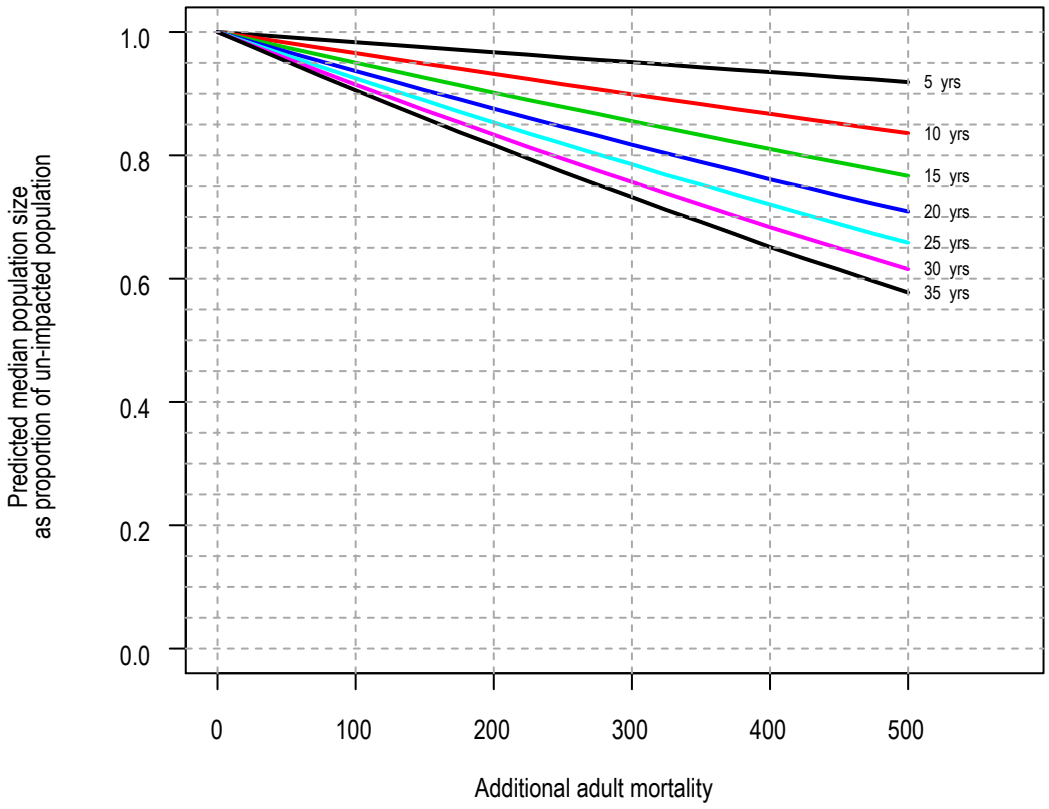


Figure A1_4.2. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

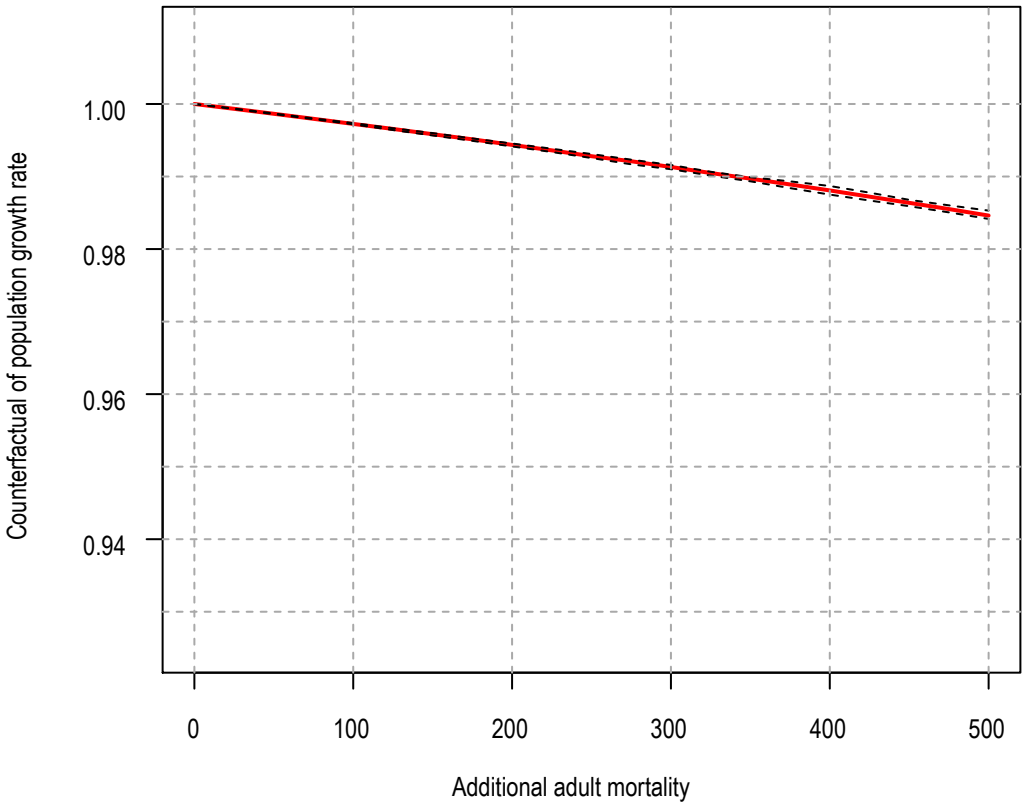


Figure A1_4.3. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

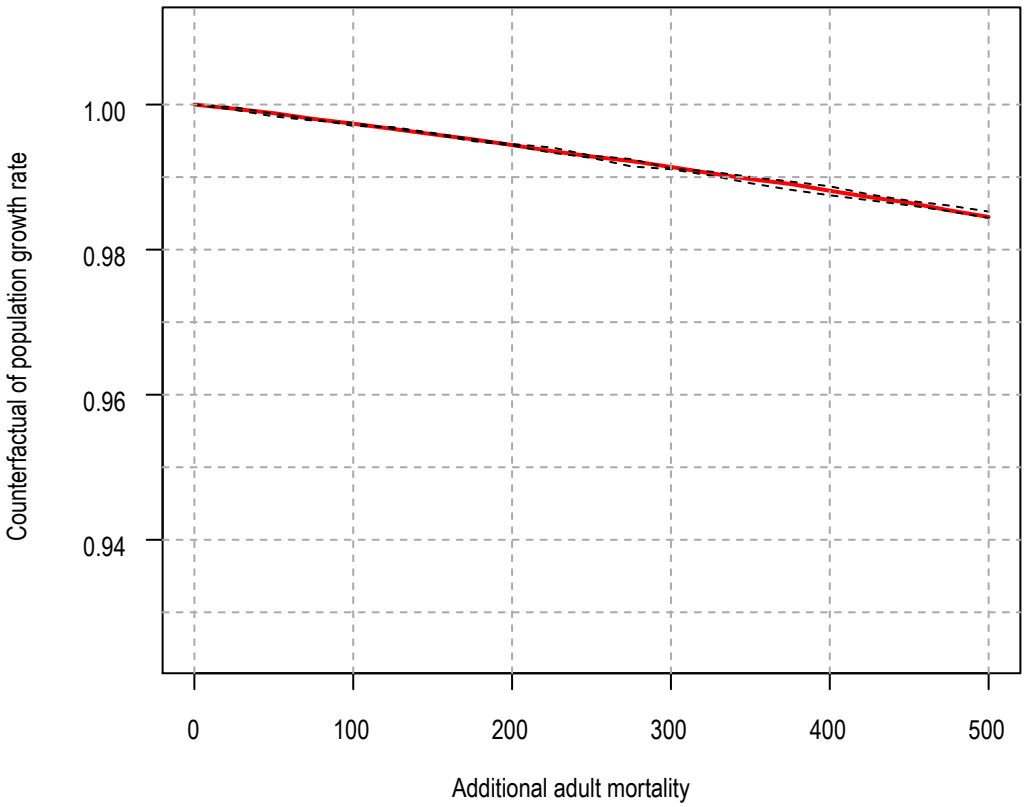


Figure A1_4.4. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

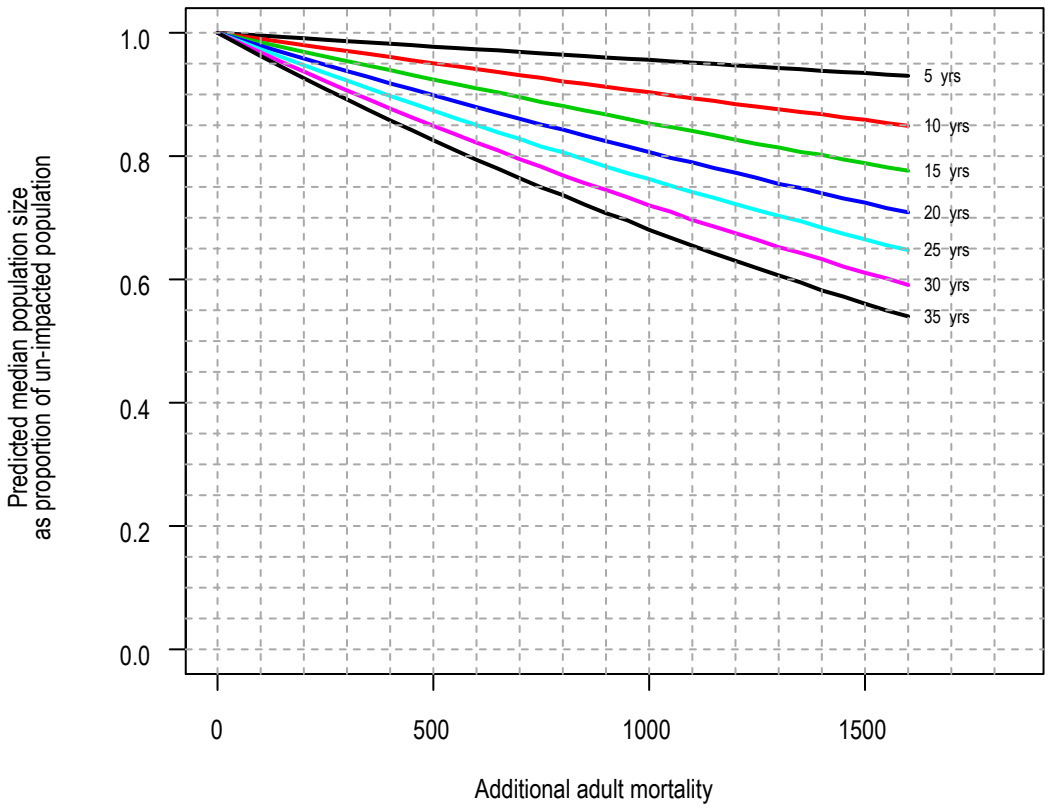


Figure A1_5.1. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

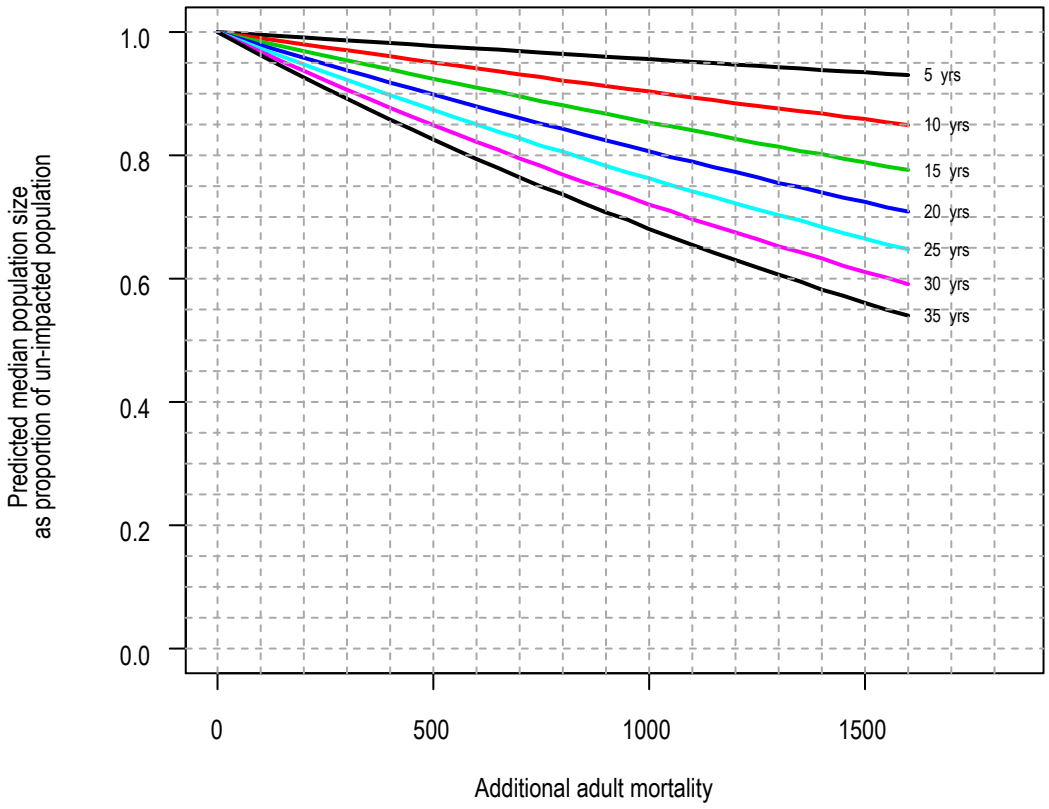


Figure A1_5.2. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

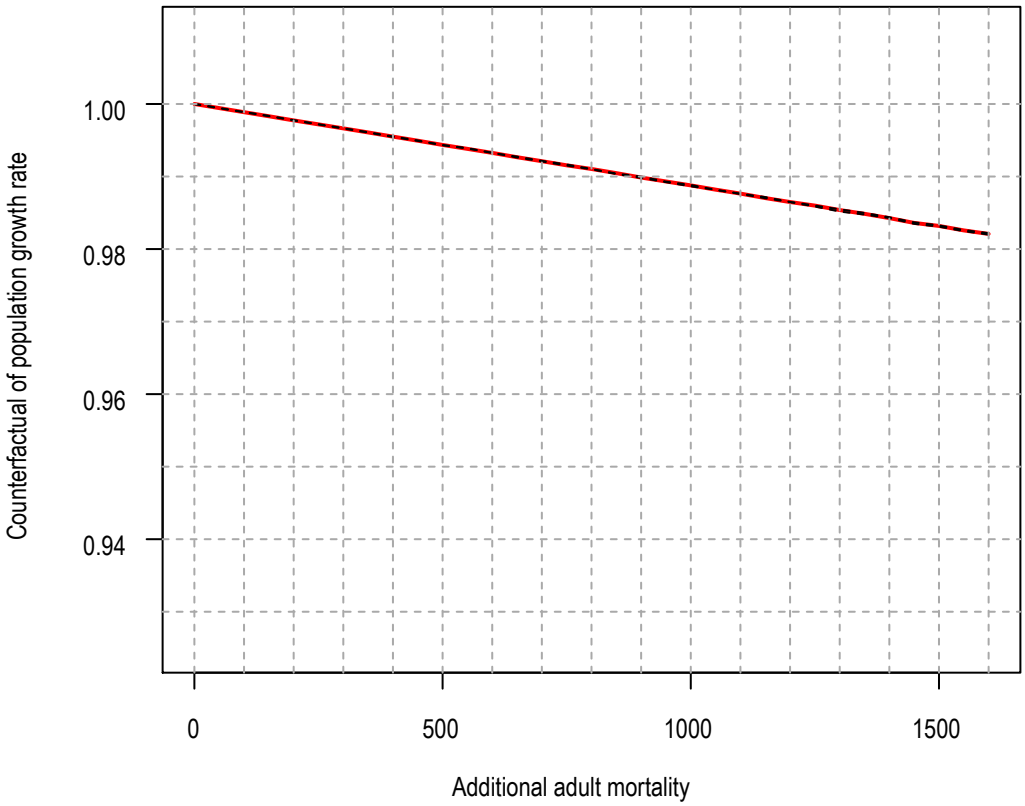


Figure A1_5.3. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

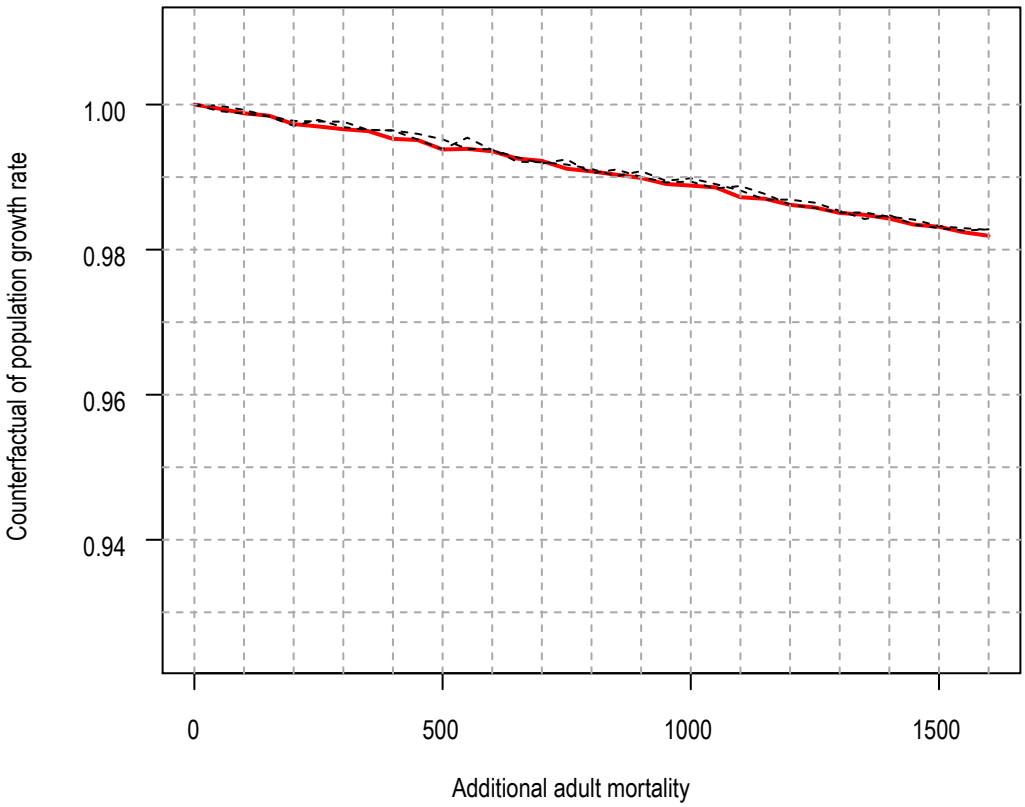


Figure A1_5.4. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

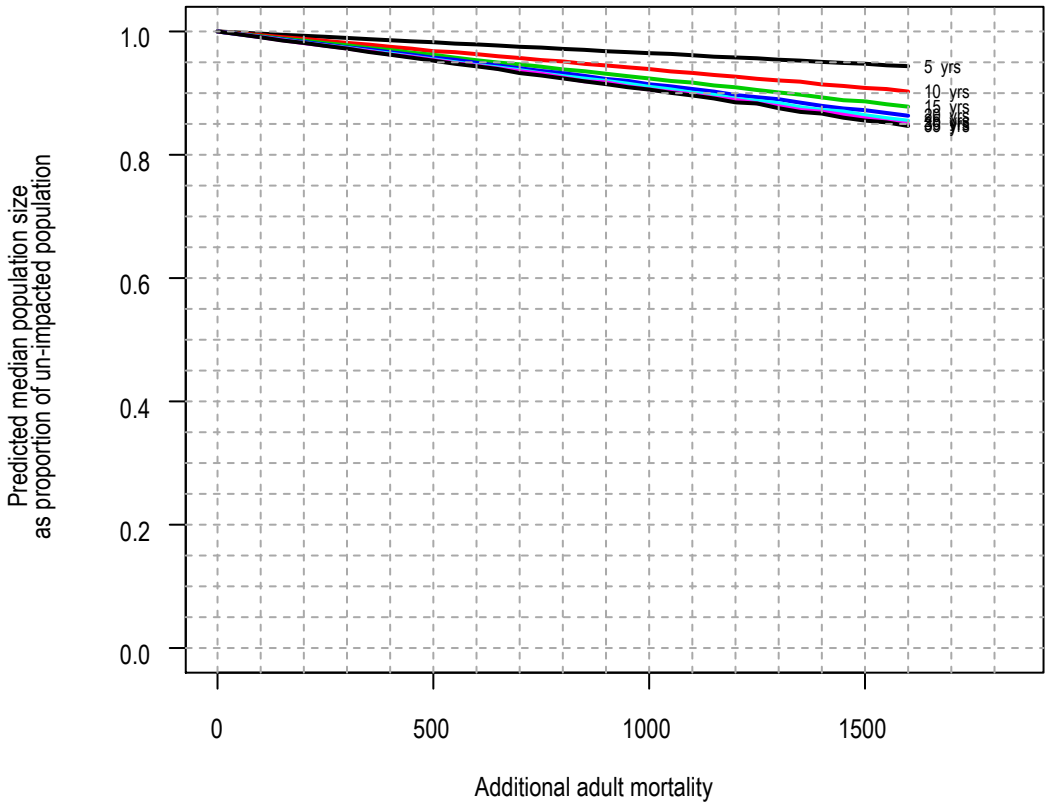


Figure A1_6.1. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

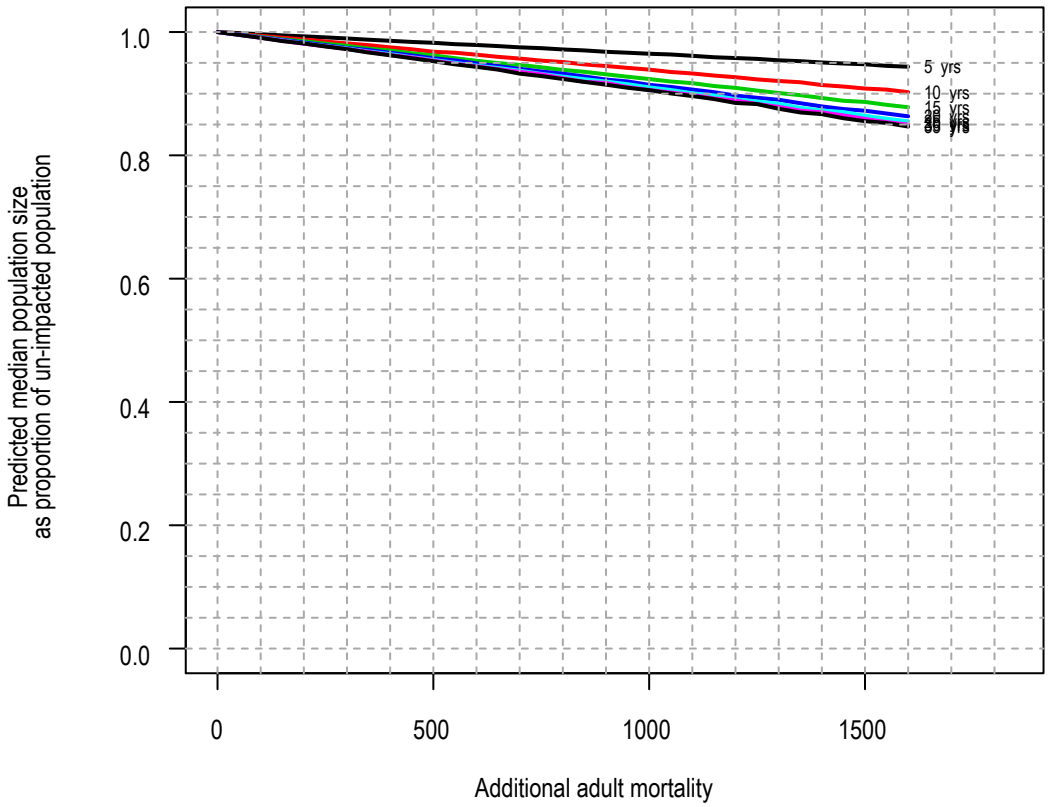


Figure A1_6.2. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

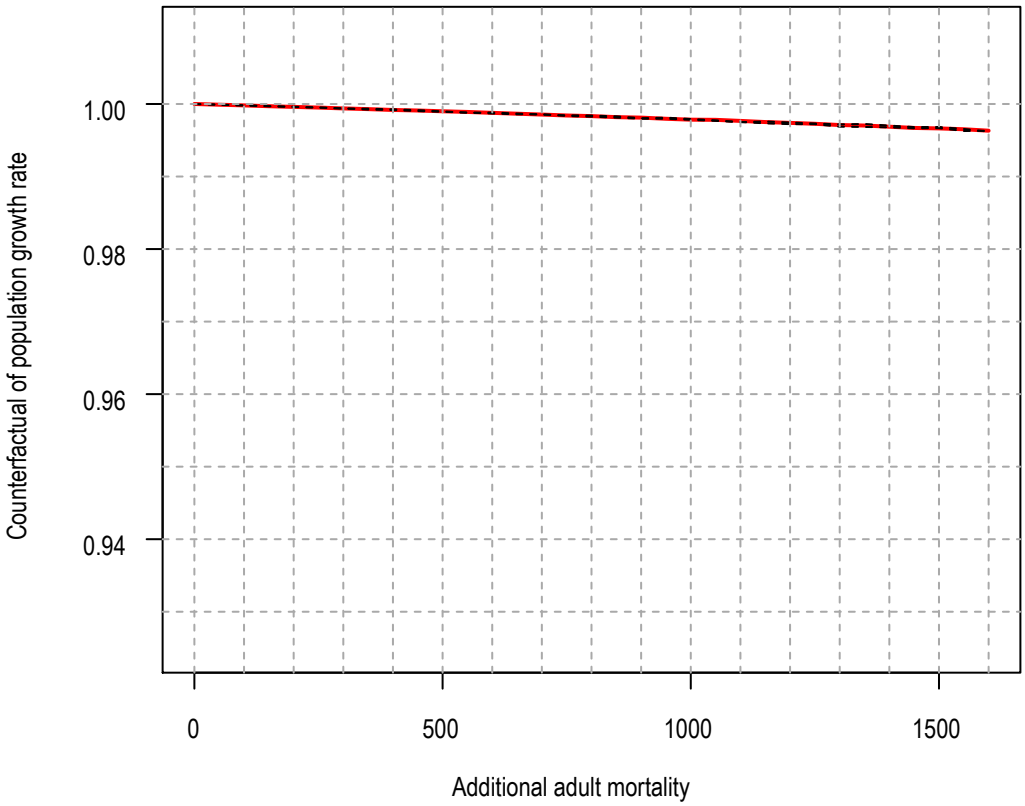


Figure A1_6.3. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

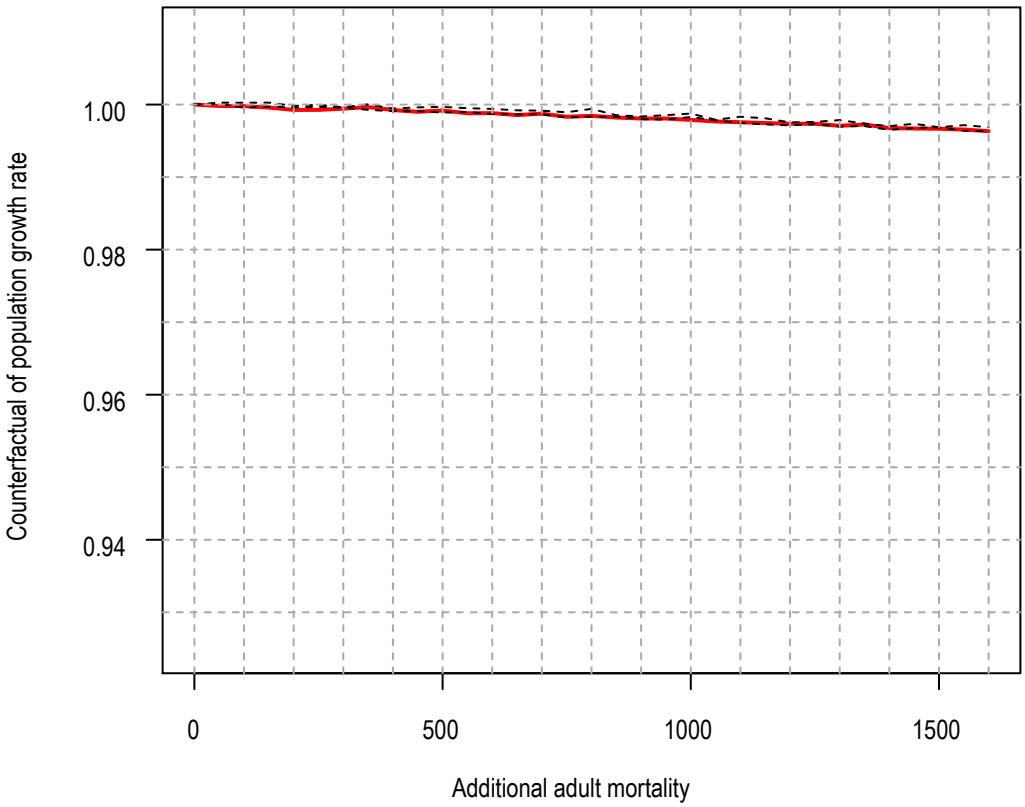


Figure A1_6.4. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

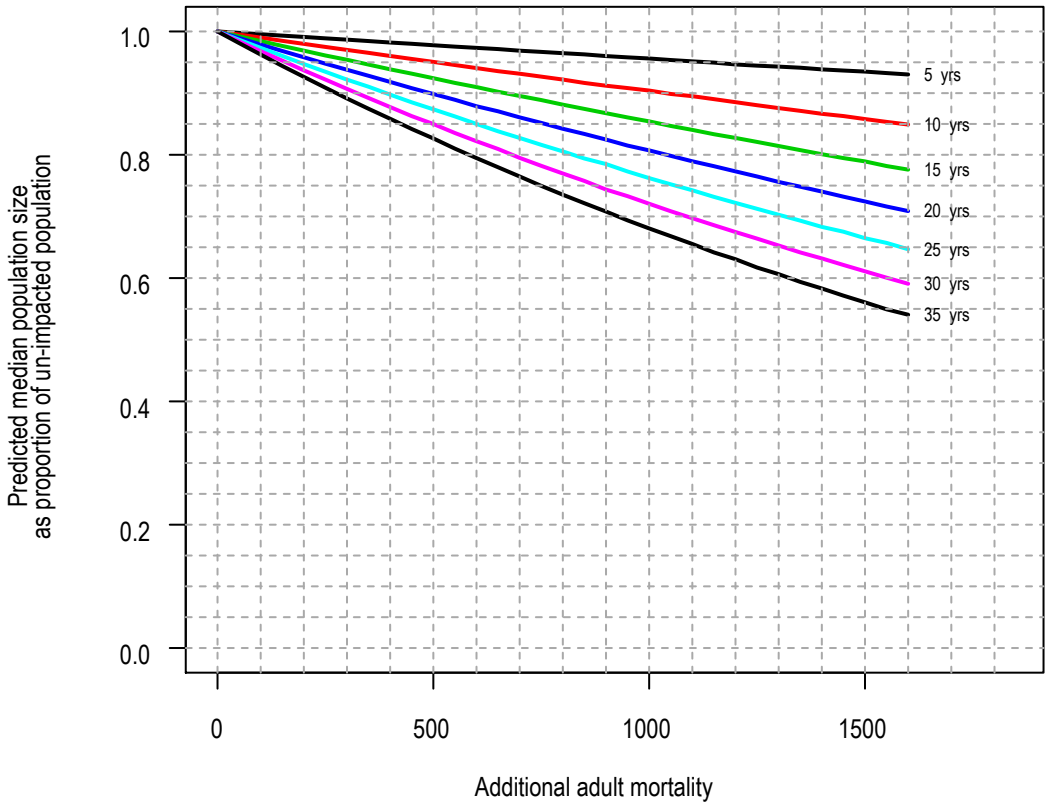


Figure A1_7.1. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

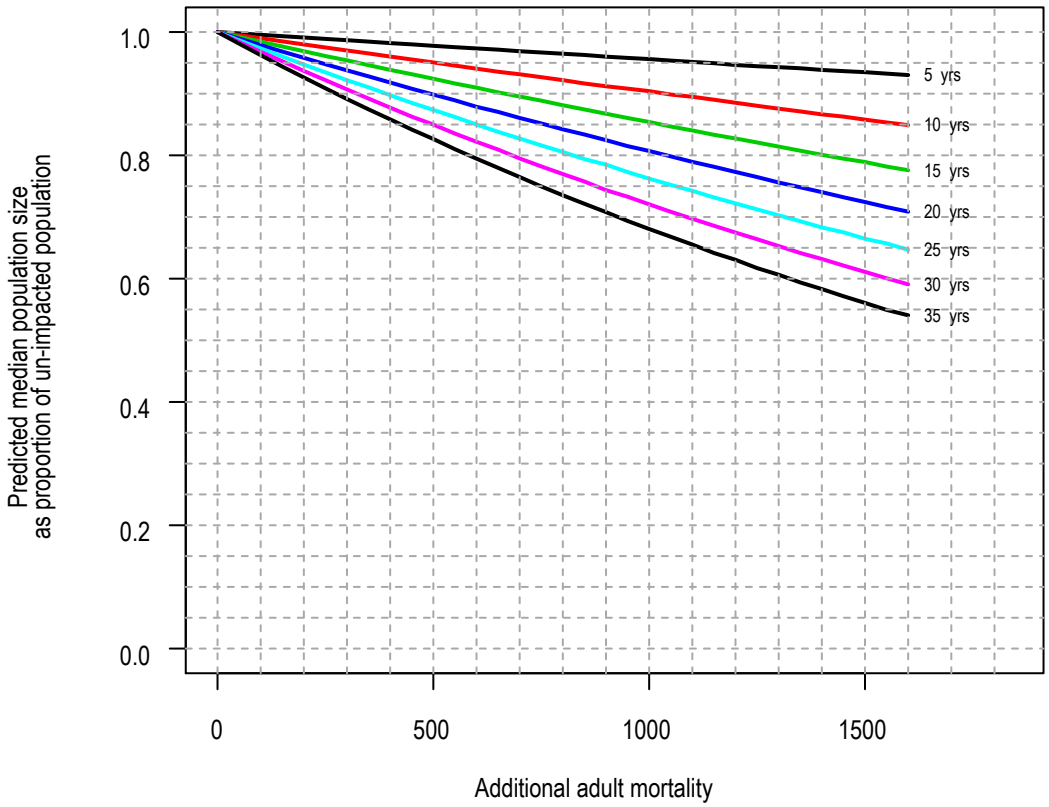


Figure A1_7.2. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

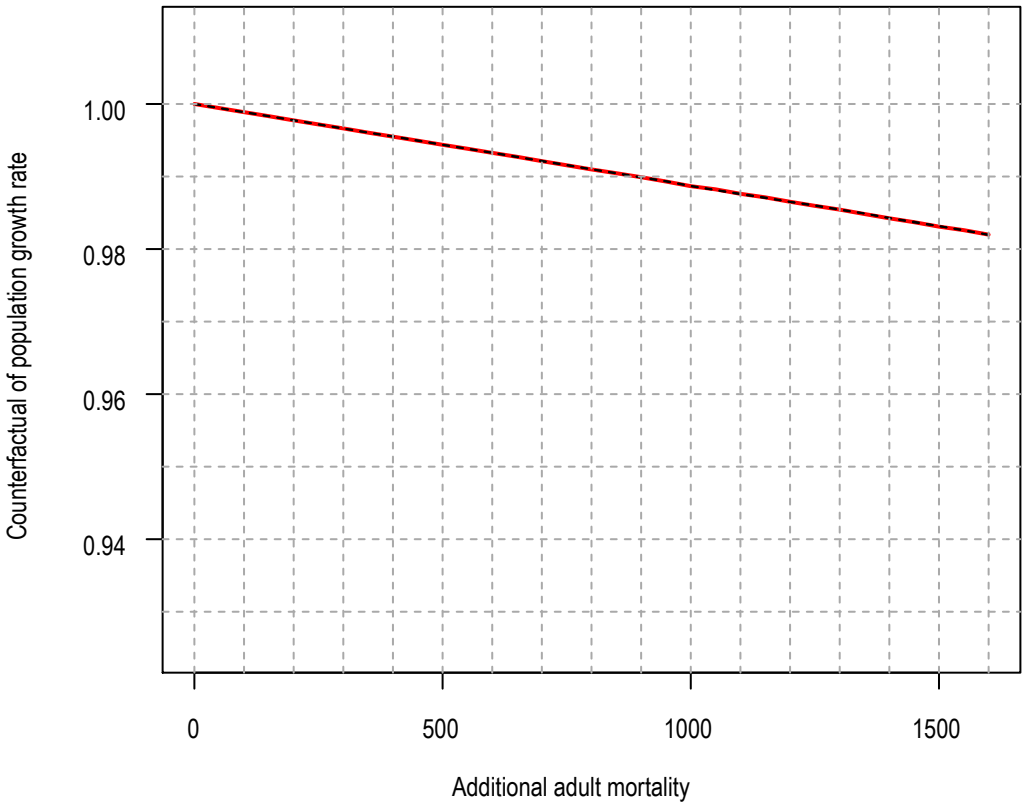


Figure A1_7.3. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

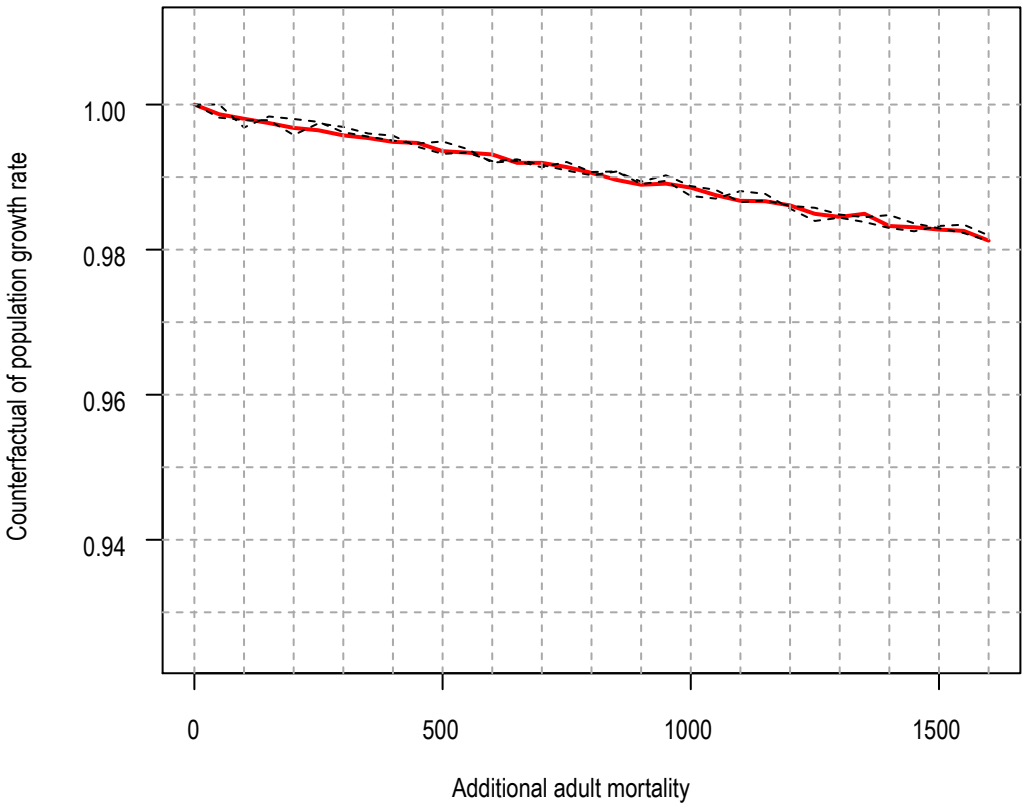


Figure A1_7.4. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

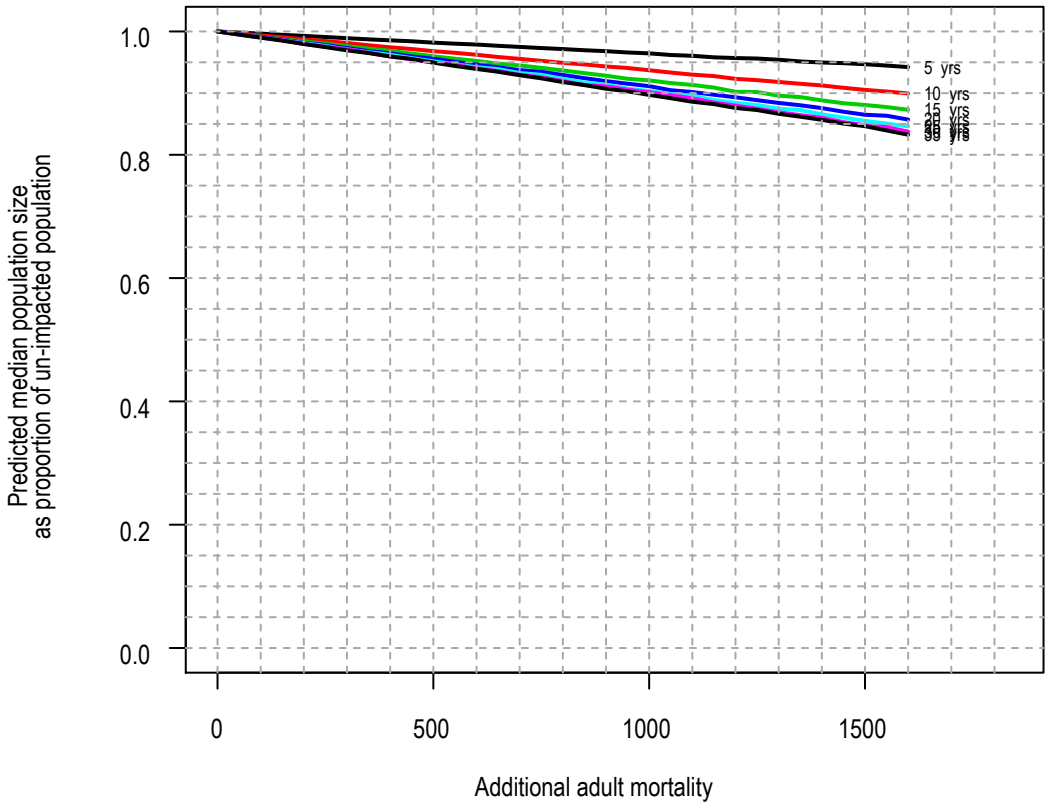


Figure A1_8.1. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

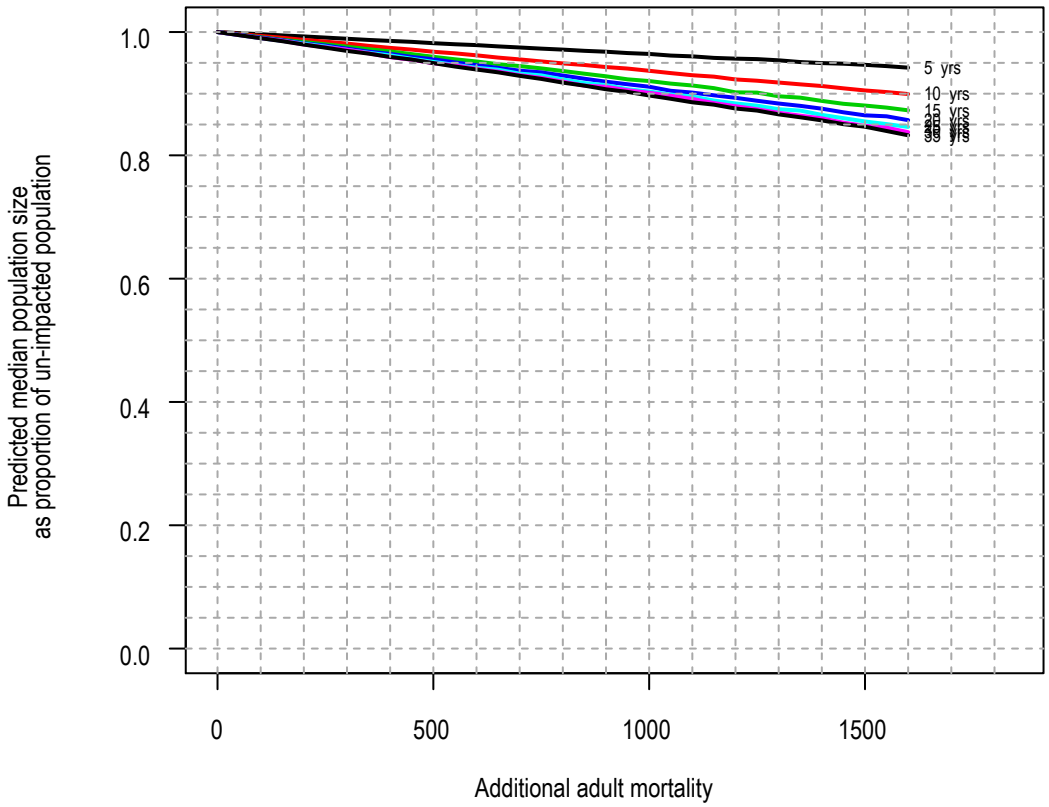


Figure A1_8.2. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

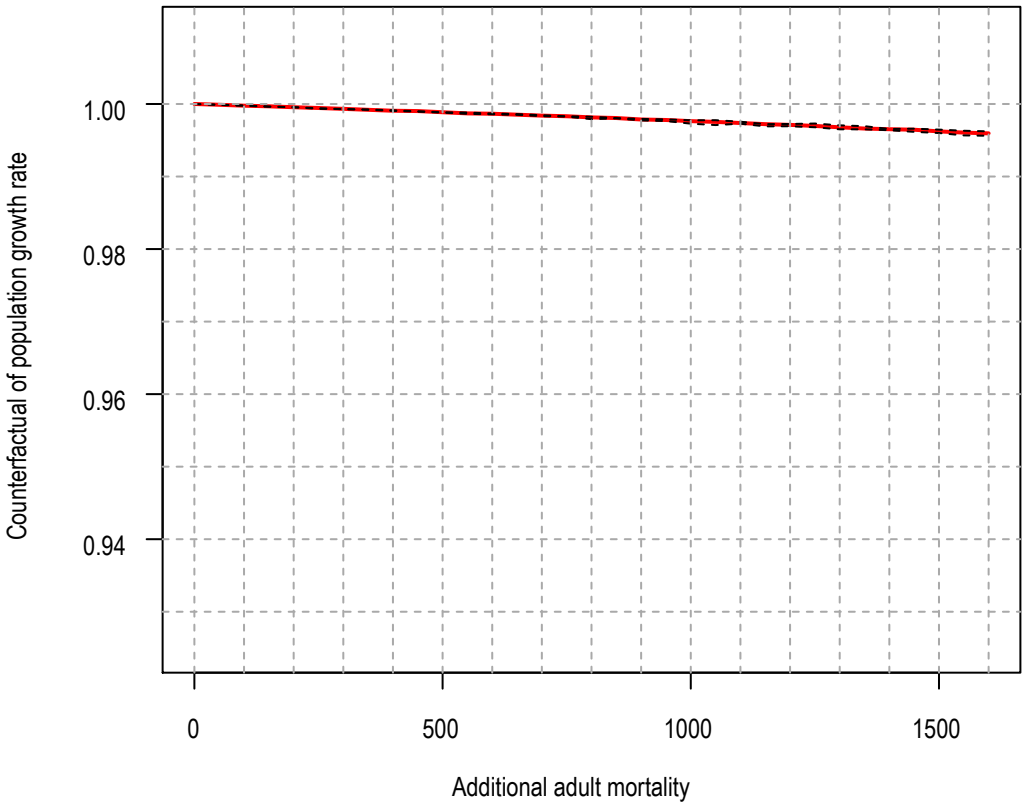


Figure A1_8.3. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

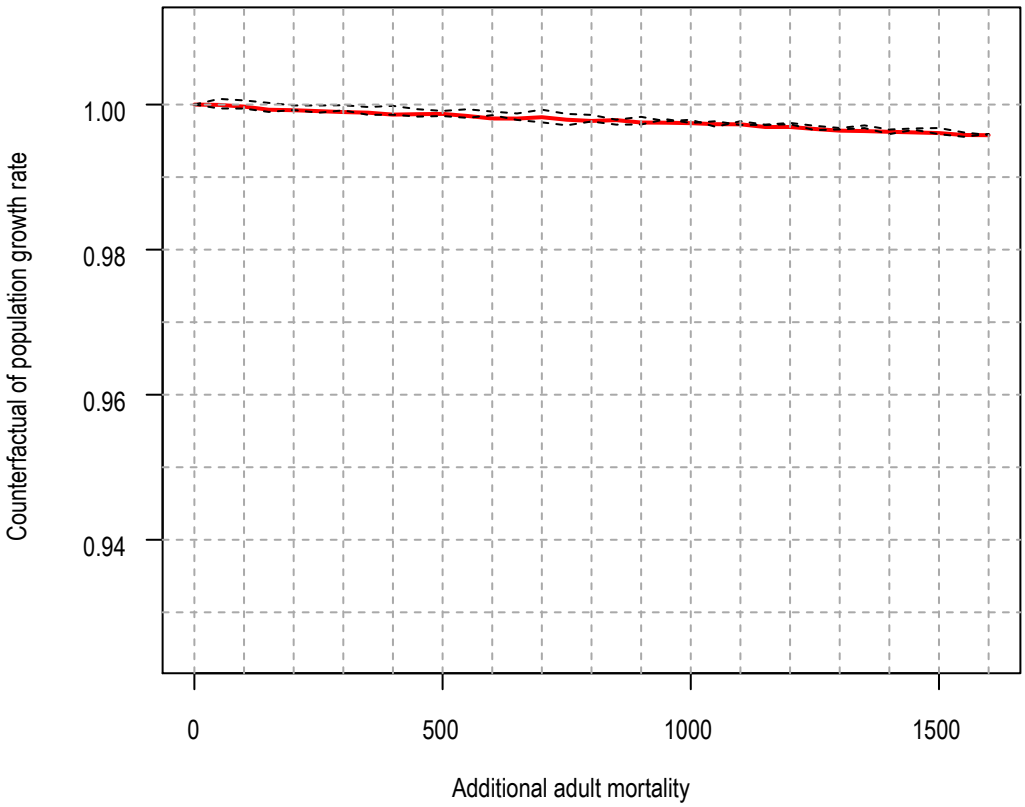


Figure A1_8.4. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

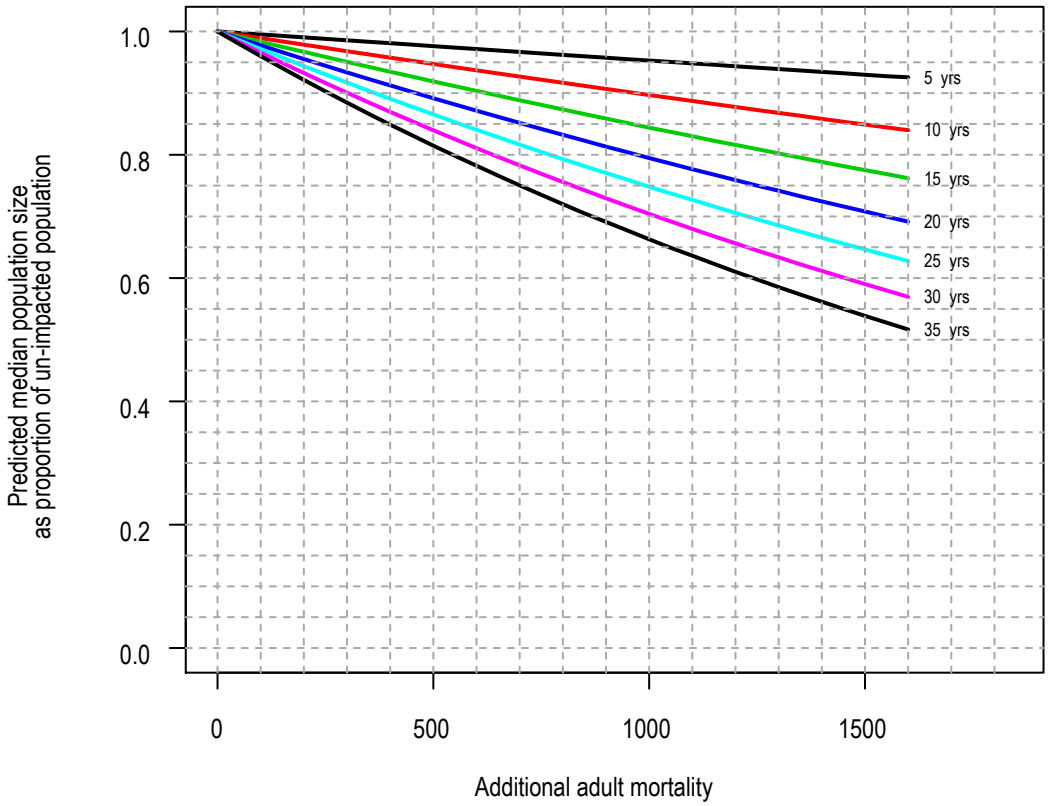


Figure A1_9.1. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

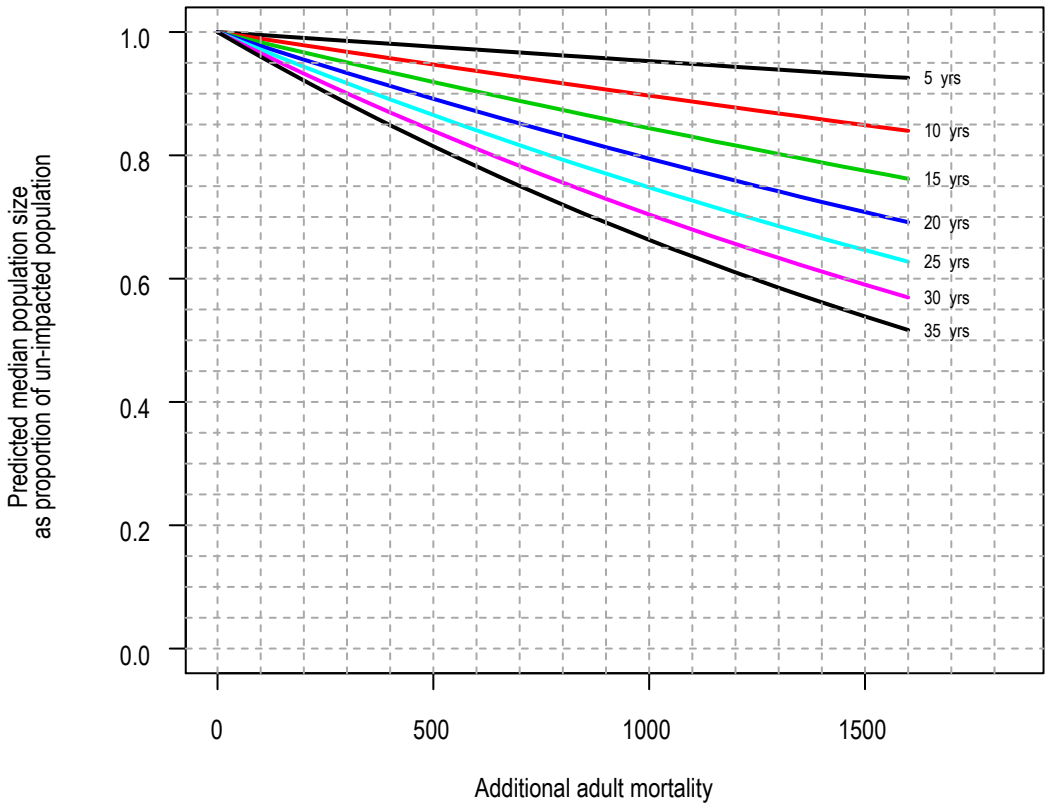


Figure A1_9.2. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

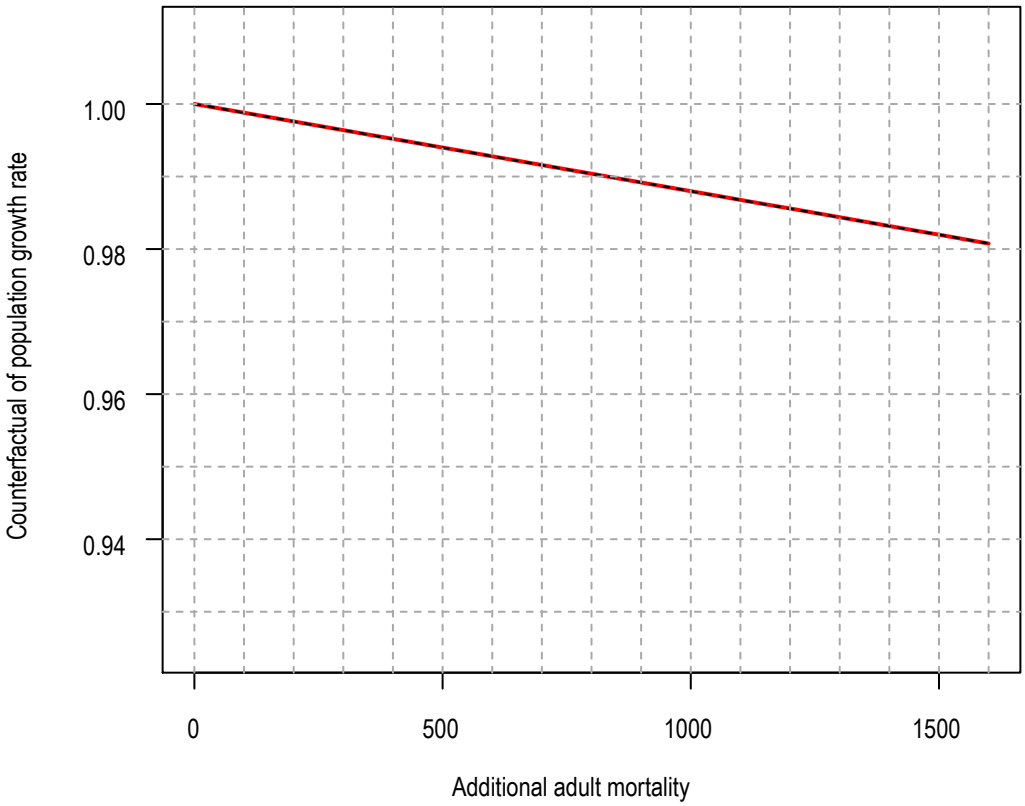


Figure A1_9.3. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

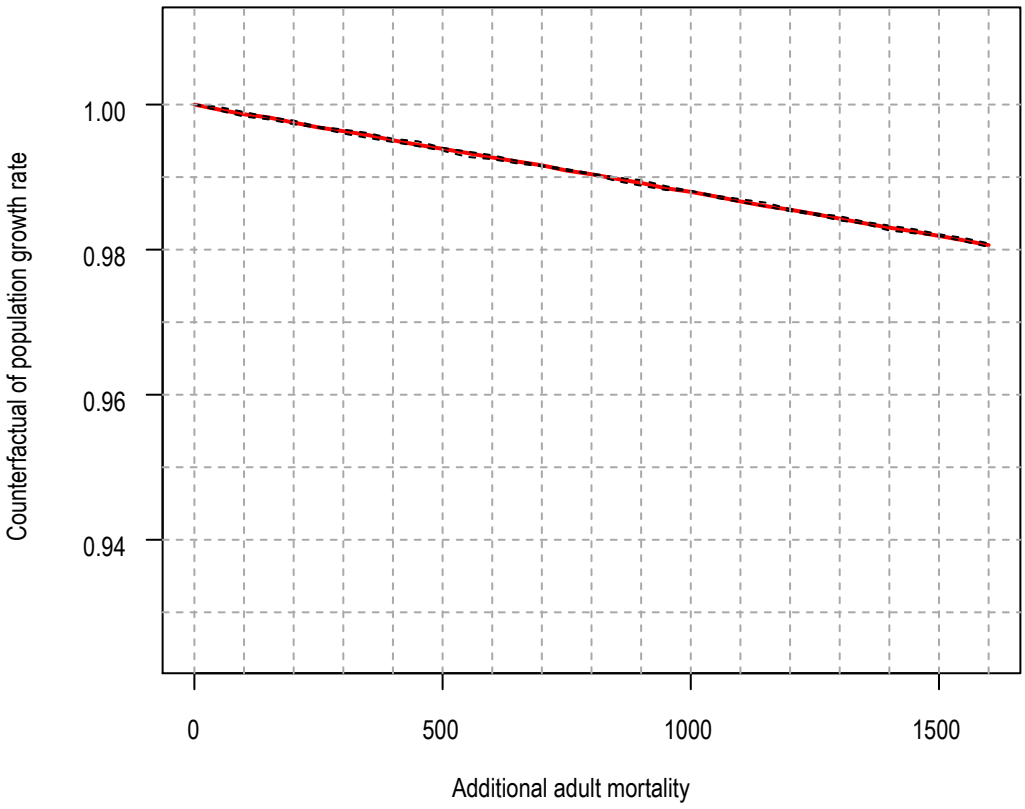


Figure A1_9.4. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

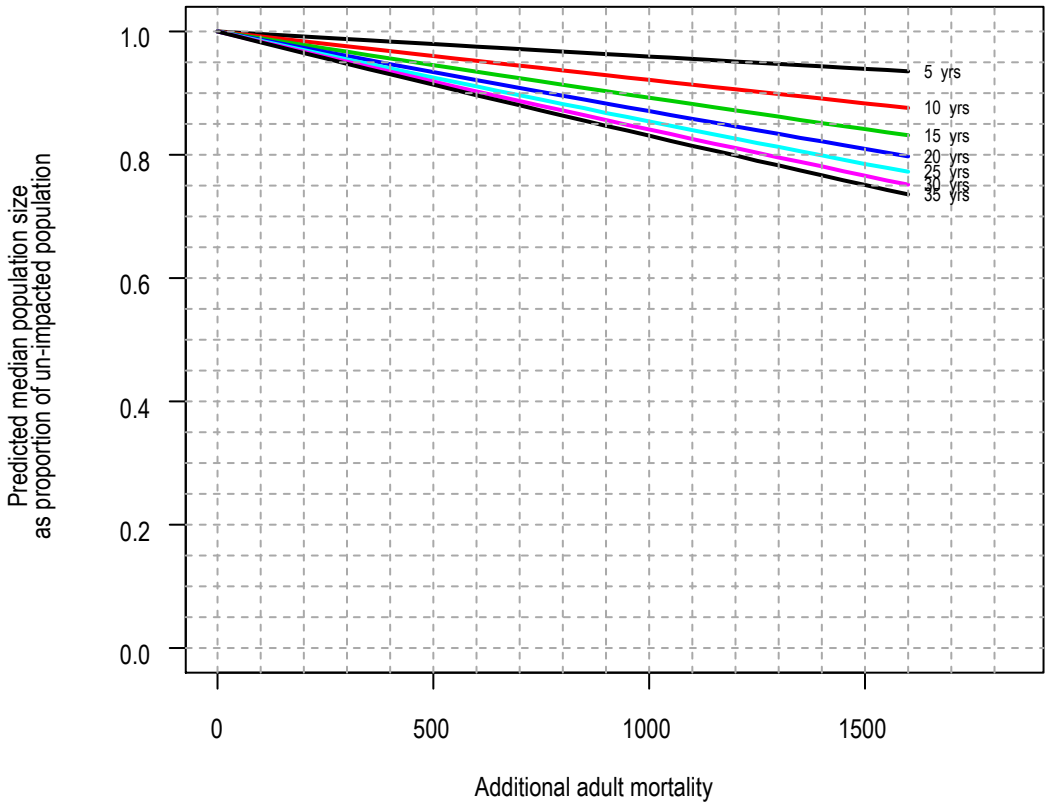


Figure A1_10.1. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

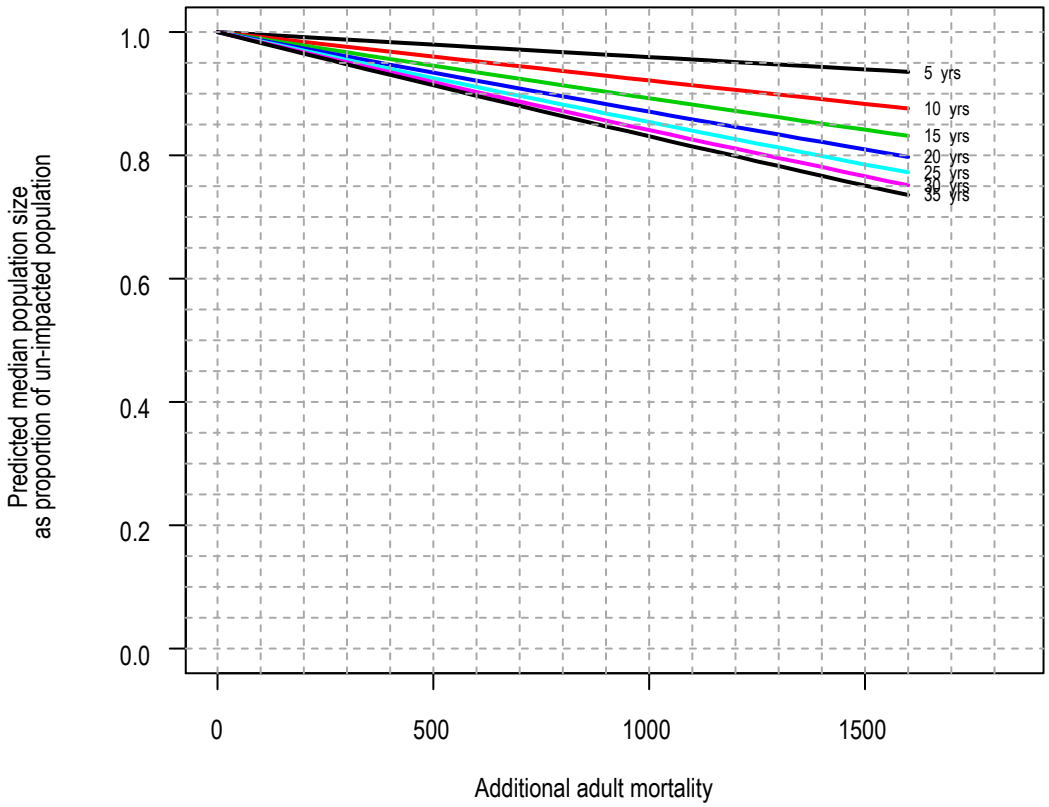


Figure A1_10.2. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

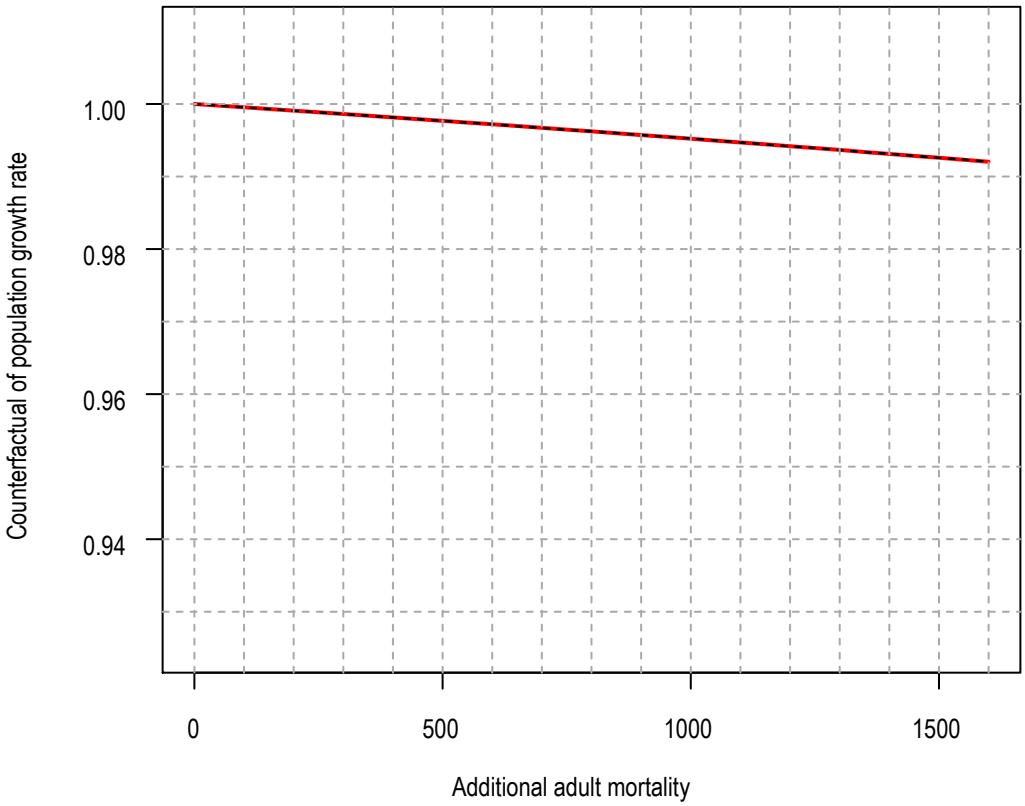


Figure A1_10.3. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

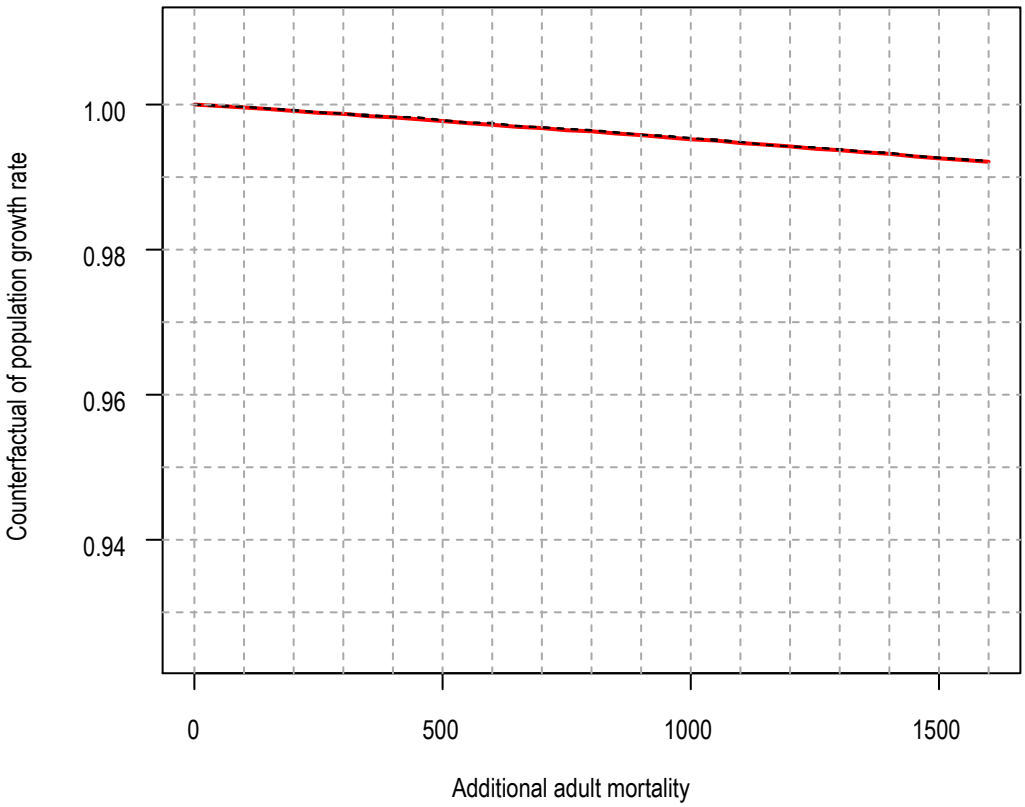


Figure A1_10.4. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

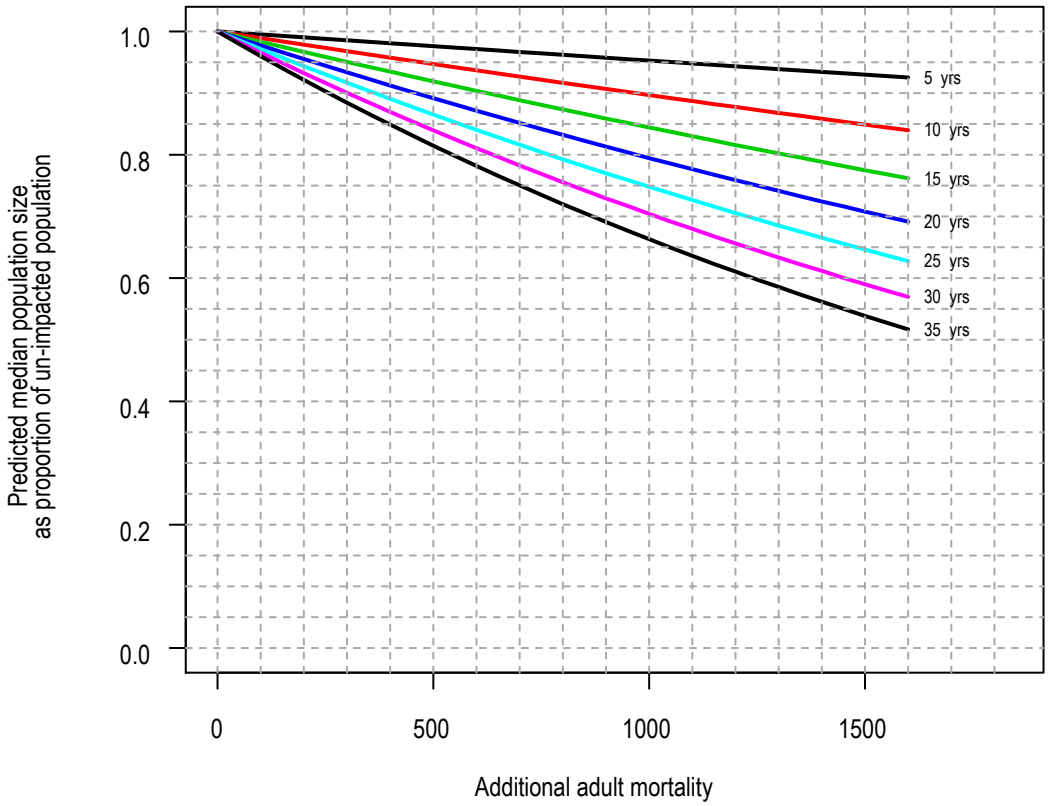


Figure A1_11.1. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

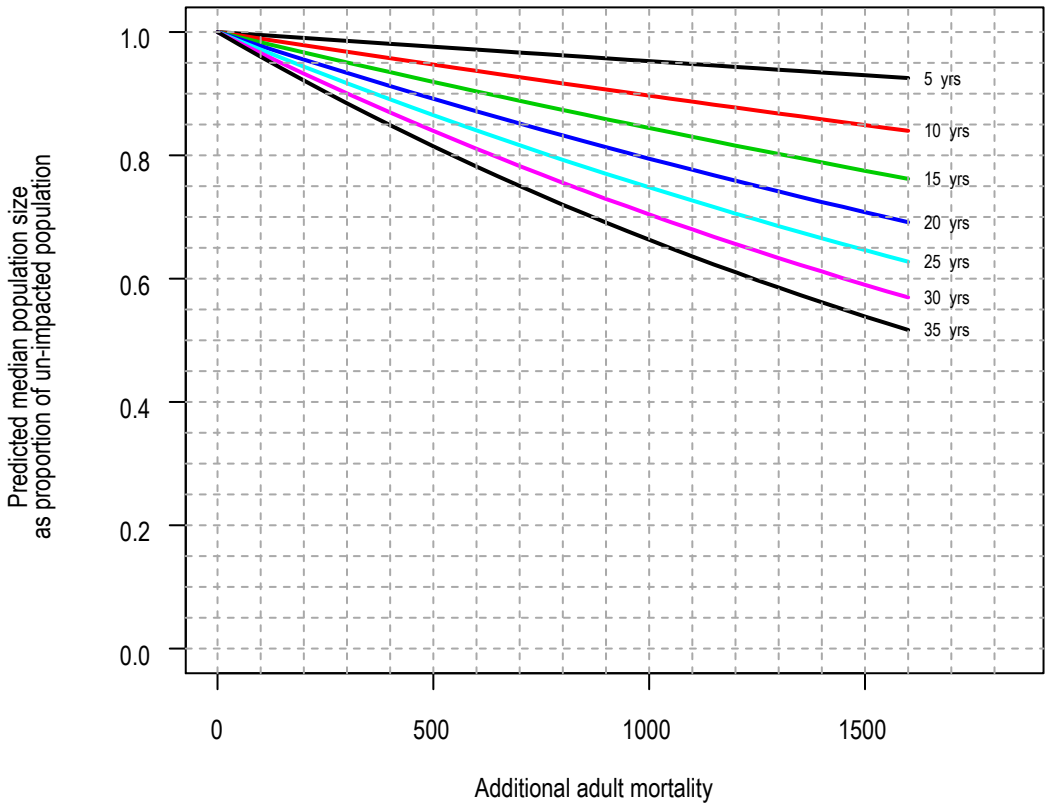


Figure A1_11.2. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

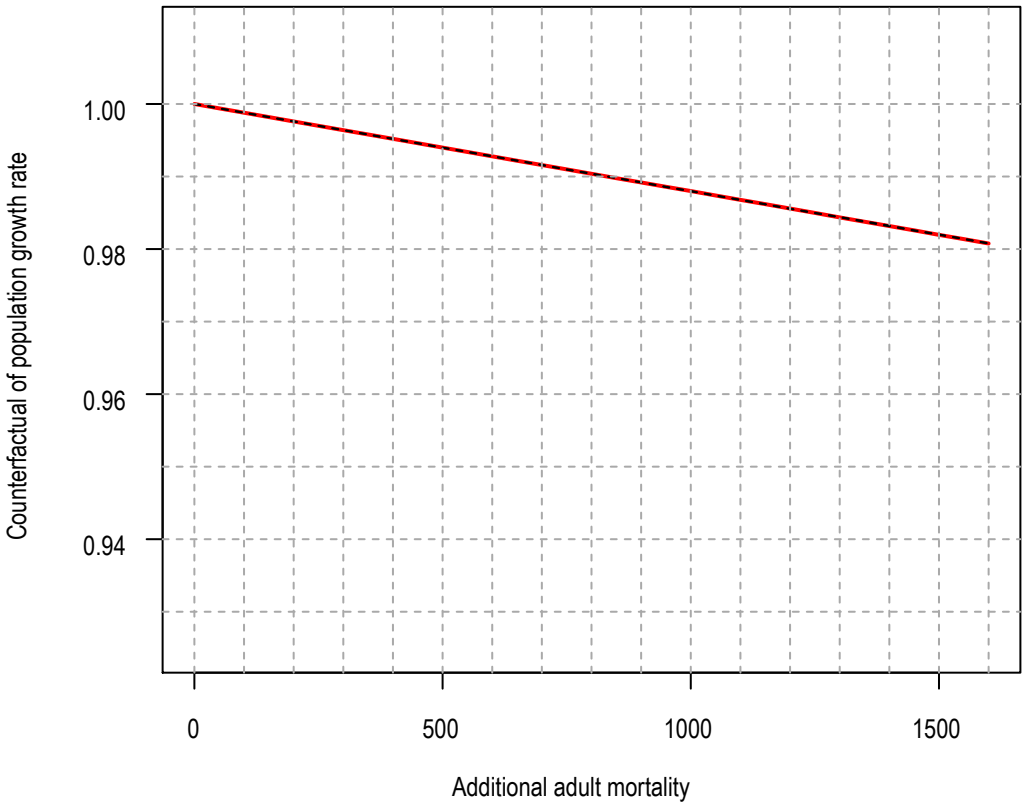


Figure A1_11.3. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

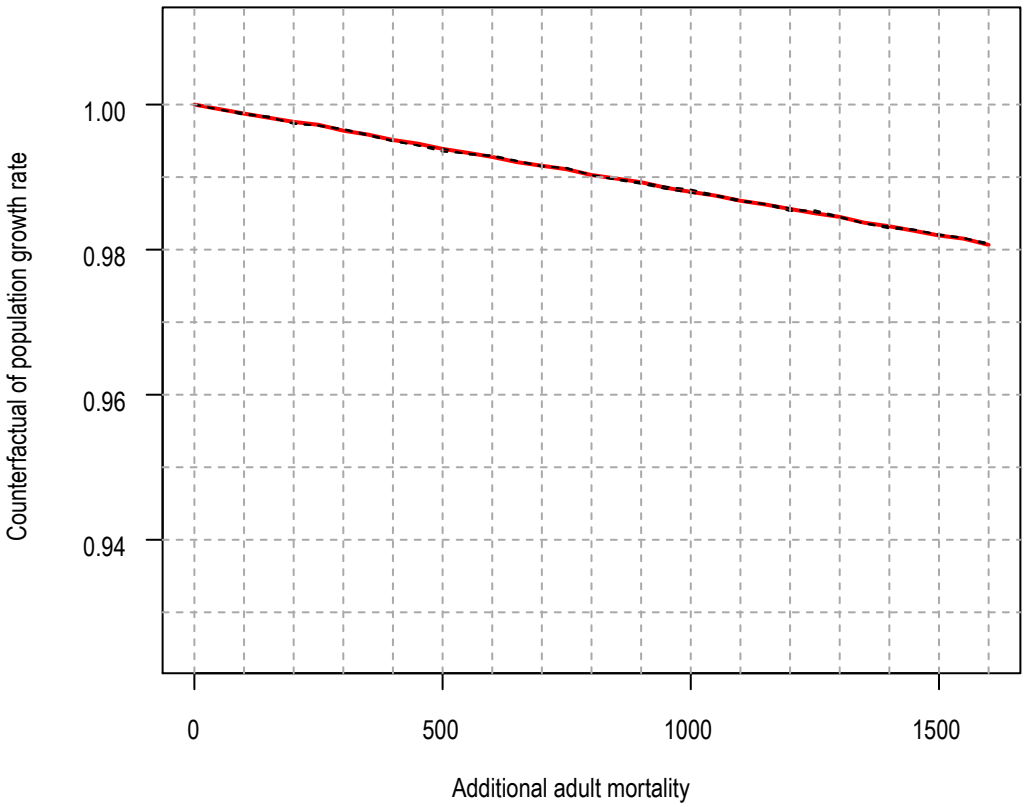


Figure A1_11.4. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

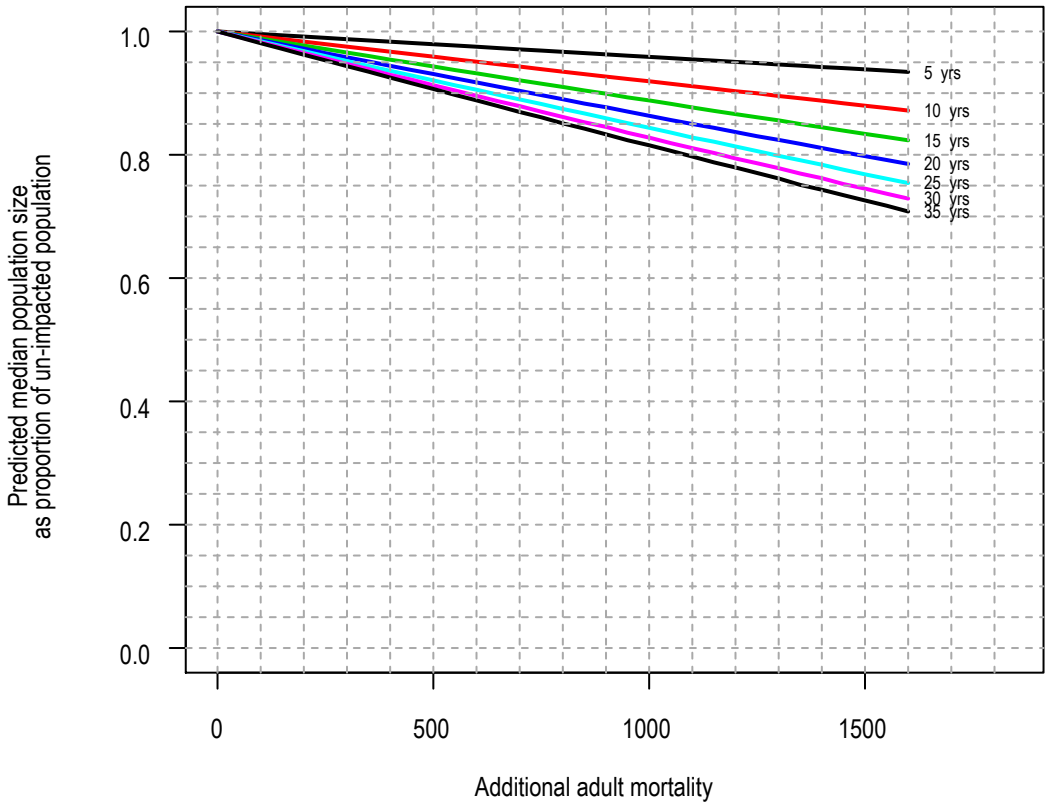


Figure A1_12.1. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

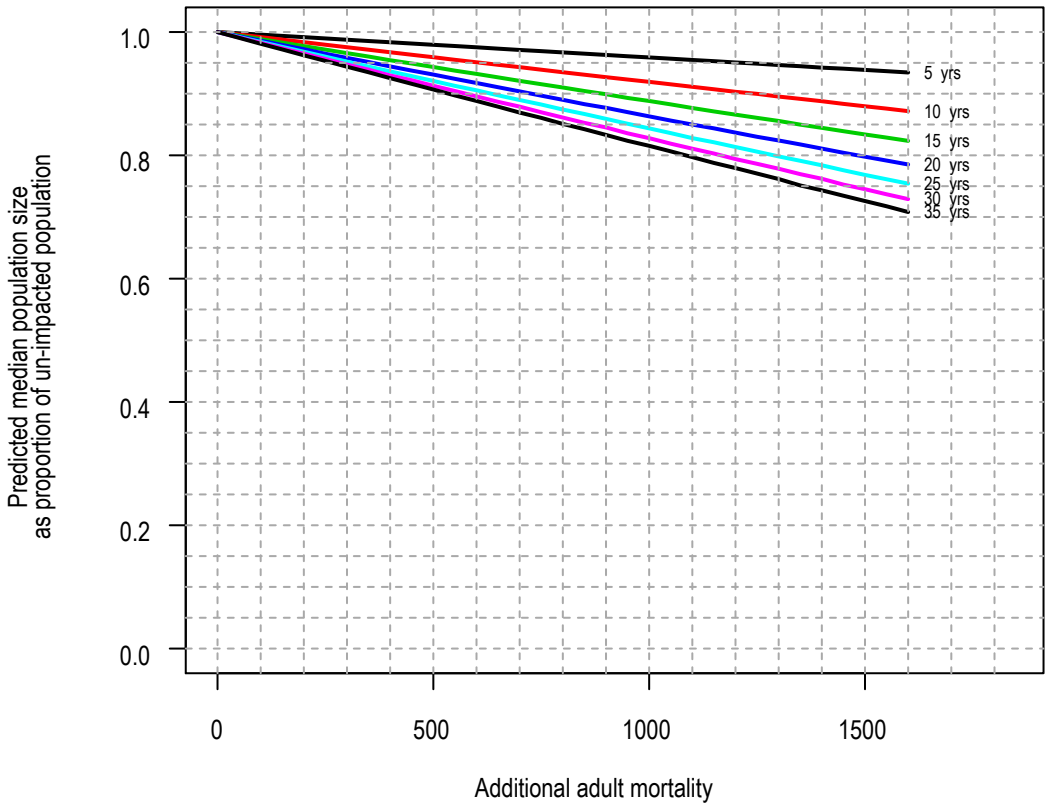


Figure A1_12.2. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

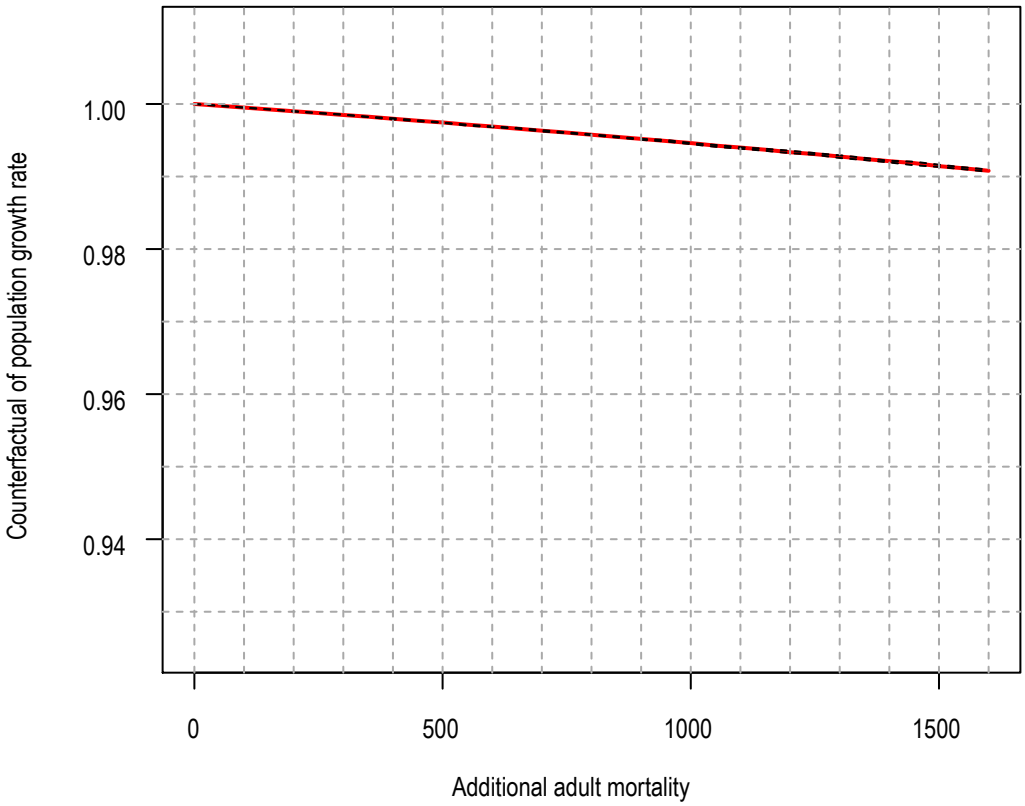


Figure A1_12.3. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

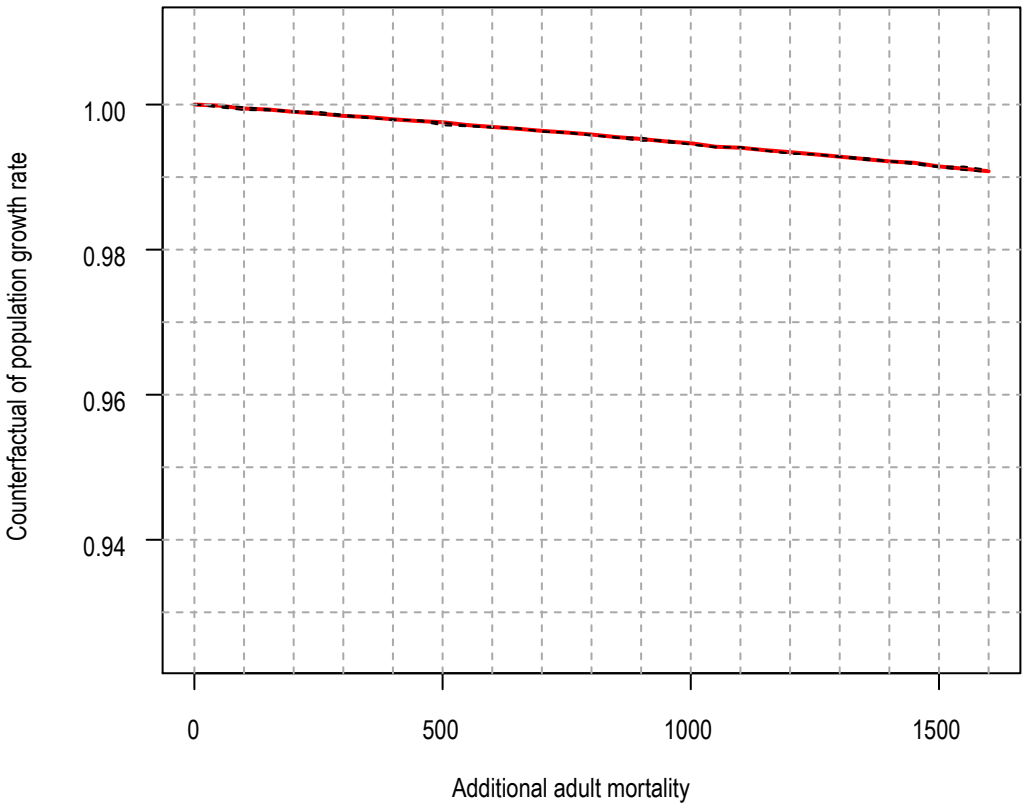


Figure A1_12.4. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

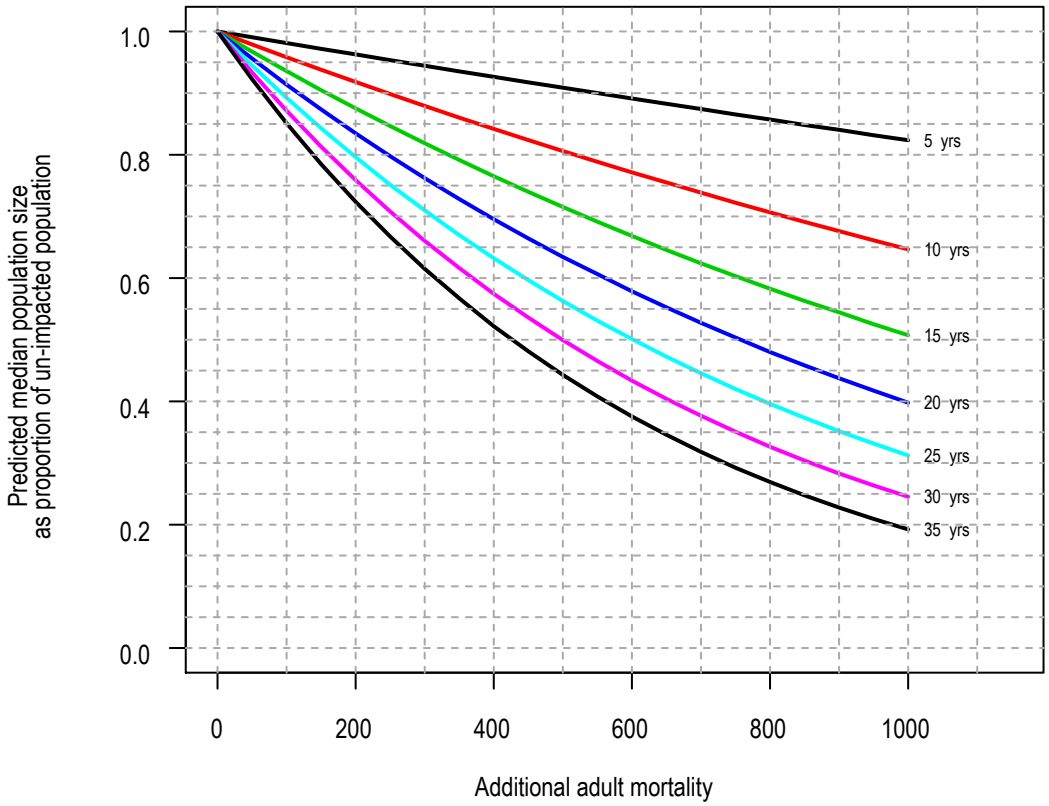


Figure A1_13.1. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

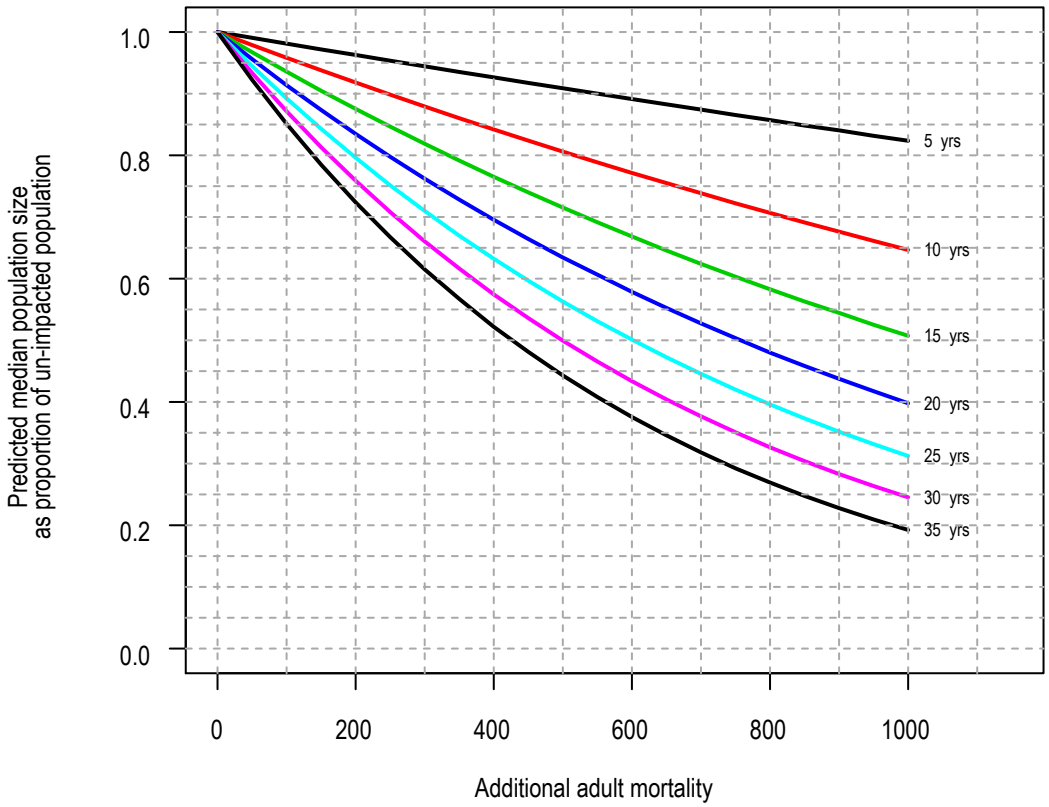


Figure A1_13.2. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

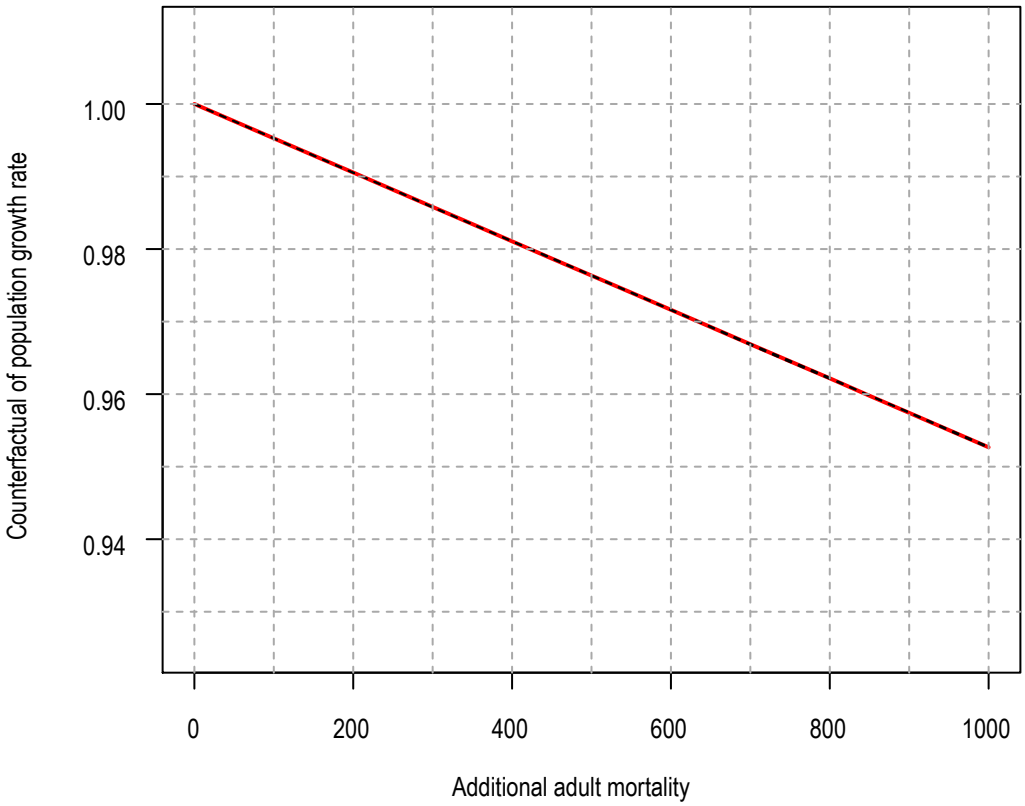


Figure A1_13.3. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

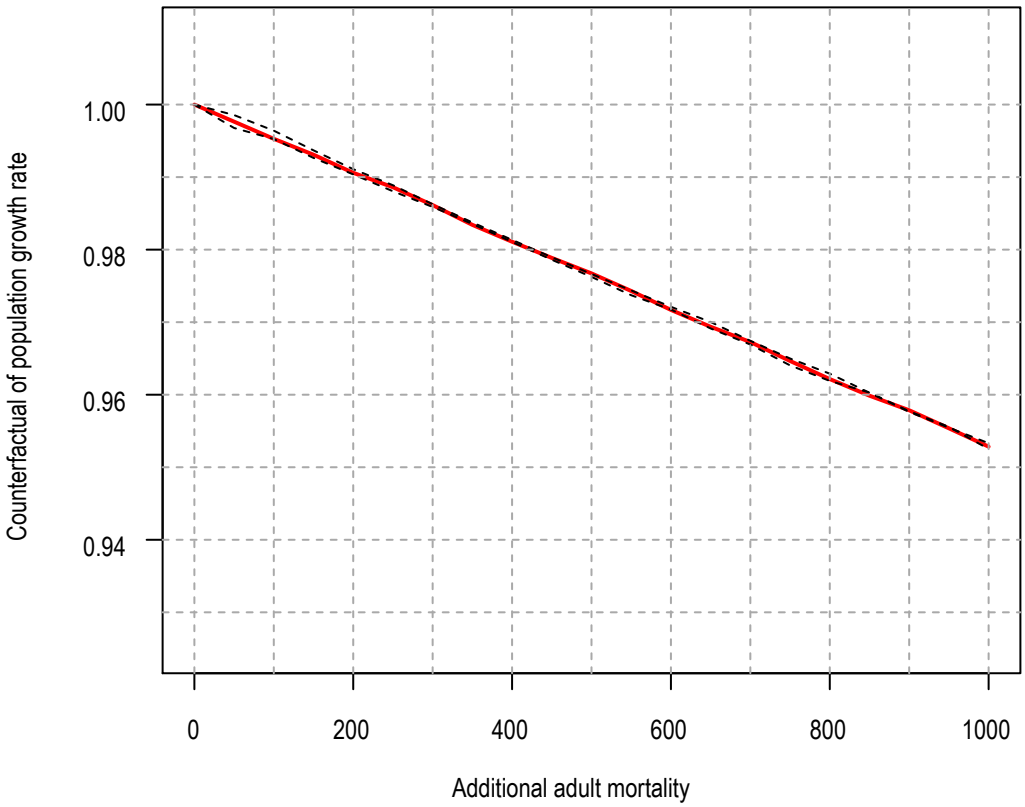


Figure A1_13.4. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

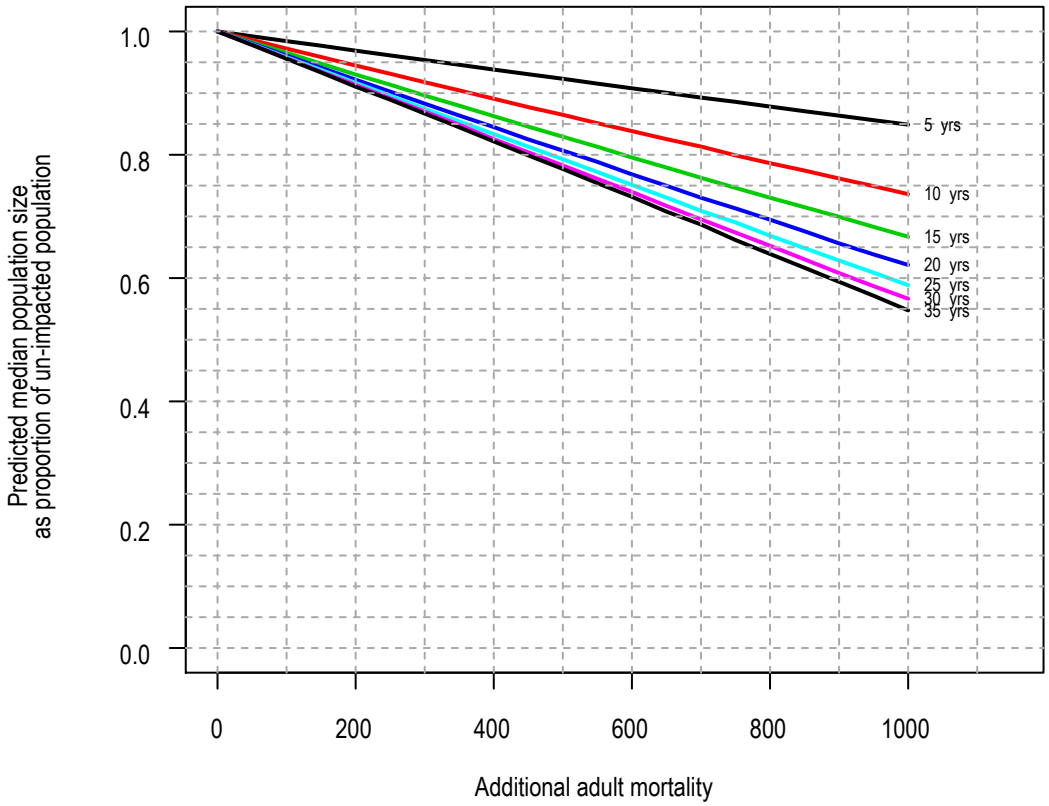


Figure A1_14.1. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

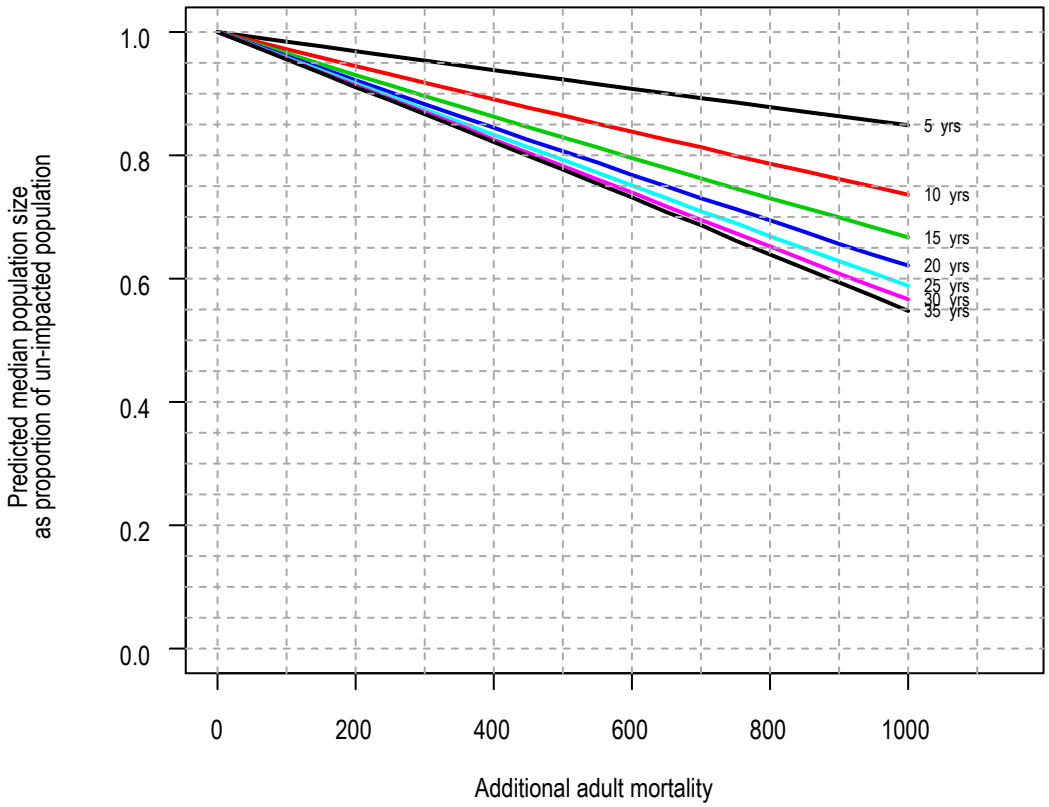


Figure A1_14.2. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

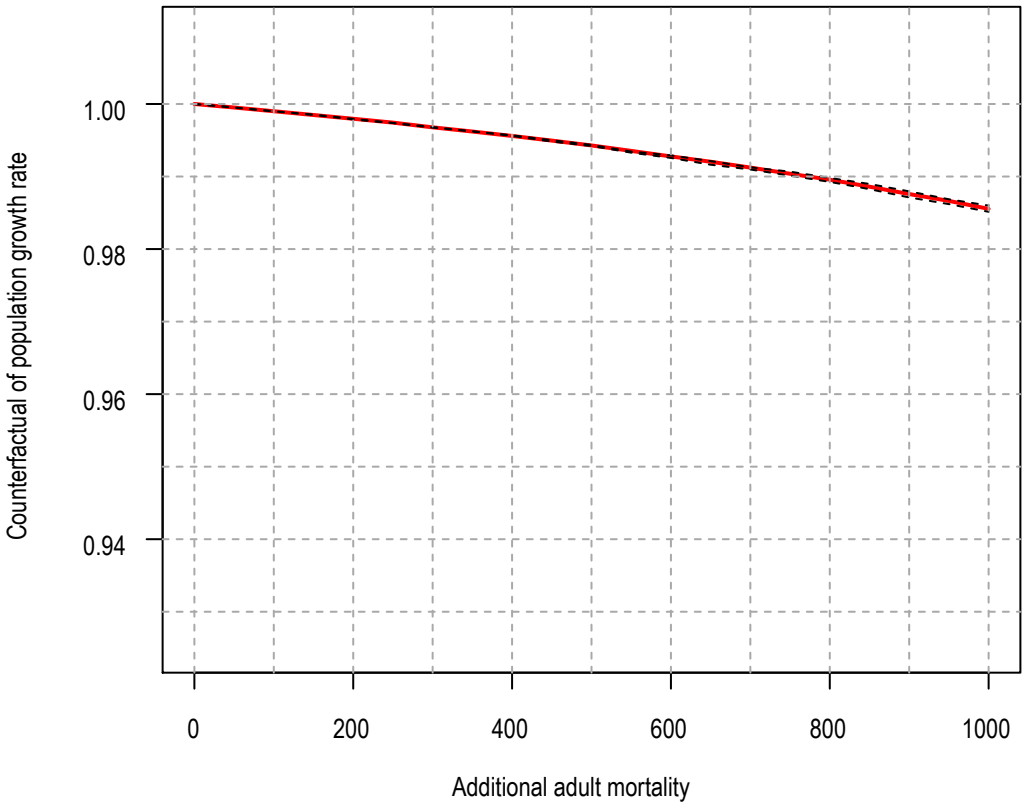


Figure A1_14.3. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

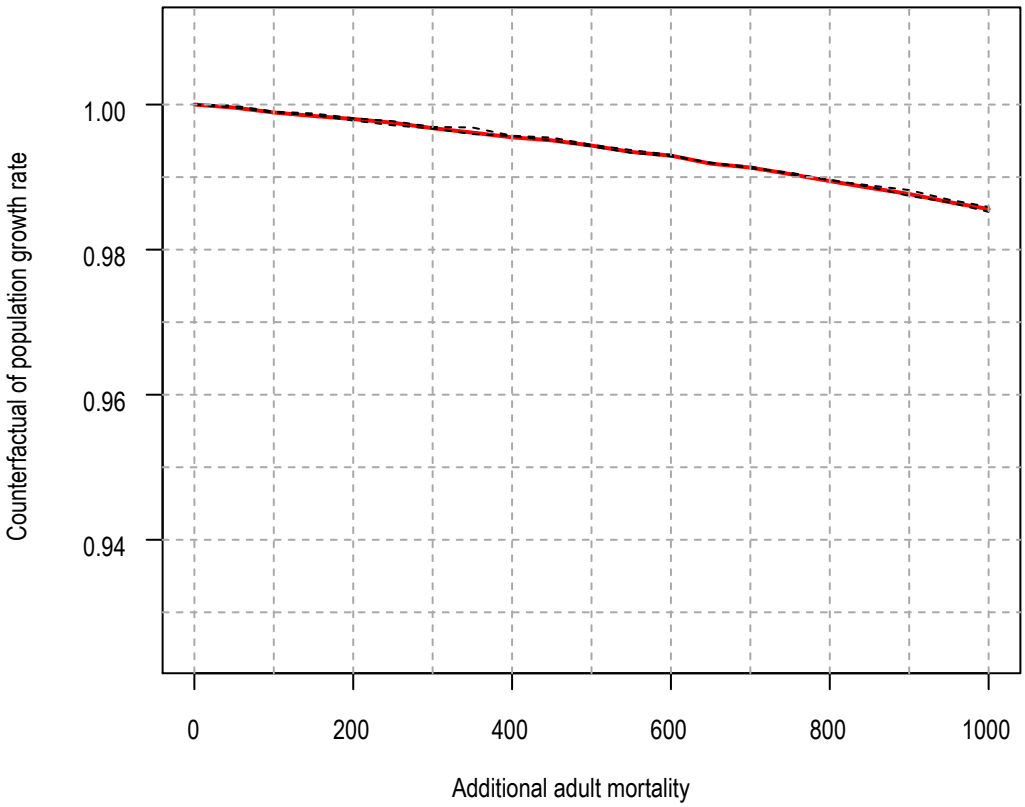


Figure A1_14.4. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

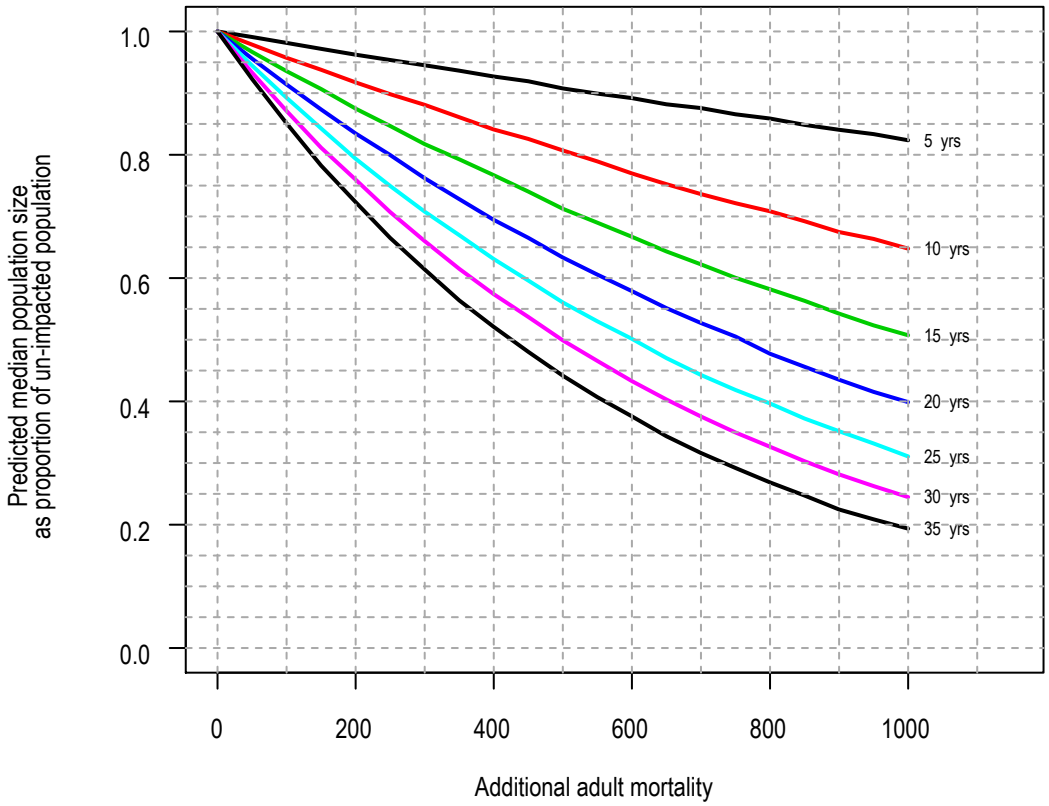


Figure A1_15.1. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

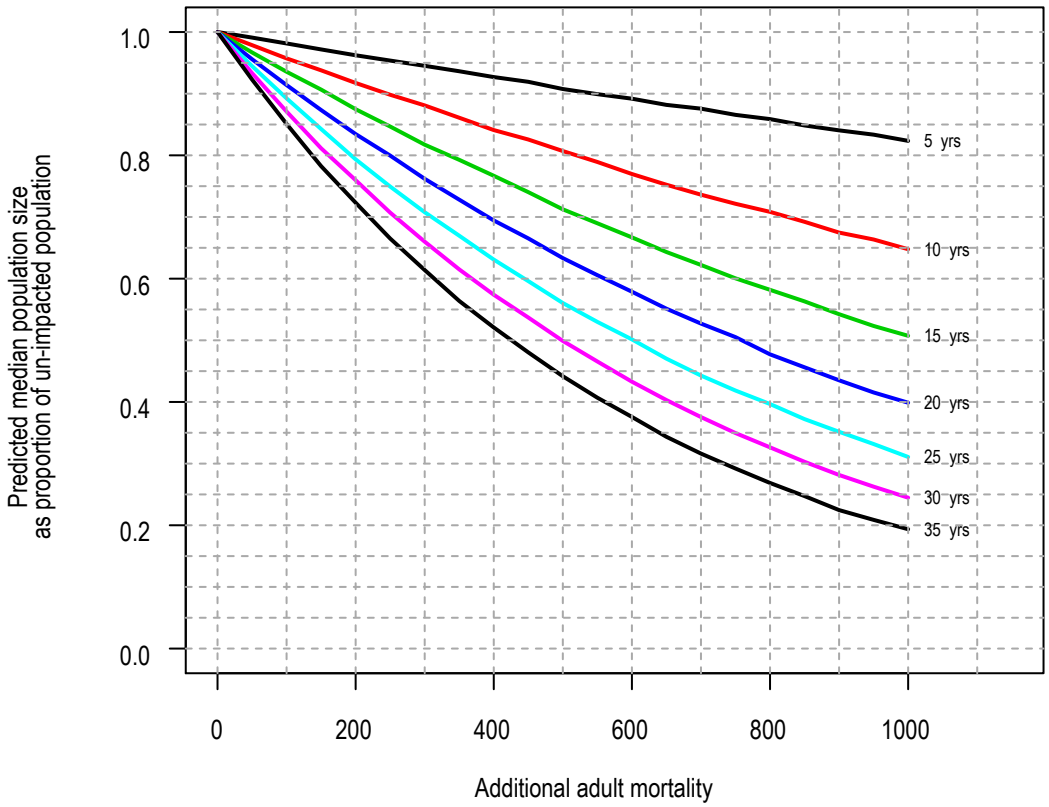


Figure A1_15.2. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

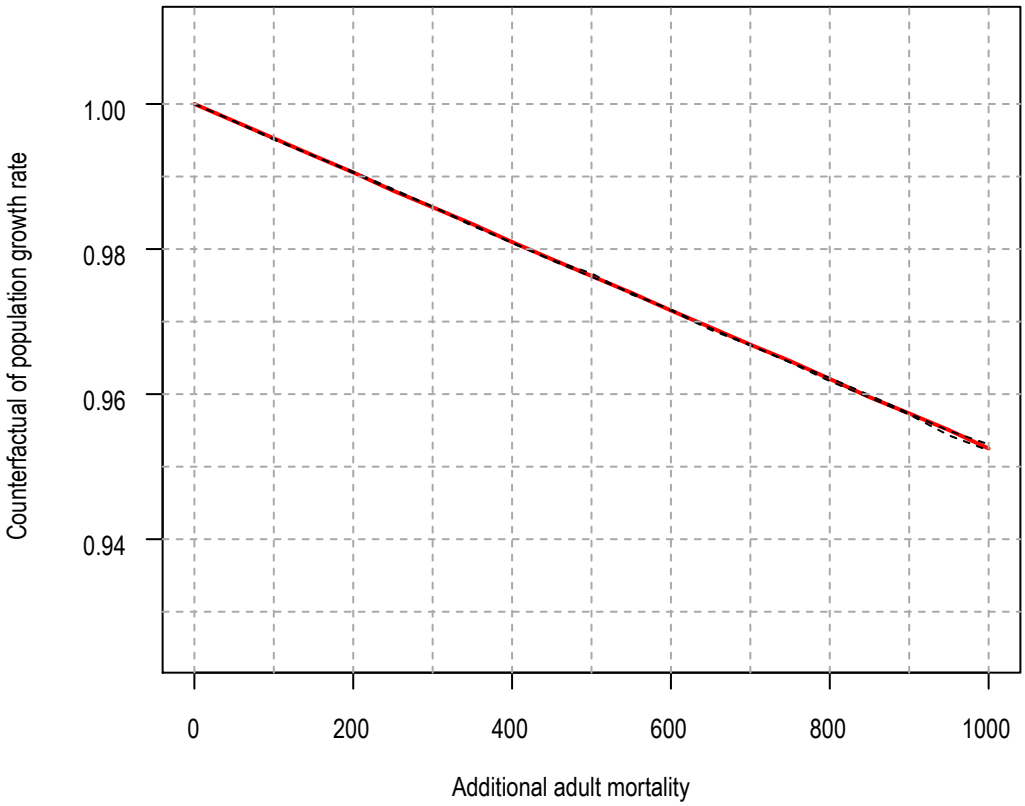


Figure A1_15.3. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

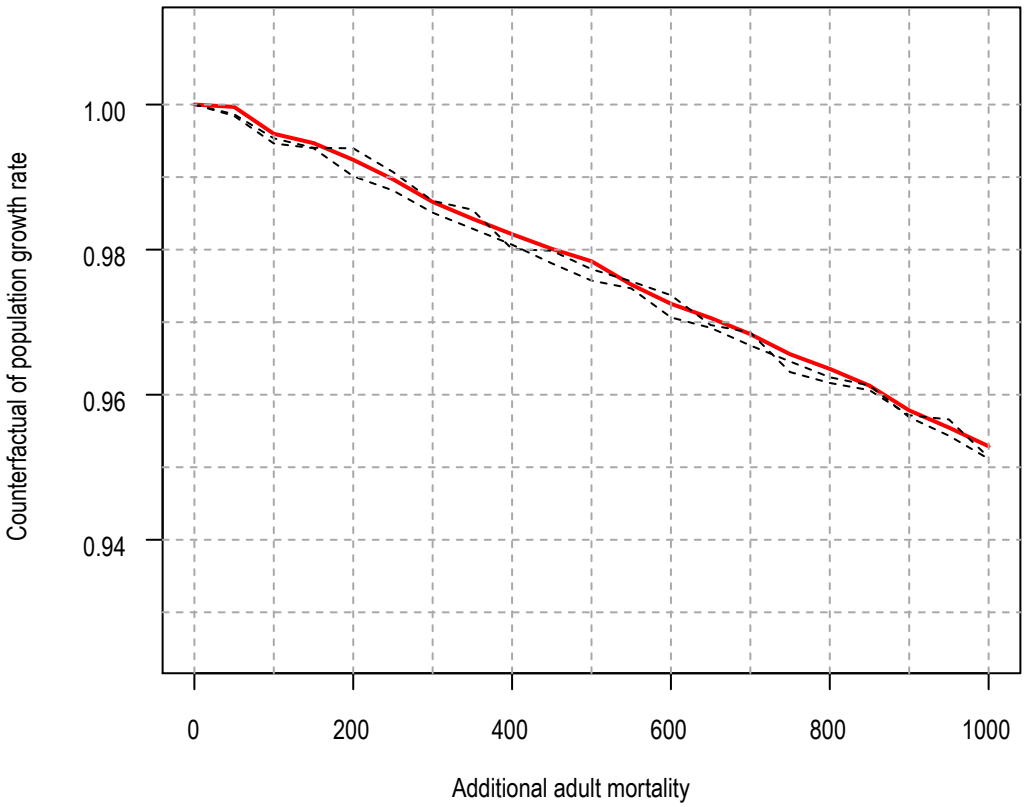


Figure A1_15.4. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

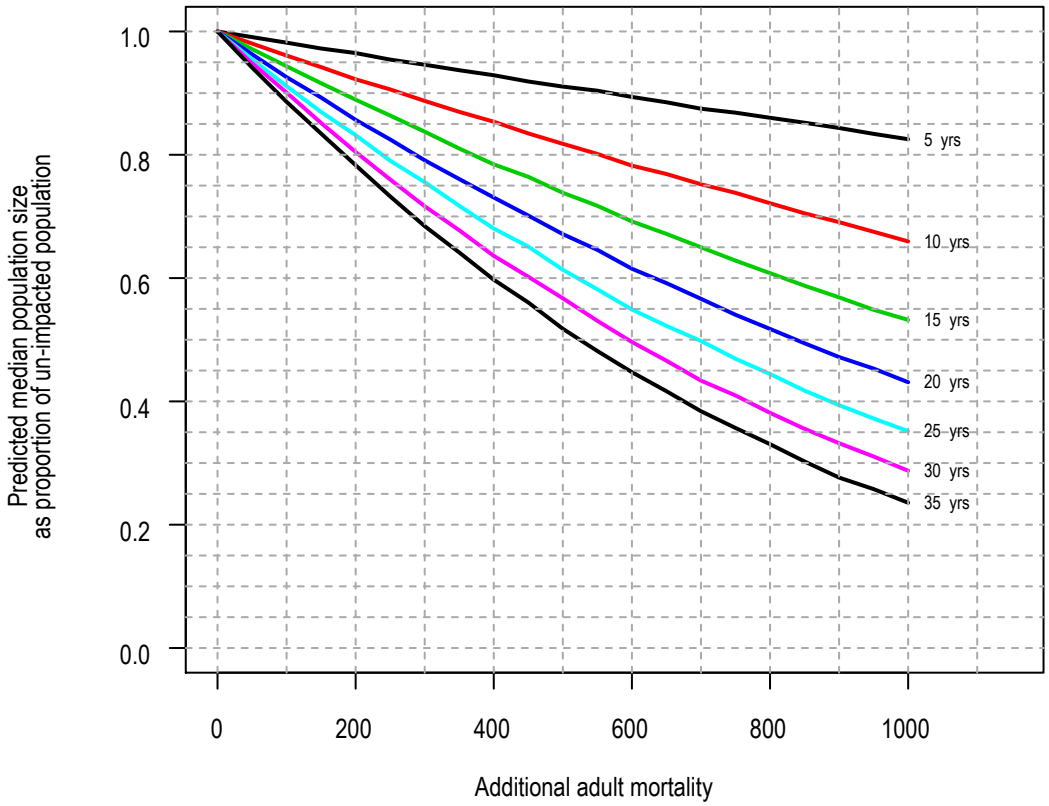


Figure A1_16.1. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

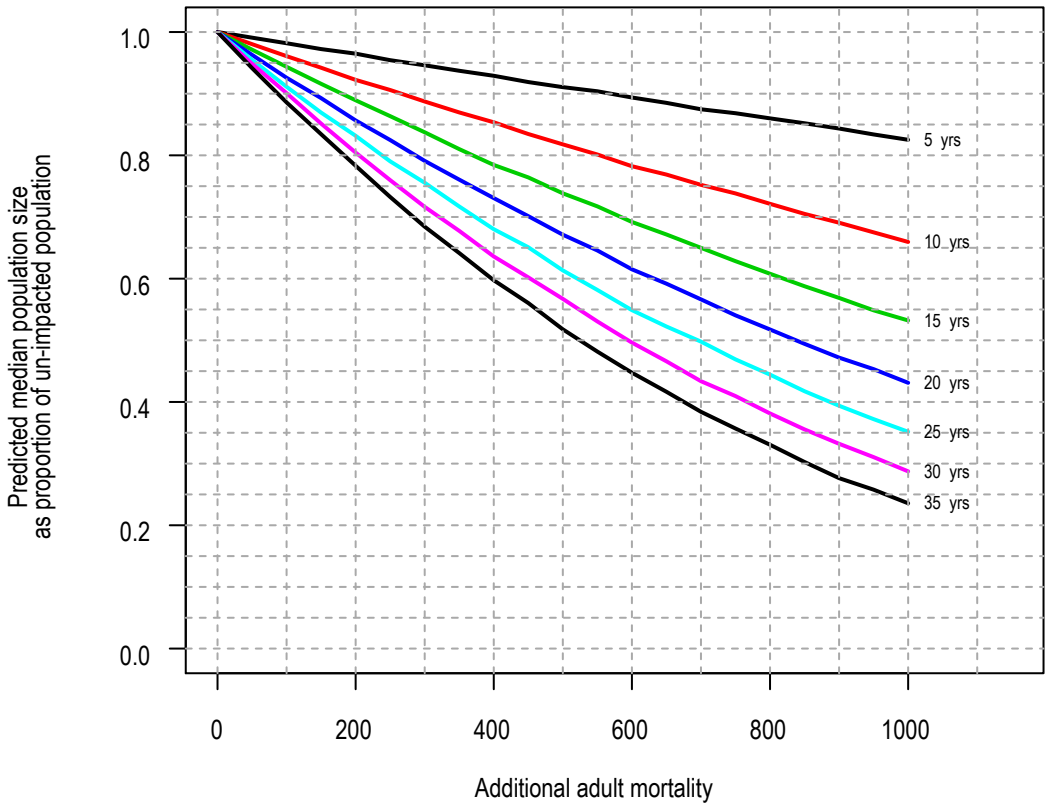


Figure A1_16.2. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

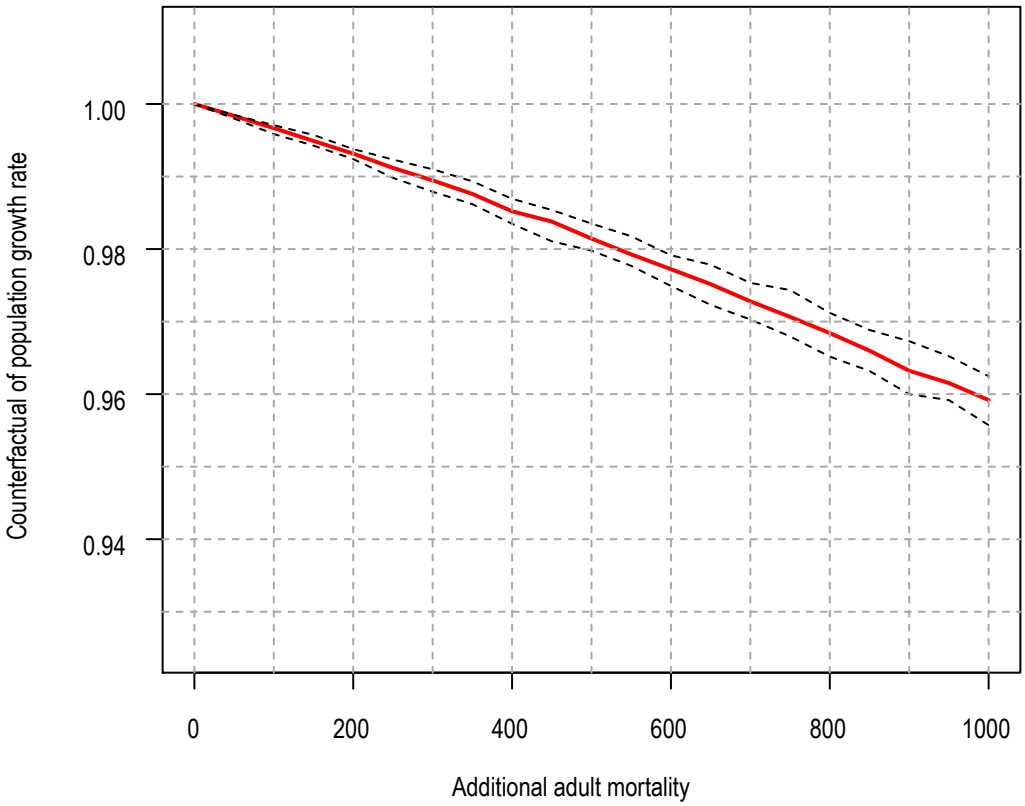


Figure A1_16.3. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

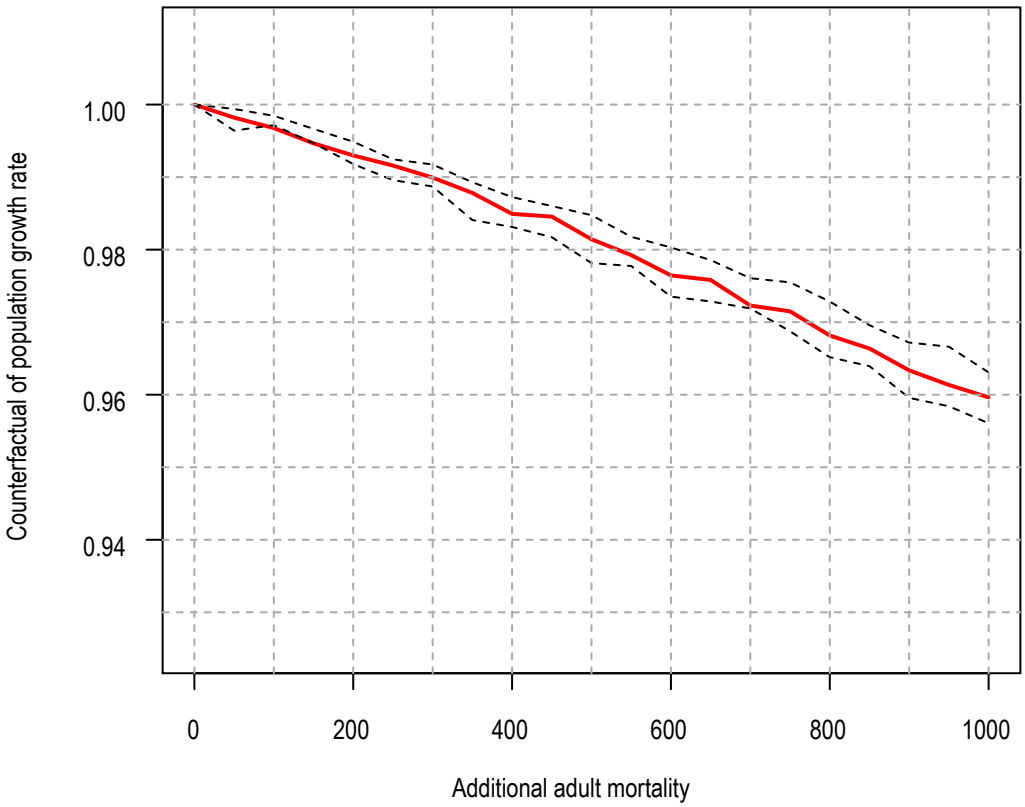


Figure A1_16.4. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

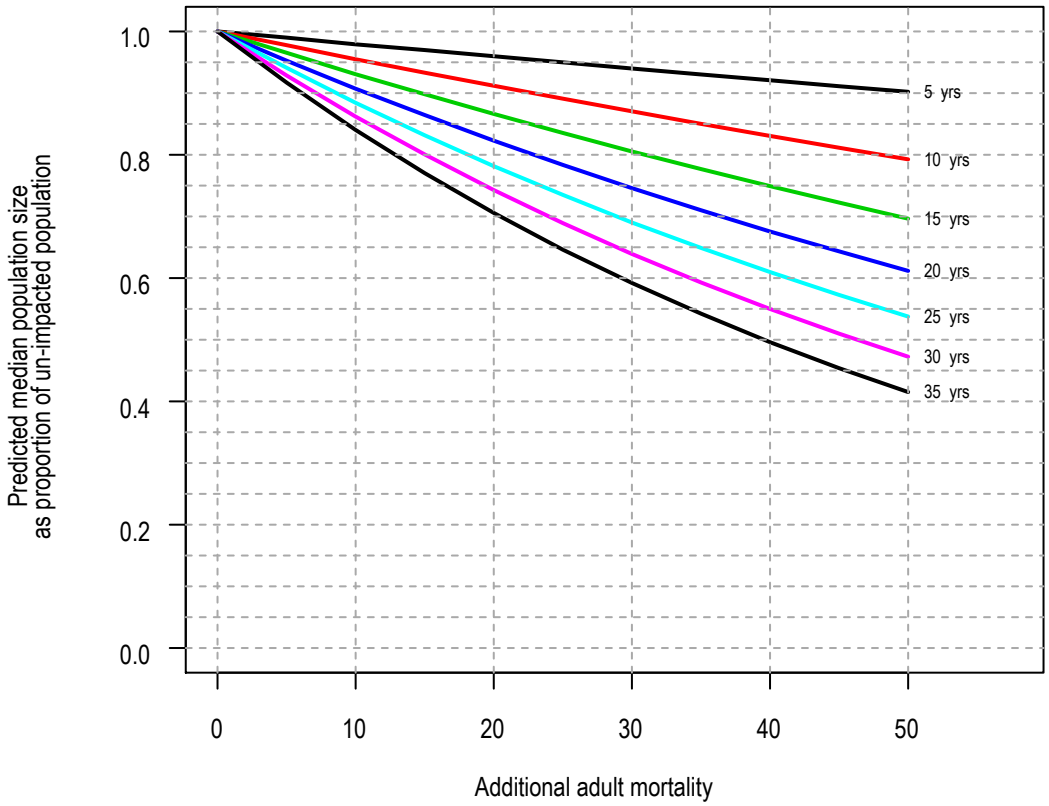


Figure A1_17.1. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

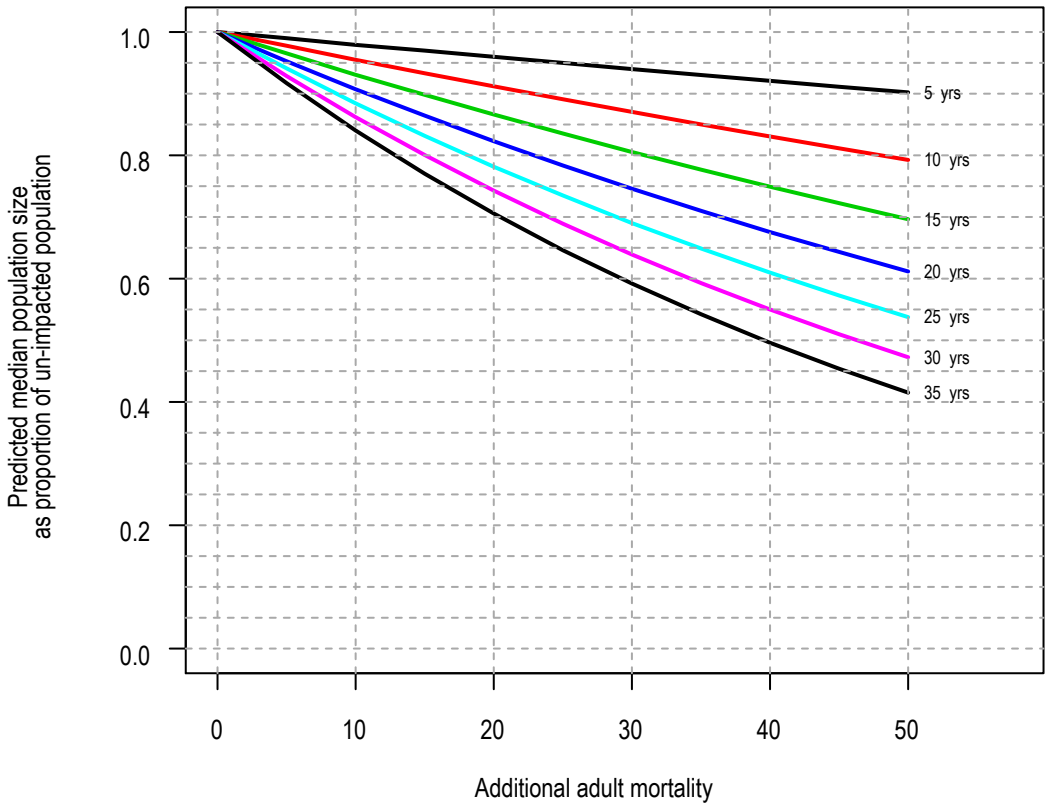


Figure A1_17.2. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

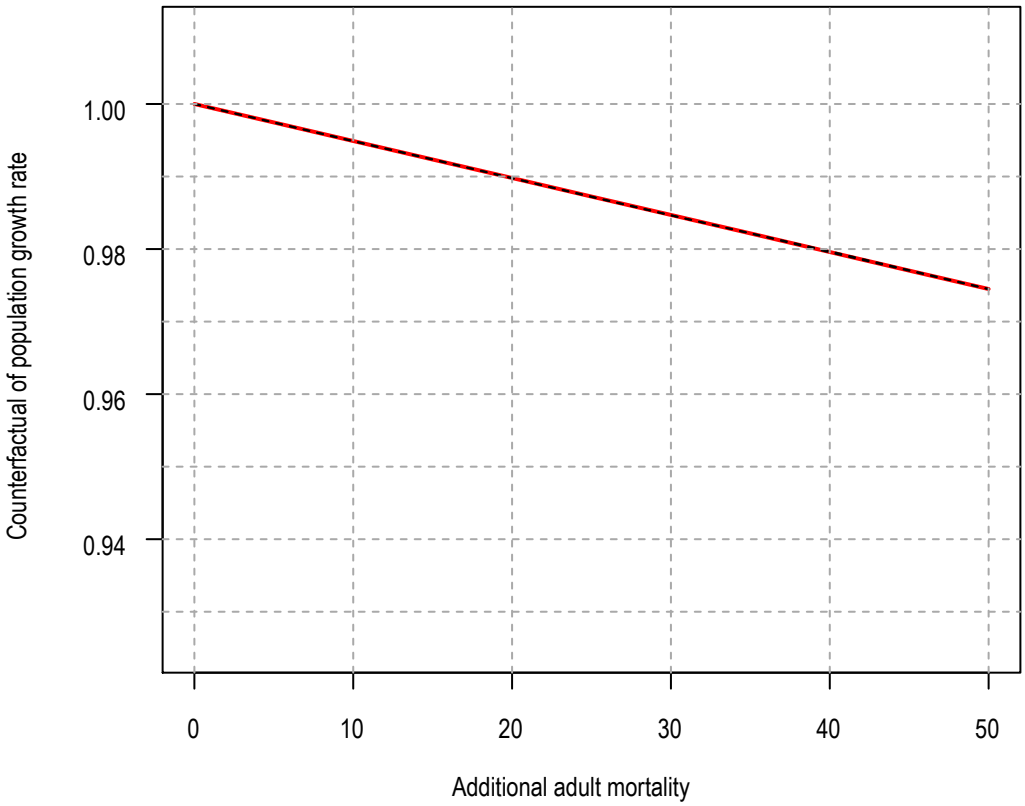


Figure A1_17.3. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

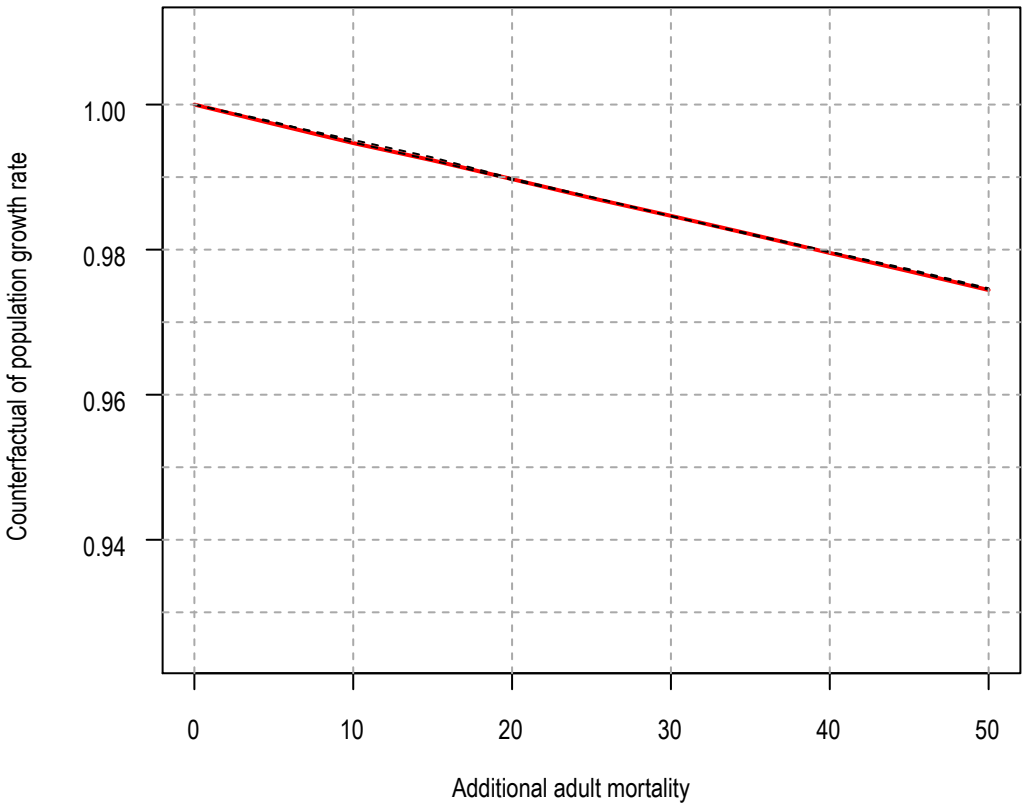


Figure A1_17.4. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

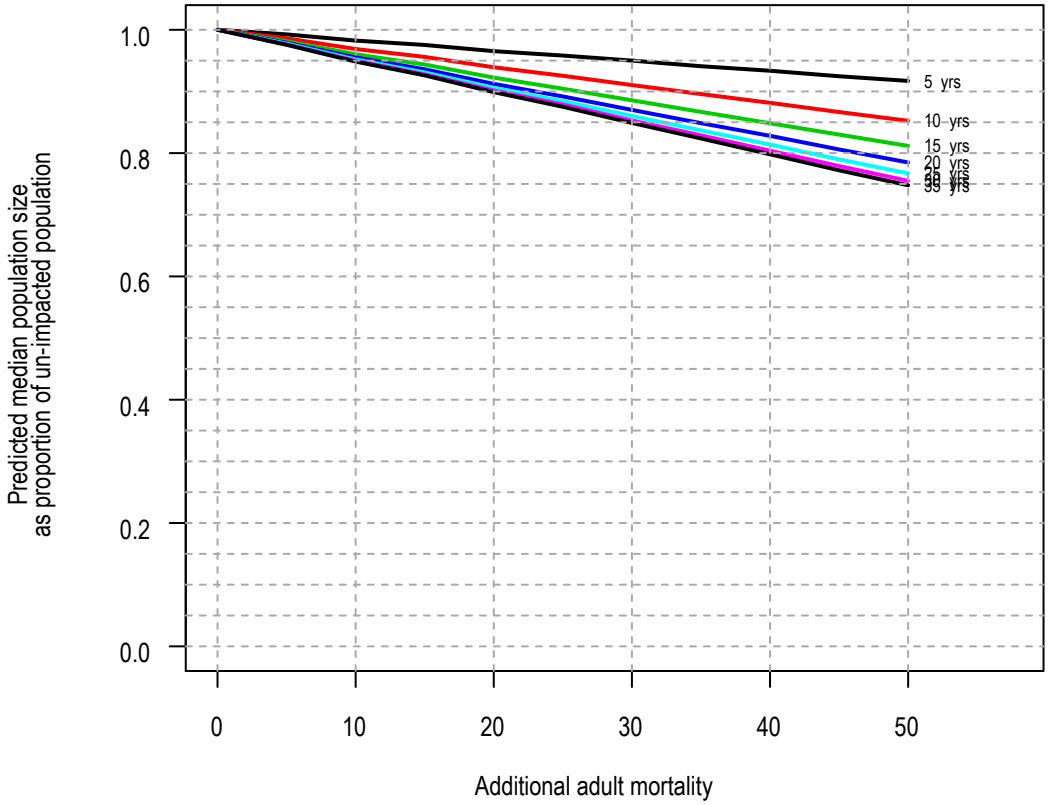


Figure A1_18.1. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

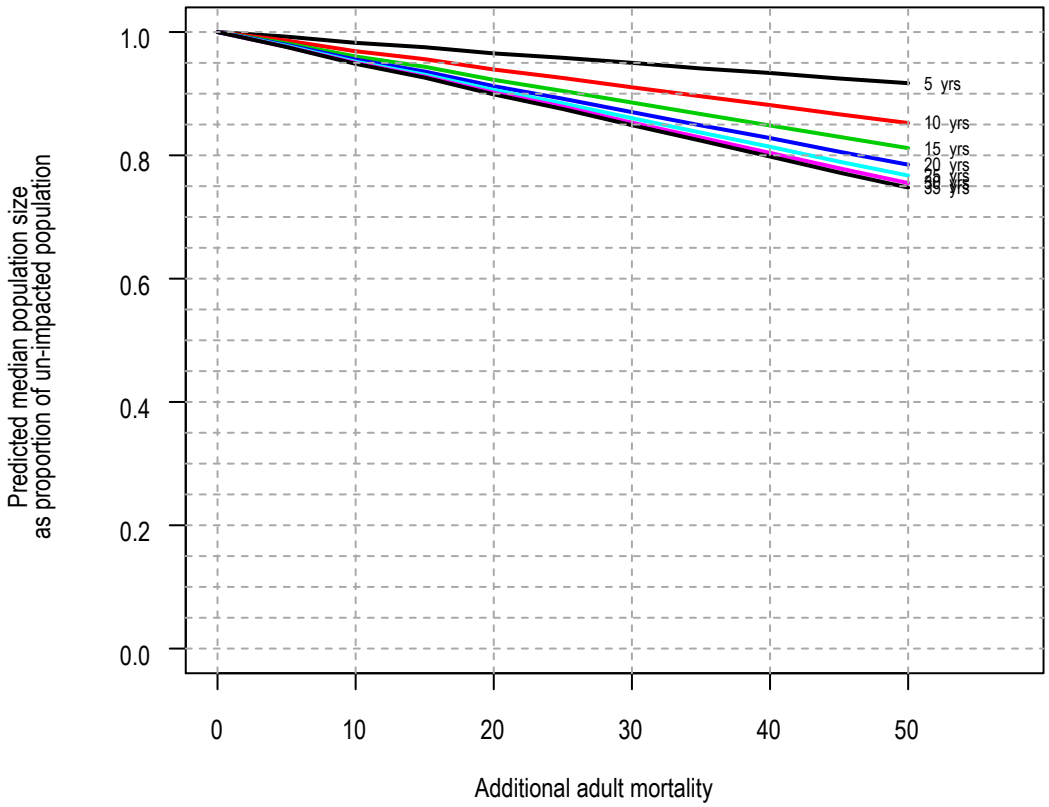


Figure A1_18.2. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

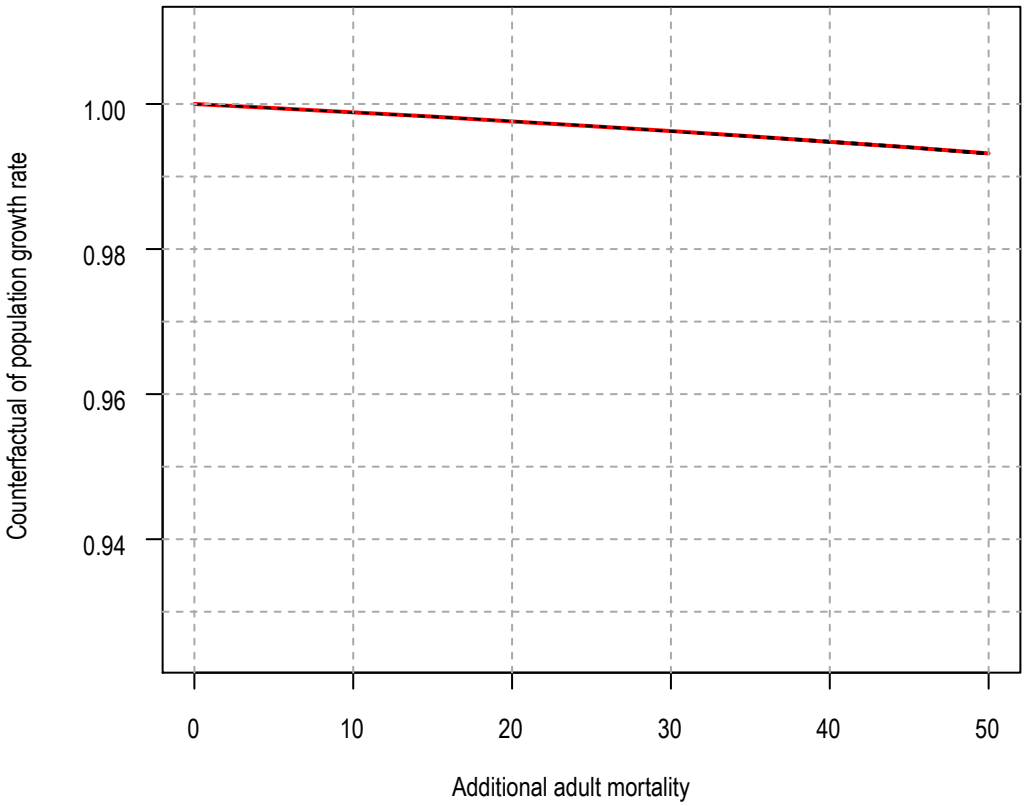


Figure A1_18.3. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

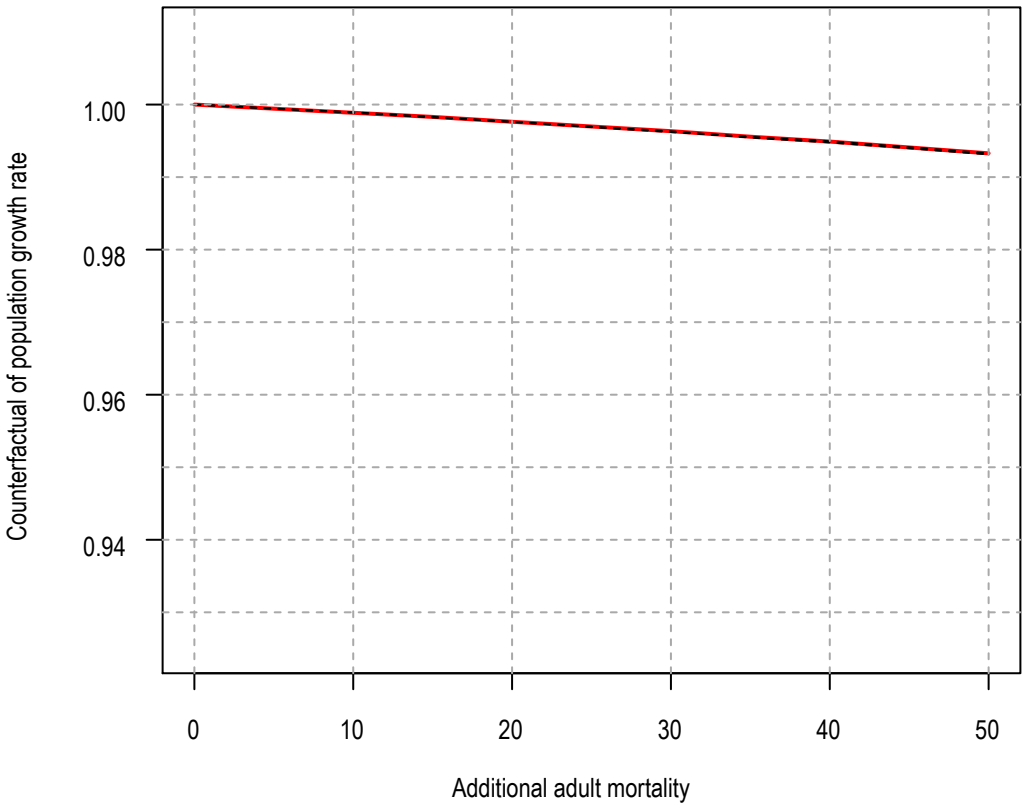


Figure A1_18.4. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

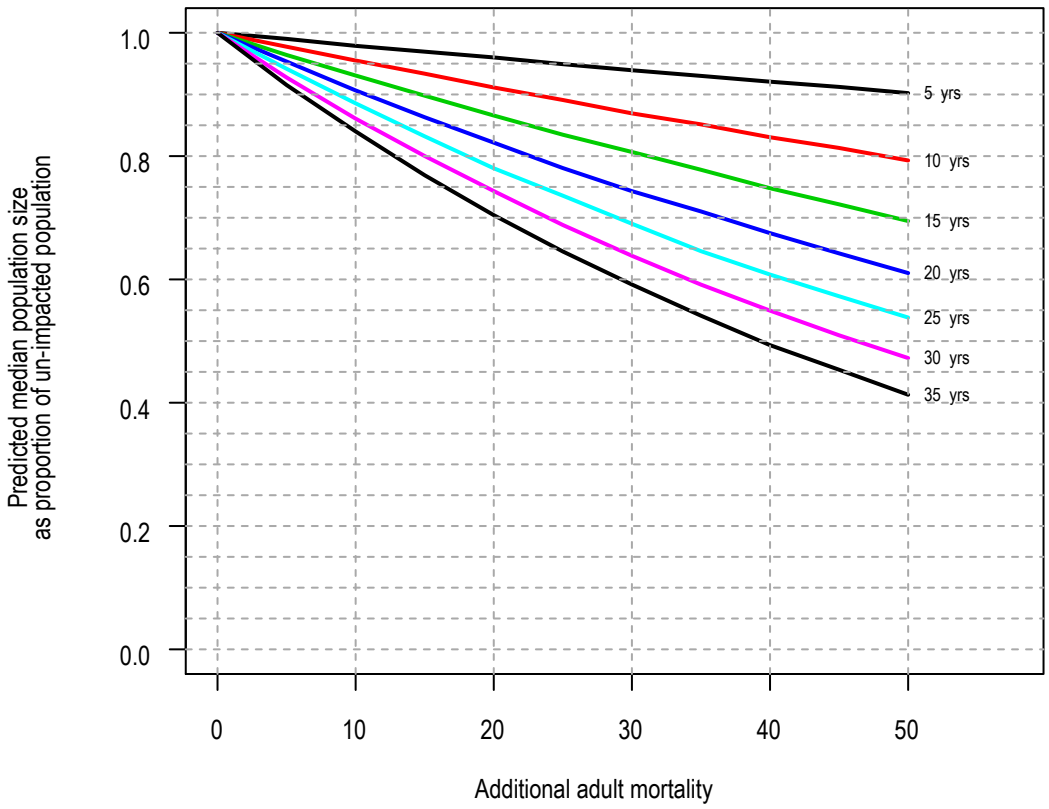


Figure A1_19.1. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

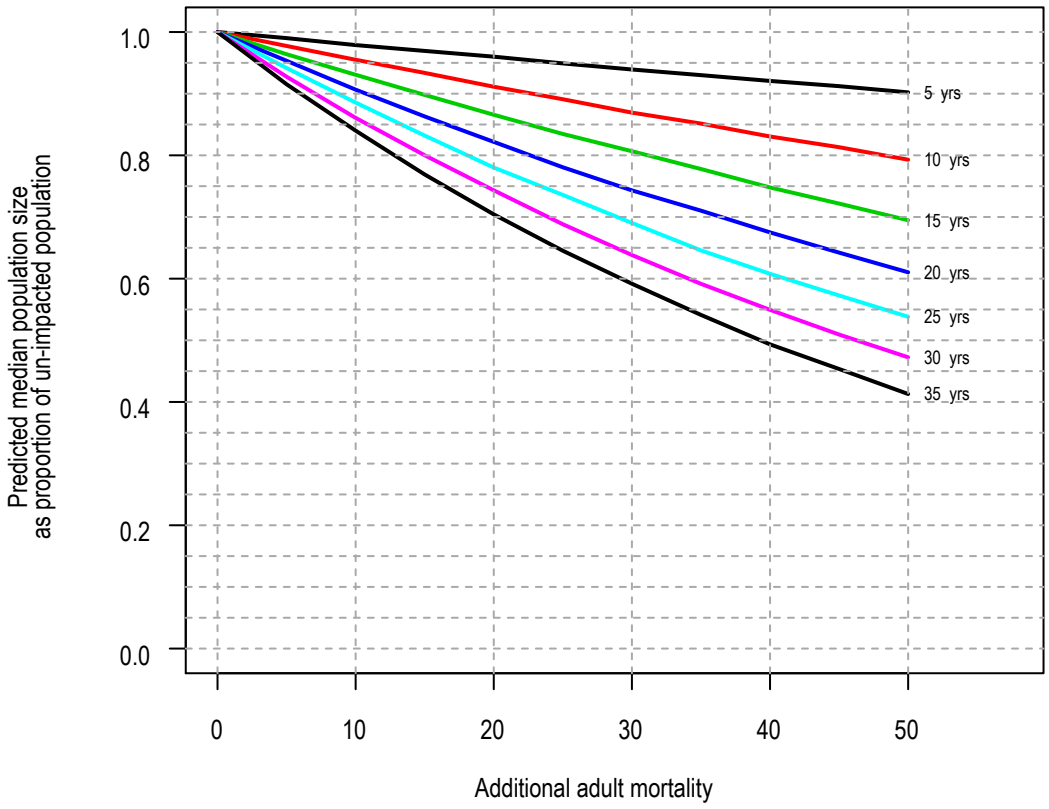


Figure A1_19.2. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

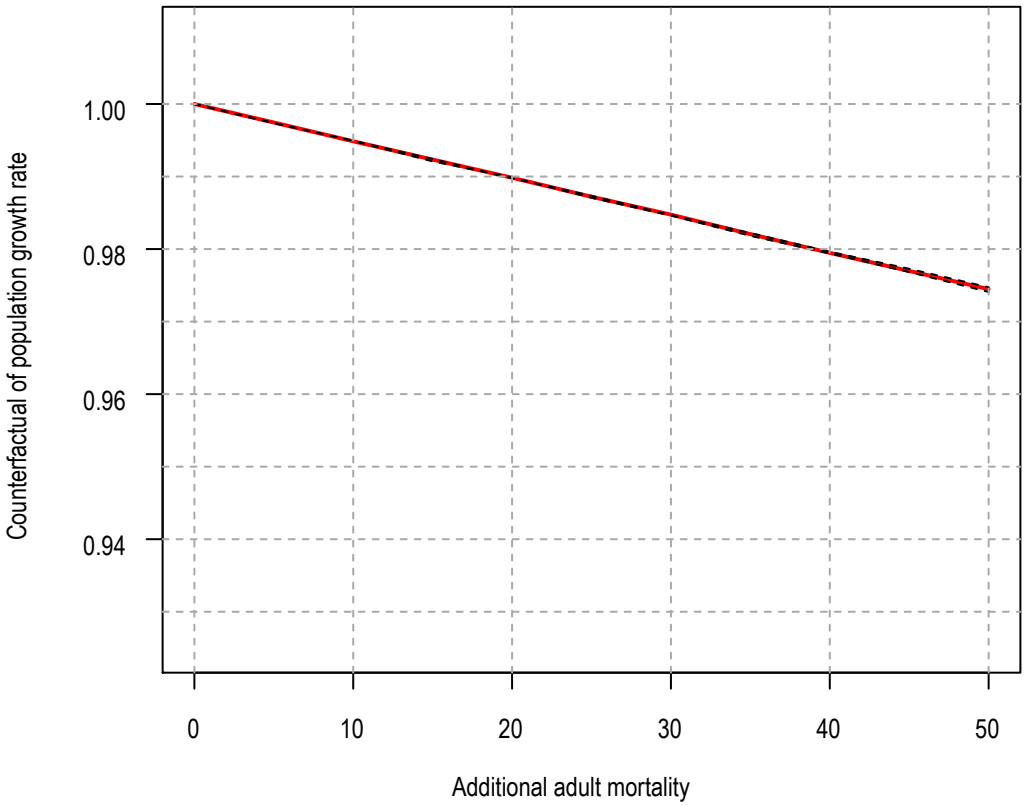


Figure A1_19.3. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

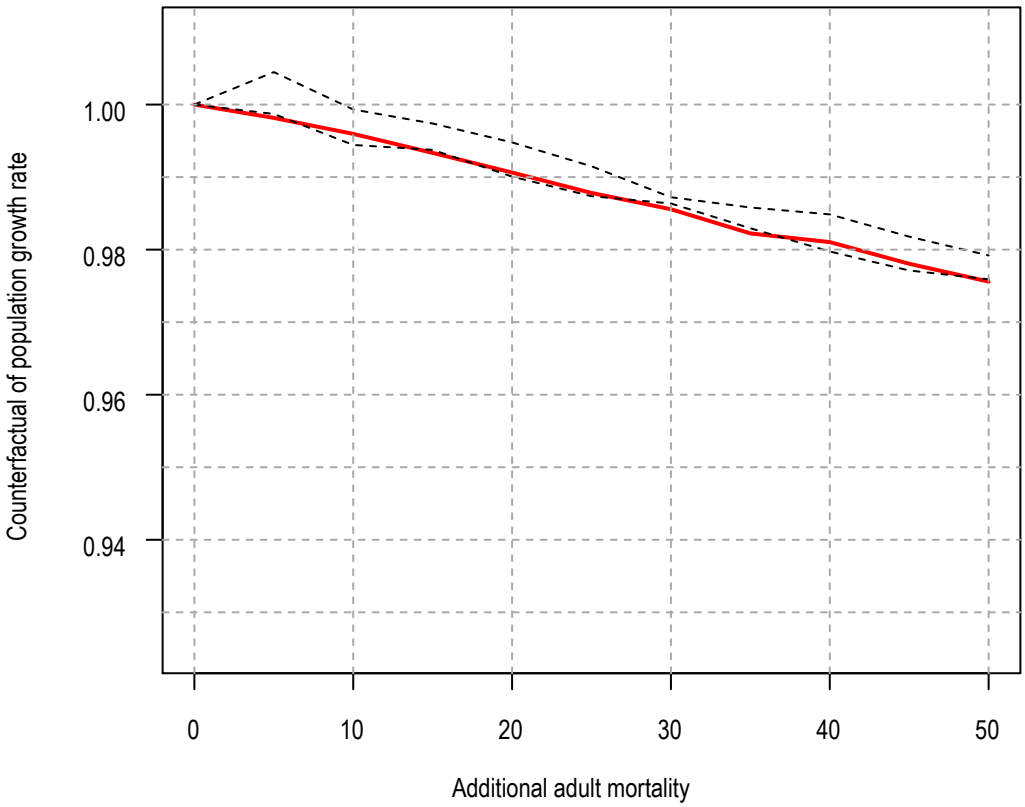


Figure A1_19.4. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

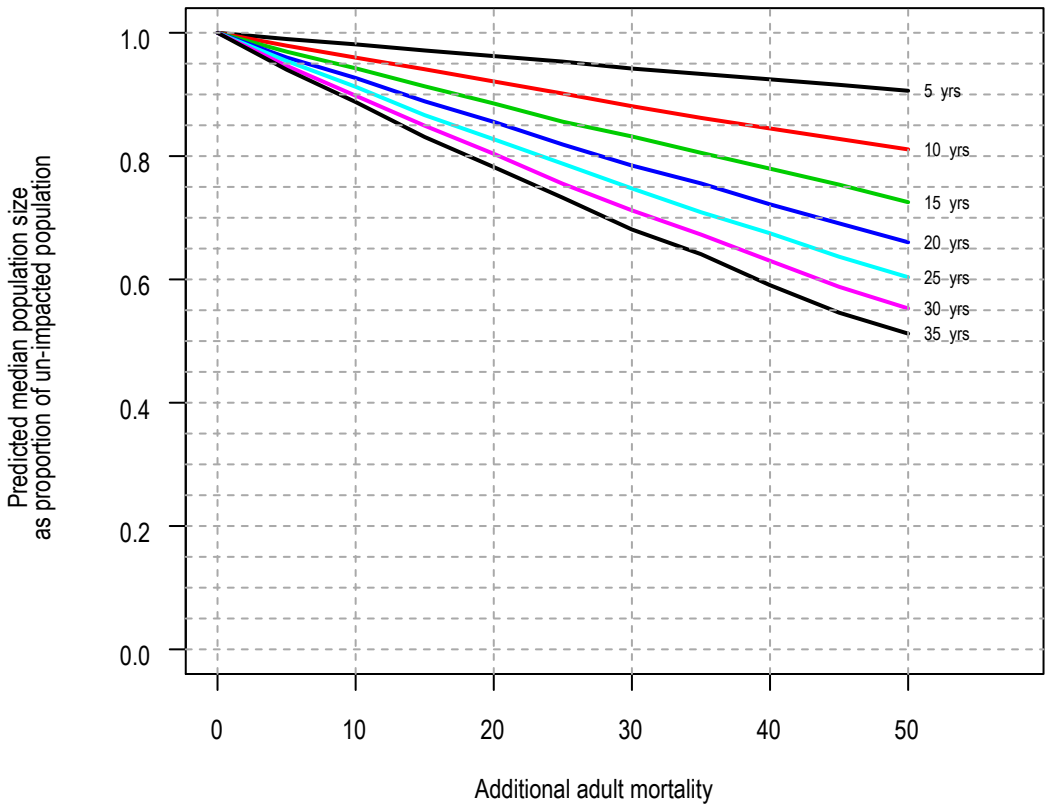


Figure A1_20.1. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

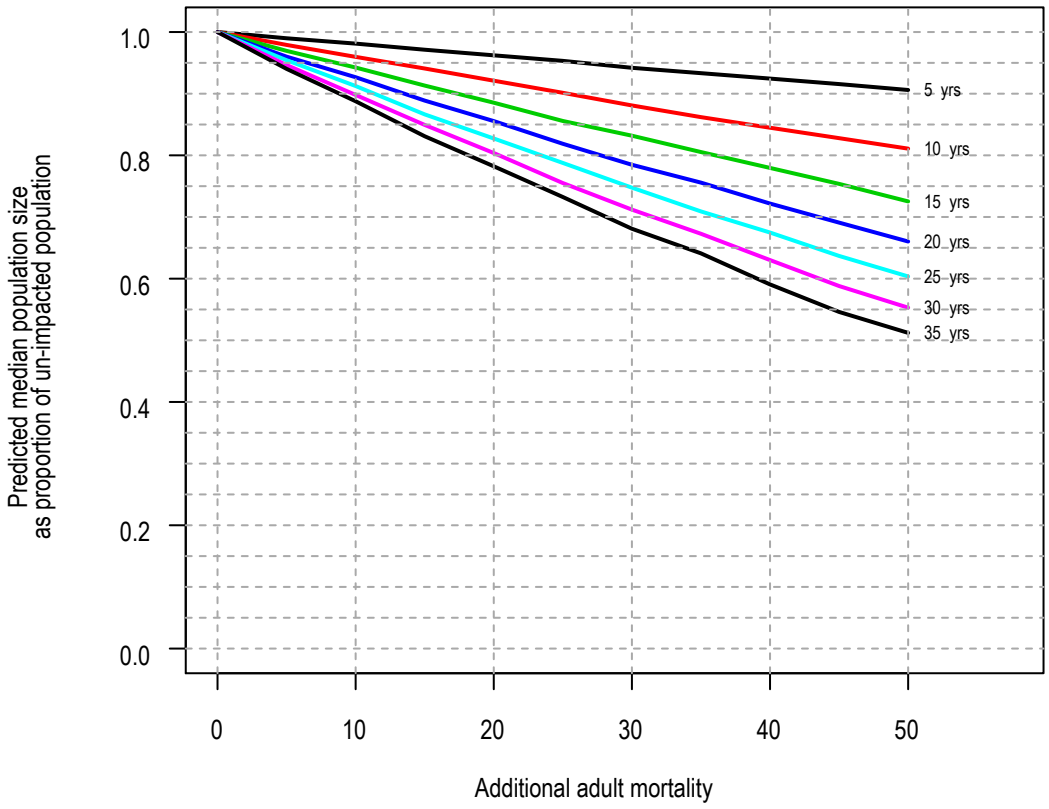


Figure A1_20.2. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

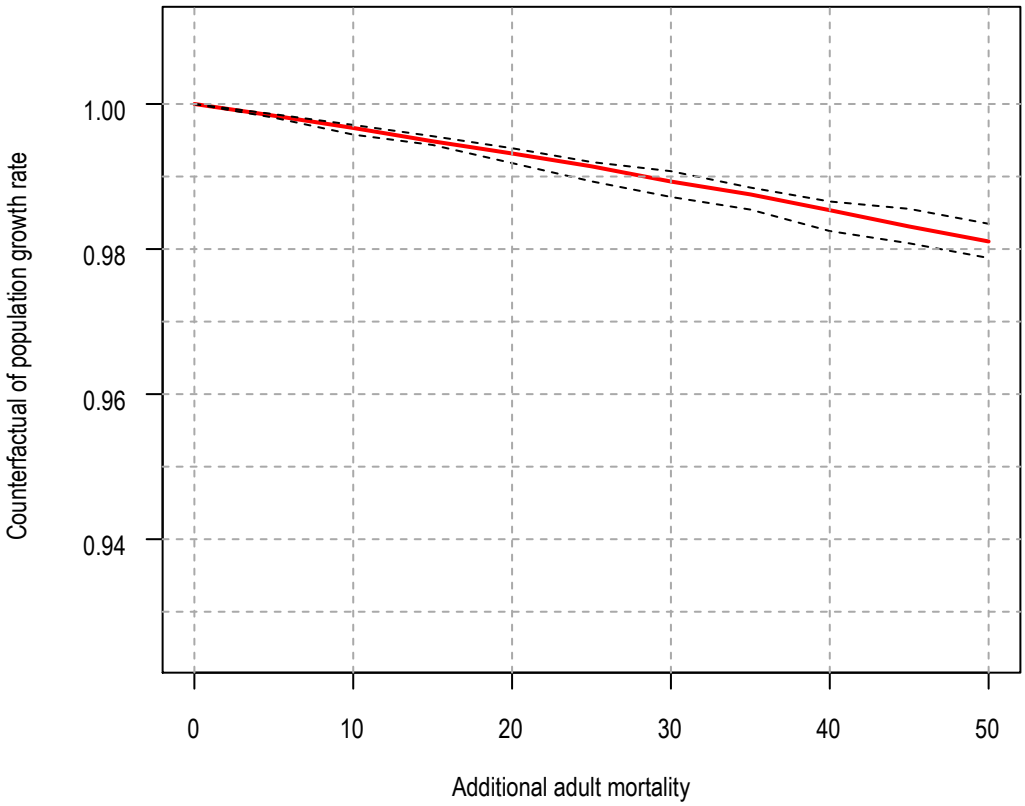


Figure A1_20.3. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

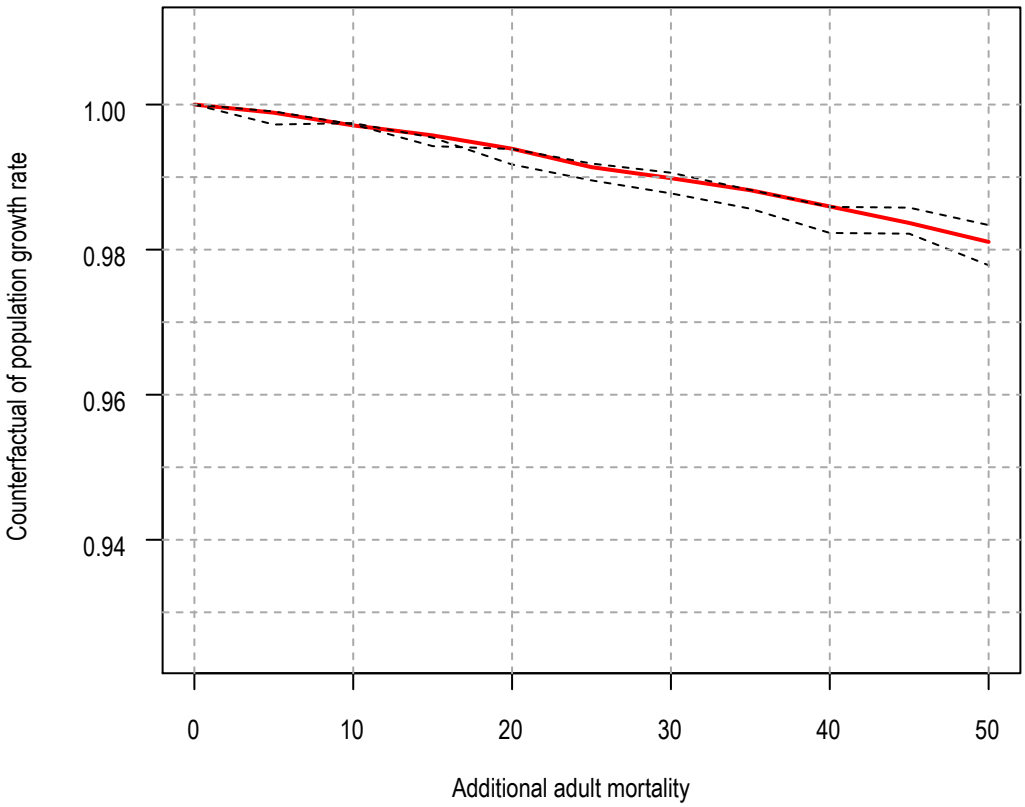


Figure A1_20.4. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

# 10. ANNEX 2 – Tables

Key to table numbers.

| Species | Density dependent | Rate set | Counterfactual of population size | | Counterfactual of population growth rate | |
|---|---|---|---|---|---|---|
| | | | Matched | Non-matched | Matched | Non-matched |
| Gannet | No | 1 | 1.1 | 1.2 | 1.3 | 1.4 |
| | Yes | 1 | 2.1 | 2.2 | 2.3 | 2.4 |
| | No | 2 | 3.1 | 3.2 | 3.3 | 3.4 |
| | Yes | 2 | 4.1 | 4.2 | 4.3 | 4.4 |
| Kittiwake | No | 1 | 5.1 | 5.2 | 5.3 | 5.4 |
| | Yes | 1 | 6.1 | 6.2 | 6.3 | 6.4 |
| | No | 2 | 7.1 | 7.2 | 7.3 | 7.4 |
| | Yes | 2 | 8.1 | 8.2 | 8.3 | 8.4 |
| Guillemot | No | 1 | 9.1 | 9.2 | 9.3 | 9.4 |
| | Yes | 1 | 10.1 | 10.2 | 10.3 | 10.4 |
| | No | 2 | 11.1 | 11.2 | 11.3 | 11.4 |
| | Yes | 2 | 12.1 | 12.2 | 12.3 | 12.4 |
| Razorbill | No | 1 | 13.1 | 13.2 | 13.3 | 13.4 |
| | Yes | 1 | 14.1 | 14.2 | 14.3 | 14.4 |
| | No | 2 | 15.1 | 15.2 | 15.3 | 15.4 |
| | Yes | 2 | 16.1 | 16.2 | 16.3 | 16.4 |
| Puffin | No | 1 | 17.1 | 17.2 | 17.3 | 17.4 |
| | Yes | 1 | 18.1 | 18.2 | 18.3 | 18.4 |
| | No | 2 | 19.1 | 19.2 | 19.3 | 19.4 |
| | Yes | 2 | 20.1 | 20.2 | 20.3 | 20.4 |

Table A2_1.1. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.996 | 0.990 | 0.984 | 0.979 | 0.973 | 0.968 | 0.962 |
| 50 | 0.991 | 0.980 | 0.969 | 0.958 | 0.947 | 0.937 | 0.926 |
| 75 | 0.986 | 0.970 | 0.953 | 0.937 | 0.922 | 0.906 | 0.891 |
| 100 | 0.982 | 0.960 | 0.939 | 0.918 | 0.897 | 0.877 | 0.857 |
| 125 | 0.978 | 0.950 | 0.924 | 0.898 | 0.873 | 0.848 | 0.825 |
| 150 | 0.973 | 0.940 | 0.909 | 0.879 | 0.849 | 0.821 | 0.793 |
| 175 | 0.969 | 0.931 | 0.895 | 0.860 | 0.826 | 0.794 | 0.763 |
| 200 | 0.965 | 0.921 | 0.881 | 0.842 | 0.804 | 0.768 | 0.734 |
| 225 | 0.960 | 0.912 | 0.867 | 0.824 | 0.782 | 0.743 | 0.706 |
| 250 | 0.956 | 0.903 | 0.853 | 0.806 | 0.761 | 0.719 | 0.680 |
| 275 | 0.951 | 0.894 | 0.840 | 0.789 | 0.741 | 0.696 | 0.654 |
| 300 | 0.947 | 0.885 | 0.826 | 0.772 | 0.720 | 0.673 | 0.628 |
| 325 | 0.942 | 0.875 | 0.813 | 0.755 | 0.701 | 0.651 | 0.605 |
| 350 | 0.938 | 0.866 | 0.800 | 0.739 | 0.681 | 0.629 | 0.581 |
| 375 | 0.934 | 0.857 | 0.787 | 0.723 | 0.663 | 0.609 | 0.559 |
| 400 | 0.930 | 0.848 | 0.775 | 0.707 | 0.646 | 0.589 | 0.537 |
| 425 | 0.926 | 0.840 | 0.762 | 0.692 | 0.628 | 0.570 | 0.517 |
| 450 | 0.921 | 0.831 | 0.751 | 0.677 | 0.610 | 0.552 | 0.497 |
| 475 | 0.917 | 0.823 | 0.738 | 0.662 | 0.593 | 0.533 | 0.478 |
| 500 | 0.912 | 0.814 | 0.726 | 0.647 | 0.578 | 0.515 | 0.459 |

Table A2_1.2. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.997 | 0.989 | 0.982 | 0.984 | 0.977 | 0.969 | 0.965 |
| 50 | 0.993 | 0.978 | 0.971 | 0.963 | 0.949 | 0.939 | 0.928 |
| 75 | 0.986 | 0.969 | 0.949 | 0.942 | 0.921 | 0.904 | 0.890 |
| 100 | 0.983 | 0.959 | 0.941 | 0.926 | 0.902 | 0.882 | 0.863 |
| 125 | 0.980 | 0.949 | 0.924 | 0.903 | 0.876 | 0.852 | 0.827 |
| 150 | 0.974 | 0.937 | 0.907 | 0.886 | 0.852 | 0.827 | 0.800 |
| 175 | 0.968 | 0.929 | 0.893 | 0.863 | 0.828 | 0.798 | 0.765 |
| 200 | 0.964 | 0.920 | 0.880 | 0.844 | 0.805 | 0.770 | 0.737 |
| 225 | 0.962 | 0.911 | 0.866 | 0.826 | 0.784 | 0.746 | 0.708 |
| 250 | 0.957 | 0.904 | 0.855 | 0.812 | 0.767 | 0.724 | 0.683 |
| 275 | 0.953 | 0.892 | 0.840 | 0.793 | 0.743 | 0.699 | 0.659 |
| 300 | 0.946 | 0.883 | 0.823 | 0.776 | 0.724 | 0.680 | 0.635 |
| 325 | 0.943 | 0.874 | 0.813 | 0.759 | 0.708 | 0.658 | 0.615 |
| 350 | 0.940 | 0.865 | 0.799 | 0.744 | 0.686 | 0.633 | 0.587 |
| 375 | 0.934 | 0.853 | 0.786 | 0.723 | 0.663 | 0.611 | 0.561 |
| 400 | 0.929 | 0.850 | 0.776 | 0.714 | 0.647 | 0.591 | 0.542 |
| 425 | 0.925 | 0.840 | 0.763 | 0.698 | 0.633 | 0.574 | 0.520 |
| 450 | 0.922 | 0.827 | 0.747 | 0.680 | 0.612 | 0.555 | 0.500 |
| 475 | 0.917 | 0.820 | 0.738 | 0.664 | 0.596 | 0.535 | 0.479 |
| 500 | 0.914 | 0.813 | 0.728 | 0.655 | 0.581 | 0.523 | 0.463 |

Table A2_1.3. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 0.999 | 0.999 |
| 50 | 0.998 | 0.998 | 0.998 |
| 75 | 0.997 | 0.997 | 0.997 |
| 100 | 0.995 | 0.996 | 0.995 |
| 125 | 0.994 | 0.994 | 0.994 |
| 150 | 0.993 | 0.993 | 0.993 |
| 175 | 0.992 | 0.992 | 0.992 |
| 200 | 0.991 | 0.991 | 0.991 |
| 225 | 0.990 | 0.990 | 0.990 |
| 250 | 0.989 | 0.989 | 0.989 |
| 275 | 0.988 | 0.988 | 0.988 |
| 300 | 0.986 | 0.987 | 0.986 |
| 325 | 0.985 | 0.985 | 0.985 |
| 350 | 0.984 | 0.984 | 0.984 |
| 375 | 0.983 | 0.983 | 0.983 |
| 400 | 0.982 | 0.982 | 0.982 |
| 425 | 0.981 | 0.981 | 0.981 |
| 450 | 0.980 | 0.980 | 0.979 |
| 475 | 0.978 | 0.979 | 0.978 |
| 500 | 0.977 | 0.978 | 0.977 |

Table A2_1.4. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 0.999 | 0.999 |
| 50 | 0.998 | 0.997 | 0.998 |
| 75 | 0.997 | 0.997 | 0.997 |
| 100 | 0.996 | 0.996 | 0.995 |
| 125 | 0.994 | 0.994 | 0.994 |
| 150 | 0.993 | 0.993 | 0.993 |
| 175 | 0.992 | 0.992 | 0.992 |
| 200 | 0.991 | 0.991 | 0.991 |
| 225 | 0.990 | 0.989 | 0.990 |
| 250 | 0.989 | 0.989 | 0.989 |
| 275 | 0.988 | 0.988 | 0.988 |
| 300 | 0.987 | 0.986 | 0.986 |
| 325 | 0.986 | 0.985 | 0.985 |
| 350 | 0.984 | 0.984 | 0.984 |
| 375 | 0.983 | 0.983 | 0.983 |
| 400 | 0.982 | 0.982 | 0.982 |
| 425 | 0.981 | 0.981 | 0.981 |
| 450 | 0.980 | 0.980 | 0.979 |
| 475 | 0.979 | 0.978 | 0.978 |
| 500 | 0.978 | 0.978 | 0.978 |

Table A2_2.1. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.996 | 0.991 | 0.987 | 0.984 | 0.981 | 0.978 | 0.976 |
| 50 | 0.992 | 0.983 | 0.975 | 0.968 | 0.962 | 0.957 | 0.952 |
| 75 | 0.988 | 0.974 | 0.963 | 0.952 | 0.943 | 0.936 | 0.929 |
| 100 | 0.983 | 0.966 | 0.950 | 0.937 | 0.925 | 0.915 | 0.906 |
| 125 | 0.980 | 0.957 | 0.939 | 0.921 | 0.907 | 0.895 | 0.883 |
| 150 | 0.975 | 0.949 | 0.926 | 0.906 | 0.889 | 0.874 | 0.861 |
| 175 | 0.971 | 0.940 | 0.914 | 0.891 | 0.871 | 0.854 | 0.839 |
| 200 | 0.967 | 0.932 | 0.902 | 0.876 | 0.854 | 0.834 | 0.817 |
| 225 | 0.963 | 0.924 | 0.891 | 0.861 | 0.836 | 0.814 | 0.795 |
| 250 | 0.959 | 0.916 | 0.878 | 0.847 | 0.820 | 0.796 | 0.774 |
| 275 | 0.955 | 0.907 | 0.867 | 0.832 | 0.802 | 0.776 | 0.753 |
| 300 | 0.951 | 0.900 | 0.856 | 0.818 | 0.786 | 0.757 | 0.733 |
| 325 | 0.947 | 0.891 | 0.844 | 0.804 | 0.769 | 0.739 | 0.712 |
| 350 | 0.943 | 0.883 | 0.833 | 0.790 | 0.752 | 0.720 | 0.691 |
| 375 | 0.939 | 0.875 | 0.821 | 0.776 | 0.736 | 0.703 | 0.673 |
| 400 | 0.935 | 0.867 | 0.811 | 0.762 | 0.720 | 0.685 | 0.653 |
| 425 | 0.931 | 0.859 | 0.800 | 0.749 | 0.704 | 0.667 | 0.634 |
| 450 | 0.927 | 0.851 | 0.789 | 0.736 | 0.690 | 0.649 | 0.615 |
| 475 | 0.923 | 0.844 | 0.778 | 0.721 | 0.674 | 0.633 | 0.597 |
| 500 | 0.919 | 0.836 | 0.767 | 0.708 | 0.659 | 0.616 | 0.578 |

Table A2_2.2. Gannet, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.994 | 0.987 | 0.984 | 0.983 | 0.978 | 0.975 | 0.976 |
| 50 | 0.990 | 0.981 | 0.973 | 0.966 | 0.959 | 0.957 | 0.955 |
| 75 | 0.987 | 0.970 | 0.960 | 0.950 | 0.942 | 0.939 | 0.933 |
| 100 | 0.983 | 0.961 | 0.949 | 0.938 | 0.923 | 0.918 | 0.912 |
| 125 | 0.978 | 0.955 | 0.939 | 0.921 | 0.907 | 0.897 | 0.888 |
| 150 | 0.974 | 0.947 | 0.926 | 0.903 | 0.884 | 0.873 | 0.861 |
| 175 | 0.970 | 0.940 | 0.913 | 0.890 | 0.872 | 0.854 | 0.841 |
| 200 | 0.967 | 0.931 | 0.903 | 0.879 | 0.854 | 0.836 | 0.819 |
| 225 | 0.960 | 0.920 | 0.886 | 0.859 | 0.834 | 0.813 | 0.794 |
| 250 | 0.954 | 0.912 | 0.877 | 0.844 | 0.817 | 0.797 | 0.774 |
| 275 | 0.953 | 0.906 | 0.867 | 0.833 | 0.802 | 0.776 | 0.754 |
| 300 | 0.949 | 0.899 | 0.853 | 0.814 | 0.784 | 0.757 | 0.734 |
| 325 | 0.948 | 0.891 | 0.843 | 0.804 | 0.767 | 0.739 | 0.716 |
| 350 | 0.943 | 0.880 | 0.831 | 0.789 | 0.750 | 0.721 | 0.695 |
| 375 | 0.938 | 0.872 | 0.817 | 0.771 | 0.732 | 0.702 | 0.675 |
| 400 | 0.933 | 0.864 | 0.808 | 0.759 | 0.721 | 0.688 | 0.655 |
| 425 | 0.930 | 0.859 | 0.798 | 0.747 | 0.703 | 0.666 | 0.637 |
| 450 | 0.925 | 0.849 | 0.785 | 0.734 | 0.688 | 0.651 | 0.619 |
| 475 | 0.922 | 0.841 | 0.777 | 0.720 | 0.673 | 0.633 | 0.599 |
| 500 | 0.917 | 0.833 | 0.766 | 0.707 | 0.656 | 0.617 | 0.580 |

Table A2_2.3. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 0.999 | 0.999 |
| 50 | 0.999 | 0.999 | 0.999 |
| 75 | 0.998 | 0.998 | 0.998 |
| 100 | 0.997 | 0.997 | 0.997 |
| 125 | 0.997 | 0.996 | 0.997 |
| 150 | 0.996 | 0.996 | 0.996 |
| 175 | 0.995 | 0.995 | 0.995 |
| 200 | 0.994 | 0.994 | 0.995 |
| 225 | 0.994 | 0.993 | 0.994 |
| 250 | 0.993 | 0.993 | 0.993 |
| 275 | 0.992 | 0.992 | 0.992 |
| 300 | 0.991 | 0.991 | 0.992 |
| 325 | 0.991 | 0.990 | 0.991 |
| 350 | 0.990 | 0.989 | 0.990 |
| 375 | 0.989 | 0.989 | 0.989 |
| 400 | 0.988 | 0.988 | 0.988 |
| 425 | 0.987 | 0.987 | 0.988 |
| 450 | 0.986 | 0.986 | 0.987 |
| 475 | 0.986 | 0.985 | 0.986 |
| 500 | 0.985 | 0.984 | 0.985 |

Table A2_2.4. Gannet, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 1.000 | 0.999 |
| 50 | 0.999 | 0.999 | 0.999 |
| 75 | 0.998 | 0.998 | 0.998 |
| 100 | 0.998 | 0.998 | 0.997 |
| 125 | 0.997 | 0.997 | 0.997 |
| 150 | 0.996 | 0.996 | 0.996 |
| 175 | 0.995 | 0.995 | 0.995 |
| 200 | 0.995 | 0.995 | 0.994 |
| 225 | 0.994 | 0.993 | 0.994 |
| 250 | 0.993 | 0.993 | 0.993 |
| 275 | 0.992 | 0.992 | 0.992 |
| 300 | 0.991 | 0.991 | 0.992 |
| 325 | 0.991 | 0.990 | 0.990 |
| 350 | 0.990 | 0.990 | 0.990 |
| 375 | 0.989 | 0.989 | 0.989 |
| 400 | 0.988 | 0.988 | 0.988 |
| 425 | 0.987 | 0.987 | 0.988 |
| 450 | 0.987 | 0.986 | 0.987 |
| 475 | 0.986 | 0.985 | 0.986 |
| 500 | 0.985 | 0.985 | 0.985 |

Table A2_3.1. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.995 | 0.990 | 0.984 | 0.979 | 0.973 | 0.968 | 0.962 |
| 50 | 0.991 | 0.980 | 0.969 | 0.958 | 0.947 | 0.936 | 0.926 |
| 75 | 0.987 | 0.970 | 0.954 | 0.938 | 0.922 | 0.906 | 0.891 |
| 100 | 0.982 | 0.960 | 0.938 | 0.917 | 0.897 | 0.877 | 0.857 |
| 125 | 0.978 | 0.950 | 0.924 | 0.898 | 0.873 | 0.848 | 0.824 |
| 150 | 0.973 | 0.940 | 0.909 | 0.879 | 0.849 | 0.821 | 0.793 |
| 175 | 0.969 | 0.931 | 0.895 | 0.860 | 0.827 | 0.795 | 0.763 |
| 200 | 0.964 | 0.922 | 0.881 | 0.841 | 0.804 | 0.769 | 0.734 |
| 225 | 0.960 | 0.912 | 0.867 | 0.824 | 0.782 | 0.743 | 0.707 |
| 250 | 0.956 | 0.903 | 0.853 | 0.806 | 0.761 | 0.719 | 0.680 |
| 275 | 0.951 | 0.893 | 0.839 | 0.788 | 0.741 | 0.696 | 0.653 |
| 300 | 0.947 | 0.884 | 0.825 | 0.771 | 0.721 | 0.673 | 0.628 |
| 325 | 0.943 | 0.875 | 0.813 | 0.755 | 0.701 | 0.651 | 0.605 |
| 350 | 0.938 | 0.866 | 0.800 | 0.738 | 0.682 | 0.630 | 0.581 |
| 375 | 0.934 | 0.857 | 0.787 | 0.723 | 0.663 | 0.609 | 0.559 |
| 400 | 0.930 | 0.849 | 0.774 | 0.707 | 0.645 | 0.589 | 0.538 |
| 425 | 0.925 | 0.839 | 0.762 | 0.692 | 0.628 | 0.571 | 0.517 |
| 450 | 0.921 | 0.831 | 0.750 | 0.677 | 0.610 | 0.551 | 0.497 |
| 475 | 0.917 | 0.822 | 0.738 | 0.662 | 0.594 | 0.533 | 0.479 |
| 500 | 0.913 | 0.814 | 0.726 | 0.647 | 0.577 | 0.515 | 0.460 |

Table A2_3.2. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.998 | 0.992 | 0.985 | 0.982 | 0.979 | 0.974 | 0.969 |
| 50 | 0.990 | 0.978 | 0.966 | 0.960 | 0.947 | 0.937 | 0.928 |
| 75 | 0.987 | 0.969 | 0.955 | 0.941 | 0.925 | 0.913 | 0.897 |
| 100 | 0.984 | 0.960 | 0.941 | 0.925 | 0.905 | 0.888 | 0.867 |
| 125 | 0.979 | 0.949 | 0.927 | 0.903 | 0.880 | 0.858 | 0.832 |
| 150 | 0.977 | 0.943 | 0.913 | 0.886 | 0.858 | 0.830 | 0.801 |
| 175 | 0.970 | 0.930 | 0.896 | 0.864 | 0.833 | 0.800 | 0.766 |
| 200 | 0.966 | 0.922 | 0.884 | 0.844 | 0.809 | 0.774 | 0.736 |
| 225 | 0.961 | 0.911 | 0.865 | 0.827 | 0.788 | 0.749 | 0.712 |
| 250 | 0.956 | 0.901 | 0.854 | 0.812 | 0.768 | 0.723 | 0.684 |
| 275 | 0.952 | 0.894 | 0.841 | 0.789 | 0.743 | 0.698 | 0.654 |
| 300 | 0.950 | 0.884 | 0.824 | 0.773 | 0.725 | 0.679 | 0.630 |
| 325 | 0.944 | 0.876 | 0.813 | 0.760 | 0.707 | 0.656 | 0.607 |
| 350 | 0.943 | 0.869 | 0.802 | 0.744 | 0.688 | 0.636 | 0.588 |
| 375 | 0.933 | 0.859 | 0.787 | 0.727 | 0.669 | 0.616 | 0.565 |
| 400 | 0.932 | 0.849 | 0.775 | 0.709 | 0.648 | 0.588 | 0.536 |
| 425 | 0.929 | 0.844 | 0.766 | 0.699 | 0.634 | 0.575 | 0.521 |
| 450 | 0.923 | 0.832 | 0.751 | 0.681 | 0.616 | 0.557 | 0.500 |
| 475 | 0.917 | 0.825 | 0.741 | 0.665 | 0.600 | 0.538 | 0.483 |
| 500 | 0.913 | 0.817 | 0.727 | 0.651 | 0.580 | 0.519 | 0.461 |

Table A2_3.3. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 0.999 | 0.999 |
| 50 | 0.998 | 0.998 | 0.998 |
| 75 | 0.997 | 0.997 | 0.997 |
| 100 | 0.995 | 0.995 | 0.995 |
| 125 | 0.994 | 0.994 | 0.994 |
| 150 | 0.993 | 0.993 | 0.993 |
| 175 | 0.992 | 0.992 | 0.992 |
| 200 | 0.991 | 0.991 | 0.991 |
| 225 | 0.990 | 0.990 | 0.990 |
| 250 | 0.989 | 0.989 | 0.989 |
| 275 | 0.988 | 0.988 | 0.987 |
| 300 | 0.986 | 0.987 | 0.986 |
| 325 | 0.985 | 0.986 | 0.985 |
| 350 | 0.984 | 0.984 | 0.984 |
| 375 | 0.983 | 0.983 | 0.983 |
| 400 | 0.982 | 0.982 | 0.982 |
| 425 | 0.981 | 0.981 | 0.981 |
| 450 | 0.980 | 0.980 | 0.979 |
| 475 | 0.979 | 0.979 | 0.978 |
| 500 | 0.977 | 0.978 | 0.977 |

Table A2_3.4. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 0.999 | 0.999 |
| 50 | 0.998 | 0.997 | 0.998 |
| 75 | 0.997 | 0.996 | 0.996 |
| 100 | 0.996 | 0.996 | 0.996 |
| 125 | 0.995 | 0.994 | 0.994 |
| 150 | 0.993 | 0.993 | 0.993 |
| 175 | 0.992 | 0.992 | 0.992 |
| 200 | 0.991 | 0.991 | 0.991 |
| 225 | 0.990 | 0.990 | 0.990 |
| 250 | 0.989 | 0.989 | 0.989 |
| 275 | 0.988 | 0.988 | 0.987 |
| 300 | 0.987 | 0.987 | 0.986 |
| 325 | 0.986 | 0.986 | 0.985 |
| 350 | 0.984 | 0.984 | 0.984 |
| 375 | 0.983 | 0.983 | 0.983 |
| 400 | 0.982 | 0.982 | 0.982 |
| 425 | 0.981 | 0.981 | 0.981 |
| 450 | 0.980 | 0.980 | 0.979 |
| 475 | 0.979 | 0.979 | 0.978 |
| 500 | 0.977 | 0.978 | 0.977 |

Table A2_4.1. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.996 | 0.991 | 0.987 | 0.984 | 0.981 | 0.978 | 0.976 |
| 50 | 0.992 | 0.983 | 0.975 | 0.968 | 0.962 | 0.957 | 0.952 |
| 75 | 0.988 | 0.974 | 0.963 | 0.952 | 0.943 | 0.936 | 0.928 |
| 100 | 0.983 | 0.966 | 0.950 | 0.937 | 0.925 | 0.915 | 0.906 |
| 125 | 0.979 | 0.957 | 0.938 | 0.922 | 0.907 | 0.894 | 0.883 |
| 150 | 0.975 | 0.949 | 0.926 | 0.906 | 0.889 | 0.873 | 0.860 |
| 175 | 0.971 | 0.941 | 0.914 | 0.891 | 0.871 | 0.854 | 0.838 |
| 200 | 0.967 | 0.932 | 0.902 | 0.876 | 0.853 | 0.834 | 0.817 |
| 225 | 0.963 | 0.924 | 0.890 | 0.861 | 0.836 | 0.814 | 0.795 |
| 250 | 0.959 | 0.915 | 0.879 | 0.846 | 0.819 | 0.795 | 0.773 |
| 275 | 0.955 | 0.907 | 0.867 | 0.832 | 0.802 | 0.776 | 0.753 |
| 300 | 0.951 | 0.899 | 0.855 | 0.817 | 0.786 | 0.757 | 0.732 |
| 325 | 0.947 | 0.891 | 0.844 | 0.803 | 0.768 | 0.738 | 0.711 |
| 350 | 0.943 | 0.883 | 0.833 | 0.789 | 0.753 | 0.720 | 0.692 |
| 375 | 0.939 | 0.875 | 0.821 | 0.776 | 0.736 | 0.701 | 0.672 |
| 400 | 0.935 | 0.867 | 0.810 | 0.761 | 0.720 | 0.683 | 0.651 |
| 425 | 0.931 | 0.859 | 0.799 | 0.748 | 0.704 | 0.666 | 0.632 |
| 450 | 0.927 | 0.851 | 0.788 | 0.734 | 0.688 | 0.649 | 0.615 |
| 475 | 0.923 | 0.844 | 0.778 | 0.721 | 0.673 | 0.632 | 0.596 |
| 500 | 0.919 | 0.836 | 0.767 | 0.709 | 0.658 | 0.615 | 0.577 |

Table A2_4.2. Gannet, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 25 | 0.994 | 0.991 | 0.984 | 0.985 | 0.977 | 0.976 | 0.977 |
| 50 | 0.990 | 0.983 | 0.973 | 0.969 | 0.959 | 0.956 | 0.953 |
| 75 | 0.985 | 0.971 | 0.958 | 0.949 | 0.940 | 0.932 | 0.926 |
| 100 | 0.983 | 0.966 | 0.950 | 0.936 | 0.920 | 0.912 | 0.906 |
| 125 | 0.979 | 0.955 | 0.935 | 0.922 | 0.905 | 0.893 | 0.880 |
| 150 | 0.974 | 0.948 | 0.924 | 0.905 | 0.886 | 0.872 | 0.862 |
| 175 | 0.969 | 0.939 | 0.911 | 0.890 | 0.867 | 0.851 | 0.836 |
| 200 | 0.967 | 0.930 | 0.900 | 0.873 | 0.851 | 0.830 | 0.816 |
| 225 | 0.963 | 0.923 | 0.885 | 0.860 | 0.831 | 0.808 | 0.792 |
| 250 | 0.959 | 0.917 | 0.877 | 0.847 | 0.815 | 0.792 | 0.773 |
| 275 | 0.954 | 0.906 | 0.865 | 0.829 | 0.798 | 0.773 | 0.752 |
| 300 | 0.952 | 0.900 | 0.855 | 0.819 | 0.784 | 0.756 | 0.734 |
| 325 | 0.949 | 0.892 | 0.844 | 0.802 | 0.764 | 0.736 | 0.710 |
| 350 | 0.944 | 0.884 | 0.832 | 0.791 | 0.750 | 0.720 | 0.691 |
| 375 | 0.937 | 0.876 | 0.821 | 0.775 | 0.735 | 0.700 | 0.674 |
| 400 | 0.933 | 0.865 | 0.807 | 0.760 | 0.717 | 0.682 | 0.649 |
| 425 | 0.930 | 0.859 | 0.798 | 0.748 | 0.700 | 0.663 | 0.631 |
| 450 | 0.926 | 0.851 | 0.788 | 0.733 | 0.686 | 0.647 | 0.615 |
| 475 | 0.922 | 0.842 | 0.774 | 0.719 | 0.667 | 0.628 | 0.592 |
| 500 | 0.918 | 0.834 | 0.764 | 0.707 | 0.655 | 0.612 | 0.574 |

Table A2_4.3. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 0.999 | 0.999 |
| 50 | 0.999 | 0.999 | 0.999 |
| 75 | 0.998 | 0.998 | 0.998 |
| 100 | 0.997 | 0.997 | 0.997 |
| 125 | 0.997 | 0.996 | 0.997 |
| 150 | 0.996 | 0.996 | 0.996 |
| 175 | 0.995 | 0.995 | 0.995 |
| 200 | 0.994 | 0.994 | 0.995 |
| 225 | 0.994 | 0.993 | 0.994 |
| 250 | 0.993 | 0.993 | 0.993 |
| 275 | 0.992 | 0.992 | 0.992 |
| 300 | 0.991 | 0.991 | 0.992 |
| 325 | 0.990 | 0.990 | 0.991 |
| 350 | 0.990 | 0.989 | 0.990 |
| 375 | 0.989 | 0.988 | 0.989 |
| 400 | 0.988 | 0.988 | 0.989 |
| 425 | 0.987 | 0.987 | 0.988 |
| 450 | 0.986 | 0.986 | 0.987 |
| 475 | 0.986 | 0.985 | 0.986 |
| 500 | 0.985 | 0.984 | 0.985 |

Table A2_4.4. Gannet, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 25 | 0.999 | 0.999 | 1.000 |
| 50 | 0.999 | 0.998 | 0.999 |
| 75 | 0.998 | 0.998 | 0.998 |
| 100 | 0.997 | 0.997 | 0.997 |
| 125 | 0.997 | 0.997 | 0.997 |
| 150 | 0.996 | 0.996 | 0.996 |
| 175 | 0.995 | 0.995 | 0.995 |
| 200 | 0.994 | 0.994 | 0.995 |
| 225 | 0.994 | 0.993 | 0.994 |
| 250 | 0.993 | 0.993 | 0.993 |
| 275 | 0.992 | 0.991 | 0.992 |
| 300 | 0.991 | 0.991 | 0.991 |
| 325 | 0.991 | 0.990 | 0.991 |
| 350 | 0.990 | 0.989 | 0.990 |
| 375 | 0.989 | 0.988 | 0.989 |
| 400 | 0.988 | 0.987 | 0.989 |
| 425 | 0.987 | 0.987 | 0.988 |
| 450 | 0.986 | 0.986 | 0.987 |
| 475 | 0.985 | 0.985 | 0.986 |
| 500 | 0.985 | 0.984 | 0.985 |

Table A2_5.1. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.995 | 0.992 | 0.989 | 0.987 | 0.984 | 0.981 |
| 100 | 0.996 | 0.990 | 0.984 | 0.979 | 0.973 | 0.968 | 0.962 |
| 150 | 0.993 | 0.985 | 0.977 | 0.969 | 0.960 | 0.952 | 0.944 |
| 200 | 0.991 | 0.980 | 0.969 | 0.958 | 0.947 | 0.937 | 0.926 |
| 250 | 0.989 | 0.975 | 0.961 | 0.948 | 0.935 | 0.922 | 0.909 |
| 300 | 0.986 | 0.971 | 0.954 | 0.938 | 0.923 | 0.906 | 0.892 |
| 350 | 0.984 | 0.966 | 0.947 | 0.928 | 0.910 | 0.892 | 0.875 |
| 400 | 0.982 | 0.961 | 0.940 | 0.918 | 0.898 | 0.877 | 0.858 |
| 450 | 0.980 | 0.955 | 0.932 | 0.909 | 0.886 | 0.863 | 0.842 |
| 500 | 0.977 | 0.950 | 0.924 | 0.899 | 0.874 | 0.849 | 0.826 |
| 550 | 0.975 | 0.946 | 0.917 | 0.889 | 0.862 | 0.836 | 0.810 |
| 600 | 0.973 | 0.941 | 0.910 | 0.879 | 0.850 | 0.822 | 0.794 |
| 650 | 0.972 | 0.936 | 0.903 | 0.870 | 0.838 | 0.809 | 0.780 |
| 700 | 0.969 | 0.931 | 0.896 | 0.861 | 0.828 | 0.795 | 0.764 |
| 750 | 0.967 | 0.927 | 0.888 | 0.851 | 0.815 | 0.783 | 0.749 |
| 800 | 0.964 | 0.921 | 0.881 | 0.843 | 0.806 | 0.769 | 0.737 |
| 850 | 0.962 | 0.917 | 0.874 | 0.833 | 0.795 | 0.756 | 0.722 |
| 900 | 0.960 | 0.912 | 0.868 | 0.824 | 0.783 | 0.745 | 0.707 |
| 950 | 0.958 | 0.908 | 0.860 | 0.816 | 0.772 | 0.733 | 0.696 |
| 1000 | 0.956 | 0.904 | 0.853 | 0.807 | 0.763 | 0.720 | 0.680 |
| 1050 | 0.954 | 0.899 | 0.847 | 0.797 | 0.752 | 0.710 | 0.668 |
| 1100 | 0.952 | 0.894 | 0.841 | 0.790 | 0.742 | 0.696 | 0.655 |
| 1150 | 0.950 | 0.890 | 0.834 | 0.781 | 0.732 | 0.686 | 0.642 |
| 1200 | 0.947 | 0.884 | 0.827 | 0.773 | 0.722 | 0.675 | 0.630 |
| 1250 | 0.945 | 0.880 | 0.820 | 0.765 | 0.712 | 0.664 | 0.618 |
| 1300 | 0.943 | 0.876 | 0.814 | 0.755 | 0.703 | 0.652 | 0.606 |
| 1350 | 0.941 | 0.872 | 0.807 | 0.748 | 0.695 | 0.643 | 0.595 |
| 1400 | 0.938 | 0.868 | 0.802 | 0.740 | 0.684 | 0.633 | 0.582 |
| 1450 | 0.936 | 0.863 | 0.795 | 0.731 | 0.674 | 0.621 | 0.572 |
| 1500 | 0.935 | 0.859 | 0.789 | 0.725 | 0.665 | 0.611 | 0.561 |
| 1550 | 0.932 | 0.854 | 0.782 | 0.716 | 0.655 | 0.602 | 0.550 |
| 1600 | 0.930 | 0.849 | 0.776 | 0.709 | 0.648 | 0.591 | 0.540 |

Table A2_5.2. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.998 | 0.995 | 0.992 | 0.997 | 0.989 | 0.985 |
| 100 | 0.992 | 0.987 | 0.984 | 0.975 | 0.970 | 0.961 | 0.962 |
| 150 | 0.990 | 0.985 | 0.975 | 0.969 | 0.956 | 0.948 | 0.939 |
| 200 | 0.992 | 0.974 | 0.969 | 0.960 | 0.949 | 0.933 | 0.922 |
| 250 | 0.988 | 0.975 | 0.962 | 0.947 | 0.943 | 0.923 | 0.909 |
| 300 | 0.991 | 0.972 | 0.961 | 0.946 | 0.934 | 0.912 | 0.898 |
| 350 | 0.985 | 0.961 | 0.955 | 0.932 | 0.917 | 0.899 | 0.877 |
| 400 | 0.980 | 0.953 | 0.934 | 0.915 | 0.894 | 0.877 | 0.853 |
| 450 | 0.977 | 0.955 | 0.934 | 0.907 | 0.889 | 0.863 | 0.835 |
| 500 | 0.976 | 0.944 | 0.917 | 0.891 | 0.865 | 0.836 | 0.804 |
| 550 | 0.973 | 0.946 | 0.928 | 0.898 | 0.863 | 0.837 | 0.813 |
| 600 | 0.971 | 0.945 | 0.913 | 0.882 | 0.857 | 0.827 | 0.804 |
| 650 | 0.974 | 0.941 | 0.912 | 0.876 | 0.847 | 0.815 | 0.780 |
| 700 | 0.969 | 0.934 | 0.901 | 0.862 | 0.833 | 0.798 | 0.772 |
| 750 | 0.967 | 0.932 | 0.891 | 0.852 | 0.815 | 0.782 | 0.741 |
| 800 | 0.965 | 0.922 | 0.882 | 0.836 | 0.805 | 0.764 | 0.734 |
| 850 | 0.964 | 0.915 | 0.874 | 0.830 | 0.796 | 0.752 | 0.722 |
| 900 | 0.957 | 0.915 | 0.875 | 0.830 | 0.793 | 0.749 | 0.713 |
| 950 | 0.955 | 0.904 | 0.859 | 0.809 | 0.770 | 0.728 | 0.688 |
| 1000 | 0.954 | 0.903 | 0.854 | 0.815 | 0.769 | 0.725 | 0.683 |
| 1050 | 0.950 | 0.893 | 0.845 | 0.794 | 0.760 | 0.710 | 0.670 |
| 1100 | 0.947 | 0.893 | 0.838 | 0.789 | 0.741 | 0.689 | 0.643 |
| 1150 | 0.947 | 0.886 | 0.832 | 0.779 | 0.729 | 0.681 | 0.640 |
| 1200 | 0.943 | 0.879 | 0.821 | 0.770 | 0.722 | 0.671 | 0.620 |
| 1250 | 0.947 | 0.885 | 0.830 | 0.764 | 0.718 | 0.665 | 0.616 |
| 1300 | 0.939 | 0.872 | 0.811 | 0.749 | 0.697 | 0.648 | 0.600 |
| 1350 | 0.941 | 0.869 | 0.807 | 0.749 | 0.694 | 0.644 | 0.595 |
| 1400 | 0.938 | 0.866 | 0.797 | 0.738 | 0.684 | 0.634 | 0.583 |
| 1450 | 0.930 | 0.856 | 0.793 | 0.725 | 0.671 | 0.612 | 0.567 |
| 1500 | 0.933 | 0.856 | 0.793 | 0.723 | 0.665 | 0.613 | 0.557 |
| 1550 | 0.926 | 0.853 | 0.783 | 0.716 | 0.660 | 0.597 | 0.548 |
| 1600 | 0.931 | 0.848 | 0.771 | 0.706 | 0.652 | 0.595 | 0.541 |

Table A2_5.3. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 0.999 | 0.999 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.998 | 0.998 |
| 200 | 0.998 | 0.998 | 0.998 |
| 250 | 0.997 | 0.997 | 0.997 |
| 300 | 0.997 | 0.997 | 0.997 |
| 350 | 0.996 | 0.996 | 0.996 |
| 400 | 0.996 | 0.996 | 0.995 |
| 450 | 0.995 | 0.995 | 0.995 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.994 | 0.994 | 0.994 |
| 600 | 0.993 | 0.993 | 0.993 |
| 650 | 0.993 | 0.993 | 0.993 |
| 700 | 0.992 | 0.992 | 0.992 |
| 750 | 0.992 | 0.992 | 0.992 |
| 800 | 0.991 | 0.991 | 0.991 |
| 850 | 0.990 | 0.990 | 0.990 |
| 900 | 0.990 | 0.990 | 0.990 |
| 950 | 0.989 | 0.989 | 0.989 |
| 1000 | 0.989 | 0.989 | 0.989 |
| 1050 | 0.988 | 0.988 | 0.988 |
| 1100 | 0.988 | 0.988 | 0.988 |
| 1150 | 0.987 | 0.987 | 0.987 |
| 1200 | 0.986 | 0.986 | 0.986 |
| 1250 | 0.986 | 0.986 | 0.986 |
| 1300 | 0.985 | 0.985 | 0.985 |
| 1350 | 0.985 | 0.985 | 0.985 |
| 1400 | 0.984 | 0.984 | 0.984 |
| 1450 | 0.984 | 0.984 | 0.983 |
| 1500 | 0.983 | 0.983 | 0.983 |
| 1550 | 0.983 | 0.983 | 0.982 |
| 1600 | 0.982 | 0.982 | 0.982 |

Table A2_5.4. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 0.999 | 1.000 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.998 | 0.998 |
| 200 | 0.997 | 0.998 | 0.997 |
| 250 | 0.997 | 0.998 | 0.998 |
| 300 | 0.997 | 0.998 | 0.997 |
| 350 | 0.996 | 0.997 | 0.997 |
| 400 | 0.995 | 0.996 | 0.996 |
| 450 | 0.995 | 0.996 | 0.995 |
| 500 | 0.994 | 0.995 | 0.994 |
| 550 | 0.994 | 0.994 | 0.995 |
| 600 | 0.994 | 0.994 | 0.994 |
| 650 | 0.993 | 0.992 | 0.993 |
| 700 | 0.992 | 0.992 | 0.992 |
| 750 | 0.991 | 0.992 | 0.992 |
| 800 | 0.991 | 0.991 | 0.991 |
| 850 | 0.990 | 0.990 | 0.991 |
| 900 | 0.990 | 0.991 | 0.990 |
| 950 | 0.989 | 0.989 | 0.989 |
| 1000 | 0.989 | 0.990 | 0.989 |
| 1050 | 0.989 | 0.989 | 0.988 |
| 1100 | 0.987 | 0.988 | 0.989 |
| 1150 | 0.987 | 0.987 | 0.988 |
| 1200 | 0.986 | 0.987 | 0.986 |
| 1250 | 0.986 | 0.986 | 0.986 |
| 1300 | 0.985 | 0.985 | 0.985 |
| 1350 | 0.985 | 0.984 | 0.985 |
| 1400 | 0.984 | 0.985 | 0.985 |
| 1450 | 0.983 | 0.983 | 0.984 |
| 1500 | 0.983 | 0.983 | 0.983 |
| 1550 | 0.982 | 0.983 | 0.983 |
| 1600 | 0.982 | 0.983 | 0.983 |

Table A2_6.1. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.997 | 0.996 | 0.996 | 0.996 | 0.995 | 0.995 |
| 100 | 0.996 | 0.994 | 0.992 | 0.991 | 0.991 | 0.991 | 0.991 |
| 150 | 0.995 | 0.991 | 0.988 | 0.987 | 0.986 | 0.986 | 0.985 |
| 200 | 0.993 | 0.988 | 0.985 | 0.983 | 0.982 | 0.981 | 0.981 |
| 250 | 0.991 | 0.985 | 0.981 | 0.979 | 0.977 | 0.977 | 0.977 |
| 300 | 0.990 | 0.981 | 0.978 | 0.974 | 0.973 | 0.973 | 0.972 |
| 350 | 0.988 | 0.979 | 0.973 | 0.971 | 0.968 | 0.968 | 0.967 |
| 400 | 0.986 | 0.975 | 0.970 | 0.966 | 0.964 | 0.963 | 0.962 |
| 450 | 0.984 | 0.972 | 0.966 | 0.962 | 0.959 | 0.959 | 0.957 |
| 500 | 0.983 | 0.968 | 0.962 | 0.957 | 0.955 | 0.954 | 0.953 |
| 550 | 0.980 | 0.966 | 0.958 | 0.954 | 0.950 | 0.949 | 0.948 |
| 600 | 0.979 | 0.963 | 0.953 | 0.949 | 0.946 | 0.945 | 0.944 |
| 650 | 0.977 | 0.960 | 0.950 | 0.945 | 0.942 | 0.940 | 0.939 |
| 700 | 0.975 | 0.957 | 0.947 | 0.940 | 0.937 | 0.935 | 0.933 |
| 750 | 0.974 | 0.954 | 0.943 | 0.936 | 0.932 | 0.931 | 0.929 |
| 800 | 0.972 | 0.951 | 0.939 | 0.932 | 0.928 | 0.925 | 0.924 |
| 850 | 0.970 | 0.947 | 0.935 | 0.928 | 0.924 | 0.919 | 0.919 |
| 900 | 0.968 | 0.945 | 0.931 | 0.923 | 0.920 | 0.917 | 0.915 |
| 950 | 0.966 | 0.942 | 0.928 | 0.920 | 0.915 | 0.911 | 0.910 |
| 1000 | 0.965 | 0.939 | 0.924 | 0.914 | 0.910 | 0.906 | 0.906 |
| 1050 | 0.964 | 0.935 | 0.920 | 0.911 | 0.906 | 0.902 | 0.901 |
| 1100 | 0.961 | 0.933 | 0.917 | 0.907 | 0.901 | 0.898 | 0.896 |
| 1150 | 0.959 | 0.929 | 0.912 | 0.902 | 0.897 | 0.892 | 0.891 |
| 1200 | 0.958 | 0.927 | 0.909 | 0.897 | 0.891 | 0.889 | 0.885 |
| 1250 | 0.956 | 0.923 | 0.905 | 0.893 | 0.887 | 0.883 | 0.883 |
| 1300 | 0.954 | 0.921 | 0.901 | 0.890 | 0.884 | 0.879 | 0.876 |
| 1350 | 0.953 | 0.919 | 0.898 | 0.885 | 0.877 | 0.873 | 0.870 |
| 1400 | 0.951 | 0.914 | 0.893 | 0.879 | 0.873 | 0.870 | 0.867 |
| 1450 | 0.949 | 0.912 | 0.888 | 0.875 | 0.870 | 0.865 | 0.860 |
| 1500 | 0.948 | 0.908 | 0.887 | 0.872 | 0.864 | 0.859 | 0.855 |
| 1550 | 0.945 | 0.907 | 0.882 | 0.868 | 0.859 | 0.854 | 0.853 |
| 1600 | 0.944 | 0.902 | 0.878 | 0.863 | 0.855 | 0.850 | 0.847 |

Table A2_6.2. Kittiwake, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.997 | 0.999 | 0.996 | 0.996 | 0.997 | 1.000 | 0.998 |
| 100 | 0.995 | 0.995 | 0.995 | 0.990 | 0.996 | 0.996 | 0.992 |
| 150 | 0.995 | 0.995 | 0.991 | 0.992 | 0.988 | 0.991 | 0.988 |
| 200 | 0.993 | 0.989 | 0.983 | 0.985 | 0.988 | 0.992 | 0.978 |
| 250 | 0.993 | 0.987 | 0.982 | 0.977 | 0.983 | 0.980 | 0.976 |
| 300 | 0.987 | 0.980 | 0.983 | 0.980 | 0.979 | 0.978 | 0.975 |
| 350 | 0.988 | 0.981 | 0.975 | 0.972 | 0.972 | 0.973 | 0.973 |
| 400 | 0.986 | 0.976 | 0.971 | 0.968 | 0.974 | 0.967 | 0.965 |
| 450 | 0.984 | 0.974 | 0.970 | 0.968 | 0.967 | 0.968 | 0.959 |
| 500 | 0.982 | 0.968 | 0.965 | 0.961 | 0.961 | 0.962 | 0.953 |
| 550 | 0.981 | 0.965 | 0.959 | 0.959 | 0.956 | 0.960 | 0.950 |
| 600 | 0.978 | 0.965 | 0.954 | 0.949 | 0.952 | 0.954 | 0.947 |
| 650 | 0.980 | 0.958 | 0.948 | 0.945 | 0.947 | 0.947 | 0.941 |
| 700 | 0.973 | 0.953 | 0.945 | 0.947 | 0.945 | 0.943 | 0.938 |
| 750 | 0.975 | 0.955 | 0.942 | 0.940 | 0.939 | 0.938 | 0.931 |
| 800 | 0.971 | 0.954 | 0.940 | 0.937 | 0.934 | 0.934 | 0.928 |
| 850 | 0.966 | 0.949 | 0.934 | 0.926 | 0.927 | 0.926 | 0.926 |
| 900 | 0.967 | 0.945 | 0.932 | 0.926 | 0.923 | 0.922 | 0.919 |
| 950 | 0.965 | 0.943 | 0.930 | 0.924 | 0.921 | 0.915 | 0.912 |
| 1000 | 0.964 | 0.941 | 0.921 | 0.913 | 0.909 | 0.910 | 0.907 |
| 1050 | 0.959 | 0.938 | 0.923 | 0.915 | 0.910 | 0.904 | 0.903 |
| 1100 | 0.962 | 0.929 | 0.919 | 0.908 | 0.905 | 0.904 | 0.896 |
| 1150 | 0.958 | 0.928 | 0.910 | 0.902 | 0.900 | 0.894 | 0.887 |
| 1200 | 0.960 | 0.931 | 0.910 | 0.900 | 0.894 | 0.891 | 0.886 |
| 1250 | 0.956 | 0.930 | 0.906 | 0.896 | 0.896 | 0.888 | 0.883 |
| 1300 | 0.955 | 0.922 | 0.901 | 0.889 | 0.884 | 0.883 | 0.873 |
| 1350 | 0.949 | 0.915 | 0.896 | 0.884 | 0.881 | 0.880 | 0.872 |
| 1400 | 0.949 | 0.913 | 0.893 | 0.885 | 0.879 | 0.874 | 0.864 |
| 1450 | 0.949 | 0.912 | 0.883 | 0.875 | 0.872 | 0.865 | 0.859 |
| 1500 | 0.952 | 0.912 | 0.887 | 0.875 | 0.869 | 0.870 | 0.863 |
| 1550 | 0.943 | 0.907 | 0.884 | 0.866 | 0.863 | 0.860 | 0.856 |
| 1600 | 0.944 | 0.903 | 0.880 | 0.862 | 0.859 | 0.853 | 0.849 |

Table A2_6.3. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 1.000 | 1.000 | 1.000 |
| 150 | 1.000 | 1.000 | 1.000 |
| 200 | 1.000 | 1.000 | 1.000 |
| 250 | 1.000 | 1.000 | 0.999 |
| 300 | 0.999 | 0.999 | 0.999 |
| 350 | 0.999 | 0.999 | 0.999 |
| 400 | 0.999 | 0.999 | 0.999 |
| 450 | 0.999 | 0.999 | 0.999 |
| 500 | 0.999 | 0.999 | 0.999 |
| 550 | 0.999 | 0.999 | 0.999 |
| 600 | 0.999 | 0.999 | 0.999 |
| 650 | 0.999 | 0.999 | 0.999 |
| 700 | 0.999 | 0.999 | 0.999 |
| 750 | 0.998 | 0.998 | 0.998 |
| 800 | 0.998 | 0.998 | 0.998 |
| 850 | 0.998 | 0.998 | 0.998 |
| 900 | 0.998 | 0.998 | 0.998 |
| 950 | 0.998 | 0.998 | 0.998 |
| 1000 | 0.998 | 0.998 | 0.998 |
| 1050 | 0.998 | 0.998 | 0.998 |
| 1100 | 0.998 | 0.998 | 0.998 |
| 1150 | 0.998 | 0.998 | 0.997 |
| 1200 | 0.997 | 0.997 | 0.997 |
| 1250 | 0.997 | 0.997 | 0.997 |
| 1300 | 0.997 | 0.997 | 0.997 |
| 1350 | 0.997 | 0.997 | 0.997 |
| 1400 | 0.997 | 0.997 | 0.997 |
| 1450 | 0.997 | 0.997 | 0.997 |
| 1500 | 0.997 | 0.997 | 0.997 |
| 1550 | 0.997 | 0.997 | 0.996 |
| 1600 | 0.996 | 0.996 | 0.996 |

Table A2_6.4. Kittiwake, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 1.000 | 1.000 | 1.000 |
| 150 | 1.000 | 1.000 | 1.000 |
| 200 | 0.999 | 1.000 | 1.000 |
| 250 | 0.999 | 1.000 | 1.000 |
| 300 | 0.999 | 1.000 | 1.000 |
| 350 | 1.000 | 1.000 | 0.999 |
| 400 | 0.999 | 0.999 | 0.999 |
| 450 | 0.999 | 1.000 | 0.999 |
| 500 | 0.999 | 1.000 | 0.999 |
| 550 | 0.999 | 1.000 | 0.999 |
| 600 | 0.999 | 0.999 | 0.999 |
| 650 | 0.999 | 0.999 | 0.999 |
| 700 | 0.999 | 0.999 | 0.999 |
| 750 | 0.998 | 0.999 | 0.998 |
| 800 | 0.998 | 0.999 | 0.998 |
| 850 | 0.998 | 0.999 | 0.998 |
| 900 | 0.998 | 0.998 | 0.998 |
| 950 | 0.998 | 0.999 | 0.998 |
| 1000 | 0.998 | 0.999 | 0.998 |
| 1050 | 0.998 | 0.998 | 0.998 |
| 1100 | 0.998 | 0.998 | 0.997 |
| 1150 | 0.997 | 0.998 | 0.997 |
| 1200 | 0.997 | 0.998 | 0.997 |
| 1250 | 0.997 | 0.998 | 0.997 |
| 1300 | 0.997 | 0.998 | 0.997 |
| 1350 | 0.997 | 0.997 | 0.997 |
| 1400 | 0.997 | 0.997 | 0.997 |
| 1450 | 0.997 | 0.997 | 0.997 |
| 1500 | 0.997 | 0.997 | 0.997 |
| 1550 | 0.997 | 0.997 | 0.996 |
| 1600 | 0.996 | 0.997 | 0.996 |

Table A2_7.1. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.995 | 0.992 | 0.989 | 0.987 | 0.984 | 0.981 |
| 100 | 0.996 | 0.990 | 0.984 | 0.979 | 0.973 | 0.968 | 0.963 |
| 150 | 0.993 | 0.985 | 0.977 | 0.968 | 0.960 | 0.953 | 0.944 |
| 200 | 0.991 | 0.980 | 0.969 | 0.958 | 0.947 | 0.937 | 0.926 |
| 250 | 0.989 | 0.975 | 0.961 | 0.948 | 0.935 | 0.922 | 0.909 |
| 300 | 0.987 | 0.970 | 0.954 | 0.938 | 0.922 | 0.907 | 0.891 |
| 350 | 0.984 | 0.965 | 0.946 | 0.928 | 0.910 | 0.892 | 0.875 |
| 400 | 0.982 | 0.960 | 0.939 | 0.918 | 0.898 | 0.877 | 0.858 |
| 450 | 0.980 | 0.955 | 0.932 | 0.908 | 0.885 | 0.863 | 0.842 |
| 500 | 0.978 | 0.951 | 0.924 | 0.899 | 0.874 | 0.850 | 0.827 |
| 550 | 0.975 | 0.946 | 0.917 | 0.889 | 0.862 | 0.835 | 0.810 |
| 600 | 0.973 | 0.941 | 0.910 | 0.879 | 0.850 | 0.822 | 0.795 |
| 650 | 0.971 | 0.936 | 0.902 | 0.870 | 0.838 | 0.809 | 0.780 |
| 700 | 0.969 | 0.931 | 0.895 | 0.861 | 0.827 | 0.795 | 0.765 |
| 750 | 0.967 | 0.927 | 0.889 | 0.852 | 0.816 | 0.782 | 0.750 |
| 800 | 0.965 | 0.922 | 0.881 | 0.842 | 0.805 | 0.770 | 0.735 |
| 850 | 0.963 | 0.917 | 0.874 | 0.834 | 0.794 | 0.758 | 0.721 |
| 900 | 0.960 | 0.912 | 0.867 | 0.825 | 0.785 | 0.744 | 0.708 |
| 950 | 0.958 | 0.908 | 0.861 | 0.815 | 0.773 | 0.733 | 0.694 |
| 1000 | 0.956 | 0.904 | 0.854 | 0.807 | 0.762 | 0.721 | 0.681 |
| 1050 | 0.954 | 0.899 | 0.847 | 0.798 | 0.752 | 0.708 | 0.668 |
| 1100 | 0.952 | 0.895 | 0.840 | 0.789 | 0.742 | 0.697 | 0.655 |
| 1150 | 0.950 | 0.890 | 0.833 | 0.782 | 0.732 | 0.686 | 0.642 |
| 1200 | 0.947 | 0.885 | 0.827 | 0.773 | 0.722 | 0.675 | 0.631 |
| 1250 | 0.945 | 0.880 | 0.821 | 0.765 | 0.712 | 0.664 | 0.617 |
| 1300 | 0.943 | 0.876 | 0.814 | 0.756 | 0.703 | 0.653 | 0.606 |
| 1350 | 0.941 | 0.871 | 0.808 | 0.748 | 0.693 | 0.642 | 0.594 |
| 1400 | 0.938 | 0.866 | 0.801 | 0.740 | 0.683 | 0.632 | 0.583 |
| 1450 | 0.937 | 0.863 | 0.795 | 0.732 | 0.675 | 0.621 | 0.572 |
| 1500 | 0.935 | 0.858 | 0.789 | 0.724 | 0.665 | 0.611 | 0.561 |
| 1550 | 0.933 | 0.853 | 0.782 | 0.716 | 0.657 | 0.601 | 0.549 |
| 1600 | 0.930 | 0.849 | 0.776 | 0.709 | 0.647 | 0.591 | 0.541 |

Table A2_7.2. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.996 | 0.981 | 0.977 | 0.974 | 0.966 | 0.959 | 0.957 |
| 100 | 1.000 | 0.982 | 0.966 | 0.966 | 0.952 | 0.941 | 0.947 |
| 150 | 0.998 | 0.981 | 0.964 | 0.957 | 0.940 | 0.925 | 0.923 |
| 200 | 0.997 | 0.975 | 0.958 | 0.954 | 0.921 | 0.908 | 0.905 |
| 250 | 0.994 | 0.980 | 0.964 | 0.954 | 0.927 | 0.894 | 0.898 |
| 300 | 0.988 | 0.963 | 0.948 | 0.929 | 0.903 | 0.872 | 0.867 |
| 350 | 0.989 | 0.967 | 0.945 | 0.921 | 0.900 | 0.872 | 0.857 |
| 400 | 0.986 | 0.949 | 0.933 | 0.910 | 0.889 | 0.848 | 0.841 |
| 450 | 0.993 | 0.962 | 0.946 | 0.922 | 0.893 | 0.858 | 0.850 |
| 500 | 0.985 | 0.947 | 0.915 | 0.893 | 0.862 | 0.823 | 0.811 |
| 550 | 0.981 | 0.947 | 0.920 | 0.890 | 0.850 | 0.817 | 0.810 |
| 600 | 0.970 | 0.930 | 0.892 | 0.868 | 0.832 | 0.800 | 0.784 |
| 650 | 0.973 | 0.931 | 0.890 | 0.862 | 0.825 | 0.781 | 0.762 |
| 700 | 0.970 | 0.934 | 0.883 | 0.853 | 0.815 | 0.777 | 0.764 |
| 750 | 0.976 | 0.927 | 0.888 | 0.853 | 0.821 | 0.775 | 0.754 |
| 800 | 0.970 | 0.916 | 0.875 | 0.837 | 0.791 | 0.747 | 0.737 |
| 850 | 0.965 | 0.908 | 0.874 | 0.836 | 0.786 | 0.733 | 0.711 |
| 900 | 0.969 | 0.912 | 0.868 | 0.820 | 0.773 | 0.724 | 0.693 |
| 950 | 0.962 | 0.913 | 0.860 | 0.812 | 0.771 | 0.717 | 0.691 |
| 1000 | 0.960 | 0.902 | 0.858 | 0.805 | 0.753 | 0.701 | 0.678 |
| 1050 | 0.961 | 0.898 | 0.846 | 0.790 | 0.741 | 0.686 | 0.651 |
| 1100 | 0.951 | 0.888 | 0.836 | 0.788 | 0.733 | 0.675 | 0.635 |
| 1150 | 0.953 | 0.884 | 0.827 | 0.778 | 0.728 | 0.670 | 0.639 |
| 1200 | 0.952 | 0.885 | 0.824 | 0.763 | 0.715 | 0.658 | 0.619 |
| 1250 | 0.950 | 0.876 | 0.817 | 0.770 | 0.706 | 0.649 | 0.600 |
| 1300 | 0.950 | 0.881 | 0.818 | 0.758 | 0.698 | 0.637 | 0.597 |
| 1350 | 0.943 | 0.859 | 0.793 | 0.737 | 0.683 | 0.626 | 0.592 |
| 1400 | 0.941 | 0.859 | 0.797 | 0.735 | 0.675 | 0.611 | 0.574 |
| 1450 | 0.941 | 0.860 | 0.792 | 0.725 | 0.665 | 0.607 | 0.565 |
| 1500 | 0.943 | 0.858 | 0.791 | 0.733 | 0.661 | 0.601 | 0.560 |
| 1550 | 0.938 | 0.856 | 0.782 | 0.720 | 0.655 | 0.591 | 0.550 |
| 1600 | 0.929 | 0.835 | 0.769 | 0.699 | 0.635 | 0.565 | 0.519 |

Table A2_7.3. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 0.999 | 0.999 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.998 | 0.998 |
| 200 | 0.998 | 0.998 | 0.998 |
| 250 | 0.997 | 0.997 | 0.997 |
| 300 | 0.997 | 0.997 | 0.997 |
| 350 | 0.996 | 0.996 | 0.996 |
| 400 | 0.995 | 0.996 | 0.996 |
| 450 | 0.995 | 0.995 | 0.995 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.994 | 0.994 | 0.994 |
| 600 | 0.993 | 0.993 | 0.993 |
| 650 | 0.993 | 0.993 | 0.993 |
| 700 | 0.992 | 0.992 | 0.992 |
| 750 | 0.992 | 0.992 | 0.992 |
| 800 | 0.991 | 0.991 | 0.991 |
| 850 | 0.990 | 0.990 | 0.990 |
| 900 | 0.990 | 0.990 | 0.990 |
| 950 | 0.989 | 0.989 | 0.989 |
| 1000 | 0.989 | 0.989 | 0.989 |
| 1050 | 0.988 | 0.988 | 0.988 |
| 1100 | 0.988 | 0.988 | 0.988 |
| 1150 | 0.987 | 0.987 | 0.987 |
| 1200 | 0.987 | 0.987 | 0.986 |
| 1250 | 0.986 | 0.986 | 0.986 |
| 1300 | 0.985 | 0.985 | 0.985 |
| 1350 | 0.985 | 0.985 | 0.985 |
| 1400 | 0.984 | 0.984 | 0.984 |
| 1450 | 0.984 | 0.984 | 0.984 |
| 1500 | 0.983 | 0.983 | 0.983 |
| 1550 | 0.983 | 0.983 | 0.983 |
| 1600 | 0.982 | 0.982 | 0.982 |

Table A2_7.4. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 1.000 | 0.998 |
| 100 | 0.998 | 0.997 | 0.998 |
| 150 | 0.997 | 0.998 | 0.998 |
| 200 | 0.997 | 0.998 | 0.996 |
| 250 | 0.996 | 0.998 | 0.997 |
| 300 | 0.996 | 0.996 | 0.997 |
| 350 | 0.995 | 0.996 | 0.996 |
| 400 | 0.995 | 0.995 | 0.996 |
| 450 | 0.995 | 0.995 | 0.994 |
| 500 | 0.994 | 0.995 | 0.993 |
| 550 | 0.993 | 0.994 | 0.993 |
| 600 | 0.993 | 0.992 | 0.992 |
| 650 | 0.992 | 0.992 | 0.992 |
| 700 | 0.992 | 0.991 | 0.992 |
| 750 | 0.991 | 0.992 | 0.991 |
| 800 | 0.991 | 0.991 | 0.990 |
| 850 | 0.990 | 0.991 | 0.991 |
| 900 | 0.989 | 0.989 | 0.989 |
| 950 | 0.989 | 0.989 | 0.990 |
| 1000 | 0.989 | 0.987 | 0.989 |
| 1050 | 0.988 | 0.987 | 0.988 |
| 1100 | 0.987 | 0.988 | 0.987 |
| 1150 | 0.987 | 0.988 | 0.987 |
| 1200 | 0.986 | 0.986 | 0.986 |
| 1250 | 0.985 | 0.984 | 0.986 |
| 1300 | 0.985 | 0.984 | 0.985 |
| 1350 | 0.985 | 0.984 | 0.984 |
| 1400 | 0.983 | 0.983 | 0.985 |
| 1450 | 0.983 | 0.983 | 0.984 |
| 1500 | 0.983 | 0.983 | 0.983 |
| 1550 | 0.983 | 0.983 | 0.982 |
| 1600 | 0.981 | 0.982 | 0.981 |

Table A2_8.1. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.997 | 0.996 | 0.996 | 0.995 | 0.995 | 0.995 |
| 100 | 0.997 | 0.994 | 0.992 | 0.991 | 0.990 | 0.990 | 0.990 |
| 150 | 0.995 | 0.991 | 0.988 | 0.987 | 0.986 | 0.986 | 0.985 |
| 200 | 0.993 | 0.987 | 0.984 | 0.982 | 0.981 | 0.980 | 0.980 |
| 250 | 0.991 | 0.984 | 0.980 | 0.978 | 0.976 | 0.975 | 0.975 |
| 300 | 0.989 | 0.981 | 0.976 | 0.973 | 0.971 | 0.971 | 0.969 |
| 350 | 0.987 | 0.978 | 0.972 | 0.968 | 0.966 | 0.966 | 0.965 |
| 400 | 0.986 | 0.974 | 0.969 | 0.965 | 0.962 | 0.959 | 0.960 |
| 450 | 0.984 | 0.972 | 0.964 | 0.960 | 0.957 | 0.955 | 0.955 |
| 500 | 0.982 | 0.968 | 0.960 | 0.956 | 0.952 | 0.949 | 0.950 |
| 550 | 0.980 | 0.965 | 0.956 | 0.951 | 0.947 | 0.946 | 0.944 |
| 600 | 0.979 | 0.962 | 0.952 | 0.946 | 0.942 | 0.940 | 0.939 |
| 650 | 0.977 | 0.959 | 0.948 | 0.942 | 0.939 | 0.936 | 0.935 |
| 700 | 0.975 | 0.956 | 0.945 | 0.937 | 0.933 | 0.930 | 0.929 |
| 750 | 0.973 | 0.952 | 0.941 | 0.935 | 0.930 | 0.926 | 0.924 |
| 800 | 0.971 | 0.949 | 0.937 | 0.929 | 0.923 | 0.920 | 0.918 |
| 850 | 0.970 | 0.947 | 0.932 | 0.924 | 0.917 | 0.913 | 0.913 |
| 900 | 0.968 | 0.943 | 0.928 | 0.919 | 0.914 | 0.911 | 0.907 |
| 950 | 0.966 | 0.941 | 0.923 | 0.915 | 0.907 | 0.906 | 0.903 |
| 1000 | 0.964 | 0.937 | 0.921 | 0.911 | 0.904 | 0.901 | 0.897 |
| 1050 | 0.962 | 0.933 | 0.916 | 0.905 | 0.899 | 0.897 | 0.892 |
| 1100 | 0.961 | 0.930 | 0.913 | 0.902 | 0.896 | 0.892 | 0.886 |
| 1150 | 0.958 | 0.928 | 0.909 | 0.897 | 0.889 | 0.885 | 0.882 |
| 1200 | 0.957 | 0.923 | 0.902 | 0.893 | 0.884 | 0.880 | 0.876 |
| 1250 | 0.956 | 0.921 | 0.902 | 0.889 | 0.881 | 0.875 | 0.873 |
| 1300 | 0.954 | 0.918 | 0.896 | 0.884 | 0.875 | 0.869 | 0.866 |
| 1350 | 0.951 | 0.915 | 0.894 | 0.880 | 0.873 | 0.864 | 0.862 |
| 1400 | 0.950 | 0.912 | 0.888 | 0.876 | 0.866 | 0.860 | 0.857 |
| 1450 | 0.949 | 0.909 | 0.884 | 0.870 | 0.860 | 0.853 | 0.851 |
| 1500 | 0.947 | 0.905 | 0.881 | 0.865 | 0.855 | 0.848 | 0.846 |
| 1550 | 0.945 | 0.903 | 0.877 | 0.863 | 0.851 | 0.845 | 0.839 |
| 1600 | 0.942 | 0.899 | 0.873 | 0.857 | 0.846 | 0.838 | 0.833 |

Table A2_8.2. Kittiwake, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.997 | 1.005 | 1.001 | 1.001 | 0.996 | 0.993 | 0.991 |
| 100 | 1.000 | 1.003 | 0.995 | 0.999 | 0.993 | 0.990 | 0.995 |
| 150 | 1.003 | 1.003 | 0.990 | 0.995 | 0.991 | 0.983 | 0.982 |
| 200 | 0.997 | 0.992 | 0.986 | 0.991 | 0.983 | 0.971 | 0.974 |
| 250 | 0.994 | 0.999 | 0.985 | 0.988 | 0.980 | 0.969 | 0.970 |
| 300 | 0.995 | 0.986 | 0.978 | 0.976 | 0.969 | 0.964 | 0.966 |
| 350 | 0.992 | 0.986 | 0.969 | 0.973 | 0.973 | 0.961 | 0.963 |
| 400 | 0.992 | 0.985 | 0.968 | 0.966 | 0.964 | 0.953 | 0.954 |
| 450 | 0.987 | 0.979 | 0.963 | 0.960 | 0.956 | 0.948 | 0.946 |
| 500 | 0.987 | 0.978 | 0.964 | 0.960 | 0.954 | 0.945 | 0.944 |
| 550 | 0.981 | 0.975 | 0.957 | 0.955 | 0.947 | 0.943 | 0.940 |
| 600 | 0.985 | 0.972 | 0.957 | 0.951 | 0.941 | 0.935 | 0.934 |
| 650 | 0.983 | 0.972 | 0.951 | 0.951 | 0.938 | 0.932 | 0.928 |
| 700 | 0.981 | 0.964 | 0.944 | 0.937 | 0.926 | 0.922 | 0.925 |
| 750 | 0.979 | 0.962 | 0.945 | 0.938 | 0.932 | 0.922 | 0.917 |
| 800 | 0.976 | 0.960 | 0.937 | 0.934 | 0.927 | 0.911 | 0.913 |
| 850 | 0.978 | 0.960 | 0.932 | 0.927 | 0.915 | 0.905 | 0.913 |
| 900 | 0.973 | 0.953 | 0.932 | 0.926 | 0.916 | 0.906 | 0.903 |
| 950 | 0.972 | 0.951 | 0.923 | 0.920 | 0.906 | 0.904 | 0.899 |
| 1000 | 0.970 | 0.948 | 0.921 | 0.925 | 0.907 | 0.897 | 0.892 |
| 1050 | 0.965 | 0.944 | 0.917 | 0.910 | 0.899 | 0.887 | 0.889 |
| 1100 | 0.960 | 0.938 | 0.916 | 0.905 | 0.894 | 0.885 | 0.884 |
| 1150 | 0.964 | 0.938 | 0.913 | 0.902 | 0.894 | 0.880 | 0.880 |
| 1200 | 0.960 | 0.929 | 0.900 | 0.892 | 0.881 | 0.872 | 0.873 |
| 1250 | 0.963 | 0.928 | 0.908 | 0.898 | 0.883 | 0.871 | 0.867 |
| 1300 | 0.961 | 0.923 | 0.897 | 0.885 | 0.873 | 0.860 | 0.864 |
| 1350 | 0.957 | 0.925 | 0.898 | 0.882 | 0.873 | 0.859 | 0.859 |
| 1400 | 0.955 | 0.924 | 0.891 | 0.882 | 0.870 | 0.860 | 0.849 |
| 1450 | 0.953 | 0.915 | 0.886 | 0.873 | 0.861 | 0.849 | 0.849 |
| 1500 | 0.952 | 0.908 | 0.880 | 0.865 | 0.856 | 0.843 | 0.847 |
| 1550 | 0.951 | 0.911 | 0.885 | 0.864 | 0.855 | 0.837 | 0.837 |
| 1600 | 0.947 | 0.912 | 0.872 | 0.863 | 0.845 | 0.834 | 0.833 |

Table A2_8.3. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 1.000 | 1.000 | 1.000 |
| 150 | 1.000 | 1.000 | 1.000 |
| 200 | 1.000 | 1.000 | 1.000 |
| 250 | 0.999 | 0.999 | 0.999 |
| 300 | 0.999 | 0.999 | 0.999 |
| 350 | 0.999 | 0.999 | 0.999 |
| 400 | 0.999 | 0.999 | 0.999 |
| 450 | 0.999 | 0.999 | 0.999 |
| 500 | 0.999 | 0.999 | 0.999 |
| 550 | 0.999 | 0.999 | 0.999 |
| 600 | 0.999 | 0.999 | 0.999 |
| 650 | 0.999 | 0.999 | 0.999 |
| 700 | 0.998 | 0.998 | 0.998 |
| 750 | 0.998 | 0.998 | 0.998 |
| 800 | 0.998 | 0.998 | 0.998 |
| 850 | 0.998 | 0.998 | 0.998 |
| 900 | 0.998 | 0.998 | 0.998 |
| 950 | 0.998 | 0.998 | 0.998 |
| 1000 | 0.998 | 0.997 | 0.998 |
| 1050 | 0.998 | 0.997 | 0.998 |
| 1100 | 0.997 | 0.997 | 0.998 |
| 1150 | 0.997 | 0.997 | 0.997 |
| 1200 | 0.997 | 0.997 | 0.997 |
| 1250 | 0.997 | 0.997 | 0.997 |
| 1300 | 0.997 | 0.997 | 0.997 |
| 1350 | 0.997 | 0.997 | 0.997 |
| 1400 | 0.997 | 0.996 | 0.997 |
| 1450 | 0.996 | 0.996 | 0.997 |
| 1500 | 0.996 | 0.996 | 0.996 |
| 1550 | 0.996 | 0.996 | 0.996 |
| 1600 | 0.996 | 0.996 | 0.996 |

Table A2_8.4. Kittiwake, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.001 | 0.999 |
| 100 | 1.000 | 1.001 | 0.999 |
| 150 | 0.999 | 1.000 | 0.999 |
| 200 | 0.999 | 1.000 | 0.999 |
| 250 | 0.999 | 1.000 | 0.999 |
| 300 | 0.999 | 1.000 | 0.999 |
| 350 | 0.999 | 1.000 | 0.999 |
| 400 | 0.999 | 1.000 | 0.999 |
| 450 | 0.999 | 0.999 | 0.998 |
| 500 | 0.999 | 0.999 | 0.998 |
| 550 | 0.998 | 0.999 | 0.998 |
| 600 | 0.998 | 0.999 | 0.999 |
| 650 | 0.998 | 0.999 | 0.998 |
| 700 | 0.998 | 0.999 | 0.998 |
| 750 | 0.998 | 0.999 | 0.997 |
| 800 | 0.998 | 0.999 | 0.998 |
| 850 | 0.998 | 0.998 | 0.997 |
| 900 | 0.998 | 0.998 | 0.997 |
| 950 | 0.997 | 0.998 | 0.998 |
| 1000 | 0.997 | 0.998 | 0.997 |
| 1050 | 0.997 | 0.997 | 0.998 |
| 1100 | 0.997 | 0.998 | 0.997 |
| 1150 | 0.997 | 0.997 | 0.997 |
| 1200 | 0.997 | 0.997 | 0.997 |
| 1250 | 0.997 | 0.997 | 0.996 |
| 1300 | 0.996 | 0.997 | 0.997 |
| 1350 | 0.996 | 0.997 | 0.997 |
| 1400 | 0.996 | 0.997 | 0.996 |
| 1450 | 0.996 | 0.997 | 0.997 |
| 1500 | 0.996 | 0.997 | 0.996 |
| 1550 | 0.996 | 0.996 | 0.996 |
| 1600 | 0.996 | 0.996 | 0.996 |

Table A2_9.1. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.995 | 0.992 | 0.989 | 0.986 | 0.983 | 0.980 |
| 100 | 0.995 | 0.989 | 0.983 | 0.977 | 0.972 | 0.966 | 0.960 |
| 150 | 0.993 | 0.984 | 0.975 | 0.966 | 0.958 | 0.949 | 0.941 |
| 200 | 0.990 | 0.979 | 0.967 | 0.955 | 0.944 | 0.933 | 0.921 |
| 250 | 0.988 | 0.973 | 0.959 | 0.944 | 0.930 | 0.916 | 0.903 |
| 300 | 0.986 | 0.968 | 0.951 | 0.934 | 0.917 | 0.901 | 0.885 |
| 350 | 0.983 | 0.963 | 0.943 | 0.923 | 0.904 | 0.885 | 0.867 |
| 400 | 0.981 | 0.958 | 0.935 | 0.913 | 0.891 | 0.870 | 0.849 |
| 450 | 0.979 | 0.952 | 0.927 | 0.902 | 0.878 | 0.855 | 0.832 |
| 500 | 0.976 | 0.947 | 0.919 | 0.892 | 0.865 | 0.840 | 0.815 |
| 550 | 0.974 | 0.942 | 0.911 | 0.882 | 0.853 | 0.825 | 0.798 |
| 600 | 0.972 | 0.937 | 0.904 | 0.872 | 0.841 | 0.811 | 0.782 |
| 650 | 0.969 | 0.932 | 0.896 | 0.862 | 0.829 | 0.797 | 0.766 |
| 700 | 0.967 | 0.927 | 0.888 | 0.852 | 0.816 | 0.783 | 0.750 |
| 750 | 0.964 | 0.922 | 0.881 | 0.842 | 0.805 | 0.769 | 0.735 |
| 800 | 0.962 | 0.917 | 0.874 | 0.832 | 0.793 | 0.756 | 0.720 |
| 850 | 0.960 | 0.912 | 0.866 | 0.823 | 0.782 | 0.743 | 0.705 |
| 900 | 0.957 | 0.907 | 0.859 | 0.813 | 0.770 | 0.729 | 0.691 |
| 950 | 0.955 | 0.902 | 0.851 | 0.804 | 0.759 | 0.717 | 0.677 |
| 1000 | 0.953 | 0.897 | 0.844 | 0.795 | 0.748 | 0.704 | 0.663 |
| 1050 | 0.951 | 0.892 | 0.837 | 0.786 | 0.737 | 0.692 | 0.649 |
| 1100 | 0.948 | 0.887 | 0.830 | 0.777 | 0.727 | 0.680 | 0.636 |
| 1150 | 0.946 | 0.882 | 0.823 | 0.768 | 0.716 | 0.668 | 0.623 |
| 1200 | 0.944 | 0.877 | 0.816 | 0.759 | 0.706 | 0.656 | 0.610 |
| 1250 | 0.941 | 0.873 | 0.809 | 0.750 | 0.695 | 0.645 | 0.598 |
| 1300 | 0.939 | 0.868 | 0.802 | 0.742 | 0.685 | 0.634 | 0.585 |
| 1350 | 0.937 | 0.863 | 0.795 | 0.733 | 0.675 | 0.622 | 0.573 |
| 1400 | 0.934 | 0.858 | 0.788 | 0.724 | 0.665 | 0.612 | 0.562 |
| 1450 | 0.932 | 0.853 | 0.782 | 0.716 | 0.656 | 0.601 | 0.550 |
| 1500 | 0.930 | 0.849 | 0.775 | 0.708 | 0.646 | 0.590 | 0.539 |
| 1550 | 0.927 | 0.844 | 0.769 | 0.700 | 0.637 | 0.580 | 0.528 |
| 1600 | 0.926 | 0.840 | 0.762 | 0.692 | 0.627 | 0.570 | 0.517 |

Table A2_9.2. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.997 | 0.996 | 0.992 | 0.989 | 0.982 | 0.980 | 0.976 |
| 100 | 0.995 | 0.989 | 0.983 | 0.977 | 0.968 | 0.963 | 0.955 |
| 150 | 0.993 | 0.984 | 0.975 | 0.966 | 0.956 | 0.948 | 0.942 |
| 200 | 0.990 | 0.978 | 0.966 | 0.954 | 0.941 | 0.930 | 0.918 |
| 250 | 0.987 | 0.973 | 0.957 | 0.941 | 0.925 | 0.909 | 0.897 |
| 300 | 0.985 | 0.966 | 0.951 | 0.932 | 0.915 | 0.899 | 0.881 |
| 350 | 0.983 | 0.962 | 0.943 | 0.923 | 0.902 | 0.885 | 0.866 |
| 400 | 0.981 | 0.958 | 0.935 | 0.912 | 0.890 | 0.867 | 0.847 |
| 450 | 0.979 | 0.953 | 0.925 | 0.900 | 0.874 | 0.850 | 0.828 |
| 500 | 0.975 | 0.946 | 0.917 | 0.891 | 0.863 | 0.836 | 0.812 |
| 550 | 0.974 | 0.942 | 0.911 | 0.881 | 0.852 | 0.823 | 0.797 |
| 600 | 0.971 | 0.938 | 0.904 | 0.871 | 0.839 | 0.809 | 0.782 |
| 650 | 0.969 | 0.933 | 0.896 | 0.861 | 0.828 | 0.796 | 0.765 |
| 700 | 0.966 | 0.927 | 0.888 | 0.853 | 0.815 | 0.781 | 0.751 |
| 750 | 0.965 | 0.923 | 0.879 | 0.842 | 0.802 | 0.766 | 0.733 |
| 800 | 0.962 | 0.918 | 0.873 | 0.834 | 0.790 | 0.752 | 0.718 |
| 850 | 0.959 | 0.910 | 0.864 | 0.821 | 0.779 | 0.740 | 0.705 |
| 900 | 0.957 | 0.907 | 0.858 | 0.813 | 0.769 | 0.728 | 0.690 |
| 950 | 0.956 | 0.902 | 0.850 | 0.804 | 0.757 | 0.715 | 0.675 |
| 1000 | 0.952 | 0.897 | 0.844 | 0.796 | 0.746 | 0.702 | 0.662 |
| 1050 | 0.950 | 0.893 | 0.838 | 0.786 | 0.735 | 0.690 | 0.648 |
| 1100 | 0.948 | 0.886 | 0.827 | 0.774 | 0.725 | 0.676 | 0.634 |
| 1150 | 0.946 | 0.882 | 0.824 | 0.767 | 0.715 | 0.664 | 0.620 |
| 1200 | 0.943 | 0.877 | 0.816 | 0.758 | 0.704 | 0.655 | 0.609 |
| 1250 | 0.941 | 0.873 | 0.808 | 0.750 | 0.693 | 0.644 | 0.597 |
| 1300 | 0.939 | 0.870 | 0.802 | 0.741 | 0.684 | 0.632 | 0.585 |
| 1350 | 0.937 | 0.863 | 0.794 | 0.732 | 0.672 | 0.620 | 0.572 |
| 1400 | 0.933 | 0.857 | 0.787 | 0.723 | 0.662 | 0.608 | 0.559 |
| 1450 | 0.933 | 0.852 | 0.781 | 0.716 | 0.654 | 0.598 | 0.548 |
| 1500 | 0.931 | 0.849 | 0.776 | 0.708 | 0.644 | 0.589 | 0.537 |
| 1550 | 0.927 | 0.843 | 0.767 | 0.699 | 0.635 | 0.577 | 0.526 |
| 1600 | 0.925 | 0.841 | 0.761 | 0.691 | 0.624 | 0.567 | 0.514 |

Table A2_9.3. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 0.999 | 0.999 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.998 | 0.998 |
| 200 | 0.998 | 0.998 | 0.998 |
| 250 | 0.997 | 0.997 | 0.997 |
| 300 | 0.996 | 0.996 | 0.996 |
| 350 | 0.996 | 0.996 | 0.996 |
| 400 | 0.995 | 0.995 | 0.995 |
| 450 | 0.995 | 0.995 | 0.995 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.993 | 0.993 | 0.993 |
| 600 | 0.993 | 0.993 | 0.993 |
| 650 | 0.992 | 0.992 | 0.992 |
| 700 | 0.992 | 0.992 | 0.992 |
| 750 | 0.991 | 0.991 | 0.991 |
| 800 | 0.990 | 0.990 | 0.990 |
| 850 | 0.990 | 0.990 | 0.990 |
| 900 | 0.989 | 0.989 | 0.989 |
| 950 | 0.989 | 0.989 | 0.989 |
| 1000 | 0.988 | 0.988 | 0.988 |
| 1050 | 0.987 | 0.987 | 0.987 |
| 1100 | 0.987 | 0.987 | 0.987 |
| 1150 | 0.986 | 0.986 | 0.986 |
| 1200 | 0.986 | 0.986 | 0.986 |
| 1250 | 0.985 | 0.985 | 0.985 |
| 1300 | 0.984 | 0.984 | 0.984 |
| 1350 | 0.984 | 0.984 | 0.984 |
| 1400 | 0.983 | 0.983 | 0.983 |
| 1450 | 0.983 | 0.983 | 0.983 |
| 1500 | 0.982 | 0.982 | 0.982 |
| 1550 | 0.981 | 0.981 | 0.981 |
| 1600 | 0.981 | 0.981 | 0.981 |

Table A2_9.4. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 0.999 | 1.000 |
| 100 | 0.999 | 0.998 | 0.999 |
| 150 | 0.998 | 0.998 | 0.998 |
| 200 | 0.998 | 0.997 | 0.998 |
| 250 | 0.997 | 0.997 | 0.997 |
| 300 | 0.996 | 0.996 | 0.997 |
| 350 | 0.996 | 0.995 | 0.996 |
| 400 | 0.995 | 0.995 | 0.995 |
| 450 | 0.994 | 0.994 | 0.995 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.993 | 0.993 | 0.994 |
| 600 | 0.993 | 0.992 | 0.993 |
| 650 | 0.992 | 0.992 | 0.992 |
| 700 | 0.992 | 0.991 | 0.992 |
| 750 | 0.991 | 0.991 | 0.991 |
| 800 | 0.990 | 0.990 | 0.991 |
| 850 | 0.990 | 0.989 | 0.990 |
| 900 | 0.989 | 0.989 | 0.990 |
| 950 | 0.988 | 0.988 | 0.989 |
| 1000 | 0.988 | 0.988 | 0.988 |
| 1050 | 0.987 | 0.987 | 0.987 |
| 1100 | 0.987 | 0.987 | 0.987 |
| 1150 | 0.986 | 0.986 | 0.986 |
| 1200 | 0.986 | 0.985 | 0.986 |
| 1250 | 0.985 | 0.985 | 0.985 |
| 1300 | 0.984 | 0.984 | 0.985 |
| 1350 | 0.984 | 0.984 | 0.984 |
| 1400 | 0.983 | 0.983 | 0.983 |
| 1450 | 0.983 | 0.982 | 0.983 |
| 1500 | 0.982 | 0.982 | 0.982 |
| 1550 | 0.981 | 0.981 | 0.982 |
| 1600 | 0.981 | 0.980 | 0.981 |

Table A2_10.1. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.996 | 0.994 | 0.993 | 0.992 | 0.992 | 0.991 |
| 100 | 0.996 | 0.992 | 0.989 | 0.987 | 0.985 | 0.983 | 0.982 |
| 150 | 0.994 | 0.988 | 0.983 | 0.980 | 0.977 | 0.975 | 0.974 |
| 200 | 0.992 | 0.984 | 0.978 | 0.973 | 0.970 | 0.967 | 0.965 |
| 250 | 0.990 | 0.980 | 0.972 | 0.967 | 0.962 | 0.959 | 0.956 |
| 300 | 0.988 | 0.976 | 0.967 | 0.960 | 0.955 | 0.951 | 0.948 |
| 350 | 0.986 | 0.972 | 0.961 | 0.954 | 0.947 | 0.943 | 0.939 |
| 400 | 0.984 | 0.968 | 0.956 | 0.947 | 0.940 | 0.935 | 0.931 |
| 450 | 0.982 | 0.964 | 0.951 | 0.941 | 0.933 | 0.927 | 0.922 |
| 500 | 0.980 | 0.960 | 0.945 | 0.934 | 0.925 | 0.919 | 0.914 |
| 550 | 0.978 | 0.956 | 0.940 | 0.928 | 0.918 | 0.911 | 0.905 |
| 600 | 0.975 | 0.952 | 0.935 | 0.921 | 0.911 | 0.903 | 0.896 |
| 650 | 0.974 | 0.948 | 0.929 | 0.915 | 0.903 | 0.895 | 0.888 |
| 700 | 0.971 | 0.945 | 0.924 | 0.908 | 0.897 | 0.887 | 0.880 |
| 750 | 0.969 | 0.941 | 0.919 | 0.902 | 0.890 | 0.879 | 0.872 |
| 800 | 0.967 | 0.937 | 0.914 | 0.896 | 0.882 | 0.872 | 0.863 |
| 850 | 0.965 | 0.933 | 0.908 | 0.890 | 0.876 | 0.864 | 0.855 |
| 900 | 0.963 | 0.929 | 0.903 | 0.883 | 0.868 | 0.856 | 0.847 |
| 950 | 0.961 | 0.925 | 0.898 | 0.877 | 0.861 | 0.848 | 0.839 |
| 1000 | 0.959 | 0.922 | 0.893 | 0.871 | 0.854 | 0.841 | 0.831 |
| 1050 | 0.958 | 0.917 | 0.888 | 0.864 | 0.847 | 0.834 | 0.822 |
| 1100 | 0.956 | 0.914 | 0.882 | 0.858 | 0.840 | 0.826 | 0.814 |
| 1150 | 0.953 | 0.910 | 0.877 | 0.852 | 0.833 | 0.818 | 0.807 |
| 1200 | 0.951 | 0.906 | 0.872 | 0.846 | 0.826 | 0.811 | 0.799 |
| 1250 | 0.949 | 0.902 | 0.867 | 0.840 | 0.819 | 0.803 | 0.790 |
| 1300 | 0.947 | 0.899 | 0.862 | 0.834 | 0.813 | 0.796 | 0.783 |
| 1350 | 0.945 | 0.895 | 0.856 | 0.827 | 0.806 | 0.788 | 0.775 |
| 1400 | 0.943 | 0.891 | 0.851 | 0.822 | 0.799 | 0.781 | 0.767 |
| 1450 | 0.941 | 0.887 | 0.847 | 0.816 | 0.792 | 0.773 | 0.759 |
| 1500 | 0.939 | 0.883 | 0.842 | 0.810 | 0.785 | 0.766 | 0.751 |
| 1550 | 0.938 | 0.880 | 0.836 | 0.803 | 0.779 | 0.758 | 0.743 |
| 1600 | 0.935 | 0.876 | 0.832 | 0.797 | 0.773 | 0.752 | 0.736 |

Table A2_10.2. Guillemot, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.995 | 0.993 | 0.994 | 0.993 | 0.993 | 0.992 |
| 100 | 0.996 | 0.991 | 0.988 | 0.986 | 0.985 | 0.982 | 0.983 |
| 150 | 0.994 | 0.989 | 0.983 | 0.980 | 0.978 | 0.977 | 0.975 |
| 200 | 0.991 | 0.985 | 0.979 | 0.975 | 0.971 | 0.968 | 0.967 |
| 250 | 0.989 | 0.980 | 0.973 | 0.970 | 0.965 | 0.960 | 0.957 |
| 300 | 0.986 | 0.976 | 0.966 | 0.961 | 0.957 | 0.953 | 0.949 |
| 350 | 0.985 | 0.972 | 0.962 | 0.954 | 0.947 | 0.943 | 0.939 |
| 400 | 0.983 | 0.969 | 0.956 | 0.947 | 0.941 | 0.937 | 0.932 |
| 450 | 0.981 | 0.964 | 0.950 | 0.942 | 0.934 | 0.927 | 0.924 |
| 500 | 0.979 | 0.959 | 0.944 | 0.936 | 0.926 | 0.919 | 0.914 |
| 550 | 0.977 | 0.955 | 0.939 | 0.928 | 0.918 | 0.911 | 0.906 |
| 600 | 0.976 | 0.953 | 0.935 | 0.924 | 0.913 | 0.904 | 0.897 |
| 650 | 0.973 | 0.950 | 0.929 | 0.915 | 0.905 | 0.896 | 0.889 |
| 700 | 0.971 | 0.945 | 0.924 | 0.910 | 0.898 | 0.888 | 0.880 |
| 750 | 0.970 | 0.942 | 0.918 | 0.903 | 0.890 | 0.879 | 0.873 |
| 800 | 0.965 | 0.937 | 0.912 | 0.896 | 0.882 | 0.872 | 0.865 |
| 850 | 0.965 | 0.933 | 0.909 | 0.890 | 0.874 | 0.864 | 0.856 |
| 900 | 0.963 | 0.929 | 0.904 | 0.885 | 0.869 | 0.858 | 0.848 |
| 950 | 0.961 | 0.926 | 0.897 | 0.878 | 0.861 | 0.850 | 0.840 |
| 1000 | 0.959 | 0.921 | 0.891 | 0.870 | 0.854 | 0.841 | 0.830 |
| 1050 | 0.956 | 0.918 | 0.887 | 0.866 | 0.848 | 0.836 | 0.824 |
| 1100 | 0.955 | 0.913 | 0.881 | 0.859 | 0.840 | 0.825 | 0.815 |
| 1150 | 0.953 | 0.910 | 0.877 | 0.854 | 0.833 | 0.818 | 0.807 |
| 1200 | 0.950 | 0.905 | 0.871 | 0.848 | 0.827 | 0.811 | 0.800 |
| 1250 | 0.950 | 0.903 | 0.867 | 0.841 | 0.819 | 0.803 | 0.791 |
| 1300 | 0.946 | 0.899 | 0.862 | 0.834 | 0.814 | 0.797 | 0.783 |
| 1350 | 0.945 | 0.895 | 0.858 | 0.829 | 0.808 | 0.788 | 0.775 |
| 1400 | 0.942 | 0.890 | 0.851 | 0.823 | 0.801 | 0.783 | 0.768 |
| 1450 | 0.941 | 0.887 | 0.847 | 0.816 | 0.792 | 0.774 | 0.759 |
| 1500 | 0.939 | 0.884 | 0.842 | 0.810 | 0.786 | 0.768 | 0.751 |
| 1550 | 0.935 | 0.879 | 0.836 | 0.804 | 0.778 | 0.758 | 0.743 |
| 1600 | 0.935 | 0.876 | 0.832 | 0.799 | 0.773 | 0.752 | 0.737 |

Table A2_10.3. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 1.000 | 1.000 | 1.000 |
| 150 | 0.999 | 0.999 | 0.999 |
| 200 | 0.999 | 0.999 | 0.999 |
| 250 | 0.999 | 0.999 | 0.999 |
| 300 | 0.999 | 0.999 | 0.999 |
| 350 | 0.998 | 0.998 | 0.998 |
| 400 | 0.998 | 0.998 | 0.998 |
| 450 | 0.998 | 0.998 | 0.998 |
| 500 | 0.998 | 0.998 | 0.998 |
| 550 | 0.997 | 0.997 | 0.997 |
| 600 | 0.997 | 0.997 | 0.997 |
| 650 | 0.997 | 0.997 | 0.997 |
| 700 | 0.997 | 0.997 | 0.997 |
| 750 | 0.996 | 0.996 | 0.996 |
| 800 | 0.996 | 0.996 | 0.996 |
| 850 | 0.996 | 0.996 | 0.996 |
| 900 | 0.996 | 0.996 | 0.996 |
| 950 | 0.995 | 0.996 | 0.995 |
| 1000 | 0.995 | 0.995 | 0.995 |
| 1050 | 0.995 | 0.995 | 0.995 |
| 1100 | 0.995 | 0.995 | 0.995 |
| 1150 | 0.994 | 0.994 | 0.994 |
| 1200 | 0.994 | 0.994 | 0.994 |
| 1250 | 0.994 | 0.994 | 0.994 |
| 1300 | 0.994 | 0.994 | 0.994 |
| 1350 | 0.993 | 0.993 | 0.993 |
| 1400 | 0.993 | 0.993 | 0.993 |
| 1450 | 0.993 | 0.993 | 0.993 |
| 1500 | 0.993 | 0.993 | 0.993 |
| 1550 | 0.992 | 0.992 | 0.992 |
| 1600 | 0.992 | 0.992 | 0.992 |

Table A2_10.4. Guillemot, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 1.000 | 1.000 | 1.000 |
| 150 | 0.999 | 0.999 | 0.999 |
| 200 | 0.999 | 0.999 | 0.999 |
| 250 | 0.999 | 0.999 | 0.999 |
| 300 | 0.999 | 0.999 | 0.999 |
| 350 | 0.998 | 0.998 | 0.999 |
| 400 | 0.998 | 0.998 | 0.998 |
| 450 | 0.998 | 0.998 | 0.998 |
| 500 | 0.998 | 0.998 | 0.998 |
| 550 | 0.997 | 0.998 | 0.997 |
| 600 | 0.997 | 0.997 | 0.997 |
| 650 | 0.997 | 0.997 | 0.997 |
| 700 | 0.997 | 0.997 | 0.997 |
| 750 | 0.996 | 0.997 | 0.997 |
| 800 | 0.996 | 0.997 | 0.996 |
| 850 | 0.996 | 0.996 | 0.996 |
| 900 | 0.996 | 0.996 | 0.996 |
| 950 | 0.995 | 0.996 | 0.996 |
| 1000 | 0.995 | 0.995 | 0.995 |
| 1050 | 0.995 | 0.995 | 0.995 |
| 1100 | 0.995 | 0.995 | 0.995 |
| 1150 | 0.994 | 0.994 | 0.994 |
| 1200 | 0.994 | 0.994 | 0.994 |
| 1250 | 0.994 | 0.994 | 0.994 |
| 1300 | 0.994 | 0.994 | 0.994 |
| 1350 | 0.993 | 0.994 | 0.993 |
| 1400 | 0.993 | 0.993 | 0.993 |
| 1450 | 0.993 | 0.993 | 0.993 |
| 1500 | 0.993 | 0.993 | 0.993 |
| 1550 | 0.992 | 0.993 | 0.992 |
| 1600 | 0.992 | 0.992 | 0.992 |

Table A2_11.1. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.995 | 0.992 | 0.989 | 0.986 | 0.983 | 0.980 |
| 100 | 0.995 | 0.989 | 0.983 | 0.977 | 0.972 | 0.966 | 0.960 |
| 150 | 0.993 | 0.984 | 0.975 | 0.966 | 0.958 | 0.949 | 0.941 |
| 200 | 0.990 | 0.979 | 0.967 | 0.955 | 0.944 | 0.932 | 0.921 |
| 250 | 0.988 | 0.973 | 0.959 | 0.945 | 0.930 | 0.917 | 0.903 |
| 300 | 0.986 | 0.968 | 0.951 | 0.934 | 0.917 | 0.901 | 0.884 |
| 350 | 0.983 | 0.963 | 0.943 | 0.923 | 0.904 | 0.885 | 0.867 |
| 400 | 0.981 | 0.958 | 0.935 | 0.912 | 0.891 | 0.870 | 0.849 |
| 450 | 0.979 | 0.952 | 0.927 | 0.902 | 0.878 | 0.854 | 0.832 |
| 500 | 0.976 | 0.947 | 0.919 | 0.892 | 0.865 | 0.840 | 0.815 |
| 550 | 0.974 | 0.942 | 0.911 | 0.882 | 0.853 | 0.825 | 0.798 |
| 600 | 0.972 | 0.937 | 0.904 | 0.871 | 0.840 | 0.811 | 0.782 |
| 650 | 0.969 | 0.932 | 0.896 | 0.862 | 0.828 | 0.797 | 0.766 |
| 700 | 0.967 | 0.927 | 0.888 | 0.852 | 0.816 | 0.783 | 0.750 |
| 750 | 0.965 | 0.922 | 0.881 | 0.842 | 0.804 | 0.769 | 0.735 |
| 800 | 0.962 | 0.917 | 0.874 | 0.832 | 0.793 | 0.755 | 0.720 |
| 850 | 0.960 | 0.912 | 0.866 | 0.823 | 0.781 | 0.742 | 0.706 |
| 900 | 0.957 | 0.907 | 0.859 | 0.813 | 0.770 | 0.729 | 0.691 |
| 950 | 0.955 | 0.902 | 0.852 | 0.804 | 0.759 | 0.717 | 0.677 |
| 1000 | 0.953 | 0.897 | 0.844 | 0.794 | 0.748 | 0.704 | 0.663 |
| 1050 | 0.951 | 0.892 | 0.837 | 0.786 | 0.737 | 0.692 | 0.649 |
| 1100 | 0.948 | 0.887 | 0.830 | 0.777 | 0.727 | 0.680 | 0.636 |
| 1150 | 0.946 | 0.882 | 0.823 | 0.768 | 0.716 | 0.668 | 0.623 |
| 1200 | 0.943 | 0.878 | 0.816 | 0.759 | 0.705 | 0.656 | 0.611 |
| 1250 | 0.941 | 0.873 | 0.809 | 0.750 | 0.696 | 0.645 | 0.598 |
| 1300 | 0.939 | 0.868 | 0.802 | 0.742 | 0.685 | 0.633 | 0.586 |
| 1350 | 0.937 | 0.863 | 0.796 | 0.733 | 0.675 | 0.622 | 0.573 |
| 1400 | 0.934 | 0.858 | 0.789 | 0.724 | 0.665 | 0.612 | 0.562 |
| 1450 | 0.932 | 0.854 | 0.782 | 0.716 | 0.656 | 0.600 | 0.550 |
| 1500 | 0.930 | 0.849 | 0.775 | 0.708 | 0.646 | 0.590 | 0.539 |
| 1550 | 0.928 | 0.844 | 0.768 | 0.700 | 0.637 | 0.579 | 0.528 |
| 1600 | 0.925 | 0.840 | 0.762 | 0.692 | 0.628 | 0.570 | 0.517 |

Table A2_11.2. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.997 | 0.990 | 0.988 | 0.986 | 0.983 | 0.984 | 0.978 |
| 100 | 0.993 | 0.987 | 0.979 | 0.975 | 0.968 | 0.965 | 0.955 |
| 150 | 0.990 | 0.981 | 0.975 | 0.965 | 0.956 | 0.947 | 0.937 |
| 200 | 0.989 | 0.975 | 0.964 | 0.955 | 0.944 | 0.932 | 0.919 |
| 250 | 0.987 | 0.967 | 0.956 | 0.946 | 0.934 | 0.921 | 0.907 |
| 300 | 0.984 | 0.962 | 0.947 | 0.931 | 0.917 | 0.901 | 0.883 |
| 350 | 0.982 | 0.961 | 0.941 | 0.922 | 0.905 | 0.885 | 0.867 |
| 400 | 0.978 | 0.953 | 0.932 | 0.907 | 0.886 | 0.867 | 0.845 |
| 450 | 0.975 | 0.948 | 0.922 | 0.900 | 0.877 | 0.854 | 0.828 |
| 500 | 0.975 | 0.944 | 0.916 | 0.890 | 0.864 | 0.839 | 0.811 |
| 550 | 0.972 | 0.935 | 0.905 | 0.877 | 0.850 | 0.823 | 0.794 |
| 600 | 0.970 | 0.936 | 0.901 | 0.871 | 0.841 | 0.812 | 0.779 |
| 650 | 0.968 | 0.929 | 0.893 | 0.859 | 0.827 | 0.794 | 0.762 |
| 700 | 0.964 | 0.922 | 0.886 | 0.848 | 0.815 | 0.781 | 0.748 |
| 750 | 0.962 | 0.919 | 0.880 | 0.841 | 0.804 | 0.770 | 0.732 |
| 800 | 0.959 | 0.910 | 0.867 | 0.828 | 0.789 | 0.753 | 0.715 |
| 850 | 0.957 | 0.906 | 0.861 | 0.822 | 0.780 | 0.742 | 0.703 |
| 900 | 0.956 | 0.905 | 0.857 | 0.813 | 0.769 | 0.732 | 0.692 |
| 950 | 0.953 | 0.901 | 0.848 | 0.802 | 0.759 | 0.717 | 0.674 |
| 1000 | 0.951 | 0.893 | 0.843 | 0.794 | 0.748 | 0.703 | 0.661 |
| 1050 | 0.948 | 0.889 | 0.835 | 0.785 | 0.738 | 0.692 | 0.648 |
| 1100 | 0.945 | 0.882 | 0.825 | 0.773 | 0.722 | 0.678 | 0.634 |
| 1150 | 0.944 | 0.879 | 0.821 | 0.764 | 0.715 | 0.666 | 0.621 |
| 1200 | 0.941 | 0.873 | 0.811 | 0.754 | 0.702 | 0.654 | 0.608 |
| 1250 | 0.939 | 0.869 | 0.805 | 0.748 | 0.692 | 0.643 | 0.596 |
| 1300 | 0.936 | 0.865 | 0.798 | 0.741 | 0.685 | 0.634 | 0.586 |
| 1350 | 0.934 | 0.862 | 0.792 | 0.730 | 0.673 | 0.622 | 0.572 |
| 1400 | 0.934 | 0.855 | 0.787 | 0.722 | 0.665 | 0.612 | 0.561 |
| 1450 | 0.930 | 0.852 | 0.780 | 0.717 | 0.656 | 0.602 | 0.549 |
| 1500 | 0.928 | 0.846 | 0.773 | 0.706 | 0.646 | 0.589 | 0.538 |
| 1550 | 0.925 | 0.842 | 0.767 | 0.701 | 0.638 | 0.580 | 0.528 |
| 1600 | 0.924 | 0.838 | 0.759 | 0.690 | 0.627 | 0.567 | 0.513 |

Table A2_11.3. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 0.999 | 0.999 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.998 | 0.998 |
| 200 | 0.998 | 0.998 | 0.998 |
| 250 | 0.997 | 0.997 | 0.997 |
| 300 | 0.996 | 0.996 | 0.996 |
| 350 | 0.996 | 0.996 | 0.996 |
| 400 | 0.995 | 0.995 | 0.995 |
| 450 | 0.995 | 0.995 | 0.995 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.993 | 0.993 | 0.993 |
| 600 | 0.993 | 0.993 | 0.993 |
| 650 | 0.992 | 0.992 | 0.992 |
| 700 | 0.992 | 0.992 | 0.992 |
| 750 | 0.991 | 0.991 | 0.991 |
| 800 | 0.990 | 0.990 | 0.990 |
| 850 | 0.990 | 0.990 | 0.990 |
| 900 | 0.989 | 0.989 | 0.989 |
| 950 | 0.989 | 0.989 | 0.989 |
| 1000 | 0.988 | 0.988 | 0.988 |
| 1050 | 0.987 | 0.987 | 0.987 |
| 1100 | 0.987 | 0.987 | 0.987 |
| 1150 | 0.986 | 0.986 | 0.986 |
| 1200 | 0.986 | 0.986 | 0.986 |
| 1250 | 0.985 | 0.985 | 0.985 |
| 1300 | 0.984 | 0.984 | 0.984 |
| 1350 | 0.984 | 0.984 | 0.984 |
| 1400 | 0.983 | 0.983 | 0.983 |
| 1450 | 0.983 | 0.983 | 0.983 |
| 1500 | 0.982 | 0.982 | 0.982 |
| 1550 | 0.981 | 0.981 | 0.981 |
| 1600 | 0.981 | 0.981 | 0.981 |

Table A2_11.4. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.999 | 0.999 | 0.999 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.998 | 0.998 |
| 200 | 0.998 | 0.997 | 0.997 |
| 250 | 0.997 | 0.997 | 0.997 |
| 300 | 0.996 | 0.997 | 0.997 |
| 350 | 0.996 | 0.996 | 0.996 |
| 400 | 0.995 | 0.995 | 0.995 |
| 450 | 0.995 | 0.994 | 0.994 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.993 | 0.993 | 0.993 |
| 600 | 0.993 | 0.993 | 0.993 |
| 650 | 0.992 | 0.992 | 0.992 |
| 700 | 0.992 | 0.991 | 0.992 |
| 750 | 0.991 | 0.991 | 0.991 |
| 800 | 0.990 | 0.990 | 0.990 |
| 850 | 0.990 | 0.990 | 0.990 |
| 900 | 0.989 | 0.989 | 0.989 |
| 950 | 0.989 | 0.988 | 0.989 |
| 1000 | 0.988 | 0.988 | 0.988 |
| 1050 | 0.987 | 0.987 | 0.988 |
| 1100 | 0.987 | 0.987 | 0.987 |
| 1150 | 0.986 | 0.986 | 0.986 |
| 1200 | 0.986 | 0.986 | 0.985 |
| 1250 | 0.985 | 0.985 | 0.985 |
| 1300 | 0.985 | 0.984 | 0.985 |
| 1350 | 0.984 | 0.984 | 0.984 |
| 1400 | 0.983 | 0.983 | 0.983 |
| 1450 | 0.983 | 0.983 | 0.983 |
| 1500 | 0.982 | 0.982 | 0.982 |
| 1550 | 0.982 | 0.982 | 0.982 |
| 1600 | 0.981 | 0.981 | 0.981 |

Table A2_12.1. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.996 | 0.994 | 0.993 | 0.992 | 0.991 | 0.991 |
| 100 | 0.996 | 0.992 | 0.989 | 0.986 | 0.984 | 0.982 | 0.981 |
| 150 | 0.994 | 0.988 | 0.983 | 0.979 | 0.976 | 0.974 | 0.972 |
| 200 | 0.992 | 0.984 | 0.977 | 0.972 | 0.968 | 0.965 | 0.962 |
| 250 | 0.990 | 0.979 | 0.971 | 0.965 | 0.960 | 0.956 | 0.953 |
| 300 | 0.987 | 0.975 | 0.966 | 0.958 | 0.952 | 0.947 | 0.944 |
| 350 | 0.985 | 0.971 | 0.960 | 0.951 | 0.944 | 0.939 | 0.935 |
| 400 | 0.983 | 0.967 | 0.954 | 0.944 | 0.936 | 0.930 | 0.925 |
| 450 | 0.981 | 0.963 | 0.949 | 0.937 | 0.928 | 0.922 | 0.916 |
| 500 | 0.979 | 0.959 | 0.943 | 0.931 | 0.921 | 0.913 | 0.907 |
| 550 | 0.977 | 0.955 | 0.937 | 0.924 | 0.913 | 0.904 | 0.897 |
| 600 | 0.975 | 0.951 | 0.932 | 0.917 | 0.906 | 0.896 | 0.888 |
| 650 | 0.973 | 0.947 | 0.926 | 0.910 | 0.897 | 0.887 | 0.879 |
| 700 | 0.971 | 0.943 | 0.921 | 0.904 | 0.890 | 0.879 | 0.869 |
| 750 | 0.969 | 0.939 | 0.915 | 0.897 | 0.882 | 0.870 | 0.861 |
| 800 | 0.967 | 0.935 | 0.910 | 0.890 | 0.874 | 0.861 | 0.851 |
| 850 | 0.965 | 0.931 | 0.904 | 0.883 | 0.867 | 0.853 | 0.842 |
| 900 | 0.963 | 0.927 | 0.899 | 0.877 | 0.859 | 0.845 | 0.833 |
| 950 | 0.961 | 0.923 | 0.893 | 0.870 | 0.851 | 0.836 | 0.824 |
| 1000 | 0.959 | 0.919 | 0.888 | 0.863 | 0.844 | 0.828 | 0.815 |
| 1050 | 0.957 | 0.915 | 0.883 | 0.856 | 0.836 | 0.819 | 0.806 |
| 1100 | 0.955 | 0.911 | 0.877 | 0.850 | 0.828 | 0.811 | 0.797 |
| 1150 | 0.953 | 0.907 | 0.871 | 0.844 | 0.821 | 0.803 | 0.788 |
| 1200 | 0.951 | 0.903 | 0.866 | 0.837 | 0.813 | 0.794 | 0.779 |
| 1250 | 0.949 | 0.900 | 0.861 | 0.830 | 0.806 | 0.786 | 0.770 |
| 1300 | 0.946 | 0.895 | 0.856 | 0.824 | 0.798 | 0.778 | 0.762 |
| 1350 | 0.945 | 0.892 | 0.850 | 0.818 | 0.791 | 0.770 | 0.751 |
| 1400 | 0.942 | 0.888 | 0.845 | 0.811 | 0.784 | 0.762 | 0.743 |
| 1450 | 0.941 | 0.883 | 0.839 | 0.804 | 0.776 | 0.753 | 0.735 |
| 1500 | 0.939 | 0.880 | 0.834 | 0.798 | 0.768 | 0.745 | 0.726 |
| 1550 | 0.937 | 0.876 | 0.829 | 0.792 | 0.761 | 0.737 | 0.717 |
| 1600 | 0.934 | 0.872 | 0.823 | 0.785 | 0.754 | 0.729 | 0.708 |

Table A2_12.2. Guillemot, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.996 | 0.996 | 0.995 | 0.994 | 0.994 | 0.989 | 0.991 |
| 100 | 0.995 | 0.993 | 0.989 | 0.988 | 0.984 | 0.980 | 0.980 |
| 150 | 0.994 | 0.990 | 0.985 | 0.981 | 0.979 | 0.975 | 0.975 |
| 200 | 0.991 | 0.986 | 0.977 | 0.975 | 0.970 | 0.965 | 0.963 |
| 250 | 0.991 | 0.979 | 0.971 | 0.964 | 0.961 | 0.956 | 0.953 |
| 300 | 0.989 | 0.975 | 0.966 | 0.960 | 0.954 | 0.948 | 0.945 |
| 350 | 0.986 | 0.973 | 0.961 | 0.954 | 0.946 | 0.939 | 0.937 |
| 400 | 0.982 | 0.968 | 0.952 | 0.944 | 0.936 | 0.928 | 0.925 |
| 450 | 0.982 | 0.963 | 0.950 | 0.938 | 0.928 | 0.920 | 0.915 |
| 500 | 0.979 | 0.960 | 0.943 | 0.933 | 0.923 | 0.914 | 0.909 |
| 550 | 0.977 | 0.956 | 0.938 | 0.925 | 0.914 | 0.902 | 0.898 |
| 600 | 0.975 | 0.953 | 0.933 | 0.919 | 0.907 | 0.895 | 0.889 |
| 650 | 0.973 | 0.947 | 0.927 | 0.911 | 0.899 | 0.885 | 0.880 |
| 700 | 0.970 | 0.944 | 0.921 | 0.905 | 0.890 | 0.877 | 0.868 |
| 750 | 0.970 | 0.941 | 0.917 | 0.900 | 0.888 | 0.873 | 0.863 |
| 800 | 0.966 | 0.935 | 0.910 | 0.891 | 0.875 | 0.861 | 0.852 |
| 850 | 0.965 | 0.931 | 0.904 | 0.884 | 0.869 | 0.853 | 0.843 |
| 900 | 0.964 | 0.929 | 0.901 | 0.878 | 0.859 | 0.845 | 0.836 |
| 950 | 0.960 | 0.925 | 0.894 | 0.870 | 0.852 | 0.835 | 0.823 |
| 1000 | 0.959 | 0.921 | 0.889 | 0.864 | 0.846 | 0.828 | 0.817 |
| 1050 | 0.958 | 0.916 | 0.882 | 0.857 | 0.837 | 0.817 | 0.804 |
| 1100 | 0.955 | 0.912 | 0.877 | 0.849 | 0.829 | 0.809 | 0.797 |
| 1150 | 0.953 | 0.908 | 0.872 | 0.844 | 0.822 | 0.803 | 0.789 |
| 1200 | 0.949 | 0.903 | 0.868 | 0.839 | 0.814 | 0.793 | 0.780 |
| 1250 | 0.949 | 0.901 | 0.861 | 0.832 | 0.808 | 0.786 | 0.771 |
| 1300 | 0.947 | 0.896 | 0.858 | 0.827 | 0.801 | 0.778 | 0.762 |
| 1350 | 0.943 | 0.891 | 0.850 | 0.819 | 0.793 | 0.768 | 0.752 |
| 1400 | 0.942 | 0.889 | 0.847 | 0.814 | 0.786 | 0.762 | 0.744 |
| 1450 | 0.941 | 0.884 | 0.838 | 0.805 | 0.777 | 0.752 | 0.736 |
| 1500 | 0.939 | 0.881 | 0.833 | 0.798 | 0.770 | 0.745 | 0.726 |
| 1550 | 0.937 | 0.877 | 0.829 | 0.792 | 0.763 | 0.736 | 0.717 |
| 1600 | 0.935 | 0.873 | 0.826 | 0.786 | 0.755 | 0.730 | 0.709 |

Table A2_12.3. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 1.000 | 0.999 | 1.000 |
| 150 | 0.999 | 0.999 | 0.999 |
| 200 | 0.999 | 0.999 | 0.999 |
| 250 | 0.999 | 0.999 | 0.999 |
| 300 | 0.998 | 0.999 | 0.999 |
| 350 | 0.998 | 0.998 | 0.998 |
| 400 | 0.998 | 0.998 | 0.998 |
| 450 | 0.998 | 0.998 | 0.998 |
| 500 | 0.997 | 0.997 | 0.997 |
| 550 | 0.997 | 0.997 | 0.997 |
| 600 | 0.997 | 0.997 | 0.997 |
| 650 | 0.997 | 0.997 | 0.997 |
| 700 | 0.996 | 0.996 | 0.996 |
| 750 | 0.996 | 0.996 | 0.996 |
| 800 | 0.996 | 0.996 | 0.996 |
| 850 | 0.995 | 0.995 | 0.996 |
| 900 | 0.995 | 0.995 | 0.995 |
| 950 | 0.995 | 0.995 | 0.995 |
| 1000 | 0.995 | 0.994 | 0.995 |
| 1050 | 0.994 | 0.994 | 0.994 |
| 1100 | 0.994 | 0.994 | 0.994 |
| 1150 | 0.994 | 0.994 | 0.994 |
| 1200 | 0.993 | 0.993 | 0.994 |
| 1250 | 0.993 | 0.993 | 0.993 |
| 1300 | 0.993 | 0.993 | 0.993 |
| 1350 | 0.992 | 0.992 | 0.993 |
| 1400 | 0.992 | 0.992 | 0.992 |
| 1450 | 0.992 | 0.992 | 0.992 |
| 1500 | 0.991 | 0.991 | 0.992 |
| 1550 | 0.991 | 0.991 | 0.991 |
| 1600 | 0.991 | 0.991 | 0.991 |

Table A2_12.4. Guillemot, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 0.999 | 1.000 | 0.999 |
| 150 | 0.999 | 0.999 | 0.999 |
| 200 | 0.999 | 0.999 | 0.999 |
| 250 | 0.999 | 0.999 | 0.999 |
| 300 | 0.998 | 0.999 | 0.998 |
| 350 | 0.998 | 0.998 | 0.998 |
| 400 | 0.998 | 0.998 | 0.998 |
| 450 | 0.998 | 0.998 | 0.998 |
| 500 | 0.998 | 0.998 | 0.997 |
| 550 | 0.997 | 0.997 | 0.997 |
| 600 | 0.997 | 0.997 | 0.997 |
| 650 | 0.997 | 0.997 | 0.997 |
| 700 | 0.996 | 0.996 | 0.996 |
| 750 | 0.996 | 0.996 | 0.996 |
| 800 | 0.996 | 0.996 | 0.996 |
| 850 | 0.996 | 0.995 | 0.995 |
| 900 | 0.995 | 0.995 | 0.995 |
| 950 | 0.995 | 0.995 | 0.995 |
| 1000 | 0.995 | 0.995 | 0.994 |
| 1050 | 0.994 | 0.994 | 0.994 |
| 1100 | 0.994 | 0.994 | 0.994 |
| 1150 | 0.994 | 0.994 | 0.994 |
| 1200 | 0.993 | 0.993 | 0.993 |
| 1250 | 0.993 | 0.993 | 0.993 |
| 1300 | 0.993 | 0.993 | 0.993 |
| 1350 | 0.992 | 0.992 | 0.993 |
| 1400 | 0.992 | 0.992 | 0.992 |
| 1450 | 0.992 | 0.992 | 0.992 |
| 1500 | 0.991 | 0.991 | 0.991 |
| 1550 | 0.991 | 0.991 | 0.991 |
| 1600 | 0.991 | 0.991 | 0.991 |

Table A2_13.1. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.991 | 0.979 | 0.967 | 0.956 | 0.945 | 0.934 | 0.923 |
| 100 | 0.981 | 0.958 | 0.936 | 0.914 | 0.892 | 0.872 | 0.851 |
| 150 | 0.972 | 0.938 | 0.905 | 0.874 | 0.843 | 0.813 | 0.785 |
| 200 | 0.963 | 0.918 | 0.875 | 0.835 | 0.796 | 0.759 | 0.724 |
| 250 | 0.953 | 0.899 | 0.847 | 0.798 | 0.751 | 0.708 | 0.667 |
| 300 | 0.944 | 0.879 | 0.819 | 0.762 | 0.710 | 0.660 | 0.615 |
| 350 | 0.935 | 0.860 | 0.792 | 0.728 | 0.670 | 0.616 | 0.567 |
| 400 | 0.926 | 0.842 | 0.765 | 0.695 | 0.632 | 0.574 | 0.522 |
| 450 | 0.917 | 0.824 | 0.740 | 0.664 | 0.597 | 0.536 | 0.481 |
| 500 | 0.909 | 0.806 | 0.715 | 0.634 | 0.563 | 0.499 | 0.443 |
| 550 | 0.900 | 0.789 | 0.691 | 0.607 | 0.531 | 0.466 | 0.408 |
| 600 | 0.891 | 0.771 | 0.668 | 0.579 | 0.501 | 0.434 | 0.376 |
| 650 | 0.883 | 0.755 | 0.646 | 0.553 | 0.473 | 0.404 | 0.346 |
| 700 | 0.874 | 0.739 | 0.624 | 0.527 | 0.446 | 0.377 | 0.318 |
| 750 | 0.865 | 0.722 | 0.603 | 0.504 | 0.420 | 0.351 | 0.292 |
| 800 | 0.857 | 0.707 | 0.583 | 0.480 | 0.396 | 0.326 | 0.269 |
| 850 | 0.848 | 0.691 | 0.563 | 0.458 | 0.373 | 0.304 | 0.248 |
| 900 | 0.840 | 0.676 | 0.545 | 0.438 | 0.352 | 0.283 | 0.228 |
| 950 | 0.832 | 0.661 | 0.525 | 0.417 | 0.332 | 0.264 | 0.209 |
| 1000 | 0.824 | 0.647 | 0.507 | 0.398 | 0.312 | 0.245 | 0.192 |

Table A2_13.2. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.990 | 0.973 | 0.963 | 0.953 | 0.943 | 0.935 | 0.926 |
| 100 | 0.980 | 0.956 | 0.931 | 0.911 | 0.891 | 0.873 | 0.849 |
| 150 | 0.974 | 0.944 | 0.906 | 0.878 | 0.849 | 0.822 | 0.789 |
| 200 | 0.963 | 0.919 | 0.875 | 0.837 | 0.801 | 0.771 | 0.727 |
| 250 | 0.954 | 0.900 | 0.846 | 0.807 | 0.760 | 0.718 | 0.675 |
| 300 | 0.943 | 0.878 | 0.815 | 0.766 | 0.715 | 0.669 | 0.619 |
| 350 | 0.935 | 0.861 | 0.790 | 0.731 | 0.674 | 0.619 | 0.565 |
| 400 | 0.928 | 0.844 | 0.761 | 0.696 | 0.636 | 0.583 | 0.525 |
| 450 | 0.918 | 0.823 | 0.740 | 0.669 | 0.605 | 0.545 | 0.486 |
| 500 | 0.910 | 0.809 | 0.715 | 0.638 | 0.566 | 0.506 | 0.446 |
| 550 | 0.903 | 0.795 | 0.694 | 0.614 | 0.537 | 0.473 | 0.412 |
| 600 | 0.892 | 0.770 | 0.664 | 0.580 | 0.503 | 0.434 | 0.376 |
| 650 | 0.881 | 0.756 | 0.642 | 0.553 | 0.475 | 0.407 | 0.346 |
| 700 | 0.873 | 0.738 | 0.623 | 0.527 | 0.447 | 0.378 | 0.320 |
| 750 | 0.866 | 0.722 | 0.601 | 0.506 | 0.422 | 0.355 | 0.294 |
| 800 | 0.859 | 0.707 | 0.579 | 0.480 | 0.398 | 0.328 | 0.271 |
| 850 | 0.848 | 0.691 | 0.561 | 0.458 | 0.374 | 0.307 | 0.249 |
| 900 | 0.840 | 0.676 | 0.545 | 0.438 | 0.354 | 0.286 | 0.231 |
| 950 | 0.832 | 0.661 | 0.524 | 0.418 | 0.336 | 0.268 | 0.212 |
| 1000 | 0.824 | 0.645 | 0.508 | 0.399 | 0.314 | 0.249 | 0.194 |

Table A2_13.3. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.998 | 0.998 |
| 100 | 0.995 | 0.995 | 0.995 |
| 150 | 0.993 | 0.993 | 0.993 |
| 200 | 0.991 | 0.991 | 0.991 |
| 250 | 0.988 | 0.988 | 0.988 |
| 300 | 0.986 | 0.986 | 0.986 |
| 350 | 0.983 | 0.983 | 0.983 |
| 400 | 0.981 | 0.981 | 0.981 |
| 450 | 0.979 | 0.979 | 0.979 |
| 500 | 0.976 | 0.976 | 0.976 |
| 550 | 0.974 | 0.974 | 0.974 |
| 600 | 0.972 | 0.972 | 0.972 |
| 650 | 0.969 | 0.969 | 0.969 |
| 700 | 0.967 | 0.967 | 0.967 |
| 750 | 0.965 | 0.964 | 0.965 |
| 800 | 0.962 | 0.962 | 0.962 |
| 850 | 0.960 | 0.960 | 0.960 |
| 900 | 0.957 | 0.957 | 0.957 |
| 950 | 0.955 | 0.955 | 0.955 |
| 1000 | 0.953 | 0.953 | 0.953 |

Table A2_13.4. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.997 | 0.999 |
| 100 | 0.995 | 0.995 | 0.996 |
| 150 | 0.993 | 0.993 | 0.994 |
| 200 | 0.991 | 0.990 | 0.991 |
| 250 | 0.989 | 0.988 | 0.989 |
| 300 | 0.986 | 0.986 | 0.986 |
| 350 | 0.983 | 0.984 | 0.984 |
| 400 | 0.981 | 0.981 | 0.981 |
| 450 | 0.979 | 0.979 | 0.979 |
| 500 | 0.977 | 0.976 | 0.977 |
| 550 | 0.974 | 0.974 | 0.974 |
| 600 | 0.972 | 0.972 | 0.972 |
| 650 | 0.969 | 0.969 | 0.970 |
| 700 | 0.967 | 0.967 | 0.967 |
| 750 | 0.965 | 0.964 | 0.965 |
| 800 | 0.962 | 0.962 | 0.963 |
| 850 | 0.960 | 0.960 | 0.960 |
| 900 | 0.958 | 0.958 | 0.958 |
| 950 | 0.955 | 0.956 | 0.955 |
| 1000 | 0.953 | 0.953 | 0.953 |

Table A2_14.1. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.992 | 0.986 | 0.982 | 0.981 | 0.979 | 0.978 | 0.978 |
| 100 | 0.984 | 0.972 | 0.966 | 0.961 | 0.958 | 0.957 | 0.956 |
| 150 | 0.977 | 0.959 | 0.948 | 0.941 | 0.938 | 0.935 | 0.933 |
| 200 | 0.969 | 0.945 | 0.930 | 0.922 | 0.917 | 0.913 | 0.910 |
| 250 | 0.961 | 0.931 | 0.914 | 0.902 | 0.896 | 0.891 | 0.889 |
| 300 | 0.954 | 0.918 | 0.896 | 0.883 | 0.875 | 0.870 | 0.867 |
| 350 | 0.946 | 0.904 | 0.880 | 0.864 | 0.854 | 0.849 | 0.845 |
| 400 | 0.938 | 0.891 | 0.863 | 0.845 | 0.833 | 0.825 | 0.822 |
| 450 | 0.931 | 0.877 | 0.846 | 0.825 | 0.813 | 0.804 | 0.799 |
| 500 | 0.923 | 0.865 | 0.829 | 0.807 | 0.793 | 0.783 | 0.777 |
| 550 | 0.915 | 0.851 | 0.813 | 0.788 | 0.772 | 0.761 | 0.754 |
| 600 | 0.908 | 0.838 | 0.796 | 0.768 | 0.751 | 0.740 | 0.732 |
| 650 | 0.901 | 0.825 | 0.779 | 0.750 | 0.731 | 0.717 | 0.708 |
| 700 | 0.893 | 0.813 | 0.763 | 0.730 | 0.709 | 0.695 | 0.687 |
| 750 | 0.886 | 0.799 | 0.746 | 0.713 | 0.690 | 0.674 | 0.662 |
| 800 | 0.878 | 0.786 | 0.730 | 0.695 | 0.669 | 0.652 | 0.639 |
| 850 | 0.871 | 0.774 | 0.715 | 0.676 | 0.648 | 0.630 | 0.617 |
| 900 | 0.863 | 0.761 | 0.699 | 0.656 | 0.628 | 0.608 | 0.594 |
| 950 | 0.856 | 0.749 | 0.683 | 0.638 | 0.609 | 0.587 | 0.571 |
| 1000 | 0.849 | 0.736 | 0.667 | 0.621 | 0.588 | 0.567 | 0.548 |

Table A2_14.2. Razorbill, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.990 | 0.989 | 0.984 | 0.981 | 0.981 | 0.982 | 0.979 |
| 100 | 0.983 | 0.974 | 0.963 | 0.959 | 0.958 | 0.954 | 0.951 |
| 150 | 0.976 | 0.957 | 0.943 | 0.936 | 0.935 | 0.931 | 0.930 |
| 200 | 0.968 | 0.947 | 0.929 | 0.919 | 0.916 | 0.910 | 0.909 |
| 250 | 0.960 | 0.934 | 0.914 | 0.902 | 0.898 | 0.890 | 0.888 |
| 300 | 0.953 | 0.919 | 0.895 | 0.880 | 0.875 | 0.868 | 0.863 |
| 350 | 0.945 | 0.907 | 0.881 | 0.864 | 0.858 | 0.849 | 0.842 |
| 400 | 0.938 | 0.890 | 0.860 | 0.843 | 0.834 | 0.824 | 0.818 |
| 450 | 0.929 | 0.878 | 0.845 | 0.824 | 0.814 | 0.805 | 0.800 |
| 500 | 0.922 | 0.865 | 0.830 | 0.807 | 0.796 | 0.785 | 0.776 |
| 550 | 0.916 | 0.854 | 0.813 | 0.787 | 0.773 | 0.760 | 0.752 |
| 600 | 0.906 | 0.840 | 0.796 | 0.768 | 0.755 | 0.740 | 0.732 |
| 650 | 0.900 | 0.825 | 0.778 | 0.748 | 0.732 | 0.715 | 0.705 |
| 700 | 0.891 | 0.813 | 0.762 | 0.729 | 0.711 | 0.696 | 0.686 |
| 750 | 0.883 | 0.799 | 0.745 | 0.709 | 0.688 | 0.673 | 0.660 |
| 800 | 0.877 | 0.788 | 0.729 | 0.694 | 0.670 | 0.652 | 0.637 |
| 850 | 0.870 | 0.775 | 0.714 | 0.676 | 0.652 | 0.631 | 0.615 |
| 900 | 0.862 | 0.763 | 0.697 | 0.654 | 0.632 | 0.608 | 0.594 |
| 950 | 0.855 | 0.750 | 0.685 | 0.639 | 0.610 | 0.587 | 0.569 |
| 1000 | 0.847 | 0.736 | 0.668 | 0.620 | 0.589 | 0.564 | 0.547 |

Table A2_14.3. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.999 | 0.999 |
| 200 | 0.998 | 0.998 | 0.998 |
| 250 | 0.997 | 0.997 | 0.997 |
| 300 | 0.997 | 0.997 | 0.997 |
| 350 | 0.996 | 0.996 | 0.996 |
| 400 | 0.996 | 0.996 | 0.996 |
| 450 | 0.995 | 0.995 | 0.995 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.994 | 0.993 | 0.993 |
| 600 | 0.993 | 0.993 | 0.993 |
| 650 | 0.992 | 0.992 | 0.992 |
| 700 | 0.991 | 0.991 | 0.991 |
| 750 | 0.990 | 0.990 | 0.991 |
| 800 | 0.990 | 0.989 | 0.990 |
| 850 | 0.989 | 0.988 | 0.989 |
| 900 | 0.988 | 0.987 | 0.988 |
| 950 | 0.987 | 0.986 | 0.987 |
| 1000 | 0.986 | 0.985 | 0.986 |

Table A2_14.4. Razorbill, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 1.000 | 1.000 |
| 100 | 0.999 | 0.999 | 0.999 |
| 150 | 0.998 | 0.999 | 0.999 |
| 200 | 0.998 | 0.998 | 0.998 |
| 250 | 0.997 | 0.998 | 0.997 |
| 300 | 0.997 | 0.997 | 0.997 |
| 350 | 0.996 | 0.997 | 0.996 |
| 400 | 0.995 | 0.996 | 0.996 |
| 450 | 0.995 | 0.995 | 0.995 |
| 500 | 0.994 | 0.994 | 0.994 |
| 550 | 0.993 | 0.994 | 0.993 |
| 600 | 0.993 | 0.993 | 0.993 |
| 650 | 0.992 | 0.992 | 0.992 |
| 700 | 0.991 | 0.991 | 0.991 |
| 750 | 0.990 | 0.990 | 0.991 |
| 800 | 0.989 | 0.990 | 0.990 |
| 850 | 0.989 | 0.989 | 0.989 |
| 900 | 0.988 | 0.987 | 0.988 |
| 950 | 0.987 | 0.987 | 0.987 |
| 1000 | 0.986 | 0.985 | 0.986 |

Table A2_15.1. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.991 | 0.979 | 0.967 | 0.956 | 0.945 | 0.933 | 0.923 |
| 100 | 0.981 | 0.957 | 0.936 | 0.914 | 0.892 | 0.871 | 0.851 |
| 150 | 0.972 | 0.938 | 0.907 | 0.874 | 0.843 | 0.811 | 0.782 |
| 200 | 0.962 | 0.917 | 0.875 | 0.835 | 0.794 | 0.760 | 0.723 |
| 250 | 0.954 | 0.898 | 0.847 | 0.800 | 0.749 | 0.707 | 0.665 |
| 300 | 0.945 | 0.881 | 0.817 | 0.762 | 0.708 | 0.660 | 0.614 |
| 350 | 0.936 | 0.861 | 0.793 | 0.728 | 0.670 | 0.615 | 0.564 |
| 400 | 0.927 | 0.841 | 0.767 | 0.694 | 0.631 | 0.574 | 0.521 |
| 450 | 0.919 | 0.826 | 0.740 | 0.665 | 0.596 | 0.537 | 0.480 |
| 500 | 0.908 | 0.807 | 0.712 | 0.633 | 0.560 | 0.499 | 0.442 |
| 550 | 0.899 | 0.789 | 0.690 | 0.606 | 0.530 | 0.466 | 0.407 |
| 600 | 0.892 | 0.770 | 0.667 | 0.579 | 0.501 | 0.433 | 0.376 |
| 650 | 0.882 | 0.752 | 0.643 | 0.551 | 0.470 | 0.403 | 0.343 |
| 700 | 0.876 | 0.736 | 0.622 | 0.527 | 0.443 | 0.375 | 0.316 |
| 750 | 0.866 | 0.721 | 0.600 | 0.505 | 0.419 | 0.350 | 0.292 |
| 800 | 0.859 | 0.708 | 0.582 | 0.477 | 0.397 | 0.326 | 0.269 |
| 850 | 0.848 | 0.692 | 0.563 | 0.456 | 0.372 | 0.303 | 0.247 |
| 900 | 0.841 | 0.675 | 0.542 | 0.435 | 0.352 | 0.282 | 0.225 |
| 950 | 0.834 | 0.663 | 0.523 | 0.415 | 0.332 | 0.263 | 0.209 |
| 1000 | 0.824 | 0.648 | 0.507 | 0.399 | 0.311 | 0.245 | 0.194 |

Table A2_15.2. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.988 | 0.971 | 0.993 | 0.984 | 0.965 | 0.991 | 0.980 |
| 100 | 0.981 | 0.944 | 0.940 | 0.911 | 0.882 | 0.872 | 0.874 |
| 150 | 0.969 | 0.934 | 0.926 | 0.885 | 0.845 | 0.831 | 0.813 |
| 200 | 0.960 | 0.918 | 0.894 | 0.842 | 0.795 | 0.780 | 0.762 |
| 250 | 0.954 | 0.903 | 0.855 | 0.795 | 0.759 | 0.729 | 0.704 |
| 300 | 0.950 | 0.872 | 0.841 | 0.786 | 0.717 | 0.683 | 0.627 |
| 350 | 0.928 | 0.847 | 0.790 | 0.732 | 0.665 | 0.625 | 0.575 |
| 400 | 0.925 | 0.847 | 0.780 | 0.705 | 0.627 | 0.593 | 0.540 |
| 450 | 0.909 | 0.817 | 0.747 | 0.671 | 0.600 | 0.549 | 0.498 |
| 500 | 0.902 | 0.808 | 0.728 | 0.632 | 0.566 | 0.524 | 0.459 |
| 550 | 0.898 | 0.787 | 0.693 | 0.610 | 0.534 | 0.475 | 0.420 |
| 600 | 0.888 | 0.767 | 0.674 | 0.577 | 0.492 | 0.444 | 0.388 |
| 650 | 0.879 | 0.755 | 0.659 | 0.559 | 0.475 | 0.421 | 0.362 |
| 700 | 0.886 | 0.745 | 0.643 | 0.544 | 0.465 | 0.399 | 0.339 |
| 750 | 0.867 | 0.722 | 0.608 | 0.505 | 0.416 | 0.366 | 0.301 |
| 800 | 0.854 | 0.707 | 0.597 | 0.486 | 0.398 | 0.338 | 0.282 |
| 850 | 0.841 | 0.682 | 0.567 | 0.464 | 0.377 | 0.317 | 0.261 |
| 900 | 0.841 | 0.675 | 0.549 | 0.435 | 0.348 | 0.287 | 0.230 |
| 950 | 0.825 | 0.659 | 0.524 | 0.415 | 0.329 | 0.266 | 0.212 |
| 1000 | 0.822 | 0.648 | 0.516 | 0.401 | 0.306 | 0.250 | 0.195 |

Table A2_15.3. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.998 | 0.998 |
| 100 | 0.995 | 0.995 | 0.995 |
| 150 | 0.993 | 0.993 | 0.993 |
| 200 | 0.991 | 0.991 | 0.991 |
| 250 | 0.988 | 0.988 | 0.988 |
| 300 | 0.986 | 0.986 | 0.986 |
| 350 | 0.983 | 0.983 | 0.983 |
| 400 | 0.981 | 0.981 | 0.981 |
| 450 | 0.979 | 0.979 | 0.978 |
| 500 | 0.976 | 0.977 | 0.976 |
| 550 | 0.974 | 0.974 | 0.974 |
| 600 | 0.972 | 0.972 | 0.972 |
| 650 | 0.969 | 0.969 | 0.969 |
| 700 | 0.967 | 0.967 | 0.967 |
| 750 | 0.965 | 0.964 | 0.964 |
| 800 | 0.962 | 0.962 | 0.962 |
| 850 | 0.960 | 0.960 | 0.960 |
| 900 | 0.957 | 0.957 | 0.957 |
| 950 | 0.955 | 0.955 | 0.954 |
| 1000 | 0.953 | 0.953 | 0.952 |

Table A2_15.4. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 1.000 | 0.999 | 0.998 |
| 100 | 0.996 | 0.995 | 0.995 |
| 150 | 0.995 | 0.994 | 0.994 |
| 200 | 0.992 | 0.994 | 0.990 |
| 250 | 0.990 | 0.991 | 0.988 |
| 300 | 0.987 | 0.987 | 0.985 |
| 350 | 0.984 | 0.986 | 0.983 |
| 400 | 0.982 | 0.980 | 0.981 |
| 450 | 0.980 | 0.980 | 0.978 |
| 500 | 0.978 | 0.977 | 0.976 |
| 550 | 0.975 | 0.976 | 0.975 |
| 600 | 0.973 | 0.974 | 0.971 |
| 650 | 0.971 | 0.970 | 0.969 |
| 700 | 0.968 | 0.969 | 0.967 |
| 750 | 0.966 | 0.963 | 0.965 |
| 800 | 0.964 | 0.962 | 0.962 |
| 850 | 0.961 | 0.961 | 0.961 |
| 900 | 0.958 | 0.957 | 0.957 |
| 950 | 0.955 | 0.957 | 0.954 |
| 1000 | 0.953 | 0.951 | 0.951 |

Table A2_16.1. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.991 | 0.980 | 0.971 | 0.963 | 0.955 | 0.949 | 0.942 |
| 100 | 0.982 | 0.961 | 0.944 | 0.926 | 0.911 | 0.901 | 0.886 |
| 150 | 0.972 | 0.942 | 0.916 | 0.893 | 0.869 | 0.852 | 0.834 |
| 200 | 0.965 | 0.922 | 0.889 | 0.857 | 0.832 | 0.805 | 0.783 |
| 250 | 0.954 | 0.906 | 0.864 | 0.825 | 0.790 | 0.760 | 0.732 |
| 300 | 0.946 | 0.887 | 0.837 | 0.791 | 0.756 | 0.716 | 0.684 |
| 350 | 0.937 | 0.870 | 0.810 | 0.761 | 0.717 | 0.677 | 0.642 |
| 400 | 0.929 | 0.854 | 0.784 | 0.731 | 0.680 | 0.636 | 0.597 |
| 450 | 0.919 | 0.835 | 0.764 | 0.701 | 0.651 | 0.602 | 0.560 |
| 500 | 0.911 | 0.818 | 0.738 | 0.671 | 0.613 | 0.567 | 0.518 |
| 550 | 0.904 | 0.801 | 0.717 | 0.646 | 0.582 | 0.531 | 0.482 |
| 600 | 0.894 | 0.782 | 0.692 | 0.615 | 0.549 | 0.496 | 0.447 |
| 650 | 0.885 | 0.769 | 0.672 | 0.592 | 0.522 | 0.466 | 0.417 |
| 700 | 0.875 | 0.752 | 0.650 | 0.566 | 0.498 | 0.434 | 0.384 |
| 750 | 0.868 | 0.738 | 0.628 | 0.540 | 0.469 | 0.410 | 0.357 |
| 800 | 0.860 | 0.721 | 0.608 | 0.518 | 0.444 | 0.381 | 0.331 |
| 850 | 0.852 | 0.705 | 0.588 | 0.494 | 0.417 | 0.355 | 0.303 |
| 900 | 0.843 | 0.691 | 0.569 | 0.472 | 0.394 | 0.332 | 0.276 |
| 950 | 0.834 | 0.675 | 0.549 | 0.453 | 0.372 | 0.311 | 0.258 |
| 1000 | 0.825 | 0.660 | 0.532 | 0.431 | 0.352 | 0.287 | 0.236 |

Table A2_16.2. Razorbill, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 50 | 0.992 | 0.978 | 0.957 | 0.941 | 0.946 | 0.936 | 0.931 |
| 100 | 0.982 | 0.960 | 0.924 | 0.909 | 0.914 | 0.913 | 0.904 |
| 150 | 0.971 | 0.931 | 0.903 | 0.880 | 0.875 | 0.845 | 0.833 |
| 200 | 0.965 | 0.918 | 0.882 | 0.853 | 0.845 | 0.811 | 0.789 |
| 250 | 0.956 | 0.904 | 0.858 | 0.822 | 0.797 | 0.749 | 0.740 |
| 300 | 0.947 | 0.889 | 0.834 | 0.788 | 0.761 | 0.723 | 0.690 |
| 350 | 0.947 | 0.881 | 0.810 | 0.766 | 0.728 | 0.692 | 0.655 |
| 400 | 0.928 | 0.833 | 0.762 | 0.711 | 0.672 | 0.629 | 0.589 |
| 450 | 0.926 | 0.830 | 0.755 | 0.694 | 0.655 | 0.605 | 0.571 |
| 500 | 0.917 | 0.818 | 0.736 | 0.668 | 0.619 | 0.571 | 0.523 |
| 550 | 0.902 | 0.808 | 0.707 | 0.636 | 0.585 | 0.532 | 0.482 |
| 600 | 0.891 | 0.762 | 0.674 | 0.595 | 0.543 | 0.496 | 0.440 |
| 650 | 0.886 | 0.770 | 0.666 | 0.586 | 0.527 | 0.479 | 0.423 |
| 700 | 0.887 | 0.752 | 0.648 | 0.568 | 0.499 | 0.437 | 0.381 |
| 750 | 0.865 | 0.742 | 0.627 | 0.537 | 0.472 | 0.413 | 0.365 |
| 800 | 0.863 | 0.720 | 0.606 | 0.513 | 0.443 | 0.377 | 0.330 |
| 850 | 0.847 | 0.697 | 0.583 | 0.483 | 0.416 | 0.357 | 0.303 |
| 900 | 0.842 | 0.690 | 0.562 | 0.464 | 0.393 | 0.330 | 0.275 |
| 950 | 0.837 | 0.680 | 0.548 | 0.446 | 0.373 | 0.313 | 0.258 |
| 1000 | 0.823 | 0.659 | 0.523 | 0.428 | 0.353 | 0.290 | 0.240 |

Table A2_16.3. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.998 | 0.998 |
| 100 | 0.997 | 0.996 | 0.997 |
| 150 | 0.995 | 0.994 | 0.996 |
| 200 | 0.993 | 0.992 | 0.994 |
| 250 | 0.991 | 0.990 | 0.992 |
| 300 | 0.989 | 0.988 | 0.991 |
| 350 | 0.988 | 0.986 | 0.989 |
| 400 | 0.985 | 0.983 | 0.987 |
| 450 | 0.984 | 0.981 | 0.985 |
| 500 | 0.981 | 0.980 | 0.984 |
| 550 | 0.979 | 0.978 | 0.982 |
| 600 | 0.977 | 0.975 | 0.979 |
| 650 | 0.975 | 0.972 | 0.978 |
| 700 | 0.973 | 0.970 | 0.975 |
| 750 | 0.971 | 0.968 | 0.974 |
| 800 | 0.968 | 0.965 | 0.971 |
| 850 | 0.966 | 0.963 | 0.969 |
| 900 | 0.963 | 0.960 | 0.967 |
| 950 | 0.962 | 0.959 | 0.965 |
| 1000 | 0.959 | 0.956 | 0.962 |

Table A2_16.4. Razorbill, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 50 | 0.998 | 0.996 | 0.999 |
| 100 | 0.997 | 0.997 | 0.998 |
| 150 | 0.995 | 0.995 | 0.997 |
| 200 | 0.993 | 0.992 | 0.995 |
| 250 | 0.992 | 0.990 | 0.992 |
| 300 | 0.990 | 0.989 | 0.992 |
| 350 | 0.988 | 0.984 | 0.989 |
| 400 | 0.985 | 0.983 | 0.987 |
| 450 | 0.985 | 0.982 | 0.986 |
| 500 | 0.981 | 0.978 | 0.985 |
| 550 | 0.979 | 0.978 | 0.982 |
| 600 | 0.976 | 0.974 | 0.980 |
| 650 | 0.976 | 0.973 | 0.979 |
| 700 | 0.972 | 0.972 | 0.976 |
| 750 | 0.971 | 0.969 | 0.975 |
| 800 | 0.968 | 0.965 | 0.973 |
| 850 | 0.966 | 0.964 | 0.970 |
| 900 | 0.963 | 0.960 | 0.967 |
| 950 | 0.961 | 0.958 | 0.967 |
| 1000 | 0.960 | 0.956 | 0.963 |

Table A2_17.1. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.990 | 0.978 | 0.965 | 0.953 | 0.941 | 0.929 | 0.917 |
| 10 | 0.979 | 0.955 | 0.931 | 0.907 | 0.884 | 0.862 | 0.840 |
| 15 | 0.970 | 0.933 | 0.898 | 0.864 | 0.832 | 0.801 | 0.770 |
| 20 | 0.960 | 0.912 | 0.866 | 0.823 | 0.781 | 0.743 | 0.706 |
| 25 | 0.950 | 0.891 | 0.835 | 0.784 | 0.735 | 0.689 | 0.646 |
| 30 | 0.940 | 0.871 | 0.805 | 0.746 | 0.690 | 0.639 | 0.592 |
| 35 | 0.930 | 0.850 | 0.777 | 0.710 | 0.649 | 0.593 | 0.542 |
| 40 | 0.921 | 0.831 | 0.749 | 0.676 | 0.610 | 0.550 | 0.496 |
| 45 | 0.911 | 0.811 | 0.722 | 0.643 | 0.573 | 0.510 | 0.454 |
| 50 | 0.902 | 0.793 | 0.696 | 0.612 | 0.538 | 0.472 | 0.415 |

Table A2_17.2. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| **Additional adult mortality** | **Counterfactual of population size at 5 year intervals** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **yr.5** | **yr.10** | **yr.15** | **yr.20** | **yr.25** | **yr.30** | **yr.35** |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.990 | 0.977 | 0.964 | 0.950 | 0.940 | 0.925 | 0.913 |
| 10 | 0.977 | 0.952 | 0.928 | 0.904 | 0.882 | 0.859 | 0.834 |
| 15 | 0.970 | 0.933 | 0.900 | 0.863 | 0.833 | 0.800 | 0.770 |
| 20 | 0.959 | 0.911 | 0.867 | 0.823 | 0.783 | 0.743 | 0.705 |
| 25 | 0.950 | 0.891 | 0.834 | 0.781 | 0.734 | 0.688 | 0.645 |
| 30 | 0.940 | 0.869 | 0.805 | 0.745 | 0.691 | 0.639 | 0.591 |
| 35 | 0.930 | 0.851 | 0.778 | 0.711 | 0.649 | 0.593 | 0.541 |
| 40 | 0.920 | 0.830 | 0.750 | 0.675 | 0.611 | 0.550 | 0.495 |
| 45 | 0.911 | 0.811 | 0.723 | 0.643 | 0.573 | 0.510 | 0.453 |
| 50 | 0.902 | 0.792 | 0.696 | 0.611 | 0.537 | 0.473 | 0.415 |

Table A2_17.3. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.997 | 0.997 | 0.997 |
| 10 | 0.995 | 0.995 | 0.995 |
| 15 | 0.992 | 0.992 | 0.992 |
| 20 | 0.990 | 0.990 | 0.990 |
| 25 | 0.987 | 0.987 | 0.987 |
| 30 | 0.985 | 0.985 | 0.985 |
| 35 | 0.982 | 0.982 | 0.982 |
| 40 | 0.980 | 0.980 | 0.980 |
| 45 | 0.977 | 0.977 | 0.977 |
| 50 | 0.974 | 0.974 | 0.974 |

Table A2_17.4. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.997 | 0.997 | 0.998 |
| 10 | 0.995 | 0.995 | 0.995 |
| 15 | 0.992 | 0.993 | 0.992 |
| 20 | 0.990 | 0.990 | 0.990 |
| 25 | 0.987 | 0.987 | 0.987 |
| 30 | 0.985 | 0.985 | 0.985 |
| 35 | 0.982 | 0.982 | 0.982 |
| 40 | 0.980 | 0.980 | 0.980 |
| 45 | 0.977 | 0.977 | 0.977 |
| 50 | 0.974 | 0.975 | 0.974 |

Table A2_18.1. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.993 | 0.986 | 0.982 | 0.979 | 0.978 | 0.976 | 0.976 |
| 10 | 0.982 | 0.969 | 0.960 | 0.955 | 0.952 | 0.950 | 0.948 |
| 15 | 0.975 | 0.956 | 0.944 | 0.936 | 0.931 | 0.928 | 0.926 |
| 20 | 0.965 | 0.939 | 0.922 | 0.912 | 0.906 | 0.902 | 0.899 |
| 25 | 0.958 | 0.925 | 0.904 | 0.892 | 0.884 | 0.879 | 0.875 |
| 30 | 0.950 | 0.910 | 0.886 | 0.870 | 0.860 | 0.853 | 0.849 |
| 35 | 0.941 | 0.896 | 0.867 | 0.849 | 0.837 | 0.829 | 0.824 |
| 40 | 0.934 | 0.882 | 0.848 | 0.828 | 0.814 | 0.804 | 0.798 |
| 45 | 0.925 | 0.867 | 0.830 | 0.806 | 0.790 | 0.779 | 0.772 |
| 50 | 0.917 | 0.852 | 0.812 | 0.785 | 0.767 | 0.755 | 0.748 |

Table A2_18.2. Puffin, demographic rate set 1, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.992 | 0.984 | 0.981 | 0.980 | 0.977 | 0.977 | 0.976 |
| 10 | 0.983 | 0.968 | 0.959 | 0.956 | 0.952 | 0.951 | 0.949 |
| 15 | 0.976 | 0.956 | 0.944 | 0.935 | 0.931 | 0.929 | 0.927 |
| 20 | 0.967 | 0.939 | 0.923 | 0.914 | 0.907 | 0.904 | 0.901 |
| 25 | 0.958 | 0.926 | 0.905 | 0.892 | 0.884 | 0.880 | 0.876 |
| 30 | 0.951 | 0.909 | 0.885 | 0.870 | 0.860 | 0.854 | 0.851 |
| 35 | 0.941 | 0.894 | 0.867 | 0.850 | 0.837 | 0.829 | 0.824 |
| 40 | 0.933 | 0.880 | 0.848 | 0.827 | 0.813 | 0.805 | 0.800 |
| 45 | 0.925 | 0.866 | 0.831 | 0.806 | 0.790 | 0.781 | 0.774 |
| 50 | 0.918 | 0.852 | 0.811 | 0.786 | 0.769 | 0.755 | 0.749 |

Table A2_18.3. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.999 | 0.999 | 0.999 |
| 10 | 0.999 | 0.999 | 0.999 |
| 15 | 0.998 | 0.998 | 0.998 |
| 20 | 0.998 | 0.998 | 0.998 |
| 25 | 0.997 | 0.997 | 0.997 |
| 30 | 0.996 | 0.996 | 0.996 |
| 35 | 0.996 | 0.996 | 0.995 |
| 40 | 0.995 | 0.995 | 0.995 |
| 45 | 0.994 | 0.994 | 0.994 |
| 50 | 0.993 | 0.993 | 0.993 |

Table A2_18.4. Puffin, demographic rate set 1, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.999 | 0.999 | 0.999 |
| 10 | 0.999 | 0.999 | 0.999 |
| 15 | 0.998 | 0.998 | 0.998 |
| 20 | 0.998 | 0.998 | 0.998 |
| 25 | 0.997 | 0.997 | 0.997 |
| 30 | 0.996 | 0.996 | 0.996 |
| 35 | 0.996 | 0.996 | 0.995 |
| 40 | 0.995 | 0.995 | 0.995 |
| 45 | 0.994 | 0.994 | 0.994 |
| 50 | 0.993 | 0.993 | 0.993 |

Table A2_19.1. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density independent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.990 | 0.977 | 0.964 | 0.953 | 0.942 | 0.928 | 0.915 |
| 10 | 0.979 | 0.955 | 0.931 | 0.907 | 0.886 | 0.861 | 0.840 |
| 15 | 0.969 | 0.934 | 0.898 | 0.863 | 0.832 | 0.800 | 0.769 |
| 20 | 0.960 | 0.911 | 0.866 | 0.822 | 0.780 | 0.743 | 0.704 |
| 25 | 0.949 | 0.891 | 0.835 | 0.781 | 0.736 | 0.688 | 0.645 |
| 30 | 0.939 | 0.869 | 0.807 | 0.743 | 0.690 | 0.638 | 0.592 |
| 35 | 0.930 | 0.851 | 0.778 | 0.710 | 0.646 | 0.592 | 0.541 |
| 40 | 0.921 | 0.831 | 0.748 | 0.675 | 0.608 | 0.549 | 0.493 |
| 45 | 0.912 | 0.813 | 0.722 | 0.642 | 0.573 | 0.509 | 0.453 |
| 50 | 0.902 | 0.793 | 0.695 | 0.610 | 0.538 | 0.472 | 0.413 |

Table A2_19.2. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density independent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.988 | 0.985 | 0.978 | 0.962 | 0.970 | 0.937 | 0.934 |
| 10 | 0.977 | 0.956 | 0.943 | 0.911 | 0.899 | 0.863 | 0.835 |
| 15 | 0.965 | 0.931 | 0.904 | 0.866 | 0.860 | 0.815 | 0.800 |
| 20 | 0.969 | 0.919 | 0.878 | 0.827 | 0.790 | 0.732 | 0.715 |
| 25 | 0.941 | 0.883 | 0.832 | 0.775 | 0.748 | 0.677 | 0.641 |
| 30 | 0.936 | 0.873 | 0.804 | 0.741 | 0.713 | 0.651 | 0.597 |
| 35 | 0.920 | 0.853 | 0.778 | 0.708 | 0.646 | 0.600 | 0.544 |
| 40 | 0.926 | 0.838 | 0.757 | 0.686 | 0.617 | 0.557 | 0.516 |
| 45 | 0.911 | 0.810 | 0.733 | 0.654 | 0.593 | 0.516 | 0.461 |
| 50 | 0.895 | 0.783 | 0.691 | 0.605 | 0.541 | 0.481 | 0.426 |

Table A2_19.3. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.997 | 0.997 | 0.997 |
| 10 | 0.995 | 0.995 | 0.995 |
| 15 | 0.992 | 0.992 | 0.992 |
| 20 | 0.990 | 0.990 | 0.990 |
| 25 | 0.987 | 0.987 | 0.987 |
| 30 | 0.985 | 0.985 | 0.985 |
| 35 | 0.982 | 0.982 | 0.982 |
| 40 | 0.979 | 0.979 | 0.980 |
| 45 | 0.977 | 0.977 | 0.977 |
| 50 | 0.974 | 0.974 | 0.975 |

Table A2_19.4. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density independent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.998 | 1.004 | 0.999 |
| 10 | 0.996 | 0.999 | 0.994 |
| 15 | 0.993 | 0.997 | 0.994 |
| 20 | 0.991 | 0.995 | 0.990 |
| 25 | 0.988 | 0.991 | 0.987 |
| 30 | 0.986 | 0.987 | 0.986 |
| 35 | 0.982 | 0.986 | 0.983 |
| 40 | 0.981 | 0.985 | 0.980 |
| 45 | 0.978 | 0.982 | 0.977 |
| 50 | 0.976 | 0.979 | 0.976 |

Table A2_20.1. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a matched runs method, from 1000 density dependent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.990 | 0.979 | 0.969 | 0.960 | 0.954 | 0.946 | 0.940 |
| 10 | 0.981 | 0.960 | 0.942 | 0.927 | 0.912 | 0.898 | 0.888 |
| 15 | 0.971 | 0.941 | 0.913 | 0.889 | 0.866 | 0.849 | 0.831 |
| 20 | 0.962 | 0.921 | 0.885 | 0.856 | 0.827 | 0.804 | 0.782 |
| 25 | 0.953 | 0.901 | 0.856 | 0.819 | 0.788 | 0.755 | 0.732 |
| 30 | 0.942 | 0.881 | 0.832 | 0.785 | 0.748 | 0.712 | 0.681 |
| 35 | 0.933 | 0.862 | 0.805 | 0.756 | 0.709 | 0.673 | 0.641 |
| 40 | 0.924 | 0.845 | 0.780 | 0.722 | 0.675 | 0.630 | 0.591 |
| 45 | 0.916 | 0.828 | 0.754 | 0.691 | 0.637 | 0.588 | 0.546 |
| 50 | 0.906 | 0.811 | 0.725 | 0.660 | 0.604 | 0.553 | 0.512 |

Table A2_20.2. Puffin, demographic rate set 2, counterfactuals of population size after 5 to 35 years, estimated using a non-matched runs method, from 1000 density dependent simulations.

| Additional adult mortality | Counterfactual of population size at 5 year intervals | | | | | | |
|---|---|---|---|---|---|---|---|
| | yr.5 | yr.10 | yr.15 | yr.20 | yr.25 | yr.30 | yr.35 |
| 0 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 5 | 0.987 | 0.978 | 0.964 | 0.973 | 0.962 | 0.958 | 0.951 |
| 10 | 0.986 | 0.970 | 0.951 | 0.939 | 0.929 | 0.905 | 0.902 |
| 15 | 0.975 | 0.947 | 0.925 | 0.906 | 0.870 | 0.868 | 0.854 |
| 20 | 0.968 | 0.930 | 0.901 | 0.878 | 0.836 | 0.805 | 0.797 |
| 25 | 0.953 | 0.908 | 0.853 | 0.816 | 0.786 | 0.757 | 0.740 |
| 30 | 0.935 | 0.878 | 0.835 | 0.799 | 0.744 | 0.718 | 0.677 |
| 35 | 0.938 | 0.867 | 0.807 | 0.761 | 0.711 | 0.682 | 0.657 |
| 40 | 0.918 | 0.843 | 0.777 | 0.733 | 0.682 | 0.632 | 0.594 |
| 45 | 0.915 | 0.833 | 0.755 | 0.700 | 0.640 | 0.587 | 0.553 |
| 50 | 0.911 | 0.815 | 0.725 | 0.673 | 0.608 | 0.551 | 0.510 |

Table A2_20.3. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.998 | 0.998 | 0.999 |
| 10 | 0.997 | 0.996 | 0.997 |
| 15 | 0.995 | 0.994 | 0.996 |
| 20 | 0.993 | 0.992 | 0.994 |
| 25 | 0.991 | 0.989 | 0.992 |
| 30 | 0.989 | 0.987 | 0.991 |
| 35 | 0.988 | 0.985 | 0.988 |
| 40 | 0.985 | 0.982 | 0.987 |
| 45 | 0.983 | 0.981 | 0.986 |
| 50 | 0.981 | 0.979 | 0.983 |

Table A2_20.4. Puffin, demographic rate set 2, counterfactuals of population growth rate calculated between year 5 and year 35, using a non-matched runs method, from 1000 density dependent simulations; red line (median), dashed lines (95% c.i.).

| Additional adult mortality | Median population growth rate | Lwr. 95% c.i. | Uppr. 95% c.i. |
|---|---|---|---|
| 0 | 1.000 | 1.000 | 1.000 |
| 5 | 0.999 | 0.997 | 0.999 |
| 10 | 0.997 | 0.997 | 0.997 |
| 15 | 0.996 | 0.995 | 0.994 |
| 20 | 0.994 | 0.992 | 0.994 |
| 25 | 0.991 | 0.990 | 0.992 |
| 30 | 0.990 | 0.988 | 0.991 |
| 35 | 0.988 | 0.986 | 0.988 |
| 40 | 0.986 | 0.982 | 0.986 |
| 45 | 0.984 | 0.982 | 0.986 |
| 50 | 0.981 | 0.978 | 0.983 |