RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Environmental Statement

Volume 7

Appendix 12-13 Population Viability Analyses (Revision 2) (Tracked)

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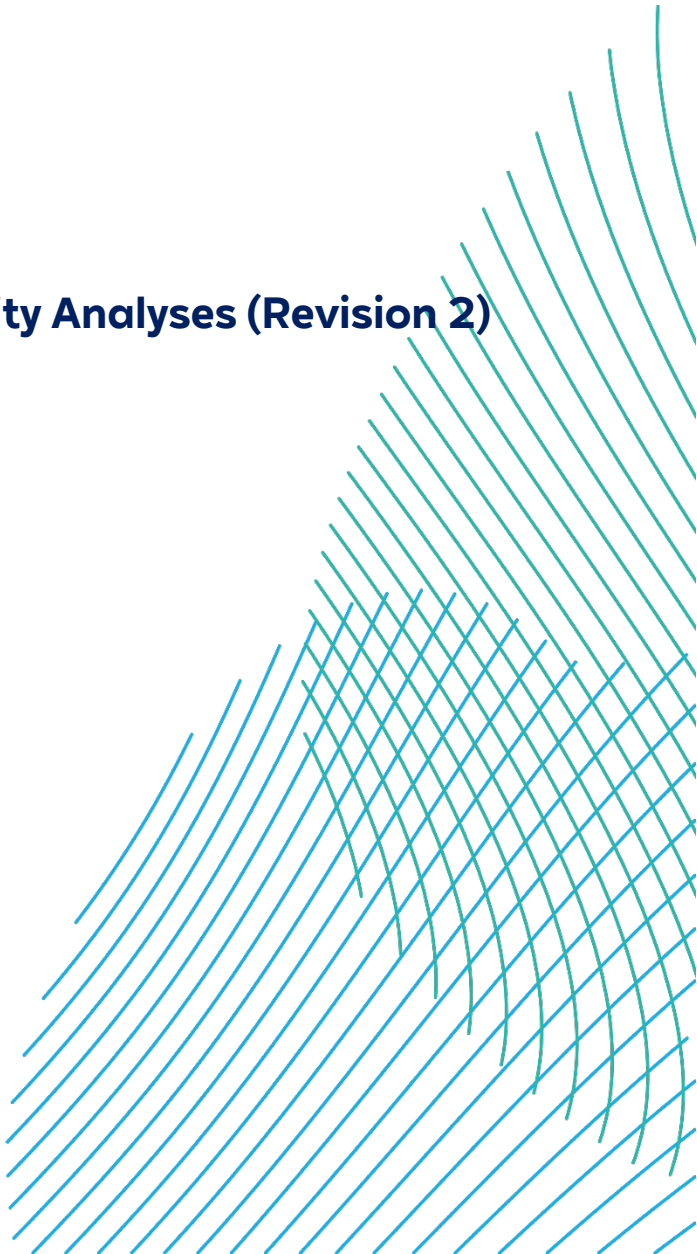

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Dogger Bank South Offshore Windfarm

Ornithology Technical Appendix 12-13 Population Viability Analyses

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2 RESULTS 2

INTRODUCTION

1. This Technical Report provides details of Population Viability Analysis (PVA) for the ~~kittiwake breeding population at the Flamborough and Filey Coast SPA.~~ following species and populations:

Species and Population	Inputs table	Outputs table	Figure
Gannet at Flamborough and Filey Coast (FFC) SPA,	1	2	1
Kittiwake at FFC SPA,	3	4	2
Guillemot at FFC SPA,	5	6	3
Razorbill at FFC SPA,	7	8	4
Guillemot at Farne Islands SPA,	9	10	5
Puffin at Farne Islands SPA,	11	12	6
Gannet at Biologically Defined Minimum Population Scale (BDMPS);	13	14	7
Kittiwake at BDMPS,	15	16	8
Guillemot at BDMPS and biogeographic scales,	17 and 19	18 and 20	9 and 10
Razorbill at BDMPS and biogeographic scales,	21 and 23	22 and 24	11 and 12
Lesser black-backed gull at BDMPS,	25	26	13
Herring gull at BDMPS and,	27	28	14
Great black-backed gull at BDMPS and biogeographic scales.	29 and 31	30 and 32	15 and 16

~~1.~~2. The Natural England commissioned PVA tool (hereafter NEPVA) developed by the Centre for Ecology and Hydrology (CEH; Searle et al. 2019) was used for this analysis. The NEPVA, which is the recommended tool for undertaking seabird PVA in the UK, is written using the R programming language and the scripts are available to download from the project's webpage. The PVA was run using these scripts rather than using the online version of the model.

~~2.~~3. The parameters for the model were derived from counts of breeding adults and productivity data collected at the SPA combined with survival and age at first breeding rates from a review of seabird literature conducted by the British Trust for Ornithology (BTO; Horswill and Robinson, 2015). The latter were used as no studies of survival rates have been conducted at Flamborough and Filey Coast SPA.

~~3.~~4. Outputs are provided as the ratios of the impacted to unimpacted population sizes and impacted to unimpacted population growth rate, respectively referred to as the counterfactual of population size (CPS) and the counterfactual of population growth rate (CPGR). These measures of relative, rather than absolute, effects of additional mortality are preferred because they have been found to be comparatively less sensitive to assumptions about demographic rate values and therefore are considered more robust and reliable.

~~4.~~5. These have been obtained across a range of mortality levels. The inputs and outputs are provided below.

RESULTS

Table 1. Inputs: Gannet FFC Annual

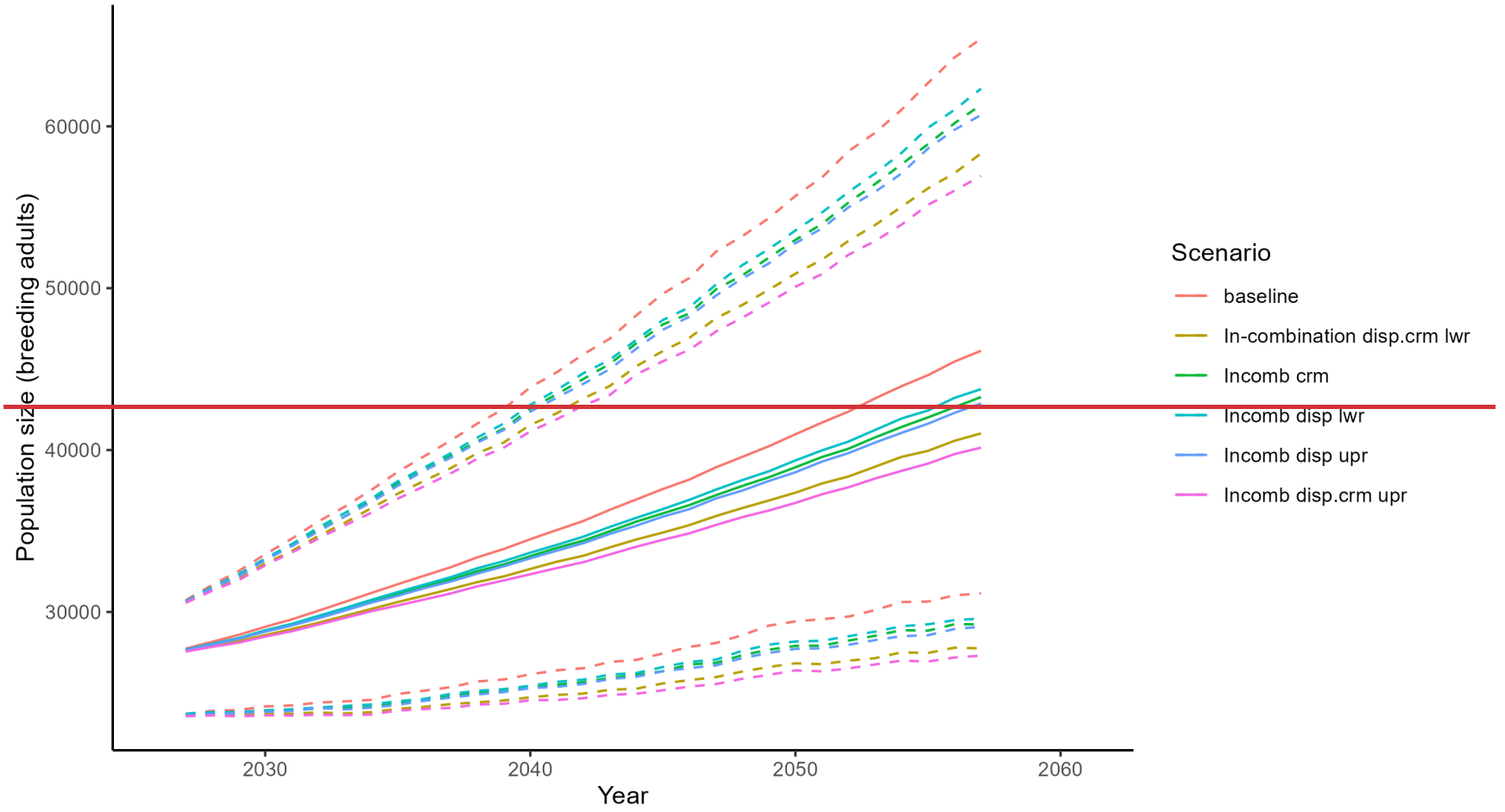
Baseline parameters	Settings	Impact parameters	Values
Reference name	GX FFC Annual	Number of scenarios of impact	~~5~~6
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	~~Incomb~~Proj alone disp ~~lwr~~80-1 plus crm
Species	Northern gannet	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.~~00232381~~0008228571
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	-
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	Incomb disp ~~upr~~60-1
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	breeding.adults	Scenario B Impact on adult survival rate	0.~~00331428~~6002666667
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	26250	Scenario C name	Incomb ~~crm~~disp 80-1
Year	2024	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair mean	0.823	Scenario C Impact on adult survival rate per pair mean	0.~~00291047~~6003542857
Productivity rate per pair standard deviation	0.038	Scenario C Impact on immature survival rate mean	-
Adult survival rate Mean	0.919	Scenario D name	~~In combination disp.crm lwr~~Incomb crm
Adult survival rate standard deviation	0.042	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.424	Scenario D Impact on adult survival rate	0.~~00521904~~8003009524
Immatures survival rates 0 to 1 standard deviation	0.045	Scenario D Impact on immature survival rate mean	-
Immatures survival rates 1 to 2 mean	0.829	Scenario E name	~~Incomb~~In-combination disp~~.~~ 60-1 plus
Immatures survival rates 1 to 2 standard deviation	0.026	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.891	Scenario E Impact on adult survival rate	0.~~00620952~~400567619
Immatures survival rates 2 to 3 standard deviation	0.019	Scenario E Impact on immature survival rate mean	-
Immatures survival rates 3 to 4 mean	0.895	Scenario F name	Incomb disp 80-1 plus crm
Immatures survival rates 3 to 4 standard deviation	0.019	Scenario F Impact on productivity rate per pair mean	0

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 4 to 5 mean	0.919	Scenario F Impact on adult survival rate	0.006552381
Immatures survival rates 4 to 5 standard deviation	0.042	Scenario F Impact on immature survival rate mean	-
Immatures survival rates 5 to 6 mean		Scenario G name	
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	0
Units for output	breeding.adults	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	-

Table 2. Outputs: Gannet FFC Annual

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Incomb Proj alone disp lwr 80-1 plus crm	6122	0.00232381000082 28571	10	0.99829 994	0.99829 994	0.0007	0.99689 980	0.99971.0 008	0.98099 931	0.98099 931	0.00810 082	0.96539 769	1.00900.9 972	43.4447 .48	56.4452 .42
Incomb disp upr 60-1	8770	0.00331428600266 66667	10	0.99759 980	0.99759 980	0.0007	0.99619 966	0.99899 94	0.97309 779	0.97309 781	0.0082	0.95709 624	0.98909 943	40.7242 .48	59.2257 .50
Incomb disp 80-1	93	0.0035428571	10	0.9973	0.9973	0.0007	0.9959	0.9988	0.9710	0.9709	0.0082	0.9550	0.9869	40.18	60.08
Incomb crm	7679	0.00291047600300 95238	10	0.99789 977	0.99789 977	0.0007	0.99649 963	0.9992	0.97629 752	0.97649 753	0.00810 082	0.96089 593	0.992399 19	41.9008	58.1846
In-combination disp- 60-1 plus crm- lwr	13719 49	0.00521904800567 61905	10	0.99619 957	0.99619 957	0.0007	0.99479 943	0.99759971	0.95779 540	0.95789 540	0.00800 081	0.94229 385	0.973697 01	35.9834 .20	64.7666 .12
Incomb disp- 80-1 plus crm upr	16317 2	0.00620952400655 23810	10	0.99539 951	0.99539 951	0.0007	0.99399 936	0.99679965	0.94999 471	0.94999 471	0.00800 081	0.93419 312	0.965396 31	33.2632 .22	67.2468 .26
Proj alone disp 80-1 plus crm	22	0.0008228571	20	0.9994	0.9994	0.0005	0.9985	1.0004	0.9873	0.9873	0.0103	0.9674	1.0077	46.66	53.24

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Incomb disp lwr60-1	6170	0.0023238100026666667	20	0.99839981	0.99839980	0.0005	0.99739971	0.99939990	0.96509599	0.96509598	0.0102	0.94569401	0.98579797	40.583942	59.266002
Incomb disp upr80-1	8793	0.0033142860035428571	20	0.99769974	0.99769974	0.0005	0.99669964	0.99859984	0.95059468	0.95059470	0.0102	0.93039272	0.97059677	37.323584	62.866356
Incomb crm	7679	0.0029104760030095238	20	0.99799978	0.99799978	0.0005	0.99699968	0.9988	0.95649546	0.95649548	0.01010102	0.93719348	0.97599748	38.626204	61.206606
In-combination disp 60-1 plus crm	149	0.0056761905	20	0.9959	0.9959	0.0005	0.9949	0.9968	0.9166	0.9165	0.0098	0.8973	0.9360	29.02	71.46
In-combinationIncomb disp- 60-1 plus crm-lwr	13717172	0.0052190480065523810	20	0.99629952	0.99629952	0.0005	0.99529942	0.99729962	0.92319042	0.92319042	0.0099	0.90418853	0.94289235	30.542600	69.967418
IncombProj alone disp- 60-1 plus crm-upr	163222	0.0062095240008228571	2030	0.99559994	0.99559994	0.00050004	0.99459986	0.99651.0002	0.99029818	0.99029817	0.00980118	0.89039584	0.92861.0051	27.384580	73.445388
Incomb disp lwr60-1	6170	0.0023238100026666667	30	0.99839981	0.99839981	0.0004	0.99769973	0.99919988	0.94919417	0.94929419	0.01160115	0.92659194	0.97239647	38.663726	61.286304
Incomb disp upr80-1	8793	0.0033142860035428571	30	0.99769974	0.99769974	0.0004	0.99689967	0.99849982	0.92869233	0.92859234	0.0114	0.90639014	0.95099452	34.183348	66.086738
Incomb crm	7679	0.0029104760030095238	30	0.99799978	0.99799978	0.0004	0.99719970	0.99879986	0.93689346	0.93699346	0.01140115	0.91539120	0.95979573	3635.44	64.161664
In-combination disp- 60-1 plus crm-lwr	13714149	0.0052190480056761905	30	0.99629959	0.99629959	0.0004	0.99559952	0.99709966	0.88968803	0.88978804	0.01100107	0.86858598	0.91139015	25.742402	74.227598
Incomb disp- 80-1 plus crm upr	16317172	0.0062095240065523810	30	0.99559953	0.99559953	0.0004	0.99479945	0.99639960	0.87008633	0.87028633	0.0108	0.84928428	0.89168848	22.042088	78.007924


Population size (breeding adults)
60000
50000
40000
30000
2030
2040
2050
2060
Year
Scenario
baseline
In-combination disp.crm lwr
Incomb crm
Incomb disp lwr
Incomb disp upr
Incomb disp.crm upr

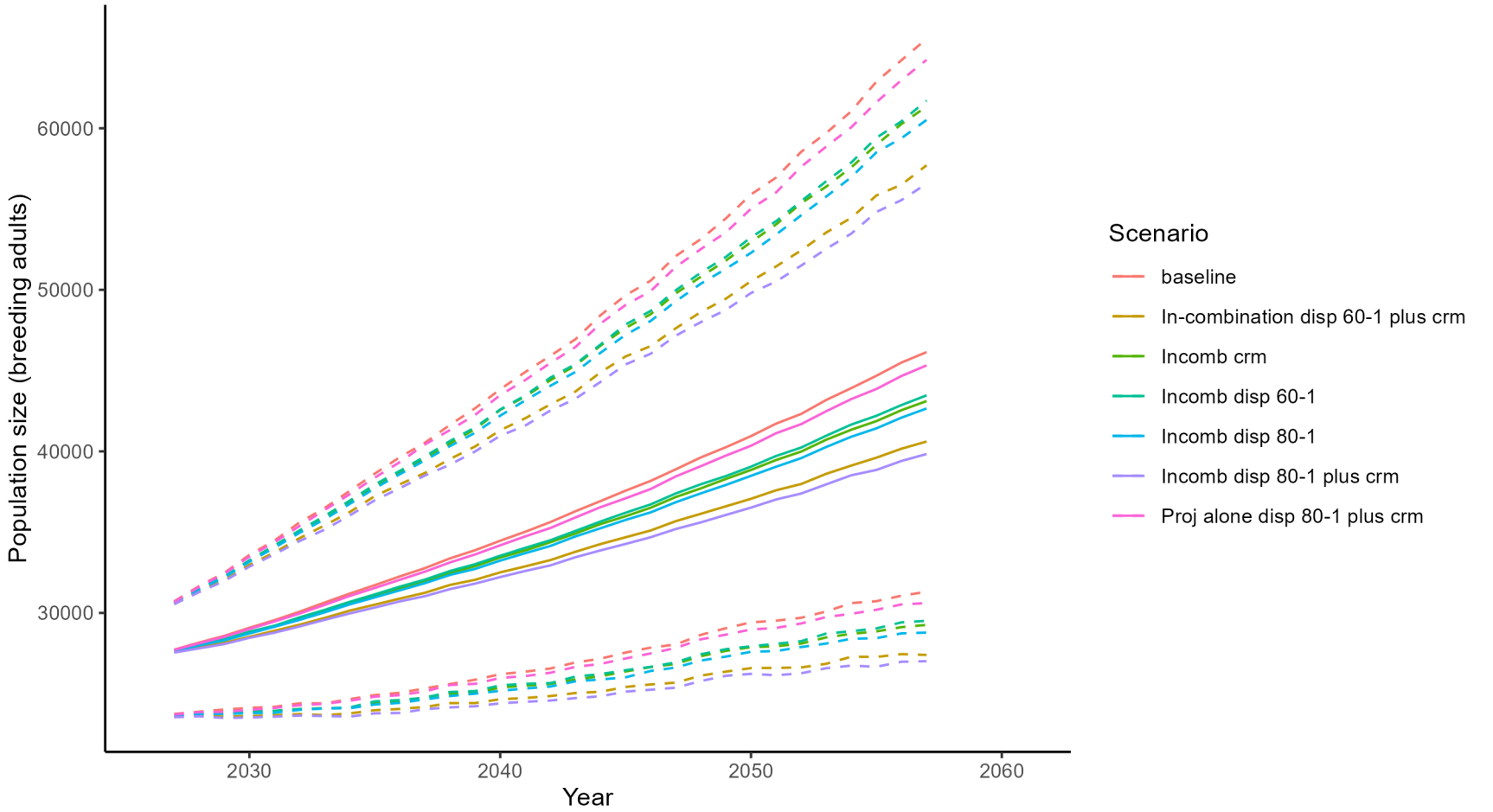


Figure 1.Gannet FFC Annual

Table 3. Inputs: Kittiwake FFC Annual

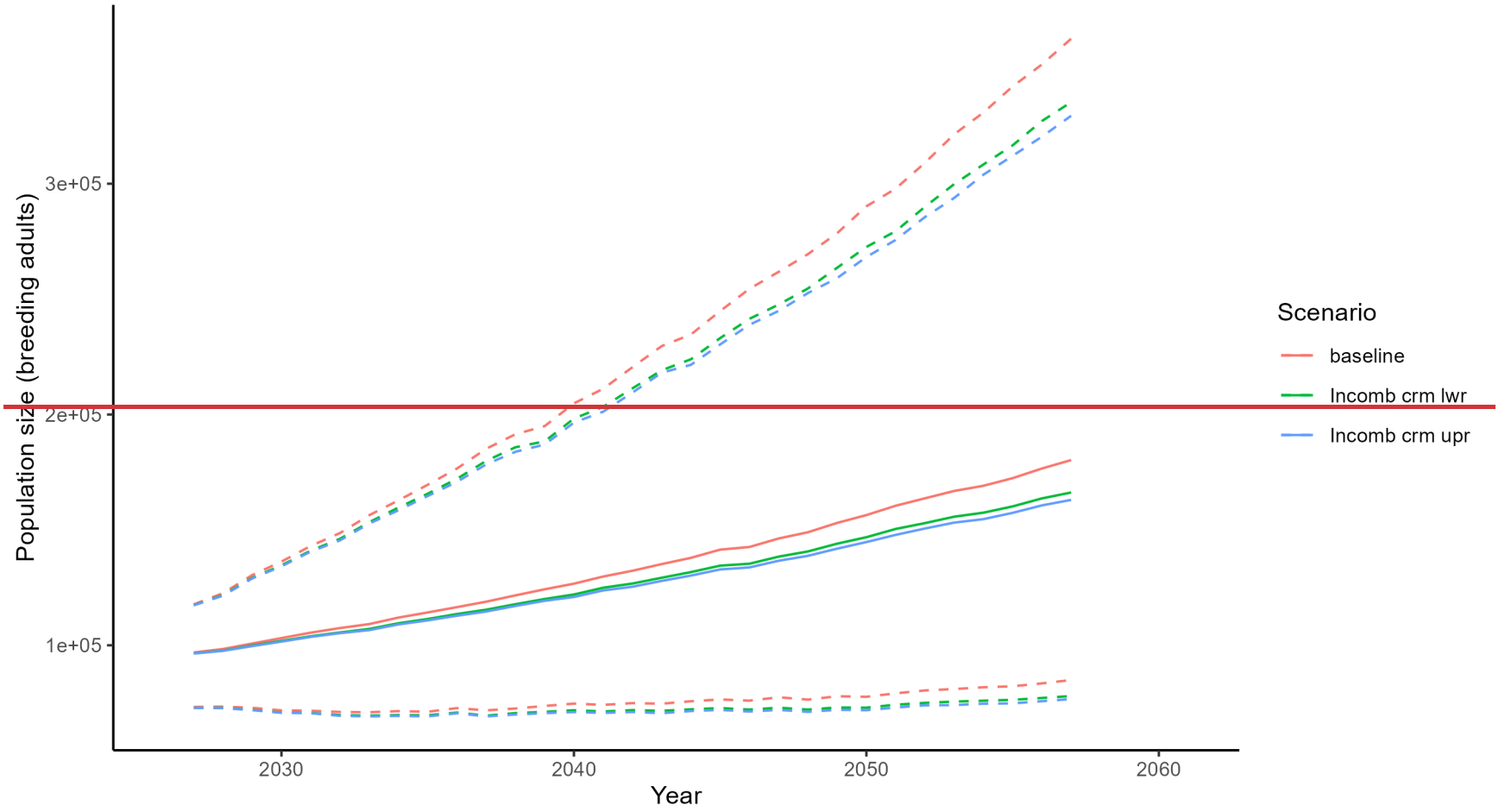
Baseline parameters	Settings	Impact parameters	Values
Reference name	KI FFC Annual	Number of scenarios of impact	~~2~~5
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	~~Incomb~~Proj alone crm ~~lwr~~DBS 100pct ads
Species	Black-legged	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	4	Scenario A Impact on adult survival rate	0.~~00385680~~4002142505
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	~~0~~
Maximum brood size per pair chicks will be constrained to be no greater than	2	Scenario B name	Incomb crm ~~upr~~DBS 53pct ads exc comp
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	breeding.adults	Scenario B Impact on adult survival rate	0.~~00476881~~2004195271
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	~~91008~~89148	Scenario C name	Incomb crm DBS 100pct ads exc comp
Year	2024	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair mean	0.737	Scenario C Impact on adult survival rate per pair mean	0.005171176
Productivity rate per pair standard deviation	0.2015	Scenario C Impact on immature survival rate mean	-
Adult survival rate Mean	0.854	Scenario D name	Incomb crm DBS 53pct ads inc comp
Adult survival rate standard deviation	0.077	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.79	Scenario D Impact on adult survival rate	0.00565352
Immatures survival rates 0 to 1 standard deviation	0.077	Scenario D Impact on immature survival rate mean	-
Immatures survival rates 1 to 2 mean	0.854	Scenario E name	Incomb crm DBS 100pct ads inc comp
Immatures survival rates 1 to 2 standard deviation	0.077	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.854	Scenario E Impact on adult survival rate	0.006629425
Immatures survival rates 2 to 3 standard deviation	0.077	Scenario E Impact on immature survival rate mean	-
Immatures survival rates 3 to 4 mean	0.854	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.077	Scenario F Impact on productivity rate per pair mean	0
Immatures survival rates 4 to 5 mean		Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation		Scenario F Impact on immature survival rate mean	-
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	0
Units for output	breeding.adults	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	-

Table 4. Outputs: Kittiwake FFC Annual

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
IncombProj alone crm lwrDBS 100pct ads	351191	0.003856804002142505	10	0.99739985	0.99739985	0.0005	0.99649976	0.99839994	0.97089838	0.97099837	0.00540053	0.96049732	0.98159941	45.0047.14	54.8852.96
Incomb crm uprDBS 53pct ads exc comp	434374	0.004768812004195271	10	0.99679971	0.99679971	0.0005	0.99579961	0.99769980	0.96419683	0.96429684	0.0054	0.95359579	0.97469790	43.5844.68	56.0855.20
Incomb crm lwrDBS 100pct ads exc comp	351461	0.003856804005171176	2010	0.99749964	0.99749964	0.00030005	0.99689954	0.99809974	0.94679611	0.94669610	0.00660054	0.93379504	0.95969717	43.3210	57.1056.58
Incomb crm DBS 53pct ads inc comp	504	0.005653520	10	0.9961	0.9961	0.0005	0.9951	0.9971	0.9576	0.9576	0.0054	0.9472	0.9681	42.72	57.28
Incomb crm DBS 100pct ads inc comp	591	0.006629425	10	0.9954	0.9954	0.0005	0.9944	0.9964	0.9505	0.9506	0.0056	0.9396	0.9615	41.42	58.28
Proj alone crm DBS 100pct ads	191	0.002142505	20	0.9986	0.9986	0.0003	0.9979	0.9992	0.9700	0.9700	0.0067	0.9569	0.9830	46.50	53.96
Incomb crm DBS 53pct ads exc comp	374	0.004195271	20	0.9972	0.9972	0.0003	0.9965	0.9978	0.9421	0.9421	0.0066	0.9288	0.9550	42.70	57.70
Incomb crm DBS 100pct ads exc comp	461	0.005171176	20	0.9965	0.9965	0.0003	0.9958	0.9972	0.9292	0.9291	0.0066	0.9157	0.9421	40.74	59.54
Incomb crm uprDBS 53pct ads inc comp	434504	0.004768812005653520	20	0.99689962	0.99689962	0.0003	0.99619955	0.99749968	0.93439229	0.93449228	0.00650067	0.92189097	0.94749359	41.6439.66	58.7860.42
Incomb crm DBS 100pct ads inc comp	591	0.006629425	20	0.9955	0.9955	0.0003	0.9948	0.9962	0.9102	0.9102	0.0067	0.8965	0.9236	38.12	61.98
Proj alone crm DBS 100pct ads	191	0.002142505	30	0.9986	0.9986	0.0002	0.9981	0.9991	0.9565	0.9565	0.0075	0.9418	0.9714	44.80	54.72

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Incomb crm ~~lwr~~DBS 53pct ads exc comp	~~351~~374	0.~~003856804~~004195271	30	0.~~9974~~9972	0.~~9974~~9972	0.0003	0.~~9969~~9967	0.~~9979~~9977	0.~~9231~~9165	0.~~9231~~9166	0.~~0075~~0074	0.~~9082~~9022	0.~~9377~~9311	40.~~921~~2	58.~~188~~6
Incomb crm ~~upr~~DBS 100pct ads exc comp	~~434~~461	0.~~004768812~~005171176	30	0.~~9968~~9965	0.~~9968~~9965	0.0003	0.~~9963~~9960	0.~~9973~~9970	0.~~9057~~8981	0.~~9057~~8982	0.~~0073~~0074	0.~~8913~~8834	0.~~9202~~9125	38.~~720~~0	60.~~229~~4
Incomb crm DBS 53pct ads inc comp	504	0.005653520	30	0.9962	0.9962	0.0003	0.9957	0.9967	0.8893	0.8893	0.0074	0.8743	0.9038	36.90	61.70
Incomb crm DBS 100pct ads inc comp	591	0.006629425	30	0.9956	0.9956	0.0003	0.9950	0.9961	0.8718	0.8716	0.0074	0.8569	0.8860	35.38	63.78


Population size (breeding adults)
3e+05
2e+05
1e+05
2030
2040
2050
2060
Year
Scenario
baseline
Incomb crm lwr
Incomb crm upr

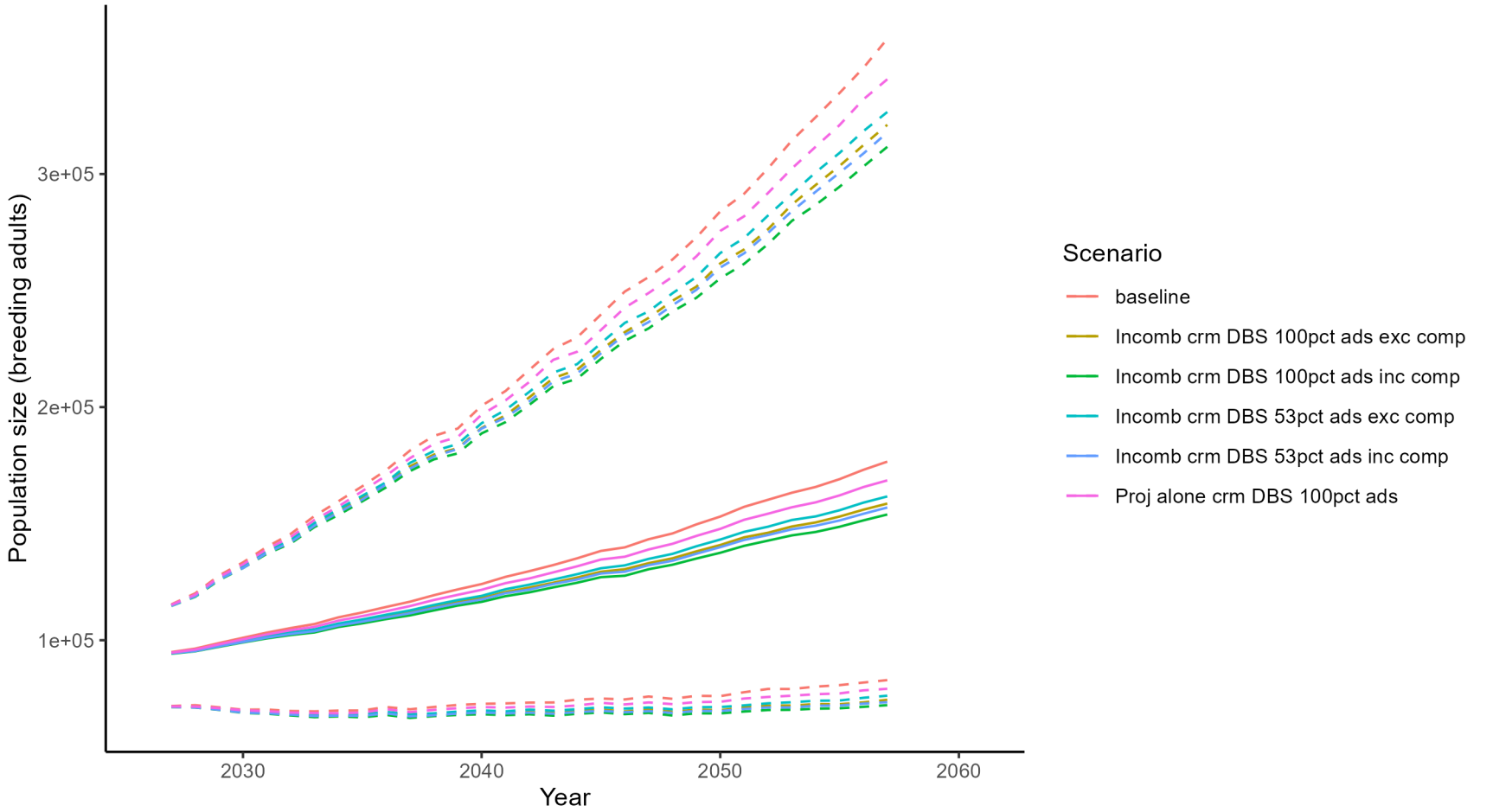


Figure 2. Kittiwake FFC Annual

Table 5. Inputs: Guillemot FFC Annual

Baseline parameters	Settings	Impact parameters	Values
Reference name	GU FFC Annual	Number of scenarios of impact	~~6~~10
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	~~Incomb~~Proj alone disp ~~lwr1~~50-1 DBS 55pct ads
Species	Common	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	6	Scenario A Impact on adult survival rate	0.~~000773446~~80008201203
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	~~-~~
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	~~Incomb~~Proj_alone disp ~~lwr2~~50-1_DBS_100pct
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	breeding.adults	Scenario B Impact on adult survival rate	0.~~000933470~~2001086826
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	149978	Scenario C name	~~Incomb~~Proj_alone disp ~~mid1~~70-2_DBS_55pct
Year	2024	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair mean	0.6879	Scenario C Impact on adult survival rate per pair mean	0.~~00129352~~300229367
Productivity rate per pair standard deviation	0.0825	Scenario C Impact on immature survival rate mean	-
Adult survival rate Mean	0.94	Scenario D name	~~Incomb~~Proj_alone disp ~~mid2~~70-2_DBS_100pct
Adult survival rate standard deviation	0.025	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.56	Scenario D Impact on adult survival rate	0.~~00156022~~9003040446
Immatures survival rates 0 to 1 standard deviation	0.058	Scenario D Impact on immature survival rate mean	-
Immatures survival rates 1 to 2 mean	0.792	Scenario E name	~~Incomb~~Proj_alone disp ~~upr1~~70-10_DBS_100pct
Immatures survival rates 1 to 2 standard deviation	0.152	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.917	Scenario E Impact on adult survival rate	0.~~0181159~~901519556
Immatures survival rates 2 to 3 standard deviation	0.098	Scenario E Impact on immature survival rate mean	-
Immatures survival rates 3 to 4 mean	0.938	Scenario F name	Incomb disp ~~upr2~~50-1_DBS_100pct_ads_exc
Immatures survival rates 3 to 4 standard deviation	0.107	Scenario F Impact on productivity rate per pair mean	0
Immatures survival rates 4 to 5 mean	0.94	Scenario F Impact on adult survival rate	0.~~0218365~~4002567043
Immatures survival rates 4 to 5 standard deviation	0.025	Scenario F Impact on immature survival rate mean	~~-~~
Immatures survival rates 5 to 6 mean	0.94	Scenario G name	Incomb disp 50-1 DBS 100pct ads inc comp

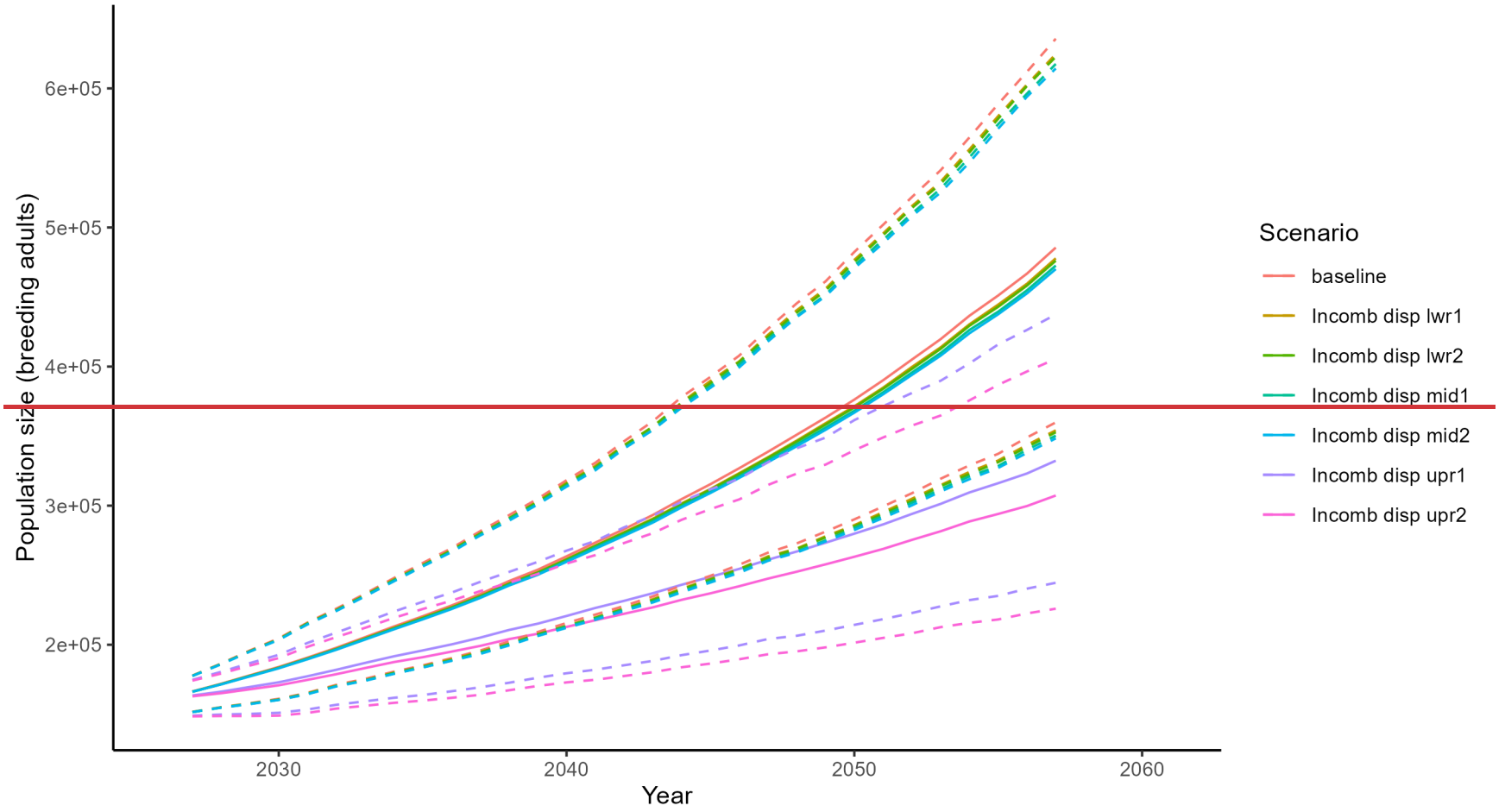
Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation	0.025	Scenario G Impact on productivity rate per pair mean	0
Units for output	breeding.adults	Scenario G Impact on adult survival rate	0.003673872
		Scenario G Impact on immature survival rate mean	-

Table 6. Outputs: Guillemot FFC Annual

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
~~Incomb~~Proj alone disp ~~lwr1~~50-1 DBS 55pct ads	~~116~~123	0.~~000773446 8~~000820120 3	10	0.9994	0.9994	0.0002	0.~~9990~~ 9989	0.9999	0.~~9940~~ 9935	0.~~9939~~ 9935	0.0028	0.~~9885~~ 9881	0.~~9994~~ 9990	47.~~384~~ 0	~~52.705~~ 3.22
~~Incomb~~Proj alone disp ~~lwr2~~50-1 DBS 100pct ads	~~140~~163	0.~~000933470 2~~001086826 1	10	0.~~9993~~ 9992	0.~~9993~~ 9992	0.0002	0.~~9989~~ 9988	0.~~9998~~ 9997	0.~~9927~~ 9914	0.~~9927~~ 9914	0.0027	0.~~9873~~ 9860	0.~~9980~~ 9968	46.~~801~~ 2	~~53.485~~ 4.22
Proj alone disp 70-2 DBS 55pct ads	344	0.002293669 7	10	0.9984	0.9984	0.0002	0.9979	0.9988	0.9820	0.9820	0.0028	0.9768	0.9875	42.34	58.10
~~Incomb~~Proj alone disp ~~mid1~~70-2 DBS 100pct ads	~~194~~456	0.~~001293523 1~~003040445 9	10	0.~~9991~~ 9978	0.~~9991~~ 9978	0.0002	0.~~9986~~ 9973	0.~~9995~~ 9983	0.~~9899~~ 9763	0.~~9898~~ 9763	0.0028	0.~~9845~~ 9707	0.~~9952~~ 9817	~~45.703~~ 9.80	~~54.806~~ 0.36
Proj alone disp 70-10 DBS 100pct ads	2,279	0.015195562 0	10	0.9892	0.9892	0.0004	0.9884	0.9899	0.8874	0.8873	0.0037	0.8798	0.8944	10.04	90.78
Incomb disp ~~mid2~~50-1 DBS 100pct ads exc comp	~~234~~385	0.~~001560228 8~~002567043 2	10	0.~~9989~~ 9982	0.~~9989~~ 9982	0.0002	0.~~9984~~ 9977	0.~~9994~~ 9987	0.~~9878~~ 9799	0.~~9878~~ 9799	0.~~0027~~ 0028	0.~~9824~~ 9746	0.~~9932~~ 9856	~~44.884~~ 1.26	~~55.745~~ 8.86
Incomb disp ~~upr1~~50-1 DBS 100pct ads inc comp	~~2,717~~551	0.~~018115990 3~~003673872 2	10	0.~~9871~~ 9974	0.~~9871~~ 9974	0.~~0004~~ 0003	0.~~9863~~ 9969	0.~~9879~~ 9979	0.~~8673~~ 9714	0.~~8673~~ 9714	0.~~0041~~ 0028	0.~~8591~~ 9660	0.~~8752~~ 9772	~~6.543~~7.62	~~93.846~~ 2.68
Incomb disp ~~upr2~~70-2 DBS 100pct ads exc comp	~~3,275~~1,079	0.~~021836536 0~~007194388 5	10	0.~~9845~~ 9949	0.~~9845~~ 9949	0.~~0005~~ 0003	0.~~9836~~ 9943	0.~~9854~~ 9954	0.~~8424~~ 9450	0.~~8423~~ 9449	0.~~0045~~ 0030	0.~~8332~~ 9391	0.~~8510~~ 9508	~~3.642~~7.50	~~96.827~~ 3.90

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Incomb disp lwr170-2 DBS 100pct ads inc comp	1161,541	0.0007734468010274843	2010	0.99959927	0.99959927	0.00020003	0.99929921	0.99989933	0.98909223	0.98899223	0.00340032	0.98239160	0.99569285	46.4419.90	5381.58
Incomb disp lwr270-10 DBS 100pct ads inc comp	1407,707	0.0009334702051387536 8	2010	0.99949642	0.99949641	0.00020010	0.99919621	0.99979659	0.98676693	0.98676691	0.00330074	0.98016534	0.99316831	46.040.00	54.14100.00
IncombProj alone disp mid150-1 DBS 55pct ads	194123	0.0012935231000820120 3	20	0.99919994	0.99919994	0.0002	0.99889991	0.99949997	0.98159882	0.98159881	0.00330034	0.97519815	0.98819947	44.446.34	55.945 3.64
IncombProj alone disp mid250-1 DBS 100pct ads	234163	0.0015602288001086826 1	20	0.99899992	0.99899992	0.0002	0.99869989	0.99929996	0.97779843	0.97779844	0.0033	0.97139778	0.98439911	43.5245.18	56.845 4.76
Proj alone disp 70-2 DBS 55pct ads	344	0.0022936697	20	0.9984	0.9984	0.0002	0.9981	0.9987	0.9673	0.9673	0.0033	0.9608	0.9737	40.20	60.52
Proj alone disp 70-2 DBS 100pct ads	456	0.0030404459	20	0.9979	0.9979	0.0002	0.9976	0.9982	0.9570	0.9570	0.0034	0.9503	0.9636	36.66	63.66
Proj alone disp 70-10 DBS 100pct ads	2,279	0.0151955620	20	0.9896	0.9896	0.0002	0.9891	0.9901	0.8034	0.8032	0.0043	0.7946	0.8116	3.86	96.38
Incomb disp upr150-1 DBS 100pct ads exc comp	2,717385	0.0181159903002567043 2	20	0.98779982	0.98779982	0.00030002	0.98719979	0.98829985	0.77049635	0.77049635	0.00460033	0.76149570	0.77929701	1.7838.76	98.5461.70
Incomb disp upr250-1 DBS 100pct ads inc comp	3,275551	0.0218365360003673872 2	20	0.98519975	0.98519975	0.00030002	0.98459972	0.98589978	0.73039482	0.73039482	0.00500034	0.72059417	0.74009550	0.6634.18	99.6066.76
Incomb disp 70-2 DBS 100pct ads exc comp	1,079	0.0071943885	20	0.9951	0.9951	0.0002	0.9947	0.9954	0.9013	0.9013	0.0035	0.8944	0.9081	20.76	80.42
Incomb disp lwr170-2 DBS 100pct ads inc comp	1161,541	0.0007734468010274843	3020	0.99959930	0.99959930	0.00010002	0.99929925	0.99979934	0.98398621	0.98388622	0.0038	0.97638546	0.99148697	46.0811.96	54.8889.46
Incomb disp 70-10 DBS 100pct ads inc comp	7,707	0.0513875368	20	0.9657	0.9656	0.0007	0.9643	0.9669	0.4800	0.4799	0.0070	0.4658	0.4935	0.00	100.00

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
~~Incomb~~Proj alone disp ~~lwr2~~50-1 DBS 55pct ads	~~140~~123	0.~~000933470~~2000820120 3	30	0.9994	0.9994	0.0001	0.~~9991~~9992	0.~~9996~~9997	0.~~9807~~9828	0.~~9806~~9828	0.0037	0.~~9734~~9756	0.~~9878~~9901	45.~~128~~0	~~56.125~~5.46
Proj alone disp 50-1 DBS 100pct ads	163	0.0010868261	30	0.9993	0.9993	0.0001	0.9990	0.9995	0.9774	0.9773	0.0037	0.9702	0.9846	44.58	56.98
Proj alone disp 70-2 DBS 55pct ads	344	0.0022936697	30	0.9984	0.9984	0.0001	0.9982	0.9987	0.9528	0.9528	0.0037	0.9457	0.9600	37.76	64.06
Proj alone disp 70-2 DBS 100pct ads	456	0.0030404459	30	0.9979	0.9979	0.0001	0.9977	0.9982	0.9380	0.9380	0.0037	0.9308	0.9453	34.44	67.80
Proj alone disp 70-10 DBS 100pct ads	2,279	0.0151955620	30	0.9898	0.9898	0.0002	0.9894	0.9901	0.7271	0.7271	0.0045	0.7181	0.7356	1.84	98.88
Incomb disp 50-1 DBS 100pct ads exc comp	385	0.0025670432	30	0.9983	0.9983	0.0001	0.9980	0.9985	0.9474	0.9474	0.0036	0.9404	0.9545	36.68	65.54
Incomb disp ~~mid1~~50-1 DBS 100pct ads inc comp	~~194~~551	0.~~001293523 1~~003673872 2	30	0.~~9991~~9975	0.~~9991~~9975	0.0001	0.~~9989~~9973	0.~~9994~~9978	0.~~9732~~9257	0.~~9732~~9256	0.0037	0.~~9660~~9183	0.~~9804~~9328	~~43.243~~1.10	~~58.147~~1.24
Incomb disp ~~mid2~~70-2 DBS 100pct ads exc comp	~~234~~1,079	0.~~001560228 8~~007194388 5	30	0.~~9989~~9951	0.~~9989~~9951	0.0001	0.~~9987~~9949	0.~~9992~~9954	0.~~9678~~8597	0.~~9678~~8597	0.~~0036~~0038	0.~~9609~~8521	0.~~9751~~8671	~~41.741~~6.36	~~59.888~~6.22
Incomb disp ~~upr1~~70-2 DBS 100pct ads inc comp	~~2,717~~1,541	0.~~018115990 3~~010274840 3	30	0.~~9878~~9931	0.~~9878~~9931	0.0002	0.~~9874~~9927	0.~~9883~~9934	0.~~6842~~8059	0.~~6842~~8059	0.~~0048~~0041	0.~~6747~~7978	0.~~6935~~8140	~~0.507~~7.78	~~99.609~~3.88
Incomb disp ~~upr2~~70-10 DBS 100pct ads inc comp	~~3,275~~7,707	0.~~021836536 0~~051387536 8	30	0.~~9854~~9662	0.~~9854~~9662	0.~~0003~~0005	0.~~9849~~9651	0.~~9858~~9672	0.~~6331~~3441	0.~~6331~~3440	0.~~0051~~0059	0.~~6230~~3322	0.~~6430~~3554	0.~~06~~00	~~99.921~~00.00


Population size (breeding adults)
6e+05
5e+05
4e+05
3e+05
2e+05
2030
2040
2050
2060
Year
Scenario
baseline
Incomb disp lwr1
Incomb disp lwr2
Incomb disp mid1
Incomb disp mid2
Incomb disp upr1
Incomb disp upr2

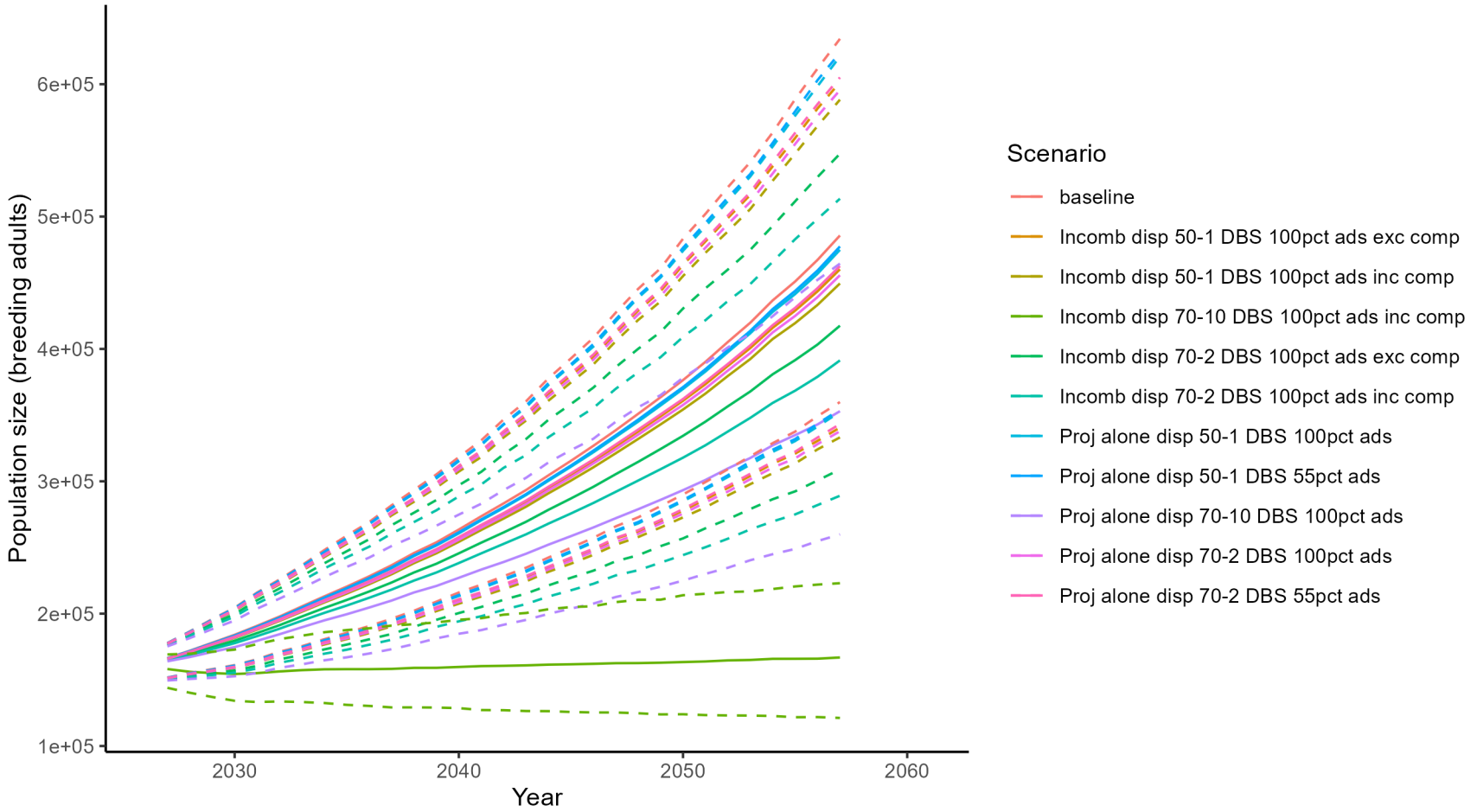


Figure 3. Guillemot FFC Annual

Table 7. Inputs: Razorbill FFC Annual

Baseline parameters	Settings	Impact parameters	Values
Reference name	RA FFC Annual	Number of scenarios of impact	~~6~~10
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	~~Incomb~~Proj alone disp ~~lwr1~~50-1 DBS 61.3pct
Species	Razorbill	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.~~000978058~~9000728665~~7~~
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	~~0~~
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	~~Incomb~~Proj alone disp ~~lwr2~~50-1 DBS 100pct
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	breeding.adults	Scenario B Impact on adult survival rate	0.~~00107586~~50008183226
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	~~3067~~361345	Scenario C name	~~Incomb~~Proj alone disp ~~med1~~70-2 DBS
Year	2022	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair mean	0.618	Scenario C Impact on adult survival rate per pair mean	0.~~00163009~~8002039286
Productivity rate per pair standard deviation	0.085	Scenario C Impact on immature survival rate mean	-
Adult survival rate Mean	0.895	Scenario D name	~~Incomb~~Proj alone disp ~~med2~~70-2 DBS
Adult survival rate standard deviation	0.067	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.~~63~~794	Scenario D Impact on adult survival rate	0.~~00179310~~8002288695
Immatures survival rates 0 to 1 standard deviation	0.067	Scenario D Impact on immature survival rate mean	-
Immatures survival rates 1 to 2 mean	0.~~63~~794	Scenario E name	~~Incomb~~Proj alone disp ~~upr1~~70-10 DBS
Immatures survival rates 1 to 2 standard deviation	0.067	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.895	Scenario E Impact on adult survival rate	0.~~02265836~~01144348
Immatures survival rates 2 to 3 standard deviation	0.067	Scenario E Impact on immature survival rate mean	~~-~~
Immatures survival rates 3 to 4 mean	0.895	Scenario F name	Incomb disp ~~upr2~~50-1 DBS 100pct ads exc
Immatures survival rates 3 to 4 standard deviation	0.067	Scenario F Impact on productivity rate per pair mean	0
Immatures survival rates 4 to 5 mean	0.895	Scenario F Impact on adult survival rate	0.~~02516872~~001727932
Immatures survival rates 4 to 5 standard deviation	0.067	Scenario F Impact on immature survival rate mean	-
Immatures survival rates 5 to 6 mean		Scenario G name	Incomb disp 50-1 DBS 100pct ads inc comp

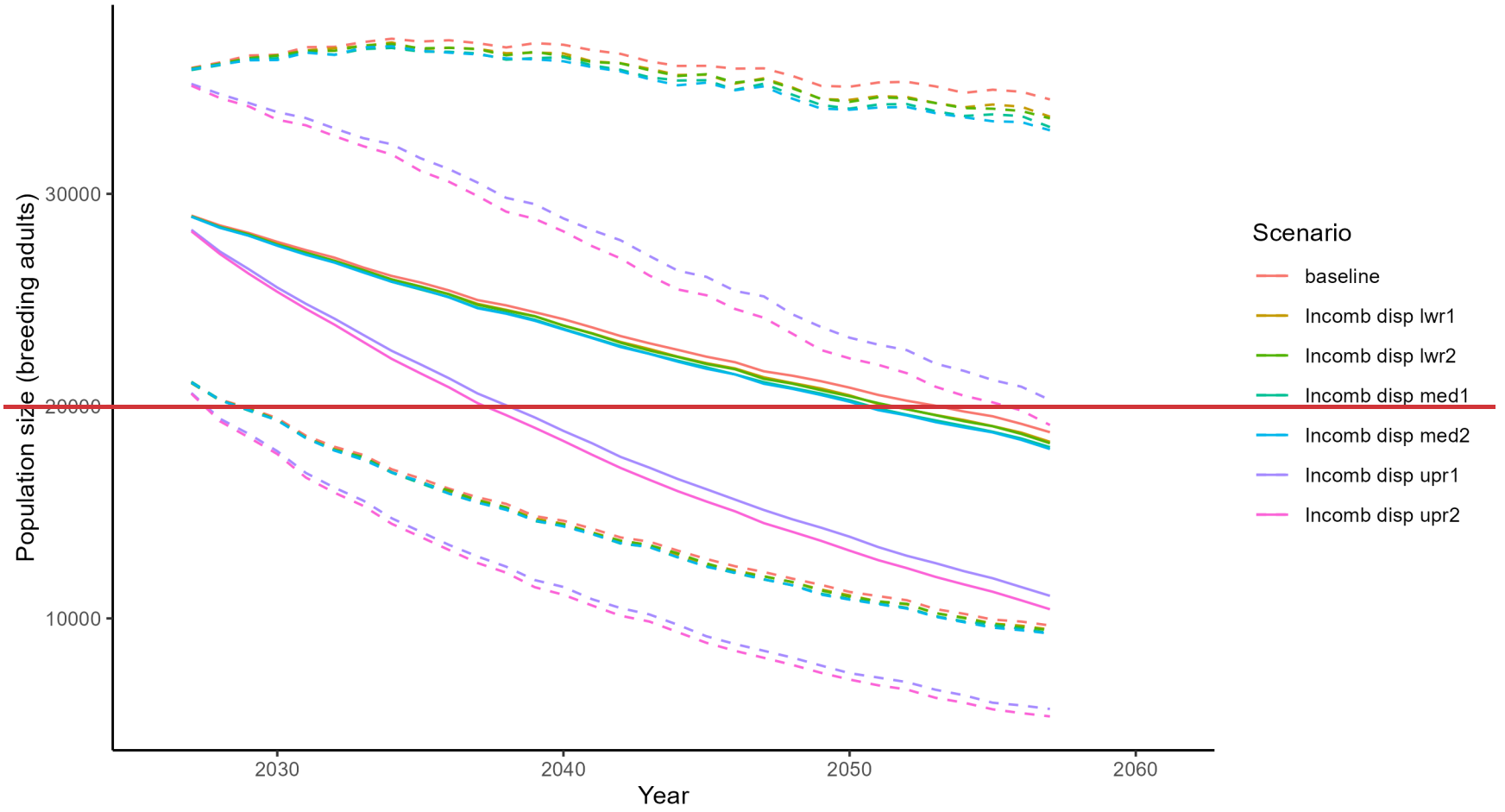
Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	0
Units for output	breeding.adults	Scenario G Impact on adult survival rate	0.002005053
		Scenario G Impact on immature survival rate mean	-

Table 8. Outputs: Razorbill FFC Annual

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
~~Incomb~~Proj alone disp ~~lwr1~~50-1 DBS 61.3pct ads	~~30~~45	0.~~00097805890~~000728665 7	10	0.~~9992~~ 9995	0.~~9992~~ 9995	0.~~0009~~ 0005	0.~~9975~~ 9985	1.~~0009~~ 0005	0.~~9915~~ 9943	0.~~9914~~ 9943	0.~~0103~~ 0058	0.~~9711~~ 9831	1.~~0120~~ 0059	48.~~709~~ 2	~~51.285~~ 0.66
~~Incomb~~Proj alone disp ~~lwr2~~50-1 DBS 100pct ads	~~33~~50	0.~~00107586480~~00081832 26	10	0.~~9991~~ 9994	0.~~9991~~ 9994	0.~~0009~~ 0005	0.~~9975~~ 9985	1.~~0009~~ 0004	0.~~9906~~ 9936	0.~~9906~~ 9937	0.~~0104~~ 0059	0.~~9705~~ 9821	1.~~0116~~ 0053	48.~~288~~ 2	51.~~640~~ 2
~~Incomb~~Proj alone disp ~~med1~~70-2 DBS 61.3pct ads	~~50~~125	0.~~00163009810~~00203928 60	10	0.~~9987~~ 9986	0.~~9987~~ 9986	0.~~0009~~ 0005	0.~~9970~~ 9976	~~1.0004~~ 0.9995	0.~~9858~~ 9843	0.~~9860~~ 9843	0.~~0103~~ 0058	0.~~9658~~ 9730	~~1.0065~~ 0.9954	47.~~061~~ 0	52.~~009~~ 2
Proj alone disp 70-2 DBS 100pct ads	140	0.0022886951	10	0.9984	0.9984	0.0005	0.9974	0.9994	0.9823	0.9824	0.0058	0.9714	0.9942	46.70	53.12
Proj alone disp 70-10 DBS 100pct ads	702	0.0114434754	10	0.9920	0.9920	0.0005	0.9910	0.9930	0.9155	0.9155	0.0058	0.9041	0.9267	32.98	67.26
Incomb disp 50-1 DBS 100pct ads exc comp	106	0.0017279322	10	0.9988	0.9988	0.0005	0.9978	0.9998	0.9867	0.9867	0.0059	0.9753	0.9983	47.42	52.18
Incomb disp ~~med2~~50-1 DBS 100pct ads inc comp	~~55~~123	0.~~00179310790~~02005053 4	10	0.9986	0.9986	0.~~0009~~ 0005	0.~~9969~~ 9976	~~1.0003~~ 0.9996	0.~~9844~~ 9845	0.~~9846~~ 9845	0.~~0104~~ 0058	0.~~9641~~ 9729	~~1.0058~~ 0.9961	~~46.904~~ 7.18	52.~~508~~ 4
Incomb disp ~~upr1~~70-2 DBS 100pct ads exc comp	~~695~~298	0.~~02265836400~~04857771 6	10	0.~~9824~~ 9966	0.~~9824~~ 9966	0.~~0010~~ 0005	0.~~9805~~ 9956	0.~~9843~~ 9976	0.~~8227~~ 9631	0.~~8228~~ 9631	0.~~0095~~ 0057	0.~~8044~~ 9520	0.~~8419~~ 9744	~~18.924~~ 2.70	~~82.445~~ 7.36
Incomb disp 70-2 DBS 100pct ads inc comp	343	0.0055913277	10	0.9961	0.9961	0.0005	0.9951	0.9971	0.9579	0.9578	0.0058	0.9464	0.9688	41.56	58.68

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Incomb disp upr270-10 DBS 100pct ads inc comp	7721,716	0.0251687152027972939	10	0.98059806	0.98059806	0.00100007	0.97859793	0.98249819	0.80508062	0.80508062	0.00950065	0.78647937	0.82408189	16.4214.94	84.9487.08
IncombProj alone disp lwr150-1 DBS 61.3pct ads	3045	0.0009780589000728665	20	0.99929995	0.99929995	0.00060003	0.99809989	1.00050001	0.98429895	0.98449896	0.01350071	0.95789758	1.01170036	47.8848.18	51.9682
IncombProj alone disp lwr250-1 DBS 100pct ads	3350	0.0010758648000818322	20	0.99929995	0.99929994	0.00060003	0.99799988	1.00040001	0.98339884	0.98319884	0.01360071	0.95609746	1.01090022	47.3292	52.1051.96
Proj alone disp 70-2 DBS 61.3pct ads	125	0.0020392860	20	0.9986	0.9986	0.0003	0.9980	0.9993	0.9714	0.9713	0.0071	0.9576	0.9851	45.60	54.52
Proj alone disp 70-2 DBS 100pct ads	140	0.0022886951	20	0.9984	0.9985	0.0003	0.9978	0.9991	0.9678	0.9679	0.0071	0.9542	0.9820	45.24	55.08
Proj alone disp 70-10 DBS 100pct ads	702	0.0114434754	20	0.9923	0.9923	0.0004	0.9916	0.9930	0.8499	0.8499	0.0067	0.8368	0.8630	26.24	74.80
Incomb disp med150-1 DBS 100pct ads exc comp	50106	0.0016300981001727932	20	0.9988	0.9988	0.00060003	0.99759982	1.00000.9995	0.97439757	0.97439757	0.01350071	0.94859611	1.00140.9895	46.0424	53.6288
Incomb disp med250-1 DBS 100pct ads inc comp	55123	0.0017931079002005053 4	20	0.9986	0.9986	0.00060003	0.99749980	0.99999993	0.97189717	0.9718	0.01350071	0.94579581	0.99889861	45.4458	53.9054.50
Incomb disp upr170-2 DBS 100pct ads exc comp	695298	0.0226583640004857771 6	20	0.98299967	0.98299967	0.00070003	0.98159961	0.98449974	0.69699332	0.69689331	0.01120069	0.67519197	0.71899464	10.2839.18	91.1261.08
Incomb disp upr270-2 DBS 100pct ads inc comp	772343	0.0251687152005591327 7	20	0.98119962	0.98119962	0.00070003	0.97969956	0.98259969	0.66939234	0.66939235	0.01080068	0.64869103	0.69109369	8.3837.48	93.3262.72
Incomb disp lwr170-10 DBS 100pct ads inc comp	301,716	0.0009780589027972939 9	3020	0.99939813	0.99939813	0.0005	0.99829804	1.00030.9822	0.97726726	0.97736726	0.01640069	0.94586594	1.01030.6862	47.106.82	52.6494.96
IncombProj alone disp lwr250-1 DBS 61.3pct ads	3345	0.0010758648000728665 7	30	0.99929995	0.99929995	0.00050002	0.99829990	1.00020000	0.97529848	0.97539850	0.01640079	0.94429697	1.00820002	46.6847.86	52.9851.76

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Proj alone disp 50-1 DBS 100pct ads	50	0.0008183226	30	0.9995	0.9995	0.0003	0.9990	0.9999	0.9832	0.9832	0.0080	0.9680	0.9988	47.82	51.98
Proj alone disp 70-2 DBS 61.3pct ads	125	0.0020392860	30	0.9986	0.9986	0.0003	0.9981	0.9992	0.9585	0.9585	0.0079	0.9432	0.9740	44.22	55.16
Proj alone disp 70-2 DBS 100pct ads	140	0.0022886951	30	0.9985	0.9985	0.0003	0.9980	0.9990	0.9534	0.9535	0.0079	0.9383	0.9694	43.26	55.92
Proj alone disp 70-10 DBS 100pct ads	702	0.0114434754	30	0.9924	0.9924	0.0003	0.9918	0.9929	0.7891	0.7889	0.0071	0.7749	0.8029	20.58	78.48
Incomb disp ~~med1~~50-1 DBS 100pct ads exc comp	~~50~~106	0.~~001630098 1~~001727932 2	30	0.9988	0.9988	0.~~0005~~0003	0.~~9978~~9983	0.~~9998~~9993	0.~~9626~~9647	0.~~9627~~9648	0.~~0162~~0080	0.~~9315~~9493	0.~~9957~~9807	45.~~181~~6	54.~~481~~2
Incomb disp ~~med2~~50-1 DBS 100pct ads inc comp	~~55~~123	0.~~001793107 9~~002005053 4	30	0.9987	0.~~9986~~9987	0.~~0005~~0003	0.~~9976~~9982	0.~~9997~~9992	0.~~9592~~9593	0.~~9591~~9593	0.~~0163~~0079	0.~~9273~~9439	0.~~9924~~9751	44.~~584~~8	55.~~400~~6
Incomb disp ~~upr1~~70-2 DBS 100pct ads exc comp	~~695~~298	0.~~022658364 0~~004857771 6	30	0.~~9831~~9968	0.~~9831~~9968	0.~~0006~~0003	0.~~9818~~9963	0.~~9843~~9973	0.~~5900~~9044	0.~~5900~~9042	0.~~0118~~0076	0.~~5666~~8893	0.~~6137~~9186	~~5.74~~36.08	~~95.366~~2.58
Incomb disp 70-2 DBS 100pct ads inc comp	343	0.0055913277	30	0.9963	0.9963	0.0003	0.9958	0.9968	0.8905	0.8904	0.0075	0.8752	0.9050	34.02	65.02
Incomb disp ~~upr2~~70-10 DBS 100pct ads inc comp	~~772~~1,716	0.~~025168715 2~~027972939 9	30	0.~~9813~~9815	0.~~9813~~9815	0.~~0006~~0004	0.~~9800~~9808	0.~~9825~~9823	0.~~5561~~5611	0.~~5563~~5612	0.~~0112~~0067	0.~~5342~~5483	0.~~5784~~5743	3.~~94~~00	~~96.929~~7.86


Population size (breeding adults)
30000
20000
10000
2030
2040
2050
2060
Year
Scenario
baseline
Incomb disp lwr1
Incomb disp lwr2
Incomb disp med1
Incomb disp med2
Incomb disp upr1
Incomb disp upr2

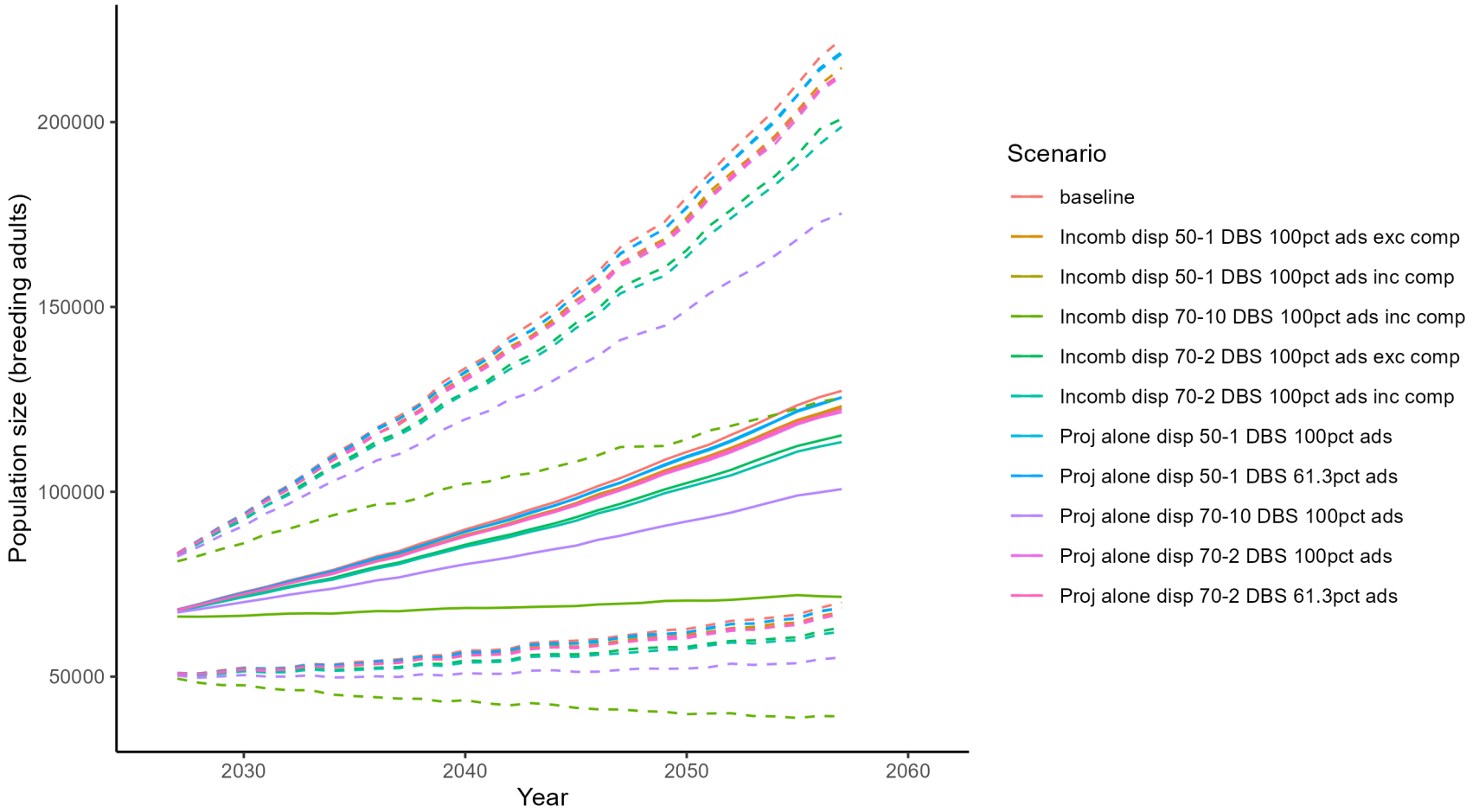


Figure 4. Razorbill FFC Annual

Table 9. Inputs: Guillemot Farne Islands Annual

Baseline parameters	Settings	Impact parameters	Values
Reference name	GU Farne Is.	Number of scenarios of impact	3
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	Incomb disp 50-1
Species	Common	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	6	Scenario A Impact on adult survival rate	0.001108647
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	-
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	Incomb disp 70-2
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	breeding.adults	Scenario B Impact on adult survival rate	0.003107336
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	64042	Scenario C name	Incomb disp 70-10
Year	2024	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair mean	0.6879	Scenario C Impact on adult survival rate per pair mean	0.01555229
Productivity rate per pair standard deviation	0.0825	Scenario C Impact on immature survival rate mean	
Adult survival rate Mean	0.94	Scenario D name	
Adult survival rate standard deviation	0.025	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.56	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.058	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.792	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.152	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.917	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.098	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.938	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.107	Scenario F Impact on productivity rate per pair mean	
Immatures survival rates 4 to 5 mean	0.94	Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation	0.025	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean	0.94	Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation	0.025	Scenario G Impact on productivity rate per pair mean	
Units for output	breeding.adults	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 10. Outputs: Guillemot Farne Islands Annual

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Incomb disp 50-1	71	0.001108647	10	0.9992	0.9992	0.0004	0.9985	0.9999	0.9913	0.9913	0.0043	0.9828	0.9997	46.08	53.96
Incomb disp 70-2	199	0.003107336	10	0.9978	0.9978	0.0004	0.9971	0.9985	0.9758	0.9759	0.0042	0.9676	0.9842	39.60	60.38
Incomb disp 70-10	996	0.015552294	10	0.9889	0.9889	0.0005	0.9880	0.9898	0.8850	0.8848	0.0048	0.8755	0.8940	9.52	91.06
Incomb disp 50-1	71	0.001108647	20	0.9992	0.9992	0.0002	0.9988	0.9997	0.9841	0.9841	0.0051	0.9740	0.9939	45.14	55.02
Incomb disp 70-2	199	0.003107336	20	0.9979	0.9979	0.0002	0.9974	0.9984	0.9561	0.9561	0.0051	0.9461	0.9661	36.58	64.18
Incomb disp 70-10	996	0.015552294	20	0.9894	0.9894	0.0003	0.9887	0.9900	0.7993	0.7992	0.0055	0.7882	0.8102	3.62	96.68
Incomb disp 50-1	71	0.001108647	30	0.9992	0.9992	0.0002	0.9989	0.9996	0.9769	0.9770	0.0057	0.9660	0.9883	44.18	57.18
Incomb disp 70-2	199	0.003107336	30	0.9979	0.9979	0.0002	0.9975	0.9983	0.9366	0.9368	0.0056	0.9258	0.9478	34.06	68.46
Incomb disp 70-10	996	0.015552294	30	0.9895	0.9895	0.0002	0.9890	0.9900	0.7218	0.7217	0.0057	0.7101	0.7328	1.70	99.04

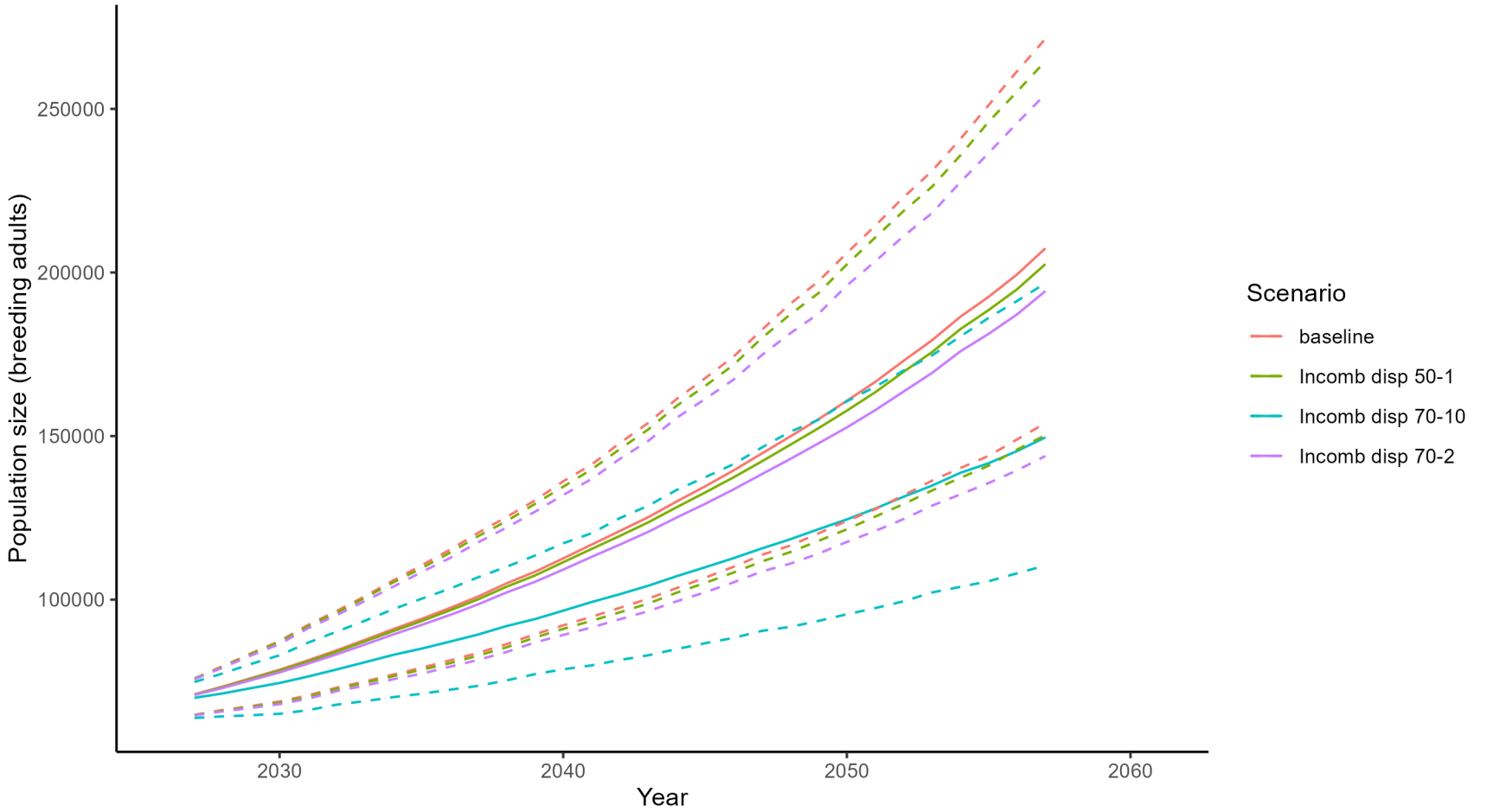


Figure 5. Guillemot Farne Islands Annual

Table 11. Inputs: Puffin Farne Islands Annual

Baseline parameters	Settings	Impact parameters	Values
Reference name	PU Farne Is.	Number of scenarios of impact	2
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	Incomb disp 50-1
Species	Atlantic Puffin	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.0004799781
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	-
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	Incomb disp 70-2
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	breeding.adults	Scenario B Impact on adult survival rate	0.00134851
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	87504	Scenario C name	
Year	2024	Scenario C Impact on productivity rate per pair mean	
Productivity rate per pair mean	0.7522	Scenario C Impact on adult survival rate per pair mean	
Productivity rate per pair standard deviation	0.1289	Scenario C Impact on immature survival rate mean	
Adult survival rate Mean	0.907	Scenario D name	
Adult survival rate standard deviation	0.083	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.892	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.108	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.892	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.108	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.892	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.108	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.76	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.093	Scenario F Impact on productivity rate per pair mean	
Immatures survival rates 4 to 5 mean	0.805	Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation	0.083	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	breeding.adults	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 12. Outputs: Puffin Farne Islands Annual

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Incomb disp 50-1	42	0.0004799781	10	0.9997	0.9997	0.0004	0.9989	1.0004	0.9964	0.9964	0.0041	0.9880	1.0044	49.32	50.66
Incomb disp 70-2	118	0.0013485098	10	0.9991	0.9991	0.0004	0.9984	0.9998	0.9900	0.9900	0.0042	0.9816	0.9983	48.06	51.68
Incomb disp 50-1	42	0.0004799781	20	0.9997	0.9997	0.0002	0.9992	1.0001	0.9934	0.9934	0.0049	0.9839	1.0031	49.06	51.02
Incomb disp 70-2	118	0.0013485098	20	0.9991	0.9991	0.0002	0.9987	0.9996	0.9815	0.9816	0.0050	0.9718	0.9916	47.30	52.82
Incomb disp 50-1	42	0.0004799781	30	0.9997	0.9997	0.0002	0.9994	1.0000	0.9904	0.9904	0.0053	0.9798	1.0010	48.80	51.04
Incomb disp 70-2	118	0.0013485098	30	0.9991	0.9991	0.0002	0.9988	0.9995	0.9733	0.9733	0.0054	0.9628	0.9838	46.98	53.02

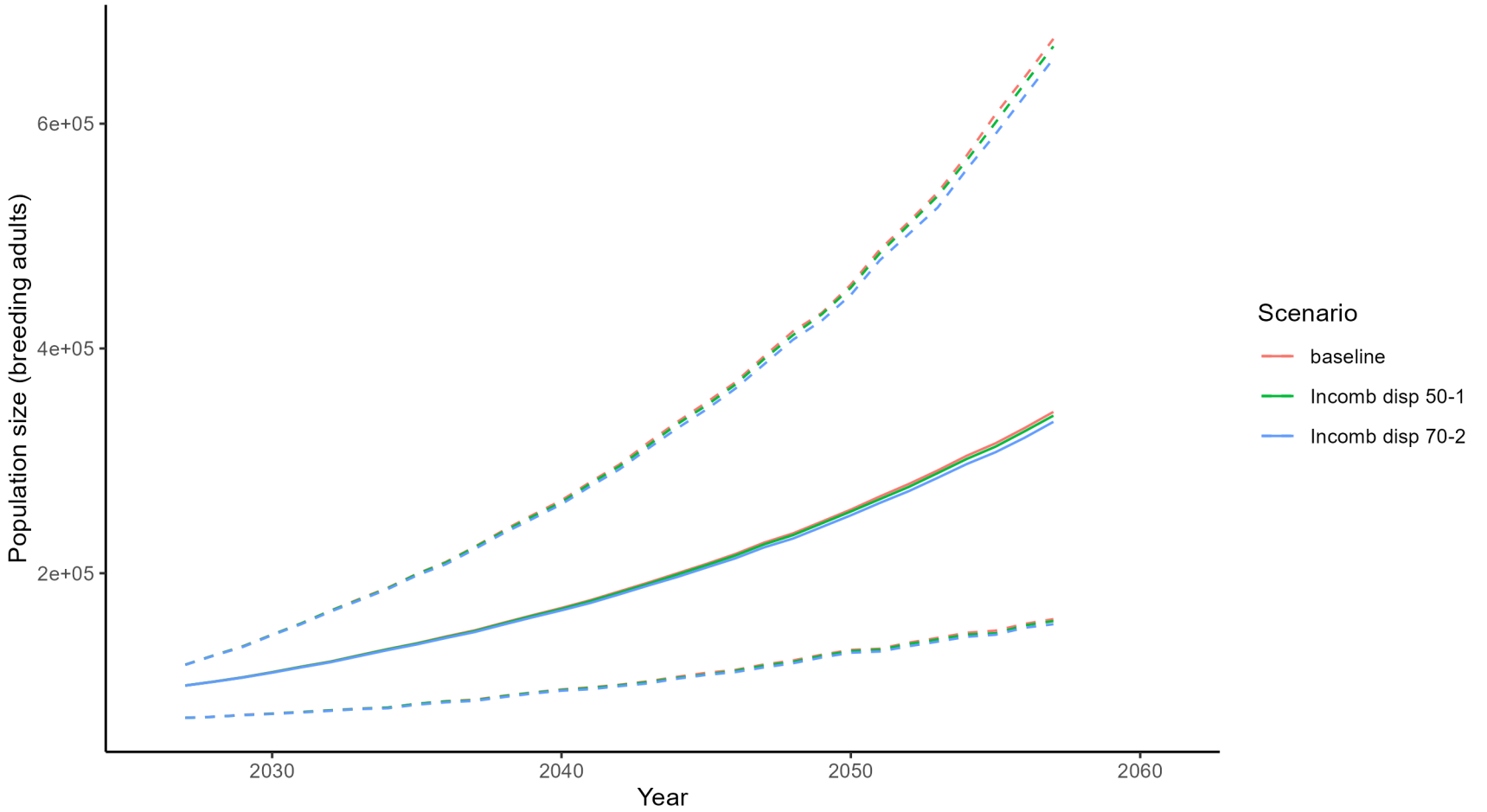


Figure 6. Puffin Farne Islands Annual

Table 13. Inputs: Gannet EIA/CIA BDMPS

Baseline parameters	Settings	Impact parameters	Values
Reference name	GX BDMPS	Number of scenarios of impact	2
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	CIA disp 60-1 plus CRM
Species	Northern gannet	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.002390976
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	-
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	CIA disp 80-1 plus CRM
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	0.002662728
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	456299	Scenario C name	
Year	2015	Scenario C Impact on productivity rate per pair mean	
Productivity rate per pair mean	0.823	Scenario C Impact on adult survival rate per pair mean	
Productivity rate per pair standard deviation	0.038	Scenario C Impact on immature survival rate mean	
Adult survival rate Mean	0.919	Scenario D name	
Adult survival rate standard deviation	0.042	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.424	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.045	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.829	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.026	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.891	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.019	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.895	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.019	Scenario F Impact on productivity rate per pair mean	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 4 to 5 mean	0.919	Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation	0.042	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 14. Outputs: Gannet EIA/CIA BDMPS

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA disp 60-1 plus CRM	1,091	0.002390976	10	0.9983	0.9983	0.0002	0.9979	0.9987	0.9814	0.9814	0.0034	0.9749	0.9882	44.86	54.88
CIA disp 80-1 plus CRM	1,215	0.002662728	10	0.9981	0.9981	0.0002	0.9977	0.9985	0.9794	0.9794	0.0034	0.9727	0.9861	44.26	55.34
CIA disp 60-1 plus CRM	1,091	0.002390976	20	0.9983	0.9983	0.0002	0.9980	0.9986	0.9649	0.9649	0.0039	0.9574	0.9726	41.98	57.68
CIA disp 80-1 plus CRM	1,215	0.002662728	20	0.9981	0.9981	0.0002	0.9978	0.9984	0.9611	0.9611	0.0039	0.9534	0.9687	41.10	58.74
CIA disp 60-1 plus CRM	1,091	0.002390976	30	0.9983	0.9983	0.0001	0.9981	0.9985	0.9487	0.9487	0.0042	0.9406	0.9573	39.68	59.90
CIA disp 80-1 plus CRM	1,215	0.002662728	30	0.9981	0.9981	0.0001	0.9979	0.9983	0.9432	0.9432	0.0042	0.9349	0.9515	38.84	61.18

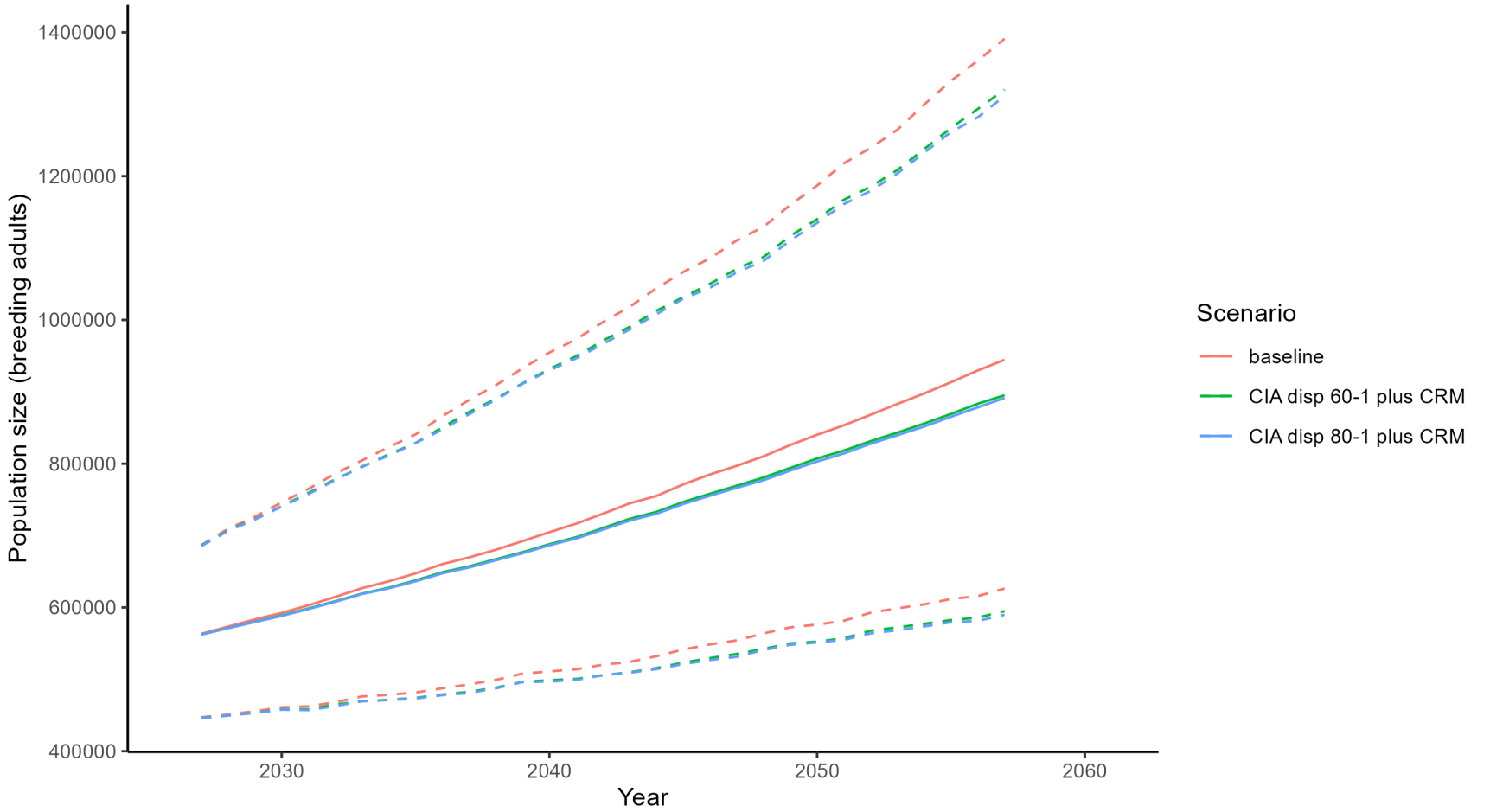


Figure 7. Gannet EIA/CIA BDMPS

Table 15. Inputs: Kittiwake EIA/CIA BDMPS

Baseline parameters	Settings	Impact parameters	Values
Reference name	KI BDMPS	Number of scenarios of impact	1
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	CIA CRM
Species	Black-legged	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	4	Scenario A Impact on adult survival rate	0.04465608
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	
Maximum brood size per pair_chicks_will be constrained to be no greater than	2	Scenario B name	
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	
Initial population size	89148	Scenario C name	
Year	2024	Scenario C Impact on productivity rate per pair mean	
Productivity rate per pair_mean	0.737	Scenario C Impact on adult survival rate per pair mean	
Productivity rate per pair_standard deviation	0.2015	Scenario C Impact on immature survival rate mean	
Adult survival rate_Mean	0.854	Scenario D name	
Adult survival rate_standard deviation	0.077	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.79	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.077	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.854	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.077	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.854	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.077	Scenario E Impact on immature survival rate mean	-
Immatures survival rates 3 to 4 mean	0.854	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.077	Scenario F Impact on productivity rate per pair mean	
Immatures survival rates 4 to 5 mean		Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation		Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 16. Outputs: Kittiwake EIA/CIA BDMPS

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA CRM	3,981	0.04465608	10	0.9712	0.9712	0.0011	0.9690	0.9734	0.7254	0.7254	0.0097	0.7065	0.7441	9.46	92.40
CIA CRM	3,981	0.04465608	20	0.9713	0.9713	0.0008	0.9696	0.9728	0.5423	0.5423	0.0098	0.5229	0.5616	2.76	97.90
CIA CRM	3,981	0.04465608	30	0.9713	0.9713	0.0007	0.9699	0.9726	0.4053	0.4053	0.0088	0.3878	0.4227	1.00	99.48

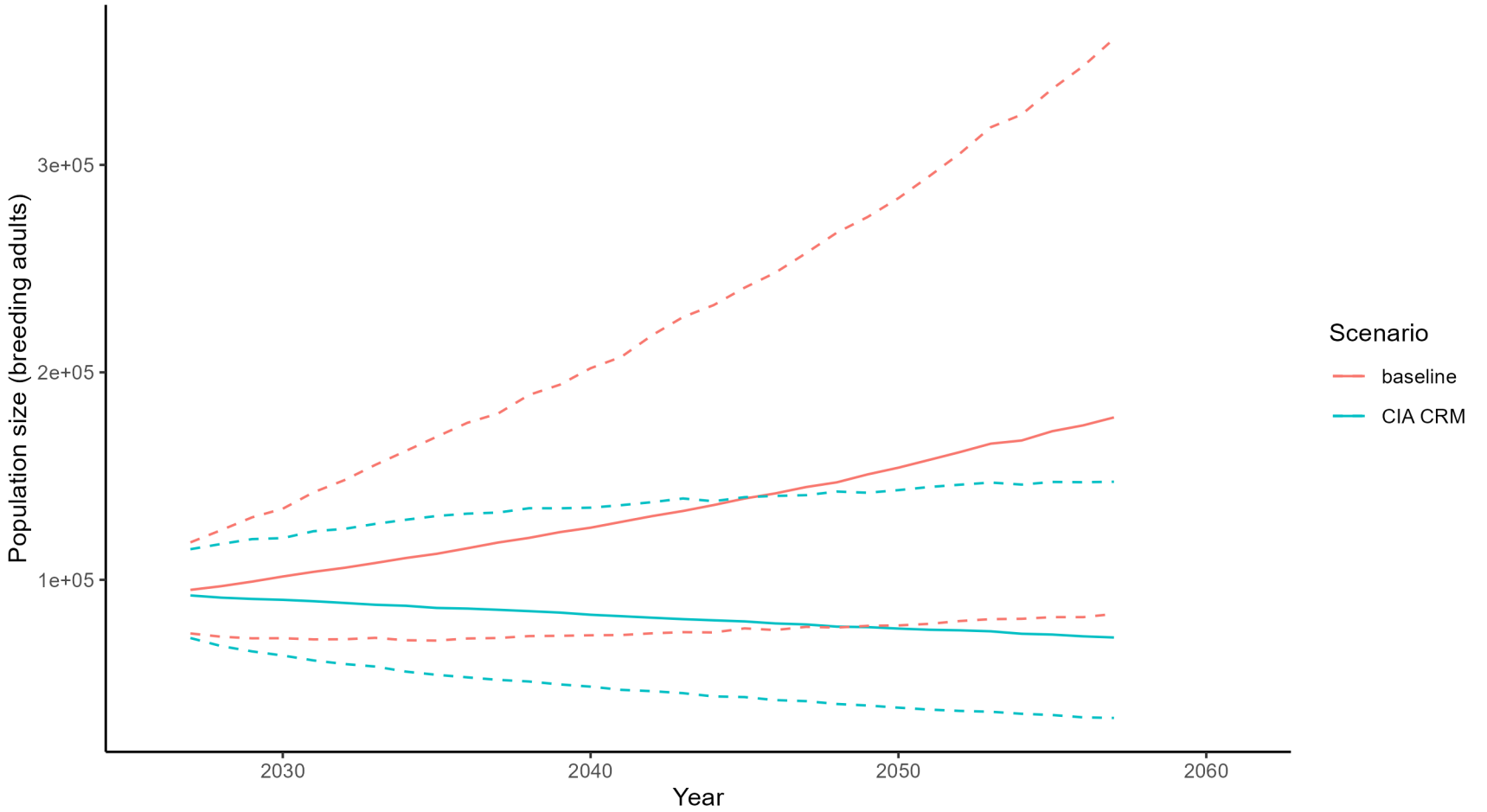


Figure 8. Kittiwake EIA/CIA BDMPS

Table 17. Inputs: Guillemot EIA/CIA BDMPS

Baseline parameters	Settings	Impact parameters	Values
Reference name	GU BDMPS	Number of scenarios of impact	6
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	Proj alone disp 50-1 DBS 100pct ads
Species	Common	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	6	Scenario A Impact on adult survival rate	0.0001476716
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	
Maximum brood size per pair_chicks_will be constrained to be no greater than	1	Scenario B name	Proj alone disp 70-2 DBS 100pct ads
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	0.0004136762
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	2045078	Scenario C name	Proj alone disp 70-10 DBS 100pct ads
Year	2015	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair_mean	0.6879	Scenario C Impact on adult survival rate per pair mean	0.002068381
Productivity rate per pair_standard deviation	0.0825	Scenario C Impact on immature survival rate mean	-
Adult survival rate_Mean	0.94	Scenario D name	CIA disp 50-1
Adult survival rate_standard deviation	0.025	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.56	Scenario D Impact on adult survival rate	0.001547618
Immatures survival rates 0 to 1 standard deviation	0.058	Scenario D Impact on immature survival rate mean	-
Immatures survival rates 1 to 2 mean	0.792	Scenario E name	CIA disp 70-2
Immatures survival rates 1 to 2 standard deviation	0.152	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.917	Scenario E Impact on adult survival rate	0.004333331
Immatures survival rates 2 to 3 standard deviation	0.098	Scenario E Impact on immature survival rate mean	-
Immatures survival rates 3 to 4 mean	0.938	Scenario F name	CIA disp 70-10
Immatures survival rates 3 to 4 standard deviation	0.107	Scenario F Impact on productivity rate per pair mean	0
Immatures survival rates 4 to 5 mean	0.94	Scenario F Impact on adult survival rate	0.02166568
Immatures survival rates 4 to 5 standard deviation	0.025	Scenario F Impact on immature survival rate mean	-
Immatures survival rates 5 to 6 mean	0.94	Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation	0.025	Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 18. Outputs: Guillemot EIA/CIA BDMPS

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Proj_alone_disp_50-1 DBS 100pct ads	302	0.0001476716	10	0.9999	0.9999	0.0001	0.9998	1.0000	0.9989	0.9989	0.0013	0.9964	1.0014	49.80	50.32
Proj_alone_disp_70-2 DBS 100pct ads	846	0.0004136762	10	0.9997	0.9997	0.0001	0.9996	0.9999	0.9970	0.9970	0.0013	0.9946	0.9995	48.94	51.04
Proj_alone_disp_70-10 DBS 100pct ads	4,230	0.0020683808	10	0.9986	0.9986	0.0001	0.9985	0.9988	0.9851	0.9851	0.0013	0.9825	0.9876	44.78	54.96
CIA disp 50-1	3,165	0.0015476182	10	0.9990	0.9990	0.0001	0.9988	0.9991	0.9888	0.9888	0.0013	0.9863	0.9914	46.08	53.56
CIA disp 70-2	8,862	0.0043333311	10	0.9971	0.9971	0.0001	0.9969	0.9973	0.9690	0.9690	0.0015	0.9660	0.9719	39.30	60.34
CIA disp 70-10	44,308	0.0216656773	10	0.9859	0.9858	0.0004	0.9851	0.9865	0.8549	0.8547	0.0035	0.8476	0.8612	9.16	90.56
Proj_alone_disp_50-1 DBS 100pct ads	302	0.0001476716	20	0.9999	0.9999	0.0001	0.9998	1.0000	0.9980	0.9980	0.0014	0.9952	1.0007	49.42	50.66
Proj_alone_disp_70-2 DBS 100pct ads	846	0.0004136762	20	0.9997	0.9997	0.0000	0.9996	0.9998	0.9943	0.9943	0.0014	0.9916	0.9970	48.56	51.90
Proj_alone_disp_70-10 DBS 100pct ads	4,230	0.0020683808	20	0.9986	0.9986	0.0001	0.9985	0.9987	0.9718	0.9718	0.0015	0.9689	0.9746	41.94	57.76
CIA disp 50-1	3,165	0.0015476182	20	0.9990	0.9990	0.0001	0.9989	0.9991	0.9788	0.9788	0.0014	0.9760	0.9816	44.04	55.66

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA disp 70-2	8,862	0.0043333311	20	0.9971	0.9971	0.0001	0.9970	0.9973	0.9418	0.9418	0.0017	0.9384	0.9450	33.44	66.28
CIA disp 70-10	44,308	0.0216656773	20	0.9859	0.9859	0.0003	0.9853	0.9863	0.7419	0.7418	0.0041	0.7333	0.7492	2.48	98.30
Proj alone disp 50-1 DBS 100pct ads	302	0.0001476716	30	0.9999	0.9999	0.0000	0.9998	1.0000	0.9970	0.9970	0.0015	0.9940	1.0000	49.04	50.72
Proj alone disp 70-2 DBS 100pct ads	846	0.0004136762	30	0.9997	0.9997	0.0000	0.9997	0.9998	0.9916	0.9916	0.0015	0.9887	0.9945	47.86	52.42
Proj alone disp 70-10 DBS 100pct ads	4,230	0.0020683808	30	0.9986	0.9986	0.0000	0.9986	0.9987	0.9587	0.9587	0.0016	0.9555	0.9616	39.50	60.44
CIA disp 50-1	3,165	0.0015476182	30	0.9990	0.9990	0.0000	0.9989	0.9991	0.9689	0.9689	0.0015	0.9658	0.9719	42.32	57.98
CIA disp 70-2	8,862	0.0043333311	30	0.9972	0.9972	0.0001	0.9970	0.9973	0.9153	0.9153	0.0018	0.9116	0.9188	29.40	71.18
CIA disp 70-10	44,308	0.0216656773	30	0.9859	0.9859	0.0002	0.9854	0.9863	0.6440	0.6438	0.0043	0.6348	0.6518	0.36	99.68

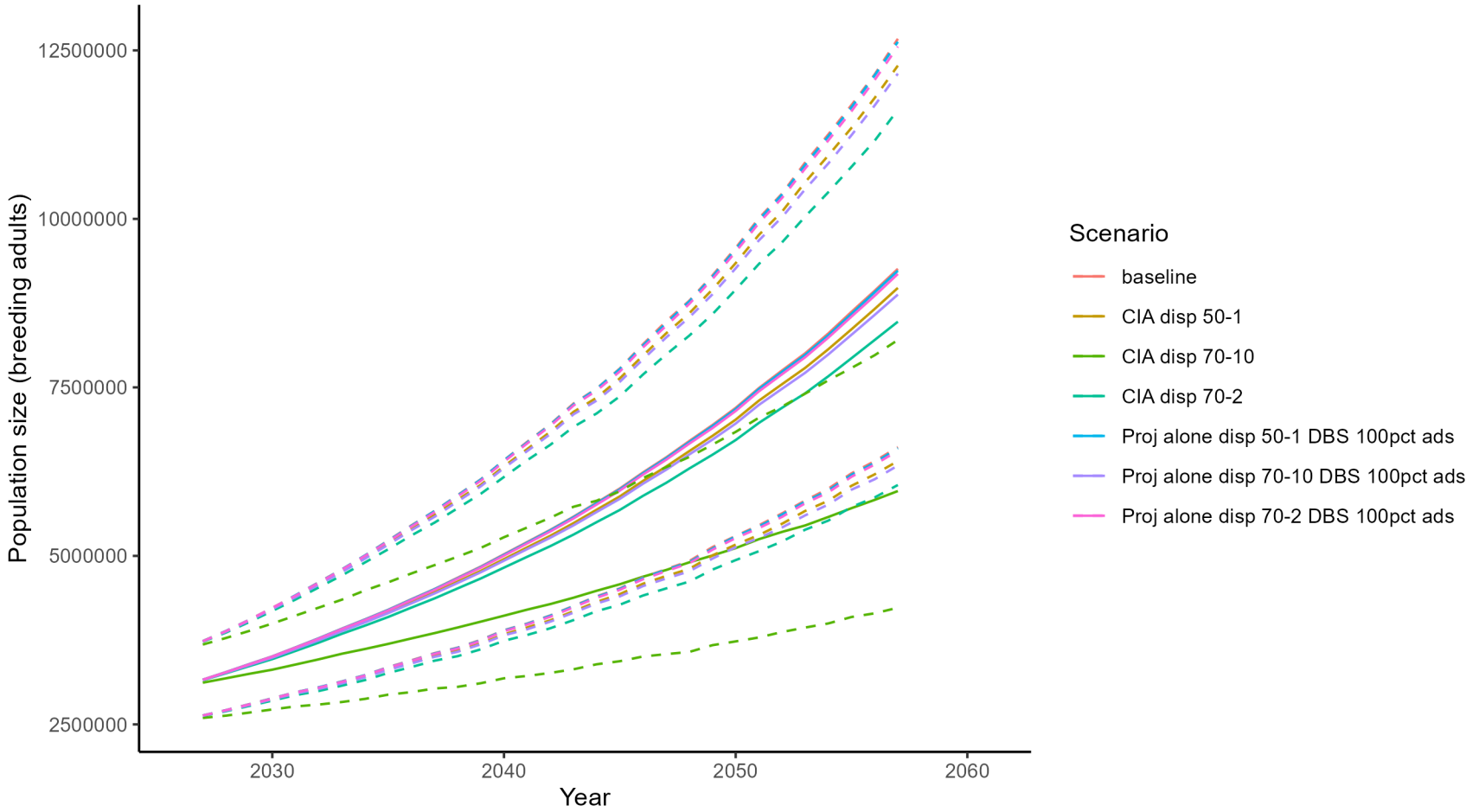


Figure 9. Guillemot EIA/CIA BDMPS

Table 19. Inputs: Guillemot EIA/CIA Biogeographic

Baseline parameters	Settings	Impact parameters	Values
Reference name	GU	Number of scenarios of impact	6
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	Proj alone disp 50-1 DBS 100pct ads
Species	Common	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	6	Scenario A Impact on adult survival rate	7.321212e-05
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	Proj alone disp 70-2 DBS 100pct ads
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	0.0002050909
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	4125000	Scenario C name	Proj alone disp 70-10 DBS 100pct ads
Year	2015	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair mean	0.6879	Scenario C Impact on adult survival rate per pair mean	0.001025455
Productivity rate per pair standard deviation	0.0825	Scenario C Impact on immature survival rate mean	-
Adult survival rate Mean	0.94	Scenario D name	CIA disp 50-1
Adult survival rate standard deviation	0.025	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.56	Scenario D Impact on adult survival rate	0.0007672727
Immatures survival rates 0 to 1 standard deviation	0.058	Scenario D Impact on immature survival rate mean	-
Immatures survival rates 1 to 2 mean	0.792	Scenario E name	CIA disp 70-2
Immatures survival rates 1 to 2 standard deviation	0.152	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.917	Scenario E Impact on adult survival rate	0.002148364
Immatures survival rates 2 to 3 standard deviation	0.098	Scenario E Impact on immature survival rate mean	-
Immatures survival rates 3 to 4 mean	0.938	Scenario F name	CIA disp 70-10
Immatures survival rates 3 to 4 standard deviation	0.107	Scenario F Impact on productivity rate per pair mean	0
Immatures survival rates 4 to 5 mean	0.94	Scenario F Impact on adult survival rate	0.01074133
Immatures survival rates 4 to 5 standard deviation	0.025	Scenario F Impact on immature survival rate mean	-
Immatures survival rates 5 to 6 mean	0.94	Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation	0.025	Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 20 Outputs: Guillemot EIA/CIA Biogeographic

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Proj alone disp 50-1 DBS 100pct ads	302	0.00007321212	10	1.0000	1.0000	0.0001	0.9998	1.0001	0.9995	0.9995	0.0009	0.9977	1.0012	49.86	50.20
Proj alone disp 70-2 DBS 100pct ads	846	0.00020509091	10	0.9999	0.9999	0.0001	0.9998	1.0000	0.9985	0.9985	0.0009	0.9968	1.0003	49.50	50.58
Proj alone disp 70-10 DBS 100pct ads	4,230	0.00102545455	10	0.9993	0.9993	0.0001	0.9992	0.9994	0.9926	0.9926	0.0009	0.9908	0.9944	47.34	52.32
CIA disp 50-1	3,165	0.00076727273	10	0.9995	0.9995	0.0001	0.9994	0.9996	0.9944	0.9944	0.0009	0.9927	0.9962	48.02	51.86
CIA disp 70-2	8,862	0.00214836364	10	0.9986	0.9986	0.0001	0.9985	0.9987	0.9845	0.9845	0.0010	0.9826	0.9864	44.62	55.24
CIA disp 70-10	44,308	0.01074133333	10	0.9929	0.9929	0.0002	0.9926	0.9933	0.9250	0.9250	0.0020	0.9209	0.9287	25.58	74.34
Proj alone disp 50-1 DBS 100pct ads	302	0.00007321212	20	1.0000	1.0000	0.0000	0.9999	1.0000	0.9990	0.9990	0.0010	0.9971	1.0009	49.72	50.28
Proj alone disp 70-2 DBS 100pct ads	846	0.00020509091	20	0.9999	0.9999	0.0000	0.9998	0.9999	0.9971	0.9971	0.0010	0.9952	0.9991	49.10	50.86
Proj alone disp 70-10 DBS 100pct ads	4,230	0.00102545455	20	0.9993	0.9993	0.0000	0.9993	0.9994	0.9859	0.9859	0.0010	0.9839	0.9879	46.18	54.00
CIA disp 50-1	3,165	0.00076727273	20	0.9995	0.9995	0.0000	0.9994	0.9996	0.9894	0.9894	0.0010	0.9874	0.9914	47.20	53.20
CIA disp 70-2	8,862	0.00214836364	20	0.9986	0.9986	0.0000	0.9985	0.9987	0.9707	0.9707	0.0011	0.9685	0.9728	41.66	58.04

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA disp 70-10	44,308	0.010741333 33	20	0.9930	0.9930	0.0001	0.9927	0.9932	0.8620	0.8620	0.0024	0.8570	0.8664	14.74	85.26
Proj alone disp 50-1 DBS 100pct ads	302	0.000073212 12	30	1.0000	1.0000	0.0000	0.9999	1.0000	0.9985	0.9985	0.0011	0.9965	1.0006	49.56	50.38
Proj alone disp 70-2 DBS 100pct ads	846	0.000205090 91	30	0.9999	0.9999	0.0000	0.9998	0.9999	0.9958	0.9958	0.0011	0.9937	0.9979	48.88	51.20
Proj alone disp 70-10 DBS 100pct ads	4,230	0.001025454 55	30	0.9993	0.9993	0.0000	0.9993	0.9994	0.9793	0.9793	0.0011	0.9771	0.9814	44.52	55.38
CIA disp 50-1	3,165	0.000767272 73	30	0.9995	0.9995	0.0000	0.9994	0.9995	0.9844	0.9844	0.0011	0.9823	0.9866	45.72	54.02
CIA disp 70-2	8,862	0.002148363 64	30	0.9986	0.9986	0.0000	0.9985	0.9987	0.9571	0.9571	0.0012	0.9548	0.9594	39.12	60.88
CIA disp 70-10	44,308	0.010741333 33	30	0.9930	0.9930	0.0001	0.9927	0.9932	0.8034	0.8033	0.0027	0.7978	0.8084	9.46	90.96

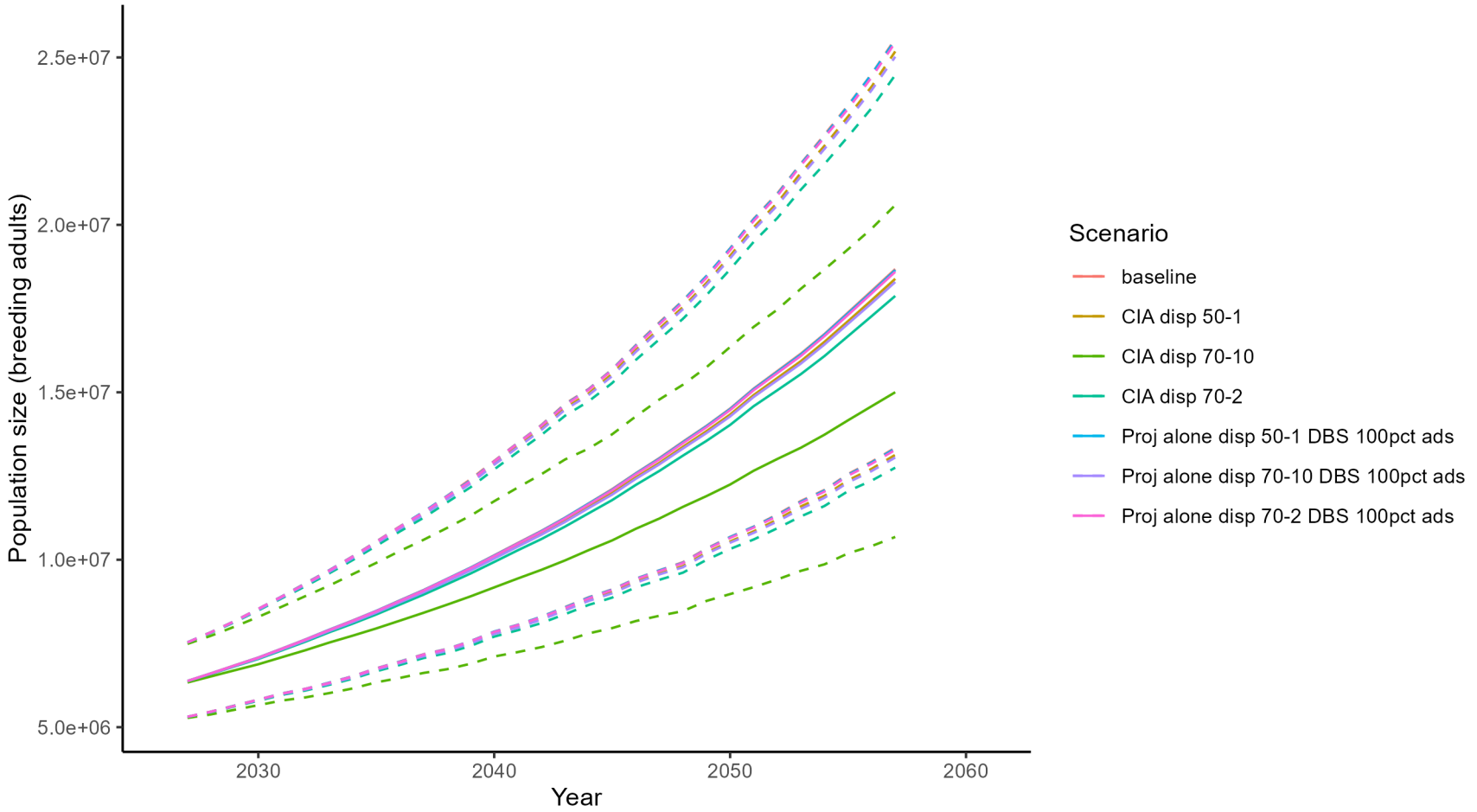


Figure 10. Guillemot EIA/CIA Biogeographic

Table 21 Inputs: Razorbill EIA/CIA BDMPS

Baseline parameters	Settings	Impact parameters	Values
Reference name	RA BDMPS	Number of scenarios of impact	6
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	Proj alone disp 50-1 DBS 100pct ads
Species	Razorbill	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.0002432946
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	-
Maximum brood size per pair chicks will be constrained to be no greater than	1	Scenario B name	Proj alone disp 70-2 DBS 100pct ads
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	0.0006825766
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	591875	Scenario C name	Proj alone disp 70-10 DBS 100pct ads
Year	2015	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair mean	0.618	Scenario C Impact on adult survival rate per pair mean	0.003416262
Productivity rate per pair standard deviation	0.085	Scenario C Impact on immature survival rate mean	
Adult survival rate Mean	0.895	Scenario D name	CIA disp 50-1
Adult survival rate standard deviation	0.067	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.794	Scenario D Impact on adult survival rate	0.001817951
Immatures survival rates 0 to 1 standard deviation	0.067	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.794	Scenario E name	CIA disp 70-2
Immatures survival rates 1 to 2 standard deviation	0.067	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.895	Scenario E Impact on adult survival rate	0.005088912
Immatures survival rates 2 to 3 standard deviation	0.067	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.895	Scenario F name	CIA disp 70-10
Immatures survival rates 3 to 4 standard deviation	0.067	Scenario F Impact on productivity rate per pair mean	0
Immatures survival rates 4 to 5 mean	0.895	Scenario F Impact on adult survival rate	0.02544118
Immatures survival rates 4 to 5 standard deviation	0.067	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 22. Outputs: Razorbill EIA/CIA BDMPS

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Proj alone disp 50-1 DBS 100pct ads	144	0.0002432946	10	0.9998	0.9998	0.0002	0.9995	1.0002	0.9982	0.9982	0.0031	0.9920	1.0044	49.76	50.34
Proj alone disp 70-2 DBS 100pct ads	404	0.0006825766	10	0.9996	0.9996	0.0002	0.9992	0.9999	0.9951	0.9951	0.0032	0.9891	1.0015	49.32	51.00
Proj alone disp 70-10 DBS 100pct ads	2,022	0.0034162619	10	0.9978	0.9978	0.0002	0.9974	0.9982	0.9758	0.9758	0.0031	0.9697	0.9817	45.64	54.66
CIA disp 50-1	1,076	0.0018179514	10	0.9988	0.9988	0.0002	0.9984	0.9992	0.9870	0.9870	0.0031	0.9808	0.9932	47.58	52.52
CIA disp 70-2	3,012	0.0050889124	10	0.9967	0.9967	0.0002	0.9963	0.9971	0.9641	0.9641	0.0031	0.9580	0.9701	43.62	56.72
CIA disp 70-10	15,058	0.0254411827	10	0.9836	0.9836	0.0004	0.9828	0.9844	0.8336	0.8335	0.0042	0.8253	0.8419	22.46	79.36
Proj alone disp 50-1 DBS 100pct ads	144	0.0002432946	20	0.9998	0.9998	0.0001	0.9996	1.0001	0.9965	0.9966	0.0036	0.9896	1.0036	49.54	50.26
Proj alone disp 70-2 DBS 100pct ads	404	0.0006825766	20	0.9996	0.9996	0.0001	0.9993	0.9998	0.9907	0.9907	0.0036	0.9837	0.9978	48.84	51.06
Proj alone disp 70-10 DBS 100pct ads	2,022	0.0034162619	20	0.9978	0.9978	0.0001	0.9975	0.9980	0.9542	0.9542	0.0035	0.9474	0.9610	43.20	56.50
CIA disp 50-1	1,076	0.0018179514	20	0.9988	0.9988	0.0001	0.9986	0.9991	0.9753	0.9754	0.0035	0.9684	0.9824	46.58	53.24
CIA disp 70-2	3,012	0.0050889124	20	0.9967	0.9967	0.0001	0.9964	0.9970	0.9325	0.9326	0.0035	0.9258	0.9396	40.20	60.14

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA disp 70-10	15,058	0.0254411827	20	0.9836	0.9836	0.0003	0.9830	0.9842	0.7066	0.7067	0.0046	0.6976	0.7158	11.24	90.12
Proj alone disp 50-1 DBS 100pct ads	144	0.0002432946	30	0.9998	0.9998	0.0001	0.9996	1.0000	0.9950	0.9950	0.0039	0.9874	1.0028	49.56	50.62
Proj alone disp 70-2 DBS 100pct ads	404	0.0006825766	30	0.9996	0.9996	0.0001	0.9994	0.9998	0.9863	0.9863	0.0039	0.9787	0.9940	48.28	51.94
Proj alone disp 70-10 DBS 100pct ads	2,022	0.0034162619	30	0.9978	0.9978	0.0001	0.9976	0.9980	0.9332	0.9332	0.0037	0.9261	0.9407	41.06	58.82
CIA disp 50-1	1,076	0.0018179514	30	0.9988	0.9988	0.0001	0.9986	0.9990	0.9638	0.9639	0.0039	0.9563	0.9715	45.08	54.88
CIA disp 70-2	3,012	0.0050889124	30	0.9967	0.9967	0.0001	0.9965	0.9969	0.9022	0.9022	0.0038	0.8949	0.9098	36.88	62.76
CIA disp 70-10	15,058	0.0254411827	30	0.9836	0.9836	0.0002	0.9832	0.9841	0.5993	0.5994	0.0047	0.5903	0.6087	5.90	95.52

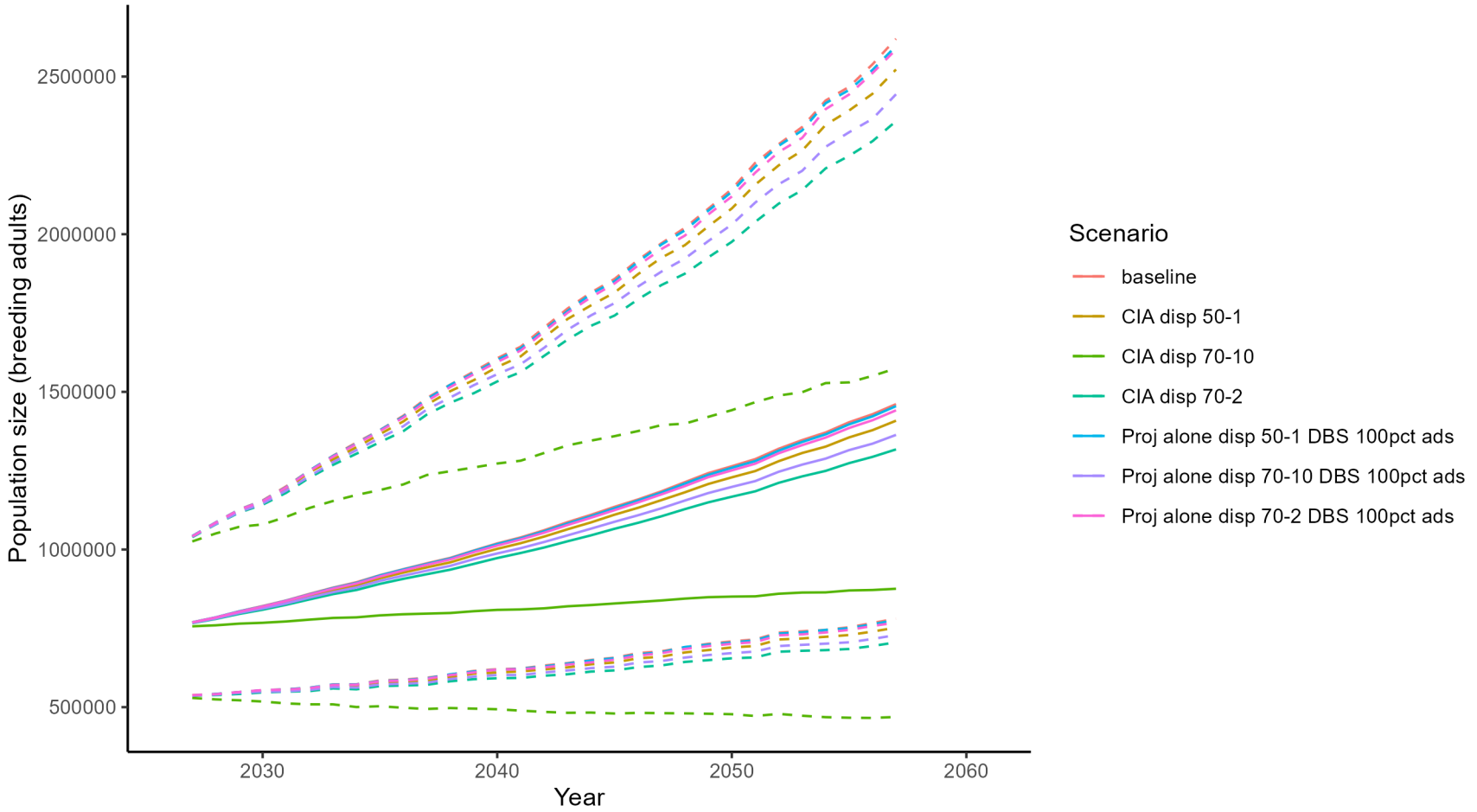


Figure 11. Razorbill EIA/CIA BDMPS

Table 23. Inputs: Razorbill EIA/CIA Biogeographic

Baseline parameters	Settings	Impact parameters	Values
Reference name	RA	Number of scenarios of impact	6
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	Proj alone disp 50-1 DBS 100pct ads
Species	Razorbill	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	8.435852e-05
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	-
Maximum brood size per pair_chicks_will be constrained to be no greater than	1	Scenario B name	Proj alone disp 70-2 DBS 100pct ads
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	0.0002366725
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	-
Initial population size	1707000	Scenario C name	Proj alone disp 70-10 DBS 100pct ads
Year	2015	Scenario C Impact on productivity rate per pair mean	0
Productivity rate per pair_mean	0.618	Scenario C Impact on adult survival rate per pair mean	0.001184534
Productivity rate per pair_standard deviation	0.085	Scenario C Impact on immature survival rate mean	
Adult survival rate_Mean	0.895	Scenario D name	CIA disp 50-1
Adult survival rate_standard deviation	0.067	Scenario D Impact on productivity rate per pair mean	0
Immatures survival rates 0 to 1 mean	0.794	Scenario D Impact on adult survival rate	0.0006303456
Immatures survival rates 0 to 1 standard deviation	0.067	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.794	Scenario E name	CIA disp 70-2
Immatures survival rates 1 to 2 standard deviation	0.067	Scenario E Impact on productivity rate per pair mean	0
Immatures survival rates 2 to 3 mean	0.895	Scenario E Impact on adult survival rate	0.001764499
Immatures survival rates 2 to 3 standard deviation	0.067	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.895	Scenario F name	CIA disp 70-10
Immatures survival rates 3 to 4 standard deviation	0.067	Scenario F Impact on productivity rate per pair mean	0
Immatures survival rates 4 to 5 mean	0.895	Scenario F Impact on adult survival rate	0.008821324
Immatures survival rates 4 to 5 standard deviation	0.067	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 24. Outputs: Razorbill EIA/CIA Biogeographic

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
Proj alone disp 50-1 DBS 100pct ads	144	0.00008435852	10	0.9999	0.9999	0.0001	0.9997	1.0002	0.9993	0.9993	0.0018	0.9957	1.0029	49.88	50.14
Proj alone disp 70-2 DBS 100pct ads	404	0.00023667252	10	0.9998	0.9998	0.0001	0.9996	1.0001	0.9983	0.9983	0.0018	0.9948	1.0019	49.82	50.40
Proj alone disp 70-10 DBS 100pct ads	2,022	0.00118453427	10	0.9992	0.9992	0.0001	0.9990	0.9994	0.9915	0.9915	0.0018	0.9879	0.9950	48.56	51.66
CIA disp 50-1	1,076	0.00063034564	10	0.9996	0.9996	0.0001	0.9994	0.9998	0.9954	0.9954	0.0018	0.9918	0.9990	49.24	51.02
CIA disp 70-2	3,012	0.00176449912	10	0.9988	0.9988	0.0001	0.9986	0.9991	0.9873	0.9873	0.0018	0.9838	0.9909	47.68	52.62
CIA disp 70-10	15,058	0.00882132396	10	0.9943	0.9943	0.0002	0.9939	0.9946	0.9386	0.9386	0.0021	0.9344	0.9427	39.48	61.36
Proj alone disp 50-1 DBS 100pct ads	144	0.00008435852	20	0.9999	0.9999	0.0001	0.9998	1.0001	0.9988	0.9988	0.0021	0.9946	1.0028	49.92	50.08
Proj alone disp 70-2 DBS 100pct ads	404	0.00023667252	20	0.9998	0.9998	0.0001	0.9997	1.0000	0.9967	0.9967	0.0021	0.9926	1.0008	49.48	50.30
Proj alone disp 70-10 DBS 100pct ads	2,022	0.00118453427	20	0.9992	0.9992	0.0001	0.9991	0.9994	0.9838	0.9838	0.0021	0.9799	0.9878	47.50	52.12
CIA disp 50-1	1,076	0.00063034564	20	0.9996	0.9996	0.0001	0.9994	0.9997	0.9914	0.9914	0.0021	0.9873	0.9955	48.78	51.08
CIA disp 70-2	3,012	0.00176449912	20	0.9988	0.9988	0.0001	0.9987	0.9990	0.9761	0.9760	0.0021	0.9720	0.9801	46.50	53.32

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA disp 70-10	15,058	0.00882132396	20	0.9943	0.9943	0.0001	0.9940	0.9945	0.8862	0.8862	0.0025	0.8813	0.8912	33.18	67.28
Proj alone disp 50-1 DBS 100pct ads	144	0.00008435852	30	0.9999	0.9999	0.0001	0.9998	1.0001	0.9982	0.9982	0.0023	0.9938	1.0026	49.76	50.30
Proj alone disp 70-2 DBS 100pct ads	404	0.00023667252	30	0.9998	0.9998	0.0001	0.9997	1.0000	0.9952	0.9952	0.0023	0.9907	0.9995	49.40	50.70
Proj alone disp 70-10 DBS 100pct ads	2,022	0.00118453427	30	0.9992	0.9992	0.0001	0.9991	0.9993	0.9763	0.9763	0.0022	0.9719	0.9806	46.66	53.44
CIA disp 50-1	1,076	0.00063034564	30	0.9996	0.9996	0.0001	0.9995	0.9997	0.9873	0.9873	0.0023	0.9828	0.9918	48.28	51.82
CIA disp 70-2	3,012	0.00176449912	30	0.9988	0.9988	0.0001	0.9987	0.9990	0.9649	0.9649	0.0023	0.9604	0.9693	45.10	54.80
CIA disp 70-10	15,058	0.00882132396	30	0.9943	0.9943	0.0001	0.9941	0.9945	0.8368	0.8368	0.0027	0.8317	0.8420	28.40	71.00

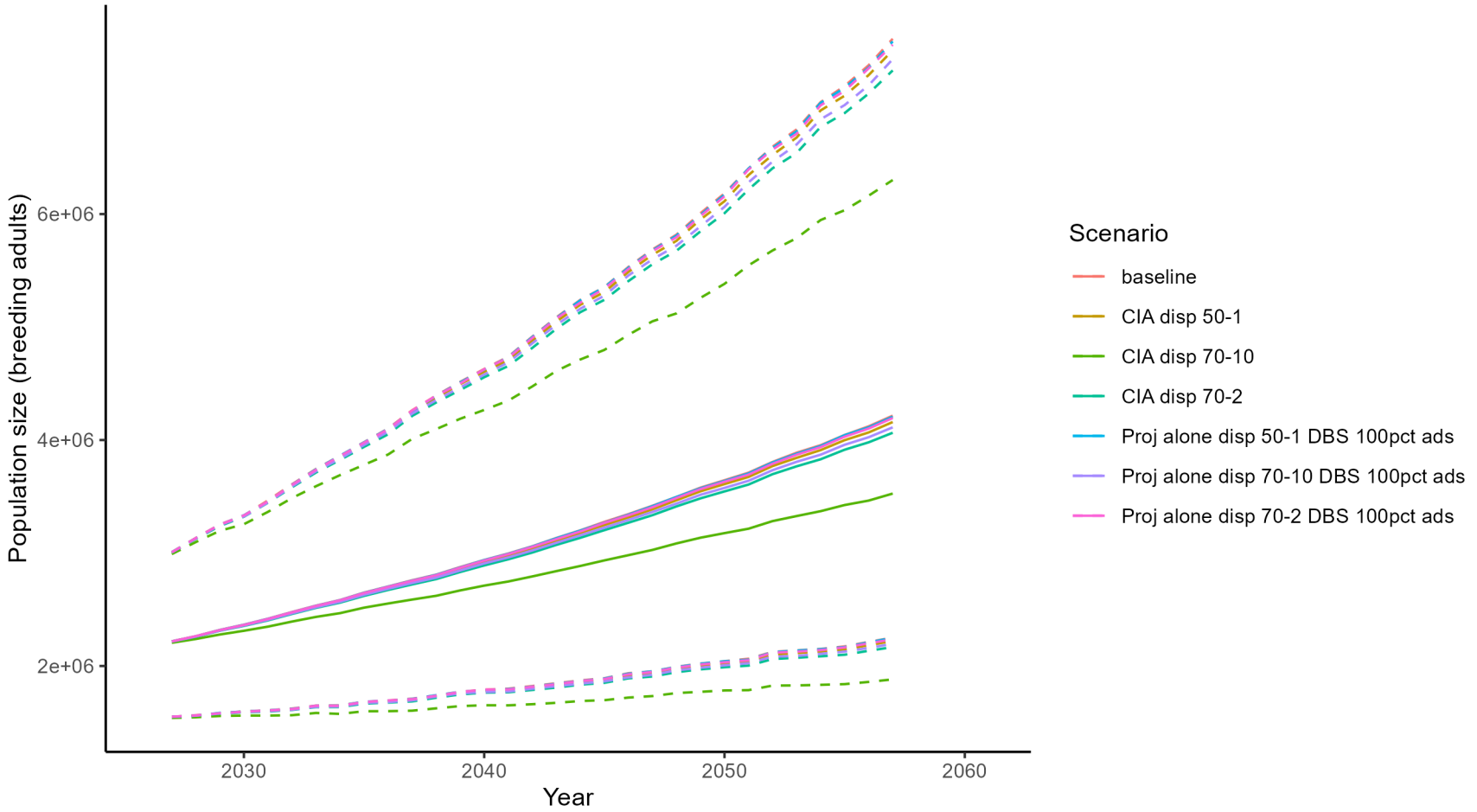


Figure 12. Razorbill EIA/CIA Biogeographic

Table 25. Inputs: Lesser black-backed gull EIA/CIA BDMPS

Baseline parameters	Settings	Impact parameters	Values
Reference name	LB BDMPS	Number of scenarios of impact	1
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	CIA CRM
Species	Lesser black-	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.003377877
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	
Maximum brood size per pair chicks will be constrained to be no greater than	3	Scenario B name	
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	0
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	
Initial population size	209007	Scenario C name	
Year	2015	Scenario C Impact on productivity rate per pair mean	
Productivity rate per pair mean	0.4	Scenario C Impact on adult survival rate per pair mean	
Productivity rate per pair standard deviation	0.376	Scenario C Impact on immature survival rate mean	
Adult survival rate Mean	0.885	Scenario D name	
Adult survival rate standard deviation	0.056	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.82	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.056	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.885	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.056	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.885	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.056	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.885	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.056	Scenario F Impact on productivity rate per pair mean	
Immatures survival rates 4 to 5 mean	0.885	Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation	0.056	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 26. Outputs: Lesser black-backed gull EIA/CIA BDMPS

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA CRM	706	0.003377877	10	0.9976	0.9976	0.0005	0.9965	0.9985	0.9737	0.9736	0.0070	0.9596	0.9869	46.94	52.50
CIA CRM	706	0.003377877	20	0.9976	0.9976	0.0004	0.9968	0.9983	0.9501	0.9501	0.0086	0.9327	0.9667	45.36	54.36
CIA CRM	706	0.003377877	30	0.9976	0.9976	0.0003	0.9969	0.9982	0.9274	0.9274	0.0100	0.9072	0.9465	44.76	55.52

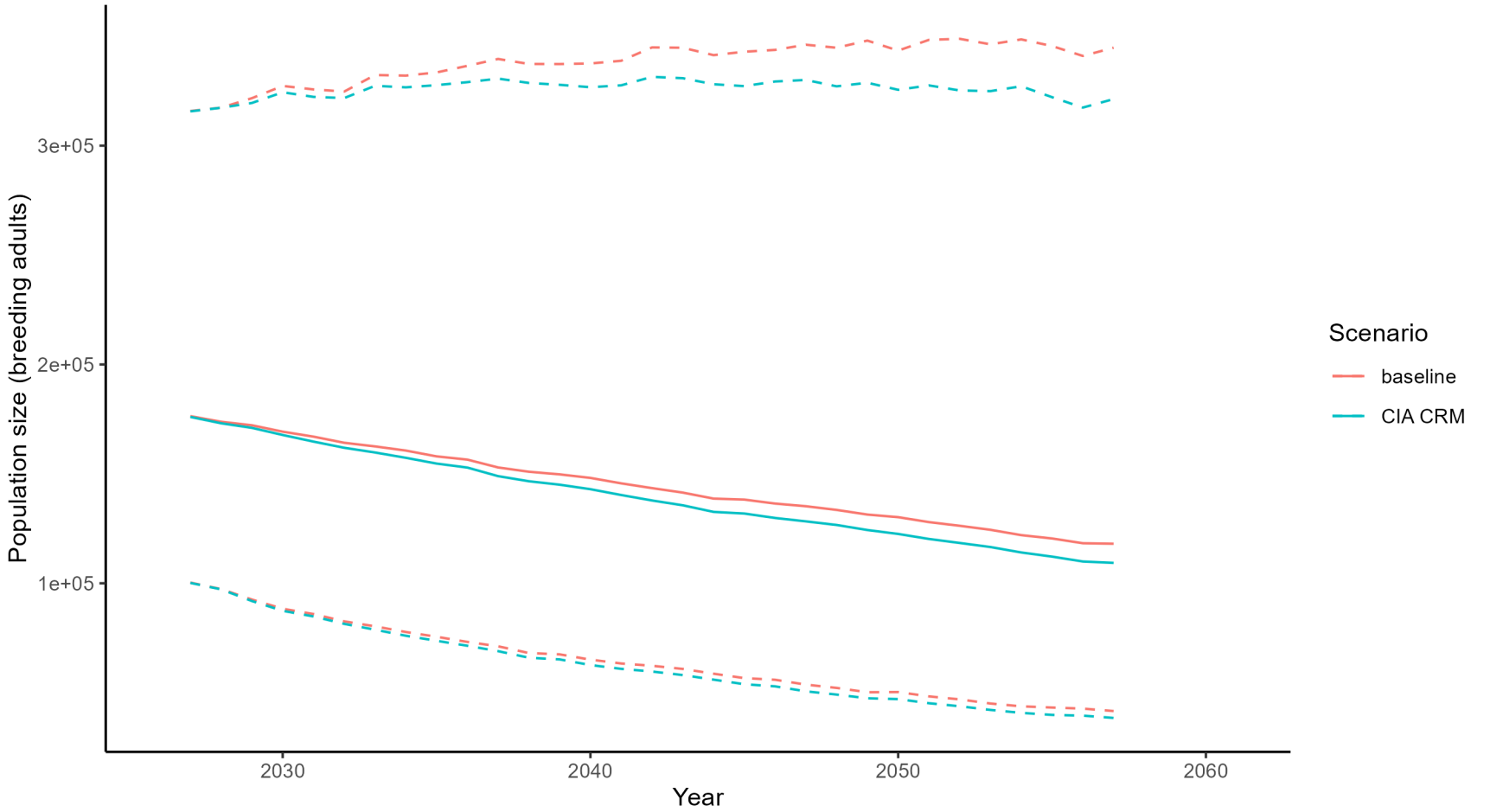


Figure 13. Lesser black-backed gull EIA/CIA BDMPS

Table 27. Inputs: Herring gull EIA/CIA BDMPS

Baseline parameters	Settings	Impact parameters	Values
Reference name	HG BDMPS	Number of scenarios of impact	1
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	CIA CRM
Species	Herring gull	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.002244325
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	
Maximum brood size per pair_chicks_will be constrained to be no greater than	3	Scenario B name	
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	
Initial population size	466510	Scenario C name	
Year	2015	Scenario C Impact on productivity rate per pair mean	
Productivity rate per pair_mean	0.615	Scenario C Impact on adult survival rate per pair mean	
Productivity rate per pair_standard deviation	0.476	Scenario C Impact on immature survival rate mean	
Adult survival rate_Mean	0.834	Scenario D name	
Adult survival rate_standard deviation	0.079	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.794	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.079	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.834	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.079	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.834	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.079	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.834	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.079	Scenario F Impact on productivity rate per pair mean	
Immatures survival rates 4 to 5 mean	0.834	Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation	0.079	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 28. Outputs: Herring gull EIA/CIA BDMPS

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA CRM	1,047	0.002244325	10	0.9985	0.9985	0.0005	0.9975	0.9994	0.9834	0.9834	0.0063	0.9712	0.9958	48.50	51.56
CIA CRM	1,047	0.002244325	20	0.9985	0.9985	0.0004	0.9977	0.9992	0.9686	0.9687	0.0085	0.9518	0.9854	47.58	52.68
CIA CRM	1,047	0.002244325	30	0.9985	0.9985	0.0003	0.9978	0.9991	0.9542	0.9541	0.0108	0.9322	0.9753	46.94	53.26

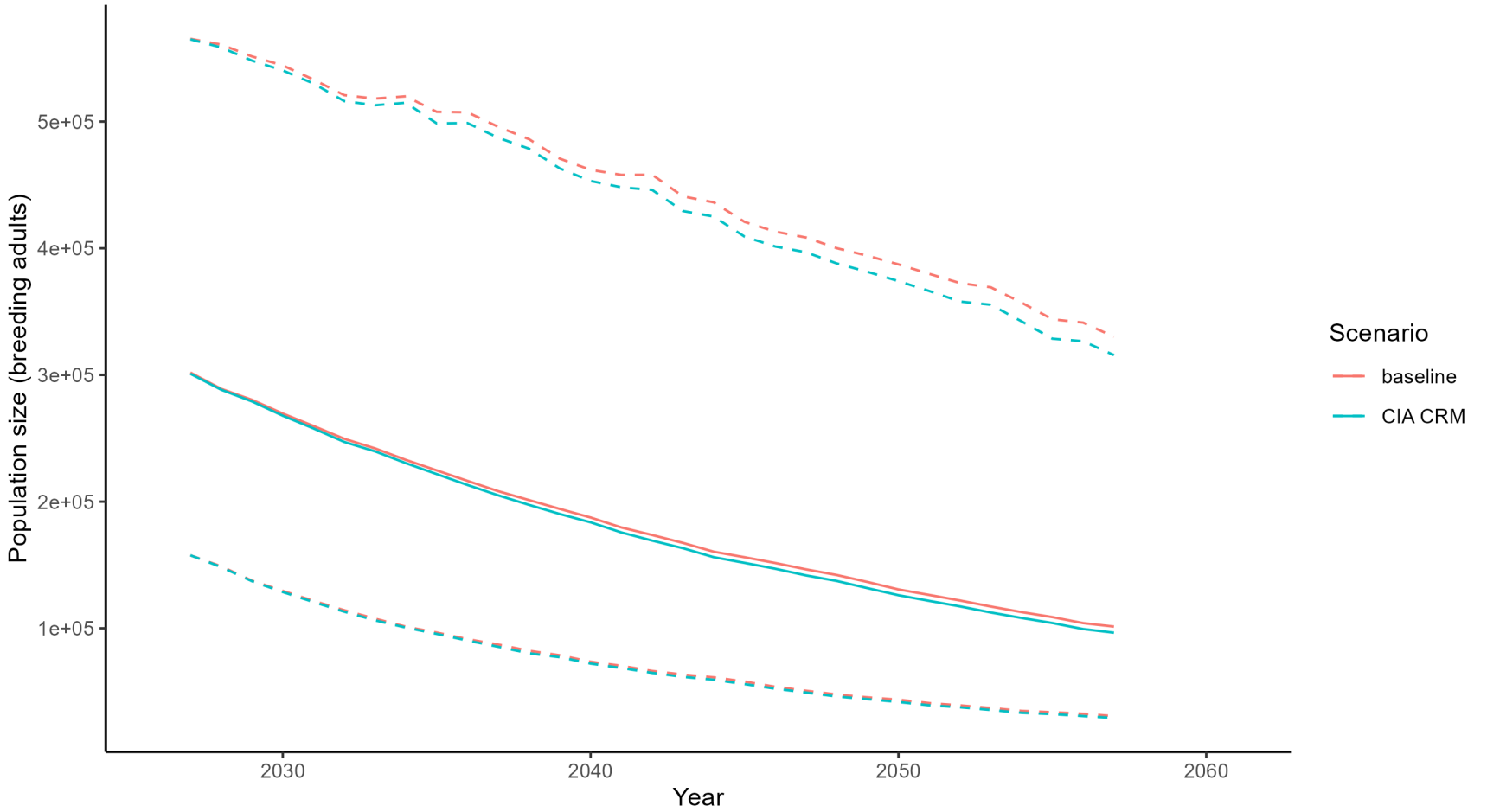


Figure 14. Herring gull EIA/CIA BDMPS

Table 29. Inputs: Great black-backed gull EIA/CIA BDMPS

Baseline parameters	Settings	Impact parameters	Values
Reference name	GB BDMPS	Number of scenarios of impact	1
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	CIA CRM
Species	Great black-	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.01336995
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	
Maximum brood size per pair_chicks_will be constrained to be no greater than	3	Scenario B name	
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	
Initial population size	91399	Scenario C name	
Year	2015	Scenario C Impact on productivity rate per pair mean	
Productivity rate per pair_mean	0.971	Scenario C Impact on adult survival rate per pair mean	
Productivity rate per pair_standard deviation	0.435	Scenario C Impact on immature survival rate mean	
Adult survival rate_Mean	0.93	Scenario D name	
Adult survival rate_standard deviation	0.034	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.93	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.034	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.93	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.034	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.93	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.034	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.93	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.034	Scenario F Impact on productivity rate per pair mean	
Immatures survival rates 4 to 5 mean	0.93	Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation	0.034	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 30. Outputs: Great black-backed gull EIA/CIA BDMPS

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA CRM	1,222	0.01336995	10	0.9931	0.9931	0.0004	0.9924	0.9938	0.9270	0.9270	0.0054	0.9164	0.9375	37.90	60.94
CIA CRM	1,222	0.01336995	20	0.9931	0.9931	0.0003	0.9926	0.9936	0.8654	0.8654	0.0058	0.8539	0.8764	32.12	68.40
CIA CRM	1,222	0.01336995	30	0.9931	0.9931	0.0002	0.9927	0.9935	0.8080	0.8080	0.0060	0.7962	0.8195	27.74	73.32

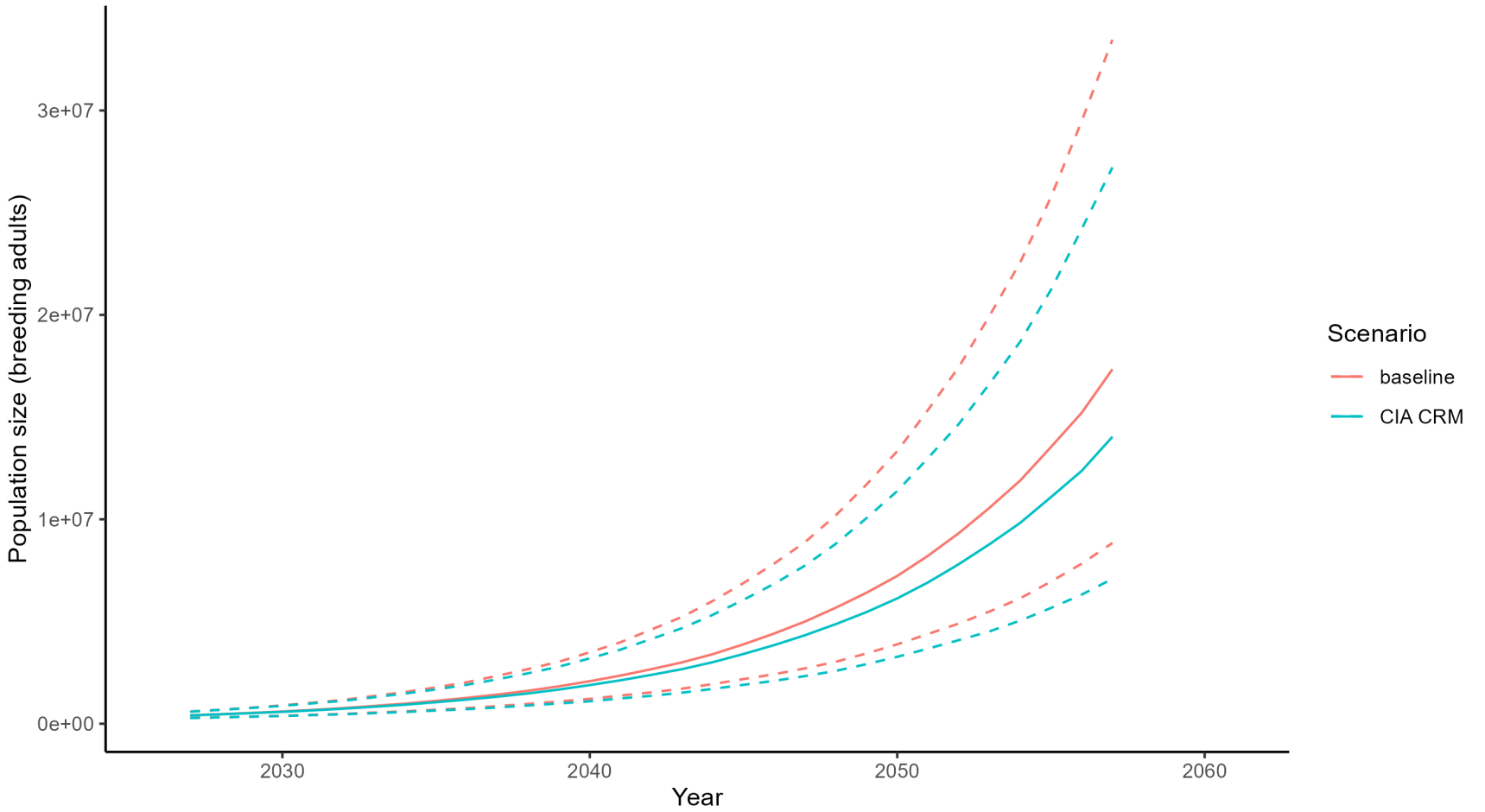


Figure 15. Great black-backed gull EIA/CIA BDMPS

Table 31. Inputs: Great black-backed gull EIA/CIA Biogeographic

Baseline parameters	Settings	Impact parameters	Values
Reference name	GB	Number of scenarios of impact	1
Type	Simulation	Are impacts applied separately to each subpopulation	FALSE
Case studies	None	Are impacts specified separately for immatures	FALSE
Model to use for environmental stochasticity	Beta/Gamma	Are standard errors of impacts available	FALSE
Choose model for density dependence	No density	Should random seeds be matched for impact scenarios	TRUE
Include demographic stochasticity in model	TRUE	Impacts are specified as	Relative
Number of simulations	5000	Years in which impacts are assumed to begin	2027
Random seed	1971	Years in which impacts are assumed to end	2057
Years for burn in	5	Scenario A name	CIA CRM
Species	Great black-	Scenario A Impact on productivity rate per pair mean	0
Age at first breeding	5	Scenario A Impact on adult survival rate	0.0052
Is there an upper constraint on productivity in the model	TRUE	Scenario A Impact on immature survival rate mean	
Maximum brood size per pair_chicks_will be constrained to be no greater than	3	Scenario B name	
Number of subpopulations	1	Scenario B Impact on productivity rate per pair mean	
Units for initial population size	all.individuals	Scenario B Impact on adult survival rate	
Are baseline demographic rates specified separately for immatures	TRUE	Scenario B Impact on immature survival rate mean	
Initial population size	235000	Scenario C name	
Year	2015	Scenario C Impact on productivity rate per pair mean	
Productivity rate per pair_mean	0.971	Scenario C Impact on adult survival rate per pair mean	
Productivity rate per pair_standard deviation	0.435	Scenario C Impact on immature survival rate mean	
Adult survival rate_Mean	0.93	Scenario D name	
Adult survival rate_standard deviation	0.034	Scenario D Impact on productivity rate per pair mean	
Immatures survival rates 0 to 1 mean	0.93	Scenario D Impact on adult survival rate	
Immatures survival rates 0 to 1 standard deviation	0.034	Scenario D Impact on immature survival rate mean	
Immatures survival rates 1 to 2 mean	0.93	Scenario E name	
Immatures survival rates 1 to 2 standard deviation	0.034	Scenario E Impact on productivity rate per pair mean	
Immatures survival rates 2 to 3 mean	0.93	Scenario E Impact on adult survival rate	
Immatures survival rates 2 to 3 standard deviation	0.034	Scenario E Impact on immature survival rate mean	
Immatures survival rates 3 to 4 mean	0.93	Scenario F name	
Immatures survival rates 3 to 4 standard deviation	0.034	Scenario F Impact on productivity rate per pair mean	
Immatures survival rates 4 to 5 mean	0.93	Scenario F Impact on adult survival rate	
Immatures survival rates 4 to 5 standard deviation	0.034	Scenario F Impact on immature survival rate mean	
Immatures survival rates 5 to 6 mean		Scenario G name	

Baseline parameters	Settings	Impact parameters	Values
Immatures survival rates 5 to 6 standard deviation		Scenario G Impact on productivity rate per pair mean	
Units for output	whole.population	Scenario G Impact on adult survival rate	
		Scenario G Impact on immature survival rate mean	

Table 32. Outputs: Great black-backed gull EIA/CIA Biogeographic

Scenario	Impact	Increase in mortality rate	Years since impact	C-PGR					C-PS					50% Quantiles	
				Med.	Mean	SD	LCI	UCI	Med.	Mean	SD	LCI	UCI	Q-UNIMP-50%	Q-IMP-50%
CIA CRM	1,222	0.0052	10	0.9973	0.9973	0.0002	0.9969	0.9976	0.9709	0.9709	0.0031	0.9649	0.9768	45.44	54.42
CIA CRM	1,222	0.0052	20	0.9973	0.9973	0.0001	0.9971	0.9975	0.9452	0.9452	0.0032	0.9389	0.9514	42.72	57.02
CIA CRM	1,222	0.0052	30	0.9973	0.9973	0.0001	0.9971	0.9975	0.9202	0.9203	0.0033	0.9136	0.9267	40.60	59.50

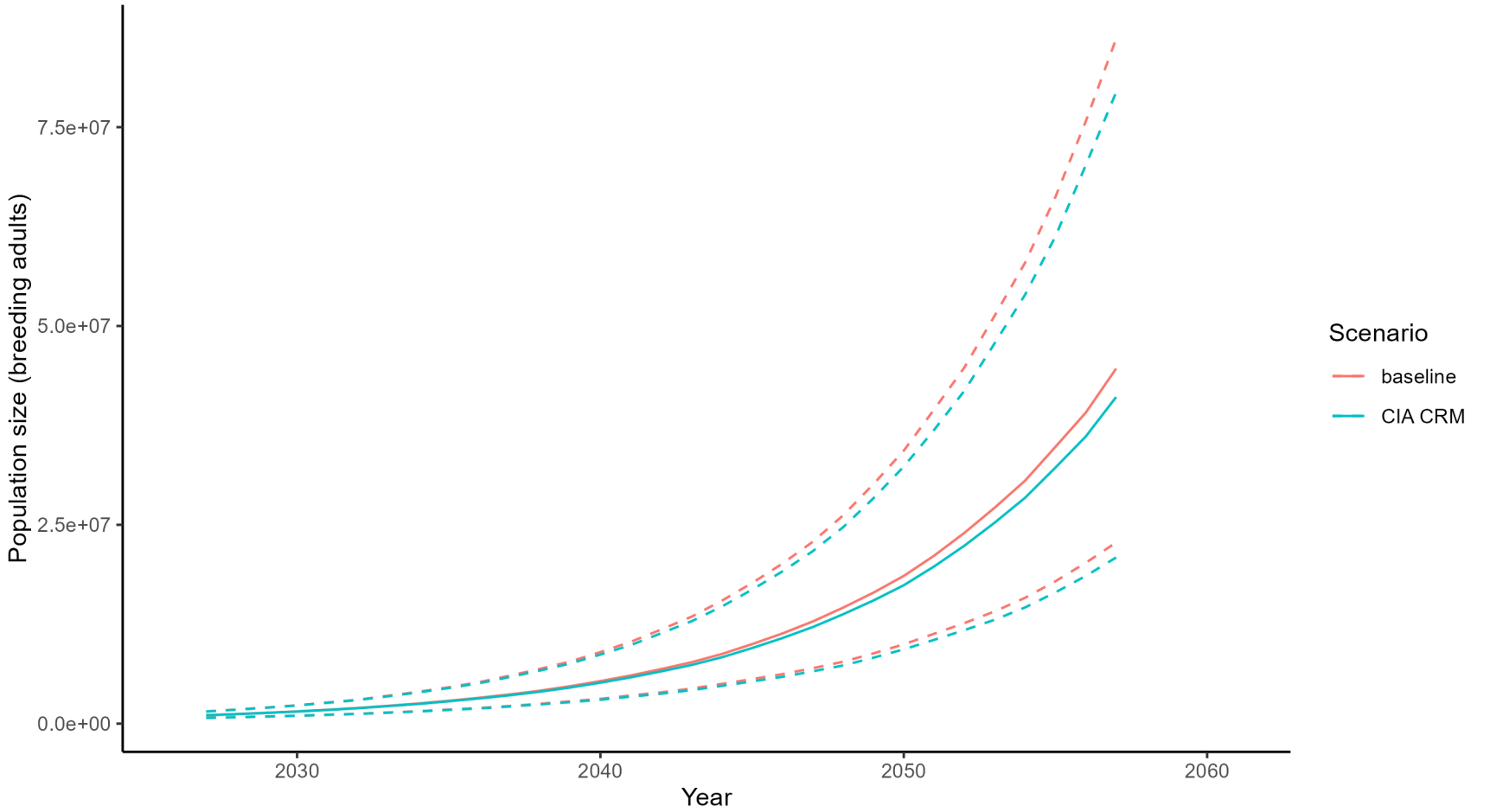


Figure 16. Great black-backed gull EIA/CIA Biogeographic