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Volume 8 Additional Information

Appendix 23: Marine Mammals iPCoD Results (Caledonia OWF)

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Acronyms and Abbreviations

CES	Coastal East Scotland
CGNS	Celtic and Greater North Sea
EDR	Effective Deterrence Range
EIA	Environment Impact Assessment
EIAR	Environment Impact Assessment Report
ES	East Scotland
GNS	Greater North Sea
iPCoD	Interim Population Consequences of Disturbance Model
MF	Moray Firth
MU	Management Unit
NC&O	North Coast and Orkney
NS	North Sea
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PTS	Permanent Threshold Shift
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
SCOS	Special Committee on Seals
SMU	Seal Monitoring Unit
WTG	Wind Turbine Generator

1 Introduction

1.1.1.1 This appendix provides a full set of results for the re-assessment of the disturbance and potential for population level effects to harbour porpoise, bottlenose dolphin, minke whale and harbour seal due to the underwater noise during piling for the Proposed Development (Offshore), specifically within the Caledonia Offshore Wind Farm (OWF) (i.e., Array Area). When referring to the Caledonia North Site and Caledonia South Site, this forms part of the Caledonia OWF, which consists of up to 101 bottom-fixed and 39 floating Wind Turbine Generator (WTG) foundations in total, as well as four Offshore Substation Platforms (OSPs) on bottom-fixed foundations.

1.1.1.2 The assessment was carried out for the Proposed Development (Offshore) alone (bottlenose dolphin only), and cumulatively with other projects.

1.1.1.3 The methodology used for the re-assessment is presented in Volume 8, Appendix 22: Marine Mammals Clarifications and Piling Re-Assessment Methodology. Detailed information about the Interim Population Consequences of Disturbance Model (iPCoD) used, including precaution and model limitations is presented in Volume 7B, Appendix 7-4: Marine Mammals Population Modelling iPCoD.

2 Proposed Development (Offshore) Alone

2.1 Time Points

2.1.1.1 For the Proposed Development (Offshore) concurrent and sequential installation scenarios, discussed in detail in Volume 8, Appendix 22: Marine Mammals Clarifications and Piling Re-Assessment Methodology, selected time points have been used to present the results on bottlenose dolphin Coastal East Scotland (CES) Management Unit (MU) population trajectory. These time points have been selected to try and represent as best as possible, a level of periodicity on population estimates following piling. The time points selected for the presentation of results are provided in Table 2-1.

Table 2-1: Time points selected for the presentation of iPCoD modelling results (Proposed Development (Offshore) alone).

Scenario	Time Points Selected (Indicative Year)	Time Point Description
Concurrent installation	Start 2028	Before piling starts
	End 2028	The end of first year of piling at Caledonia North Site and Caledonia South Site
	2029	The end of second year of piling at Caledonia North Site and Caledonia South Site
	2030	The end of third (final) year of piling at Caledonia North Site and Caledonia South Site
	2031	1-year after piling ends
	2036	6-years after piling ends
	2042	12-years after piling ends
	2048	18-years after piling ends
Sequential installation (no gap)	Start 2028	Before piling starts
	End 2028	The end of first year of piling at Caledonia North Site
	2029	The end of second year of piling at Caledonia North Site
	2030	The end of third (final) year of piling at Caledonia North Site and the end of the first year of piling at Caledonia South Site
	2031	The end of second year of piling at Caledonia South Site
	2032	The end of third (final) year of piling at Caledonia South Site
	2033	1-year after piling ends at Caledonia South Site

Scenario	Time Points Selected (Indicative Year)	Time Point Description
	2038	6-years after piling ends at Caledonia South Site
	2044	12-years after piling ends at Caledonia South Site
	2050	18-years after piling ends at Caledonia South Site
Sequential installation (five years gap)	Start 2028	Before piling starts
	End 2028	The end of first year of piling at Caledonia North site
	2029	The end of second year of piling at Caledonia North Site
	2030	The end of third (final) year of piling at Caledonia North Site
	2031	1-year after piling ends at Caledonia North Site
	2034	4-years after piling ends at Caledonia North Site and before piling starts at Caledonia South Site
	2035	The end of first year of piling at Caledonia South Site
	2036	The end of second year of piling at Caledonia South Site
	2037	The end of third (final) year of piling at Caledonia South Site
	2038	1-year after piling ends at Caledonia South Site
	2043	6-years after piling ends at Caledonia South Site
	2049	12-years after piling ends at Caledonia South Site

2.2 Bottlenose Dolphin

2.2.1.1 As detailed in Volume 8, Appendix 22: Marine Mammals Clarifications and Piling Re-Assessment Methodology, three disturbance methods were used in the iPCoD modelling for bottlenose dolphins for the Proposed Development (Offshore) alone. The number of dolphins disturbed for each threshold is presented in Table 2-2.

Table 2-2: Numbers of bottlenose dolphins affected taken forward to iPCoD.

Site	Dose-response	Deterrence Function	26km Effective Deterrent Range (EDR)
Caledonia North	44 for jackets	5 for jackets	1 for jackets
Caledonia South	48 jackets 43 anchors	6 for both jackets and anchors	2 for both jackets and anchors

Concurrent Installation

Dose-response

2.2.1.2 For the concurrent installation scenario, where both the Caledonia North Site and Caledonia South Site will be installed within the same timeframe at random distribution, the disturbance numbers used in the modelling were based on the worst case (single piling) across all modelling locations:

- 44 bottlenose dolphins per day for installation of pin piles at jackets in the Caledonia North Site;
- 48 bottlenose dolphins per day for installation of pin piles at jackets in the Caledonia South Site; and
- 43 bottlenose dolphins per day for installation of pin piles at anchors in the Caledonia South Site.

2.2.1.3 The results of the iPCoD modelling show that for CES MU the level of disturbance has the potential to result in changes at the population level (Table 2-3). In the year 2030, coinciding with the third and last piling year at the Caledonia OWF, the mean impacted population size as a proportion of the mean un-impacted population size is at its lowest (94.47% increasing population, 95.18% stable population), before increasing back up to 95.84% (increasing population) and 96.02% (stable population) by 2048 (Table 2-3). The impacted population is predicted to continue an increasing or stable trajectory (dependent on population) that is the same as the un-impacted population (Figure 2-1).

Table 2-3: Results of iPCoD modelling for bottlenose dolphin (dose-response and concurrent installation).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
Start 2028	228	228	100.00%
End 2028	236	236	100.00%
2029	245	237	96.73%
2030	253	239	94.47%
2031	262	248	94.66%
2036	313	301	96.17%
2042	387	371	95.87%
2048	481	461	95.84%
Stable Population			
Start 2028	228	228	100.00%
End 2028	228	228	100.00%
2029	228	223	97.81%
2030	228	217	95.18%
2031	228	218	95.61%
2036	228	219	96.05%
2042	226	217	96.02%
2048	226	217	96.02%
Note, time point descriptions are provided in Table 2-1.			

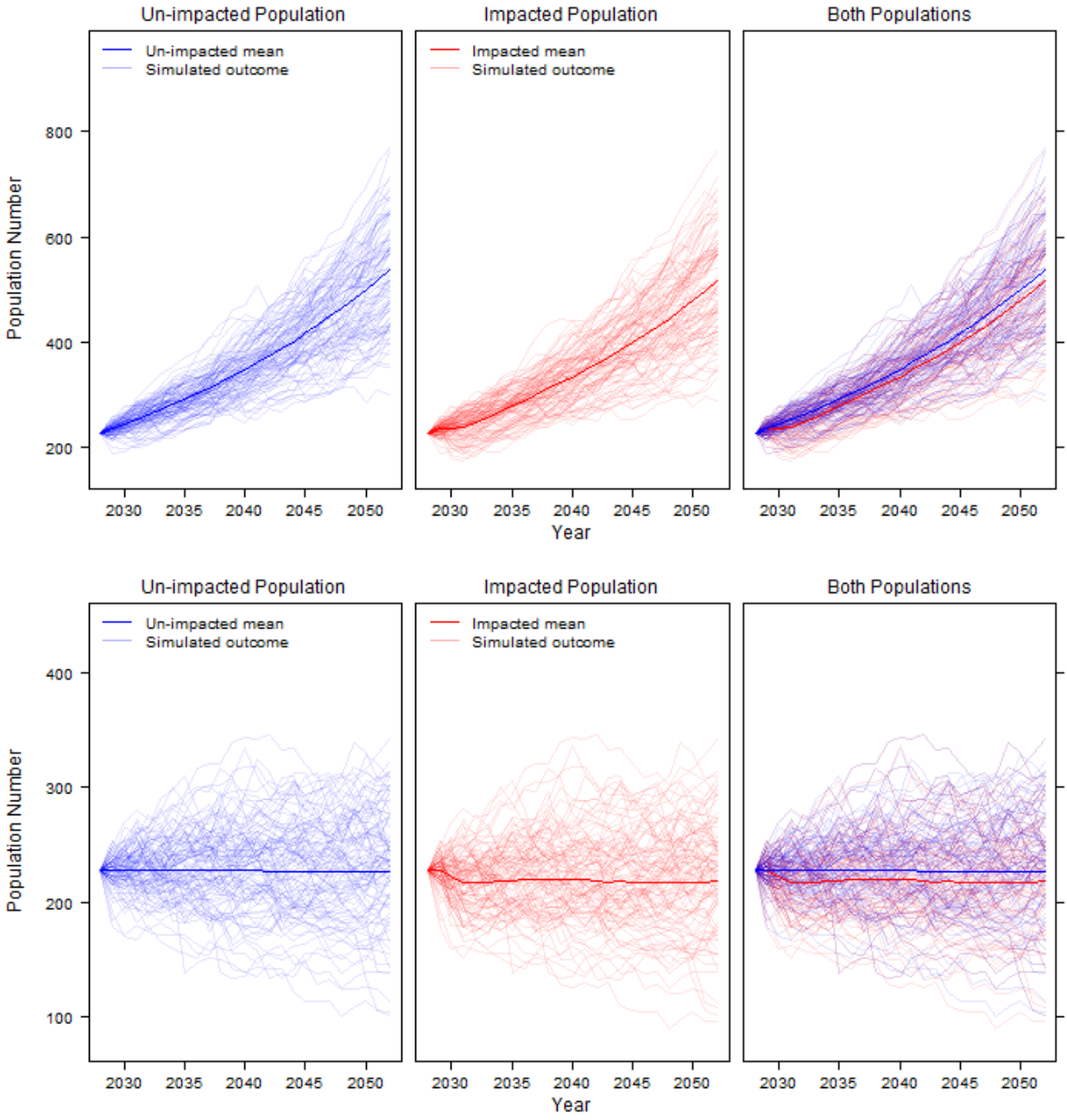

Figure 2-1: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (dose-response and concurrent installation; top graph – increasing population and bottom graph – stable population).

Deterrence Function

2.2.1.4 The number of animals affected was calculated using methodology described in Volume 8, Appendix 22: Marine Mammals Clarifications and Piling Re-Assessment Methodology. The disturbance values used in the modelling are as follows:

- Five bottlenose dolphins per day for installation in the Caledonia North Site; and
- Six bottlenose dolphins per day for installation in the Caledonia South Site.

2.2.1.5 The results of the iPCoD modelling show that the level of disturbance has the potential to result in slight changes at the population level for an increasing or stable population (Table 2-4). In the year 2030, the mean impacted population size as a proportion of the mean un-impacted population size is at its lowest (98.43% increasing, 98.68% stable), coinciding with the third and final year of piling at Caledonia OWF, before increasing to 98.97% (increasing) or 99.11% (stable) by 2048 (Table 2-4). The impacted population is predicted to continue on an increasing or stable trajectory (dependent on population), the same as the un-impacted population (Figure 2-2).

Table 2-4: Results of iPCoD modelling for bottlenose dolphin (deterrence function and concurrent installation)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
Start 2028	228	228	100.00%
End 2028	236	236	100.00%
2029	244	243	99.59%
2030	254	250	98.43%
2031	264	260	98.48%
2036	316	313	99.05%
2042	391	387	98.98%
2048	484	479	98.97%
Stable Population			
Start 2028	228	228	100.00%
End 2028	227	227	100.00%
2029	227	226	99.56%
2030	227	224	98.68%
2031	227	224	98.68%
2036	225	224	99.56%
2042	226	224	99.12%
2048	224	222	99.11%
Note, time point descriptions are provided in Table 2-1.			

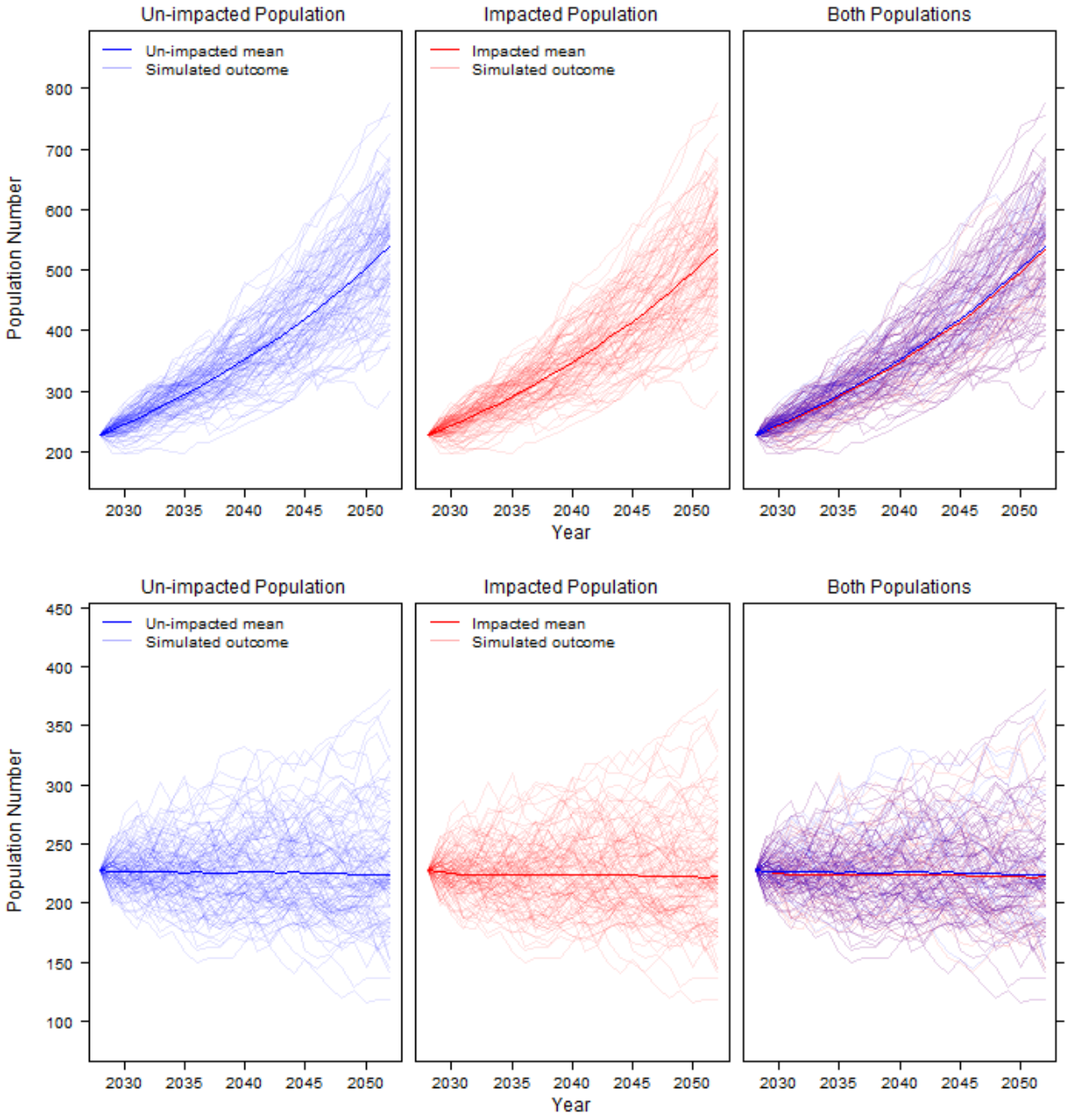

Figure 2-2: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (deterrence function and concurrent installation; top graph – increasing population and bottom graph – stable population).

26 km EDR

2.2.1.6 The number of animals affected was calculated based on 26km EDR. The disturbance values used in the modelling are as follows:

- One bottlenose dolphin per day for installation in the Caledonia North Site; and
- Two bottlenose dolphins per day for installation in the Caledonia South Site.

2.2.1.7 The results of the iPCoD modelling show that the impacted population is predicted to continue at a stable trajectory at 99.60 - 100% (increasing) and 99.56-100% (stable) of the size of the un-impacted population (Table 2-5 and Figure 2-3).

Table 2-5: Results of iPCoD modelling for bottlenose dolphin (26km EDR and concurrent installation)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
Start 2028	228	228	100.00%
End 2028	236	236	100.00%
2029	244	244	100.00%
2030	253	252	99.60%
2031	262	262	100.00%
2036	314	314	100.00%
2042	390	389	99.74%
2048	484	483	99.79%
Stable Population			
Start 2028	228	228	100.00%
End 2028	227	227	100.00%
2029	227	227	100.00%
2030	227	226	99.56%
2031	226	226	100.00%
2036	227	226	99.56%
2042	227	227	100.00%
2048	226	226	100.00%
Note, time point descriptions are provided in Table 2-1.			

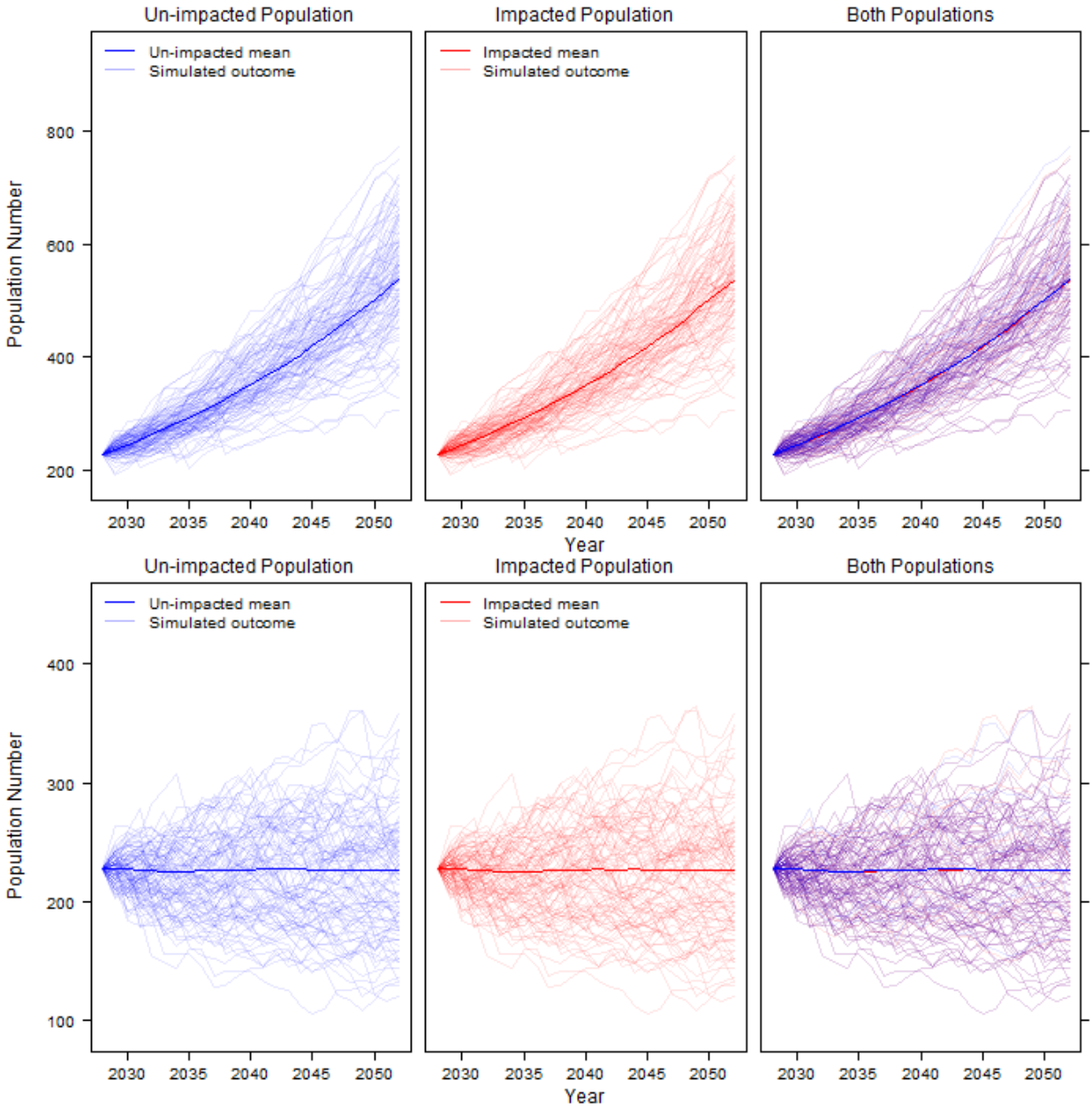

Figure 2-3: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (26km EDR and concurrent installation; top graph – increasing population and bottom graph – stable population).

Sequential (No Gap) Installation

Dose-response

2.2.1.8 For sequential installation scenario, where the Caledonia North Site and Caledonia South Site will be installed sequentially, with no gap between the completion of installation in the Caledonia North Site and the commencement of installation in the Caledonia South Site, the disturbance values used in the modelling were based on the worst case (single piling) across modelling locations in the Caledonia North Site and modelling locations in the Caledonia South Site, e.g.:

- 44 bottlenose dolphins per day for installation of pin piles at jackets in the Caledonia North Site;
- 48 bottlenose dolphins per day for installation of pin piles at jackets in the Caledonia South Site; and
- 43 bottlenose dolphins per day for installation of pin piles at anchors in the Caledonia South Site.

2.2.1.9 The results of the iPCoD modelling show that although the level of disturbance has the potential to result in changes at the population level, the impacted population is predicted to continue on an increasing or stable trajectory, the same as the un-impacted population (Table 2-6 and Figure 2-4). In the year 2032 coinciding with the second and last year of piling at the Caledonia South Site, the mean impacted population size as a proportion of the mean unimpacted population size is at its lowest (94.12% increasing, 94.74% stable), before increasing to 95.18% (increasing) or 96.00% (stable) by 2050.

Table 2-6: Results of iPCoD modelling for bottlenose dolphin (dose-response and sequential installation with no gap).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
Start 2028	228	228	100.00%
End 2028	236	236	100.00%
2029	244	241	98.77%
2030	253	246	97.23%
2031	263	248	94.30%
2032	272	256	94.12%
2033	282	266	94.33%
2038	337	322	95.55%
2044	417	397	95.20%
2050	519	494	95.18%
Stable Population			
Start 2028	228	228	100.00%
End 2028	228	228	100.00%
2029	228	226	99.12%
2030	228	222	97.37%
2031	228	217	95.18%
2032	228	216	94.74%
2033	228	217	95.18%
2038	228	219	96.05%
2044	227	217	95.59%
2050	225	216	96.00%

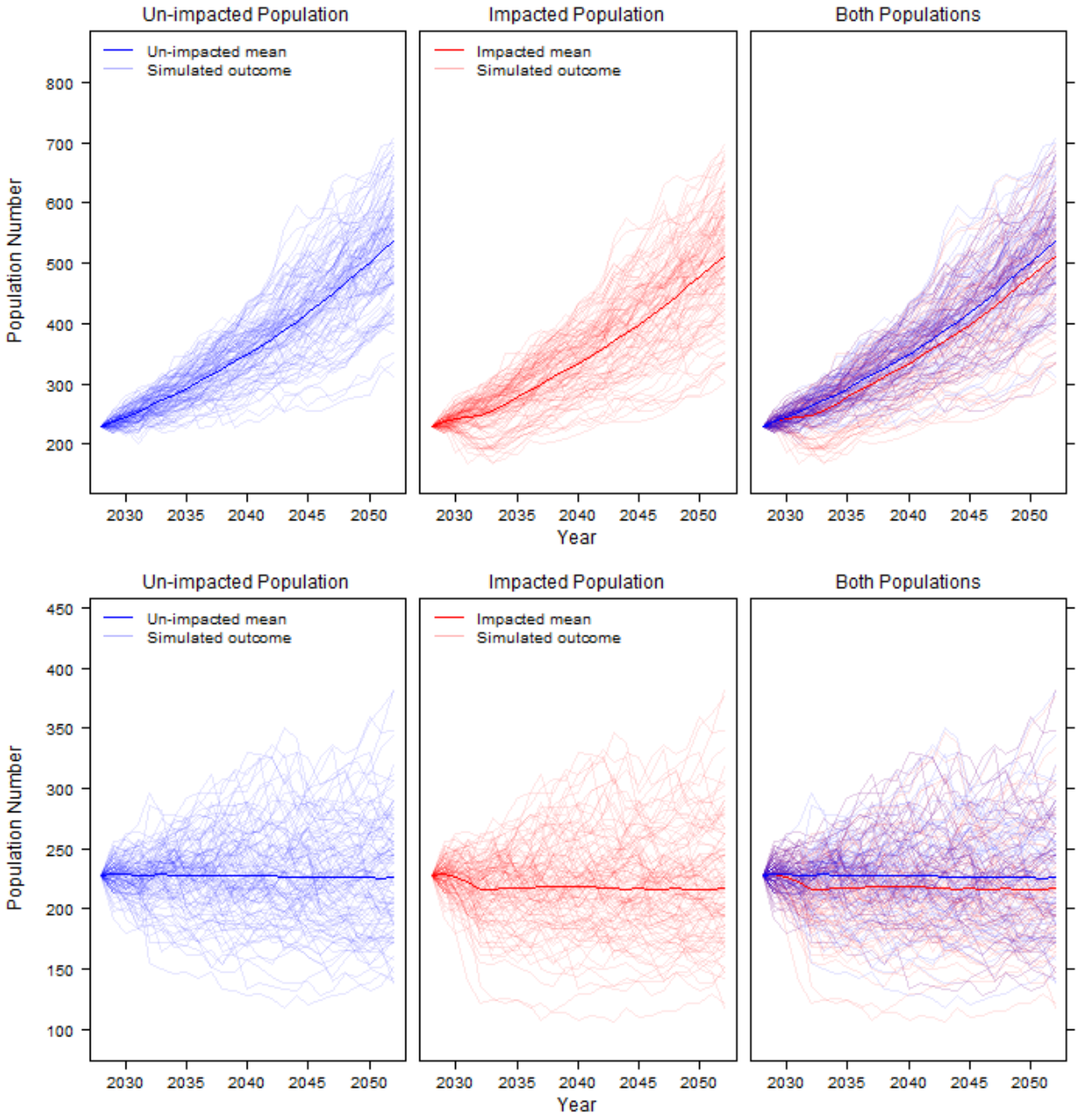

Figure 2-4: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (dose-response and sequential installation with no gap; top graph – increasing population and bottom graph – stable population).

Deterrence Function

2.2.1.10 The number of animals affected was calculated using methodology described in Volume 8, Appendix 22: Marine Mammals Clarifications and Piling Re-Assessment Methodology. The disturbance values used in the modelling are as follows:

- Five bottlenose dolphins per day for installation in the Caledonia North Site; and
- Six bottlenose dolphins per day for installation in the Caledonia South Site.

2.2.1.11 The results of the iPCoD modelling show that for an increasing population, although the level of disturbance has the potential to result in slight changes at the population level, the impacted population is predicted to continue on an increasing trajectory, the same as the un-impacted population (Table 2-7 and Figure 2-5). In the year 2032 coinciding with the second and last year of piling at the Caledonia South Site, the mean impacted population size as a proportion of the mean unimpacted population size is at its lowest (98.53%), before increasing to 99.04% by 2050.

2.2.1.12 For a stable population, the results of the iPCoD modelling for both the CES MU, show that the impacted population is predicted to continue at a stable trajectory and at 99.12 – 99.56% of the size of the un-impacted population (Table 2-7 and Figure 2-5).

Table 2-7: Results of iPCoD modelling for bottlenose dolphin (deterrence function and sequential installation with no gap).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
Start 2028	228	228	100.00%
End 2028	237	237	100.00%
2029	246	246	100.00%
2030	255	254	99.61%
2031	263	260	98.86%
2032	273	269	98.53%
2033	283	279	98.59%
2038	338	335	99.11%
2044	419	415	99.05%
2050	522	517	99.04%
Stable Population			
Start 2028	228	228	100.00%
End 2028	228	228	100.00%
2029	229	228	99.56%
2030	228	228	100.00%
2031	228	226	99.12%
2032	228	226	99.12%
2033	228	226	99.12%
2038	229	228	99.56%
2044	230	228	99.13%
2050	231	229	99.13%

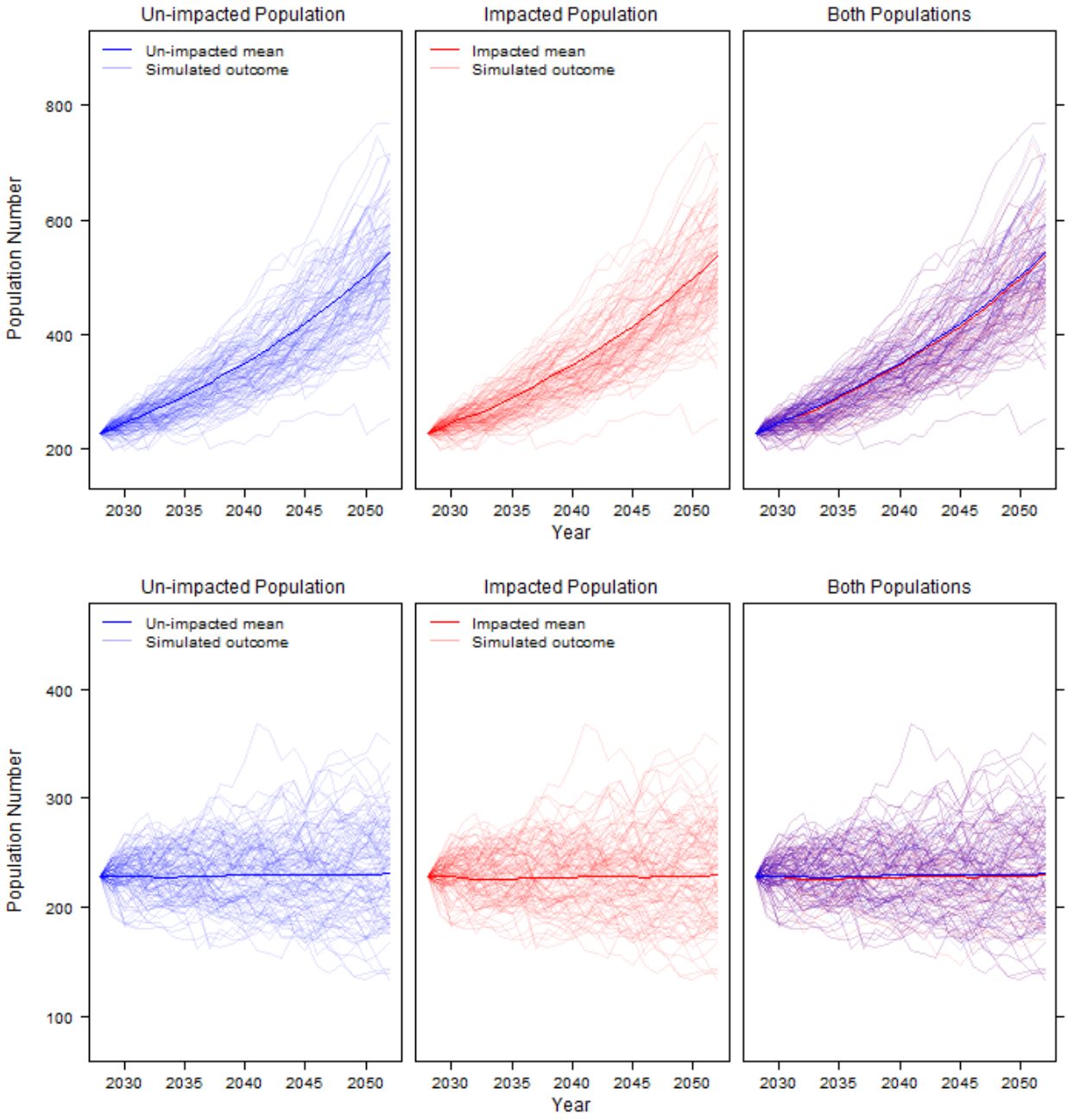

Figure 2-5: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (deterrence function and sequential installation with no gap; top graph – increasing population and bottom graph – stable population).

26km EDR

2.2.1.13 The number of animals affected was calculated based on 26km EDR. The disturbance values used in the modelling are as follows:

- One bottlenose dolphin per day for installation in the Caledonia North Site; and
- Two bottlenose dolphins per day for installation in the Caledonia South Site.

2.2.1.14 The results of the iPCoD modelling show that the impacted population is predicted to continue at a stable trajectory at 99.62 - 100% (increasing) and 99.56 - 100% (stable) of the size of the un-impacted population (Table 2-8 and Figure 2-6).

Table 2-8: Results of iPCoD modelling for bottlenose dolphin (26km EDR and sequential installation with no gap)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
Start 2028	228	228	100.00%
End 2028	236	236	100.00%
2029	245	245	100.00%
2030	253	253	100.00%
2031	263	262	99.62%
2032	271	271	100.00%
2033	281	281	100.00%
2038	336	336	100.00%
2044	417	416	99.76%
2050	519	518	99.81%
Stable Population			
Start 2028	228	228	100.00%
End 2028	228	228	100.00%
2029	228	228	100.00%
2030	228	228	100.00%
2031	228	227	99.56%
2032	227	227	100.00%
2033	228	227	99.56%
2038	227	227	100.00%
2044	226	226	100.00%
2050	227	227	100.00%

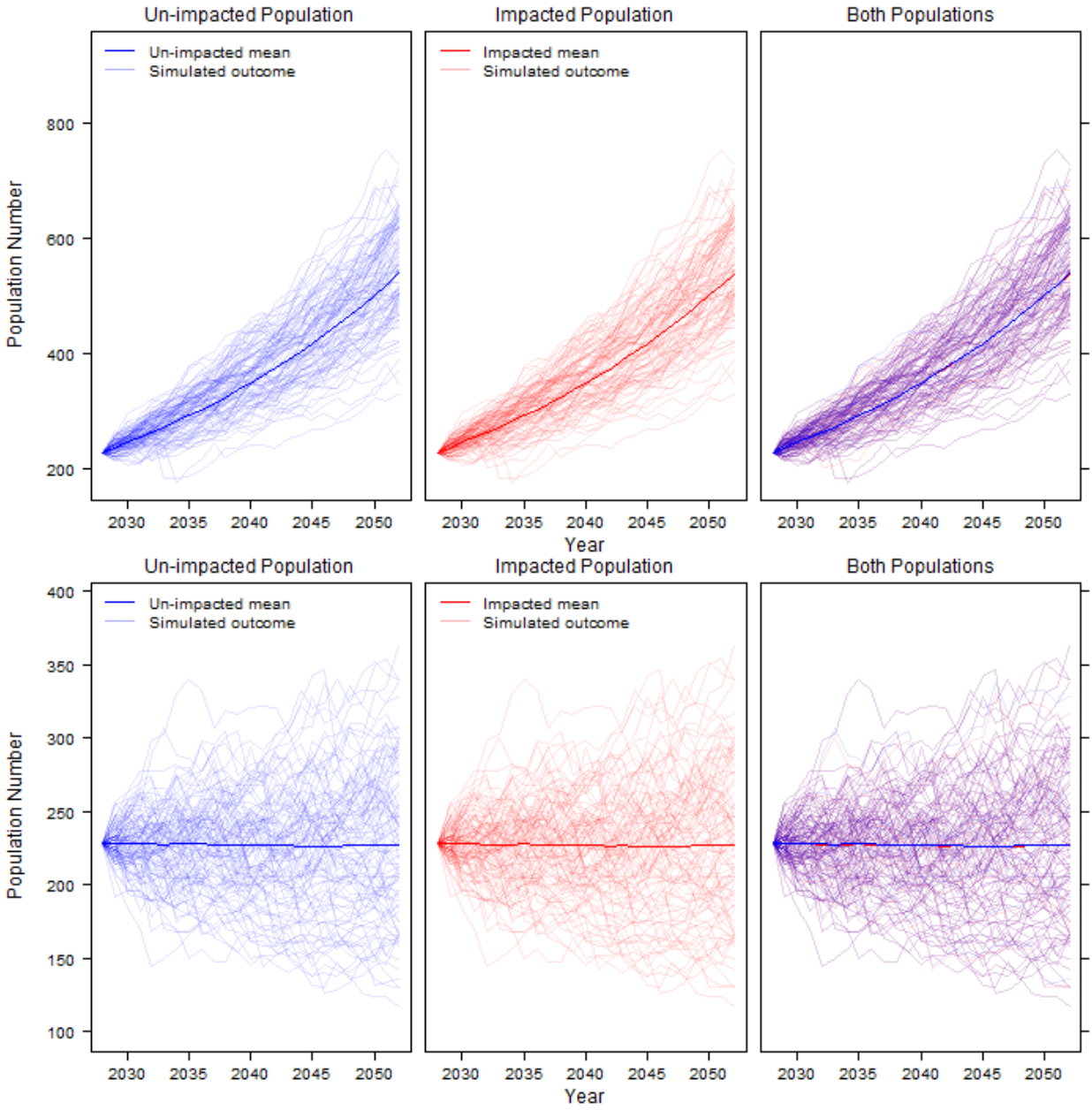

Figure 2-6: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (26km EDR and sequential installation with no gap; top graph – increasing population and bottom graph – stable population).

Sequential (Five-Year Gap) Installation

Dose-response

2.2.1.15 For sequential installation scenario, where the Caledonia North Site and Caledonia South Site will be installed sequentially with a five-year gap between the completion of installation in the Caledonia North Site and the commencement of installation in the Caledonia South Site, the disturbance values used in the modelling were based on the worst case (single piling) across modelling locations in the Caledonia North Site and modelling locations in the Caledonia South Site, e.g.:

- 44 bottlenose dolphins per day for installation of pin piles at jackets in the Caledonia North Site;
- 48 bottlenose dolphins per day for installation of pin piles at jackets in the Caledonia South Site; and
- 43 bottlenose dolphins per day for installation of pin piles at anchors in the Caledonia South Site.

2.2.1.16 The results of the iPCoD modelling show that the level of disturbance has the potential to result in changes at the population level (Table 2-9 and Figure 2-7). In the year 2037, the mean impacted population size as a proportion of the mean un-impacted population size is at its lowest (92.97% increasing, 94.69% stable), which coincides with the third (final) year of piling at the Caledonia South Site, before increasing to 94.45% (increasing) and 95.61% (stable) by 2052 (Table 2-9). The impacted population is predicted to continue on an increasing or stable trajectory (dependent on population) that is the same as the un-impacted population (Figure 2-7).

Table 2-9: Results of iPCoD modelling for bottlenose dolphin (dose-response and sequential installation scenario with five-year gap).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
Start 2028	228	228	100.00%
End 2028	237	237	100.00%
2029	245	242	98.78%
2030	254	248	97.64%
2031	263	258	98.10%
2034	295	290	98.31%
2035	306	298	97.39%
2036	316	295	93.35%
2037	327	304	92.97%
2038	339	317	93.51%
2043	405	383	94.57%
2049	500	472	94.40%
Stable Population			
Start 2028	228	228	100.00%
End 2028	227	227	100.00%
2029	227	225	99.12%
2030	227	223	98.24%
2031	227	224	98.68%
2034	227	224	98.68%
2035	227	223	98.24%
2036	226	215	95.13%
2037	226	214	94.69%
2038	226	214	94.69%
2043	227	217	95.59%
2049	229	218	95.20%

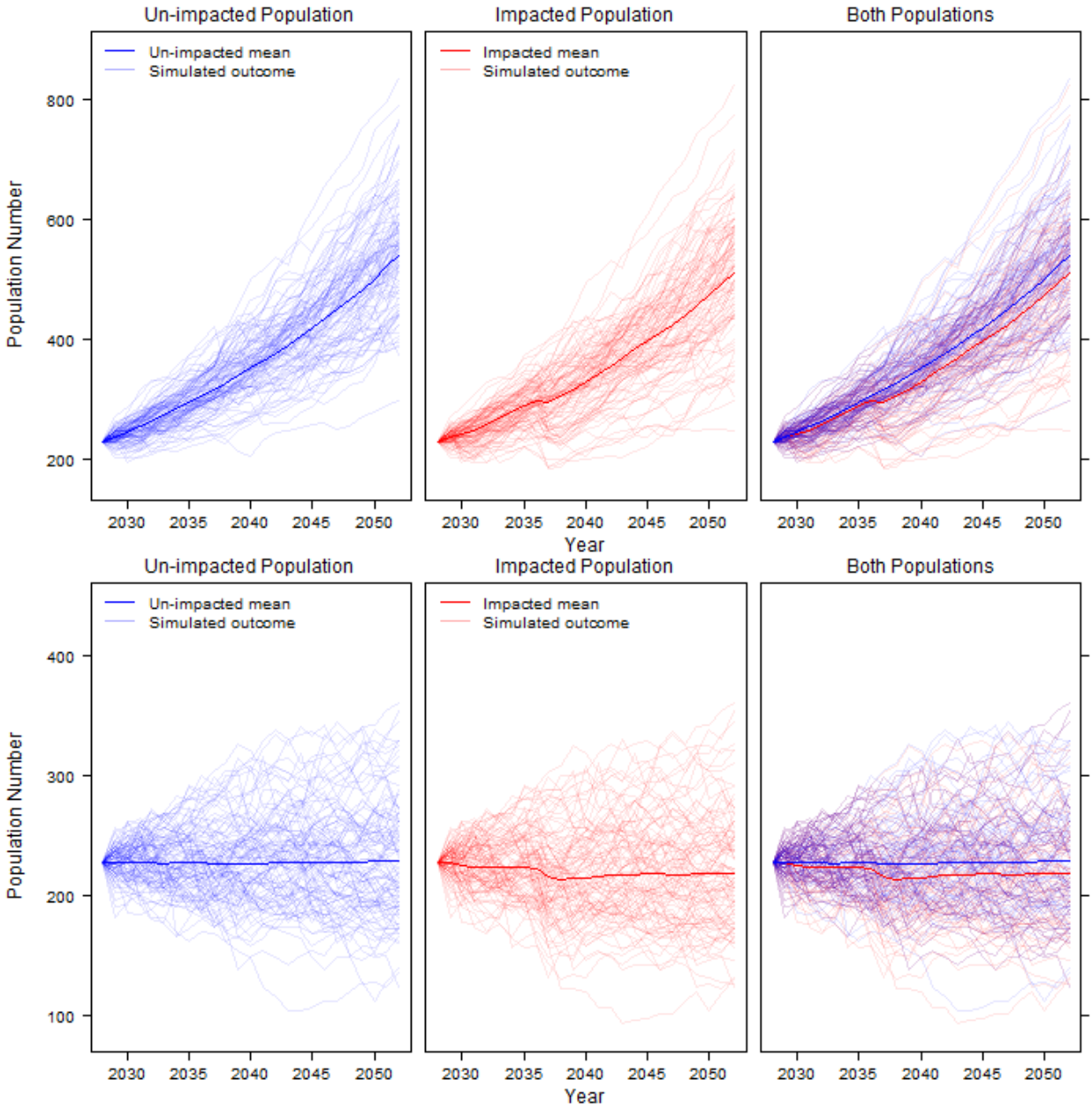

Figure 2-7: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (dose-response and sequential installation scenario with five year gap; top graph – increasing population and bottom graph – stable population).

Deterrence Function

2.2.1.17 The number of animals affected was calculated using methodology described in Volume 8, Appendix 22: Marine Mammals Clarifications and Piling Re-Assessment Methodology. The disturbance values used in the modelling are as follows:

- Five bottlenose dolphins per day for installation in the Caledonia North Site; and
- Six bottlenose dolphins per day for installation in the Caledonia South Site.

2.2.1.18 The results of the iPCoD modelling show that the level of disturbance has the potential to result in slight changes at the population level for an increasing population (Table 2-10 and Figure 2-8). In the year 2036, the mean impacted population size as a proportion of the mean un-impacted population size is at its lowest (98.73%), coinciding with the second year of piling at the Caledonia South Site, before increasing back up to 99.10% by 2052 (Table 2-10). The impacted population is predicted to continue on an increasing trajectory, the same as the un-impacted population (Figure 2-8).

2.2.1.19 For a stable population, the results of the iPCoD modelling show that the impacted population is predicted to continue at a stable trajectory and at 99.12 – 100% of the size of the un-impacted population (Table 2-10 and Figure 2-8).

Table 2-10: Results of iPCoD modelling for bottlenose dolphin (deterrence function and sequential installation scenario with five-year gap).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
2027	228	228	100.00%
2028	237	237	100.00%
2029	245	245	100.00%
2030	253	253	100.00%
2031	262	262	100.00%
2034	293	292	99.66%
2035	303	303	100.00%
2036	314	310	98.73%
2037	325	321	98.77%
2038	337	334	99.11%
2043	404	401	99.26%
2049	499	494	99.00%
Stable Population			
2027	228	228	100.00%
2028	228	228	100.00%
2029	228	228	100.00%
2030	228	228	100.00%
2031	227	227	100.00%
2034	227	227	100.00%
2035	227	227	100.00%
2036	227	225	99.12%
2037	226	224	99.12%
2038	226	224	99.12%
2043	227	226	99.56%
2049	229	227	99.13%

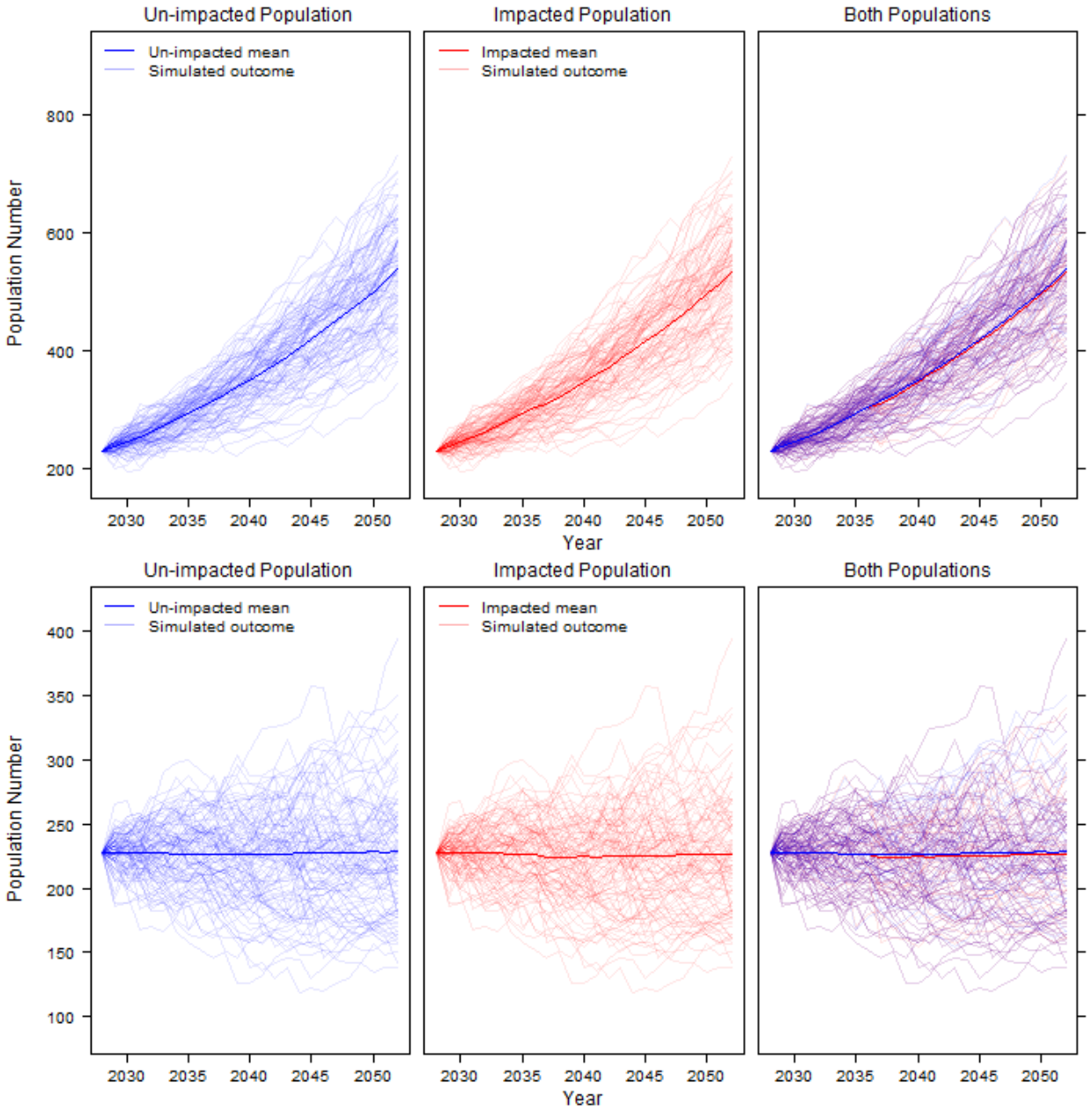

Figure 2-8: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (deterrence function and sequential installation scenario with five-year gap; top graph – increasing population and bottom graph – stable population).

26km EDR

2.2.1.20 The number of animals affected was calculated based on 26km EDR. The disturbance values used in the modelling are as follows:

- One bottlenose dolphin per day for installation in the Caledonia North Site; and
- two bottlenose dolphins per day for installation in the Caledonia South Site.

2.2.1.21 The results of the iPCoD modelling shows that the impacted population is predicted to continue at a stable trajectory at greater than 99.6% (increasing) and 100% (stable) of the size of the un-impacted population (Table 2-11 and Figure 2-9).

Table 2-11: Results of iPCoD modelling for bottlenose dolphin (26km EDR and sequential installation scenario with five-year gap).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
2027	228	228	100.00%
2028	236	236	100.00%
2029	245	245	100.00%
2030	254	254	100.00%
2031	263	263	100.00%
2034	294	294	100.00%
2035	304	304	100.00%
2036	315	314	99.68%
2037	327	326	99.69%
2038	339	338	99.71%
2043	405	405	100.00%
2049	502	501	99.80%
Stable Population			
2027	228	228	100.00%
2028	228	228	100.00%
2029	228	228	100.00%
2030	228	228	100.00%
2031	228	228	100.00%
2034	228	228	100.00%
2035	228	228	100.00%
2036	229	229	100.00%
2037	229	229	100.00%
2038	229	229	100.00%
2043	228	228	100.00%
2049	229	229	100.00%

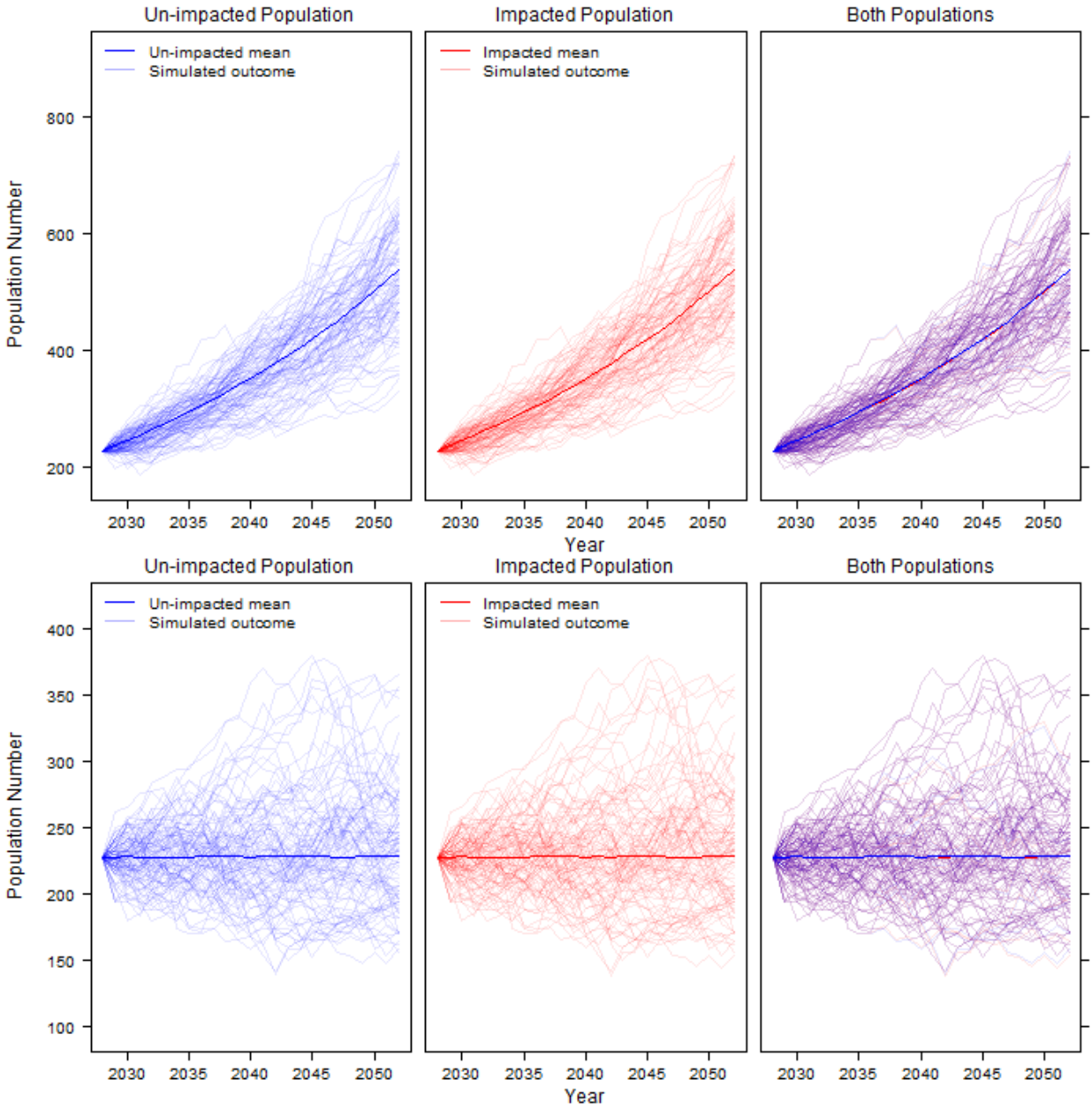

Figure 2-9: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (26 km EDR and sequential installation scenario with five-year gap; top graph – increasing population and bottom graph – stable population).

3 Cumulative Re-assessment

3.1 Time Points

3.1.1.1 The time points selected for the presentation of cumulative iPCoD modelling results are presented in Table 3-1. The timepoints are the same for harbour porpoise, bottlenose dolphin and minke whale.

3.1.1.2 The time points selected for the presentation of cumulative iPCoD modelling results are presented in Table 3-2 , Table 3-3 and Table 3-4 for the Moray Firth (MF), North Coast and Orkney (NC&O) and East Scotland (ES) Seal Monitoring Unit (SMU) respectively.

Table 3-1: Time points selected for the presentation of cumulative iPCoD modelling results for cumulative impacts on harbour porpoise, bottlenose dolphin and minke whale.

Scenario	Time Points Selected (Indicative Year)	Time Point Description
Cumulative Concurrent Installation	2026	Population size at the start of 2026, before all cumulative piling starts
	2028	End of first year of piling at the Caledonia OWF, piling at other projects
	2030	End of final year of piling at the Caledonia OWF, piling at other projects
	2038	8 years after piling ends at the Caledonia OWF and the end of piling at other projects
	2039	9 years after piling has ended at the Caledonia OWF and 1 year after piling has ended at other projects
	2044	14 years after piling has ended at the Caledonia OWF and 6 years after piling has ended at other projects
	2050	20 years after piling has ended at the Caledonia OWF and 12 years after piling has ended at other projects
Cumulative Sequential Installation (no gap)	2026	Population size at the start of the year 2026, before all piling starts
	2028	End of 1st year of piling at the Caledonia OWF, piling at other projects
	2032	End of final year of piling at the Caledonia OWF, piling at other projects
	2038	6 years after piling ends at the Caledonia OWF and the end of piling at other projects
	2039	7 years after piling has ended at the Caledonia OWF and 1 year after piling has ended at other projects
	2044	12 years after piling has ended at the Caledonia OWF and 6 years after piling has ended at other projects
	2050	18 years after piling has ended at the Caledonia OWF and 12 years after piling has ended at other projects

Table 3-2: Time points selected for the presentation of cumulative iPCoD modelling results for cumulative impacts on the MF SMU for harbour seal.

Scenario	Time Points Selected (Indicative Year)	Time Point Description
Cumulative Concurrent Installation	Start 2028	Population size at the start of 2028, before all piling starts within MF SMU
	End 2028	End of first year of piling at the Caledonia OWF, piling at projects considered for harbour seal within the MF SMU
	2030	End of final year of piling at the Caledonia OWF and the end of piling at projects considered for harbour seal within the MF SMU
	2031	1 year after piling ends at the Caledonia OWF and projects considered for harbour seal within the MF SMU
	2036	6 years after piling ends at the Caledonia OWF and projects considered for harbour seal within the MF SMU
	2042	12 years after piling ends at the Caledonia OWF and projects considered for harbour seal within the MF SMU
	2048	18 years after piling ends at the Caledonia OWF and projects considered for harbour seal within the MF SMU
Cumulative Sequential Installation (no gap)	Start 2028	Population size at the start of 2028, before all piling starts within the MF SMU
	End 2028	End of first year of piling at the Caledonia OWF, piling at other projects considered for harbour seal within the MF SMU
	2030	End of third year of piling at the Caledonia OWF and the end of piling at other projects considered for harbour seal within the MF SMU
	2032	End of final year of piling at the Caledonia OWF and 2 years after piling has ended at other projects considered for harbour seal within the MF SMU
	2033	1 year after end of cumulative piling
	2038	6 years after piling ends at the Caledonia OWF and 8 years after piling has ended at other projects considered for harbour seal within the MF SMU
	2044	12 years after piling ends at the Caledonia OWF and 14 years after piling has ended at other projects considered for harbour seal within the MF SMU
	2050	18 years after piling ends at the Caledonia OWF and 20 years after piling has ended at other projects considered for harbour seal within the MF SMU

Table 3-3: Time points selected for the presentation of cumulative iPCoD modelling results for cumulative impacts on the NC&O SMU for harbour seal.

Scenario	Time Points Selected (Indicative Year)	Time Point Description
Cumulative Concurrent Installation	Start 2028	Population size at the start of 2028, before all cumulative piling for projects in harbour seal NC&O SMU starts
	End 2028	End of first year of piling at the Caledonia OWF, piling at projects considered for harbour seal within the NC&O SMU
	2030	End of final year of piling at the Caledonia OWF, piling at projects considered for harbour seal within the NC&O SMU
	2033	3 years after piling ends at the Caledonia OWF and the end of piling at other projects considered for harbour seal within the NC&O SMU
	2034	4 years after piling ends at the Caledonia OWF and 1 year after piling has ended at other projects considered for harbour seal within the NC&O SMU
	2039	9 years after piling ends at the Caledonia OWF and 5 years after piling has ended at other projects considered for harbour seal within the NC&O SMU
	2045	15 years after piling ends at the Caledonia OWF and 12 years after piling has ended at other projects considered for harbour seal within the NC&O SMU
	2051	21 years after piling ends at the Caledonia OWF and 18 years after piling has ended at other projects considered for harbour seal within the NC&O SMU
Cumulative Sequential Installation (no gap)	Start 2028	Population size at the start of 2028, before all piling starts within the NC&O SMU
	End 2028	End of first year of piling at the Caledonia OWF, piling at other projects considered for harbour seal within the NC&O SMU
	2032	End of final year of piling at the Caledonia OWF, piling at other projects considered for harbour seal within the NC&O SMU
	2033	1 year after piling ends at the Caledonia OWF and the end of piling at other projects considered for harbour seal within the NC&O SMU
	2034	2 years after piling ends at the Caledonia OWF and 1 year after piling has ended at other projects considered for harbour seal within the MF SMU
	2039	7 years after piling ends at the Caledonia OWF and 6 years after piling has ended at other projects considered for harbour seal within the MF SMU

Scenario	Time Points Selected (Indicative Year)	Time Point Description
	2045	13 years after piling ends at the Caledonia OWF and 12 years after piling has ended at other projects considered for harbour seal within the MF SMU
	2051	19 years after piling ends at the Caledonia OWF and 18 years after piling has ended at other projects considered for harbour seal within the MF SMU

Table 3-4: Time points selected for the presentation of cumulative iPCoD modelling results for cumulative impacts on the ES SMU for harbour seal.

Scenario	Time Points Selected (Indicative Year)	Time Point Description
Cumulative Concurrent Installation	2026	Population size at the start of 2026, before all cumulative piling for projects in harbour seal ES SMU starts
	2028	End of first year of piling at the Caledonia OWF, piling at projects considered for harbour seal within the ES SMU
	2030	End of final year of piling at the Caledonia OWF, piling at projects considered for harbour seal within the ES SMU
	2033	3 years after piling ends at the Caledonia OWF and the end of piling at other projects considered for harbour seal within the ES SMU
	2034	4 years after piling ends at the Caledonia OWF and 1 year after piling has ended at other projects considered for harbour seal within the ES SMU
	2039	9 years after piling ends at the Caledonia OWF and 6 years after piling has ended at other projects considered for harbour seal within the ES SMU
	2045	15 years after piling ends at the Caledonia OWF and 12 years after piling has ended at other projects considered for harbour seal within the ES SMU
Cumulative Sequential Installation (no gap)	2026	Population size at the start of 2026, before all piling starts within the ES SMU
	2028	End of first year of piling at the Caledonia OWF, piling at other projects considered for harbour seal within the ES SMU
	2032	End of final year of piling at the Caledonia OWF, piling at other projects considered for harbour seal within the ES SMU
	2033	1 year after piling ends at the Caledonia OWF and the end of piling at other projects considered for harbour seal within the ES SMU
	2034	2 years after piling ends at the Caledonia OWF and 1 year after piling has ended at other projects considered for harbour seal within the MF SMU
	2039	7 years after piling ends at the Caledonia OWF and 6 years after piling has ended at other projects considered for harbour seal within the MF SMU
	2045	13 years after piling ends at the Caledonia OWF and 12 years after piling has ended at other projects considered for harbour seal within the MF SMU

3.2 Harbour Porpoise

Number of Animals Impacted

3.2.1.1 The numbers of harbour porpoise at risk of experiencing disturbance due to piling at each project used in the modelling are presented in Table 3-5 (using the Graham *et al*. (2019[1]) deterrence function).

Table 3-5: The number of harbour porpoise predicted to be disturbed for each project based on deterrence function (Graham *et al.*, 2019).

Project	Number Animals Impacted
Caledonia OWF	367 (North) and 388 (South)
Berwick Bank	732
Cenos	1114
Green Volt	675
Ossian	733
Salamander	681
West of Orkney	155
Muir Mhòr	731
Ayre	397
Bowdun	715
Broadshore	523
Buchan	614
Morven	733
Sinclair	543
Bellrock	733
Stromar	414

iPCoD Results

Concurrent Installation

3.2.1.2 The results of the cumulative iPCoD modelling show that the impacted population for harbour porpoise in both the UK portion of the NS MU and the NS MU are predicted to continue at a stable trajectory, the same as the un-impacted population, and at a mean size greater than 99% of the size of the un-impacted population (Table 3-6 and Figure 3-1).

Table 3-6: Results of cumulative iPCoD modelling for harbour porpoise (concurrent installation).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
UK Portion of the NS MU			
2026	159,634	159,634	100.00%
2028	159,507	159,333	99.89%
2030	159,605	158,974	99.60%
2038	160,357	159,418	99.41%
2039	160,289	159,353	99.42%
2044	160,268	159,333	99.42%
2050	160,782	159,843	99.42%
NS MU			
2026	346,602	346,602	100.00%
2028	346,239	346,101	99.96%
2030	346,370	345,857	99.85%
2038	346,744	345,952	99.77%
2039	346,537	345,748	99.77%
2044	347,251	346,466	99.77%
2050	347,087	346,301	99.77%
Note, time point descriptions are provided in Table 3-1.			

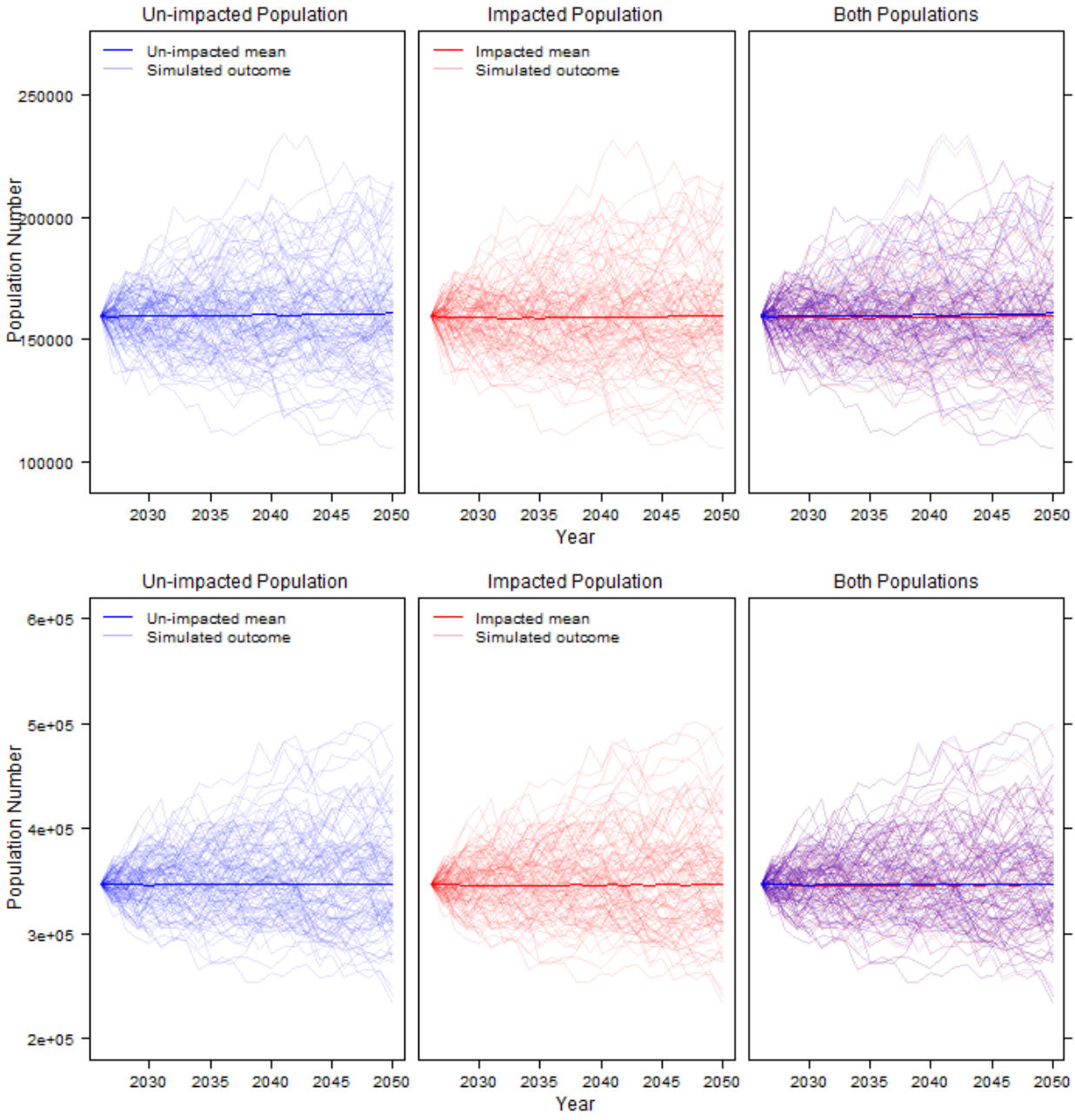

Figure 3-1: Predicted population trajectories for the un-impacted (baseline) and impacted harbour porpoise iPCoD simulations (concurrent installation; top graph – UK portion of the NS MU and bottom graph – NS MU).

Sequential Installation (No Gap)

3.2.1.3 The results of the cumulative iPCoD modelling show that the impacted population for harbour porpoise in both the UK portion of the NS MU and the NS MU are predicted to continue at a stable trajectory, the same as the un-impacted population, and at a mean size greater than 99% of the size of the un-impacted population (Table 3-7 and Figure 3-2).

Table 3-7: Results of cumulative iPCoD modelling for harbour porpoise (sequential installation with no gap).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
UK Portion of the NS MU			
2026	159,634	159,634	100.00%
2028	159,089	158,910	99.89%
2032	159,820	158,872	99.41%
2038	160,687	159,718	99.40%
2039	160,770	159,802	99.40%
2044	160,552	159,592	99.40%
2050	160,342	159,392	99.41%
NS MU			
2026	346,602	346,602	100.00%
2028	345,623	345,480	99.96%
2032	345,200	344,358	99.76%
2038	343,897	343,047	99.75%
2039	343,189	342,343	99.75%
2044	342,947	342,108	99.76%
2050	344,351	343,507	99.75%
Note, time point descriptions are provided in Table 3-1.			

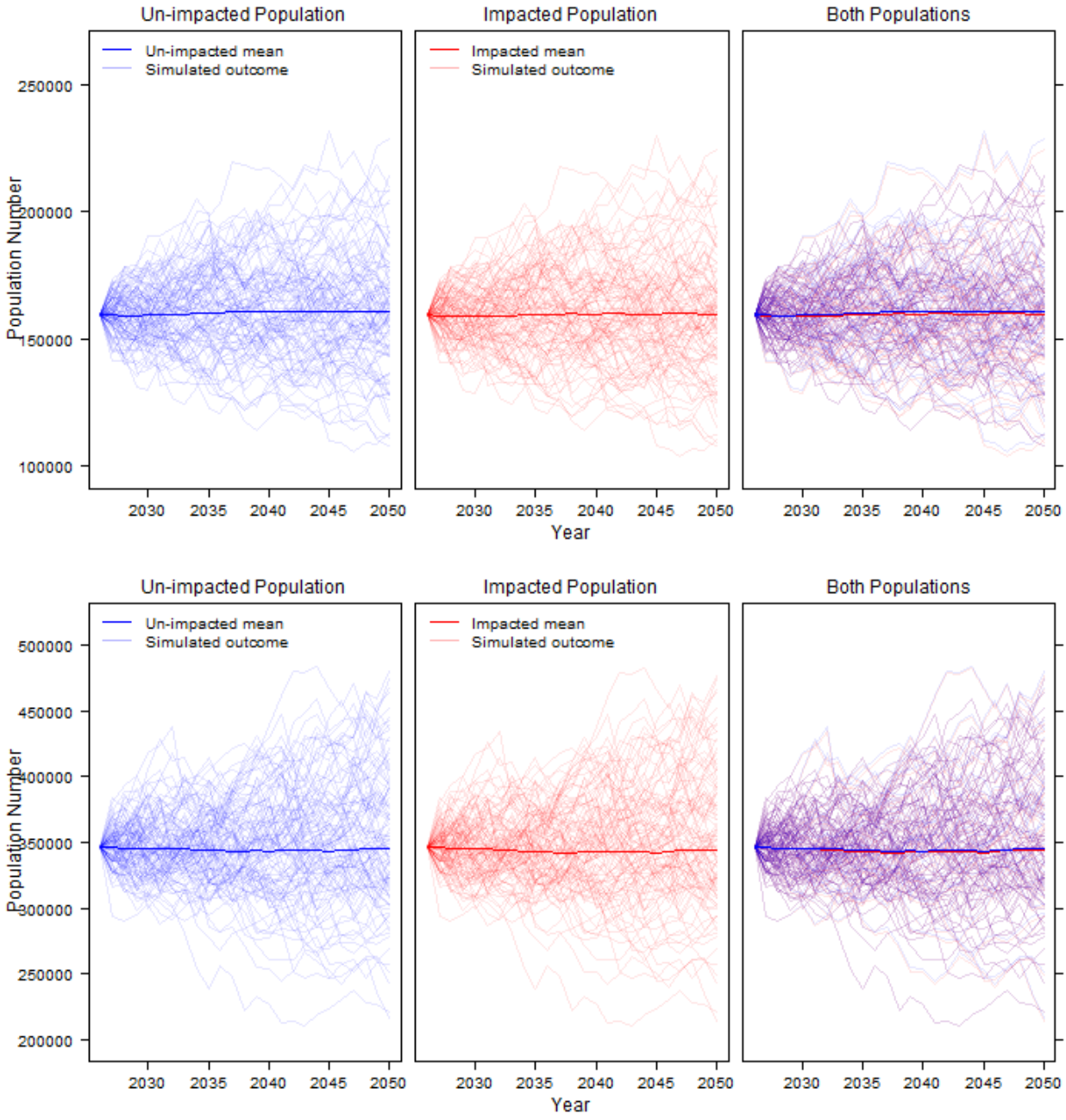

Figure 3-2: Predicted population trajectories for the un-impacted (baseline) and impacted harbour porpoise iPCoD simulations (sequential scenario with no gap; top graph – UK portion of the NS MU and bottom graph – NS MU).

3.3 Bottlenose Dolphin

Number of Animals Impacted

3.3.1.1 The numbers of bottlenose dolphin at risk of experiencing disturbance due to piling at each project used in the modelling are presented in Table 3-8 (using the Graham *et al*. (2019[1]) deterrence function).

Table 3-8: The number of bottlenose dolphin predicted to be disturbed for each project calculated based on deterrence function (Graham *et al.*, 2019)

Project	Number Animals Impacted
Caledonia OWF	5 (North) and 6 (South)
Berwick Bank	12
Green Volt	1
Ossian	1
Salamander	8
Muir Mhòr	2
Ayre	1
Bowdun	9
Broadshore	3
Buchan	1
Morven	3
Sinclair	1
Stromar	1

iPCoD Results

Concurrent installation

3.3.1.2 The results of the iPCoD modelling show that although the level of disturbance has the potential to result in changes at the population level, the impacted population is predicted to continue on an increasing or stable trajectory, the same as the un-impacted population (Table 3-9 and Figure 3-3).

3.3.1.3 For the increasing population, in the year 2039, coinciding with a year after all cumulative piling has ended, the mean impacted population size as a proportion of the mean unimpacted population size is at its lowest (94.16% increasing). For the stable population, the mean impacted population size as a proportion of the mean unimpacted population size is at its lowest (95.13%) in the 2044, coinciding with eight years after all cumulative piling has ended (Figure 3-3).

Table 3-9: Results of cumulative iPCoD modelling for bottlenose dolphin (concurrent installation).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
2026	228	228	100.00%
2028	253	245	96.84%
2030	272	258	94.85%
2038	364	343	94.23%
2039	377	355	94.16%
2044	448	422	94.20%
2050	554	522	94.22%
Stable Population			
2026	228	228	100.00%
2028	228	223	97.81%
2030	227	218	96.04%
2038	227	216	95.15%
2039	227	217	95.59%
2044	226	215	95.13%
2050	224	214	95.54%
Note, time point descriptions are provided in Table 3-1.			

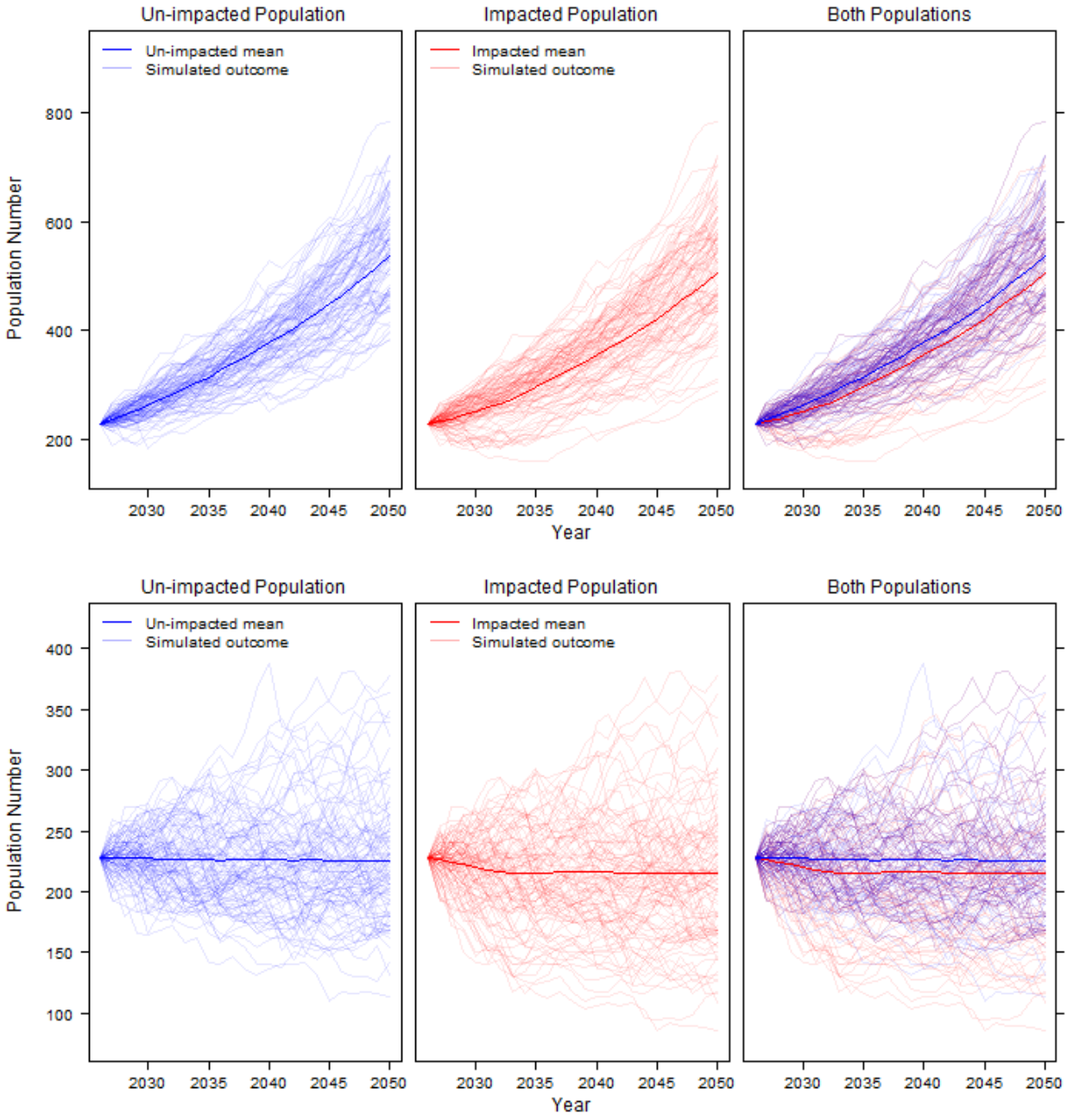

Figure 3-3: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (concurrent installation; top graph – increasing population and bottom graph – stable population).

Sequential installation (no gaps)

3.3.1.4 The results of the iPCoD modelling show that although the level of disturbance has the potential to result in changes at the population level, the impacted population is predicted to continue on an increasing or stable trajectory, the same as the un-impacted population (Table 3-10 and Figure 3-4). In the year 2032, coinciding with the end of final year of piling at the Caledonia OWF, the mean impacted population size as a proportion of the mean unimpacted population size is at its lowest (94.16% increasing, 94.32% stable). The impacted population is predicted to continue on an increasing or stable trajectory (dependent on population) that is the same as the un-impacted population (Figure 3-4).

Table 3-10: Results of cumulative iPCoD modelling for bottlenose dolphin (sequential installation with no gaps).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Increasing Population			
2026	228	228	100.00%
2028	254	246	96.85%
2032	291	274	94.16%
2038	362	344	95.03%
2039	376	357	94.95%
2044	450	426	94.67%
2050	560	530	94.64%
Stable Population			
2026	228	228	100.00%
2028	229	223	97.38%
2032	229	216	94.32%
2038	229	218	95.20%
2039	229	217	94.76%
2044	228	217	95.18%
2050	228	216	94.74%
Note, time point descriptions are provided in Table 3-1.			

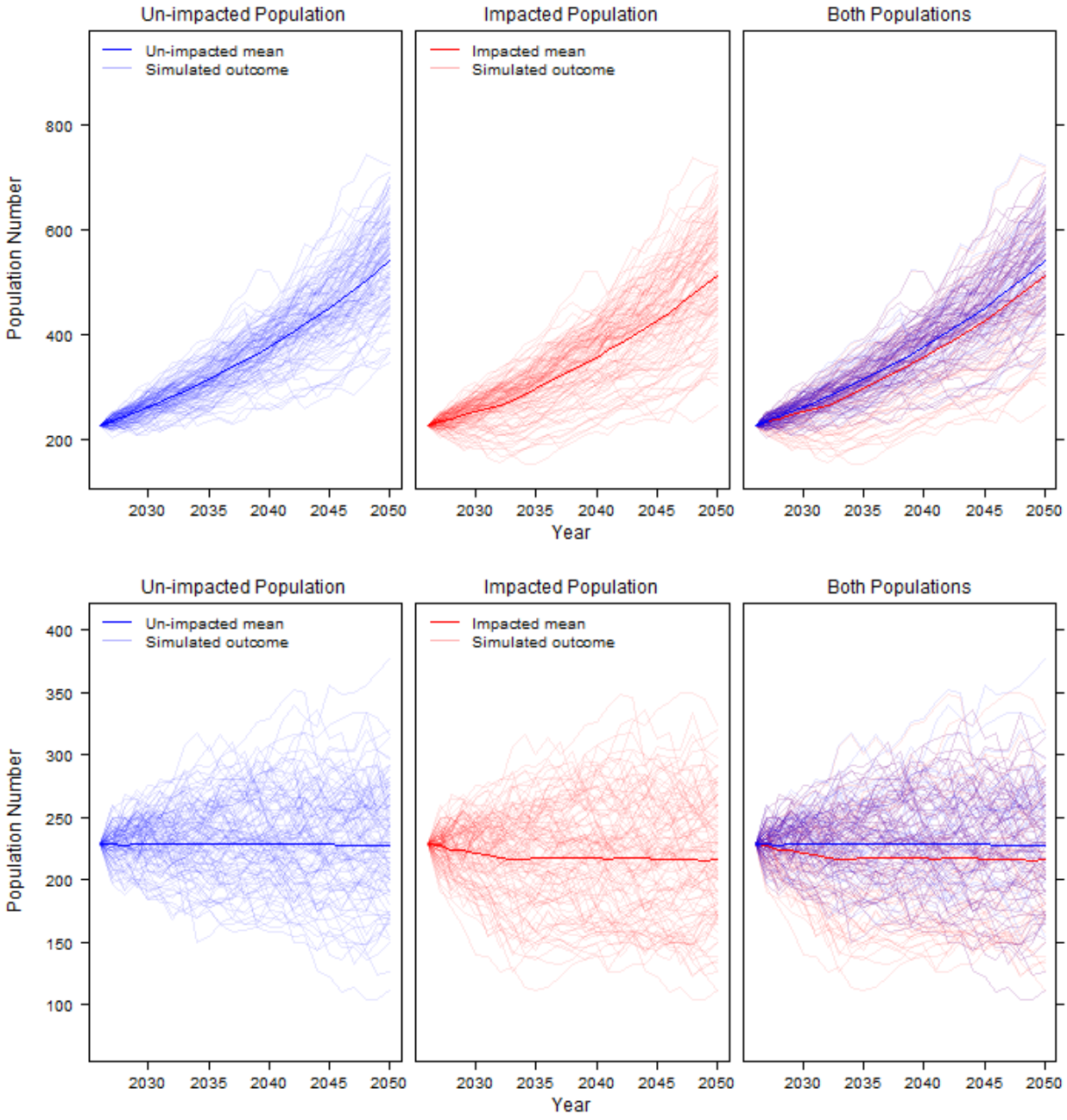

Figure 3-4: Predicted population trajectories for the un-impacted (baseline) and impacted bottlenose dolphin iPCoD simulations (sequential installation with no gaps; top graph – increasing population and bottom graph – stable population).

3.4 Minke Whale

Number of Animals Impacted

3.4.1.1 The numbers of minke whale at risk of experiencing disturbance due to piling at each project used in the modelling are presented in Table 3-11 (using the Graham *et al*. (2019[1]) deterrence function).

Table 3-11: The number of minke whale predicted to be disturbed for each project based on deterrence function (Graham *et al.*, 2019).

Project	Number Animals Impacted
Caledonia OWF	36 (North) and 35 (South)
Berwick Bank	28
Cenos	54
Green Volt	34
Ossian	35
Salamander	26
West of Orkney	31
Muir Mhòr	34
Ayre	25
Bowdun	29
Broadshore	30
Buchan	32
Morven	32
Sinclair	30
Bellrock	41
Stromar	31
Havbredey	27
Talisk	23
Spiorad na Mara	17

iPCoD Results

Concurrent Installation

3.4.1.2 The results of cumulative iPCoD modelling show that the impacted population for minke whales in both the UK portion of the NS MU and the NS MU are predicted to continue at a stable trajectory, the same as the un-impacted population, and at a mean size greater than 99.9% of the size of the un-impacted population (Table 3-12 and Figure 3-5).

Table 3-12: Results of cumulative iPCoD modelling for minke whale (concurrent installation).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
UK Portion of the CGNS MU			
2026	10,288	10,288	100.00%
2028	10,288	10,288	100.00%
2030	10,278	10,276	99.98%
2038	10,192	10,192	100.00%
2039	10,204	10,203	99.99%
2044	10,191	10,190	99.99%
2050	10,176	10,175	99.99%
CGNS MU			
2026	20,120	20,120	100.00%
2028	20,112	20,111	100.00%
2030	20,094	20,092	99.99%
2038	19,929	19,928	99.99%
2039	19,950	19,949	99.99%
2044	19,857	19,856	99.99%
2050	19,878	19,876	99.99%
Note, time point descriptions are provided in Table 3-1.			

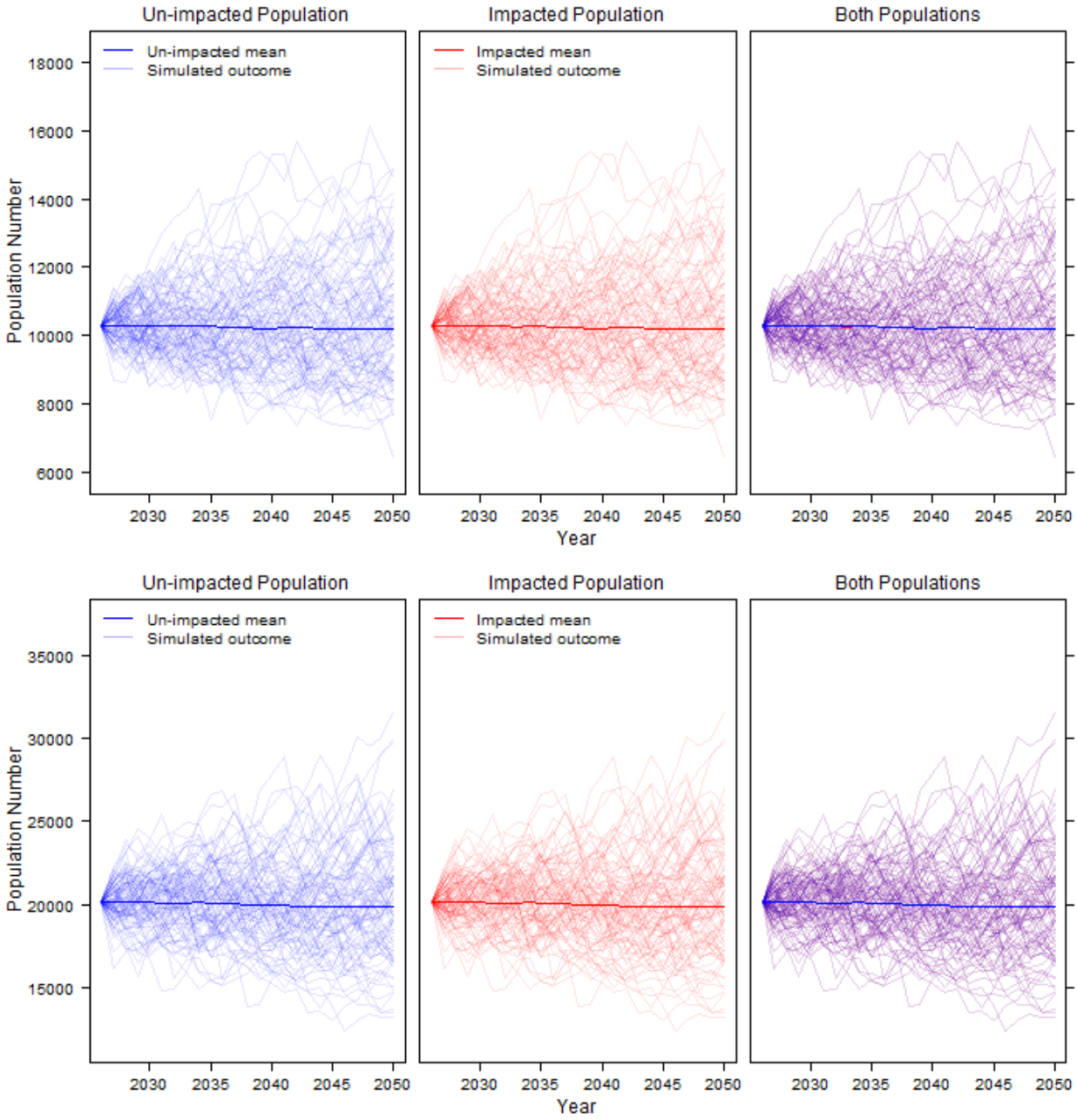

Figure 3-5: Predicted population trajectories for the un-impacted (baseline) and impacted minke whale iPCoD simulations (concurrent installation; top graph – UK portion of the CGNS MU and bottom graph – CGNS MU).

Sequential Installation (No Gap)

3.4.1.3 The results of cumulative iPCoD modelling show that the impacted population for minke whales in both the UK portion of the NS MU and the NS MU are predicted to continue at a stable trajectory, the same as the un-impacted population, and at a mean size greater than 99.9% of the size of the un-impacted population (Table 3-13 and Figure 3-6).

Table 3-13: Results of cumulative iPCoD modelling for minke whale (sequential installation with no gap).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
UK Portion of the CGNS MU			
2026	10,288	10,288	100.00%
2028	10,275	10,275	100.00%
2032	10,245	10,243	99.98%
2038	10,233	10,233	100.00%
2039	10,264	10,263	99.99%
2044	10,201	10,201	100.00%
2050	10,149	10,149	100.00%
CGNS MU			
2026	20,120	20,120	100.00%
2028	20,169	20,169	100.00%
2032	20,089	20,087	99.99%
2038	19,939	19,939	100.00%
2039	19,934	19,933	99.99%
2044	19,922	19,921	99.99%
2050	19,794	19,793	99.99%
Note, time point descriptions are provided in Table 3-1.			

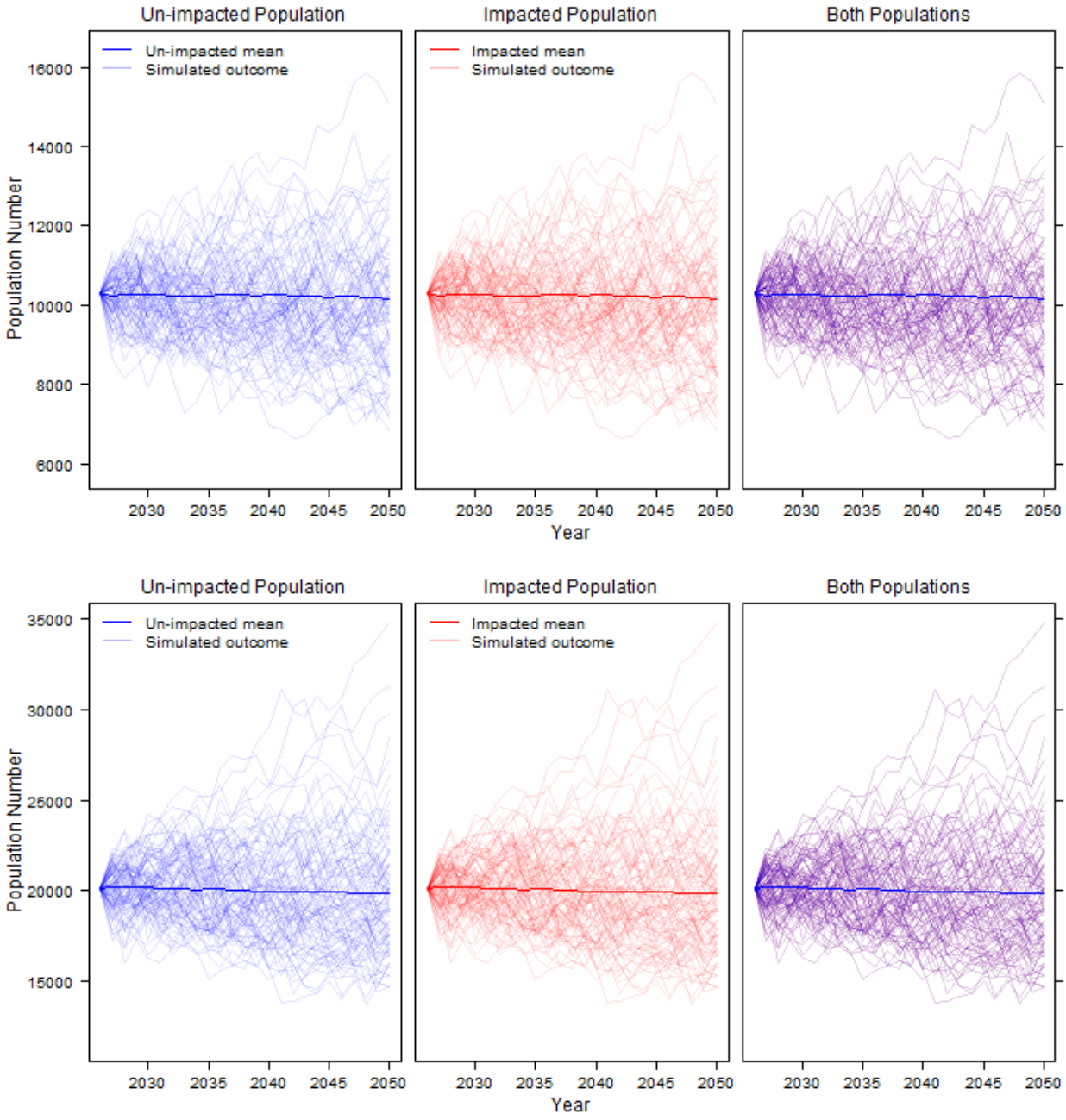

Figure 3-6: Predicted population trajectories for the un-impacted (baseline) and impacted minke whale iPCoD simulations (sequential installation with no gap; top graph – UK portion of the CGNS MU and bottom graph – CGNS MU).

3.5 Harbour Seal

3.5.1.1 It is important to note when considering the iPCoD results for harbour seals, that the NC&O SMU is currently in decline (SCOS, 2022[2]). It is noted in SCOS (2022[2]) that the 2019 count was similar to the 2016 count, which could indicate that the decline has slowed, but more counts are required to confirm this. When interpreting the iPCoD results for the NC&O SMU it is, therefore, necessary to understand that the un-impacted baseline MU is predicted to significantly decline in the absence of any impacts.

Number of Animals Impacted

3.5.1.2 The numbers of harbour seal at risk of experiencing disturbance due to piling at each project used in the modelling are presented in Table 3-14.

Table 3-14: The number of harbour seal predicted to be disturbed for each project, based on the project-specific values presented in EIARs or calculated based on the EDRs and Carter *et al*. (2025).

Project	Number Animals Impacted	Data Source
MF SMU		
Caledonia OWF	77 (North) and 87 (South)	Whyte *et al*. (2020[3]); Carter *et al.* (2025[4])
Broadshore	1	EDR; Carter *et al*. (2025[4])
Sinclair	1	EDR; Carter *et al*. (2025[4])
NC&O SMU		
Caledonia OWF	6 (North) and 1 (South)	Whyte *et al*. (2020[3]); Carter *et al*. (2025[4])
West of Orkney	176	EIAR (Xodus Group Ltd, 2023[5])
Ayre	12	EDR; Carter *et al*. (2025[4])
Buchan	1	EDR; Carter *et al*. (2025[4])
Stromar	1	EDR; Carter *et al*. (2025[4])
ES SMU		
Caledonia OWF	1 (North) and 1 (South)	Whyte *et al*. (2020[3]); Carter *et al*. (2025[4])
Berwick Bank	3	EIAR (RPS, 2022[6])
Green Volt	1	EIAR (Royal HaskoningDHV, 2023[7])
Salamander	4	EIAR (Salamander Offshore Wind Farm, 2023[8])
Muir Mhòr	1	EIAR (SMRU Consulting, 2024[9])
Bowdun	1	EDR; Carter *et al*. (2025[4])
Morven	1	EDR; Carter *et al*. (2025[4])

Cumulative Concurrent Installation Scenario

MF SMU

3.5.1.3 The results of the cumulative iPCoD modelling show that the impacted population for harbour seals in the MF SMU is predicted to continue at a stable trajectory, the same as the un-impacted population, and at a mean population size greater than 99.9% of the size of the un-impacted population (Table 3-15 and Figure 3-7).

Table 3-15: Results of cumulative iPCoD modelling for harbour seals (concurrent installation; MF SMU)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Start 2028	1,360	1,360	100.00%
End 2028	1,363	1,363	100.00%
2030	1,365	1,365	100.00%
2031	1,366	1,366	100.00%
2036	1,368	1,367	99.93%
2042	1,377	1,377	100.00%
2048	1,384	1,384	100.00%
Note, time point descriptions are provided in Table 3-2.			

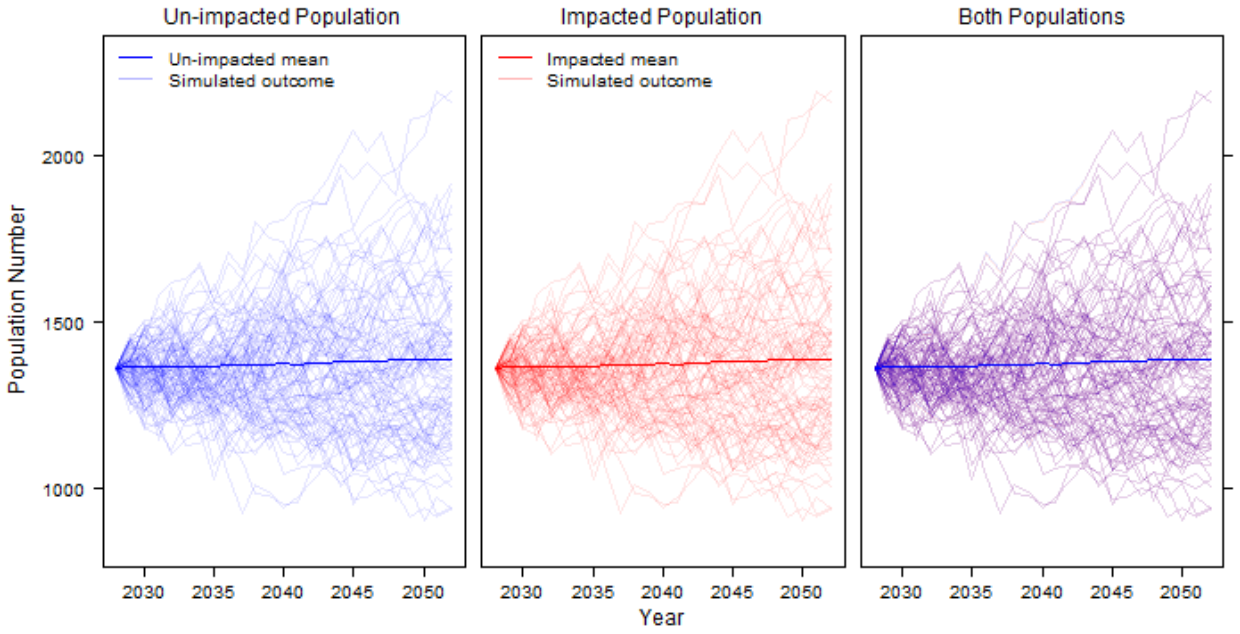

Figure 3-7: Predicted population trajectories for the un-impacted (baseline) and impacted harbour seal iPCoD simulations for the MF SMU (concurrent installation).

NC&O SMU

3.5.1.4 The results of the cumulative iPCoD modelling show that the impacted population for harbour seals in the NC&O SMU is predicted to continue on a declining trajectory, the same as the un-impacted population, and at 100% the size of the un-impacted population (Table 3-16 and Figure 3-8).

Table 3-16: Results of cumulative iPCoD modelling for harbour seals (concurrent installation; NC&O SMU)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Start 2028	1,950	1,950	100%
End 2028	1,743	1,743	100%
2030	1,403	1,403	100%
2033	1,012	1,012	100%
2034	910	910	100%
2039	524	524	100%
2045	273	273	100%
2051	140	140	100%
Note, time point descriptions are provided in Table 3-3.			

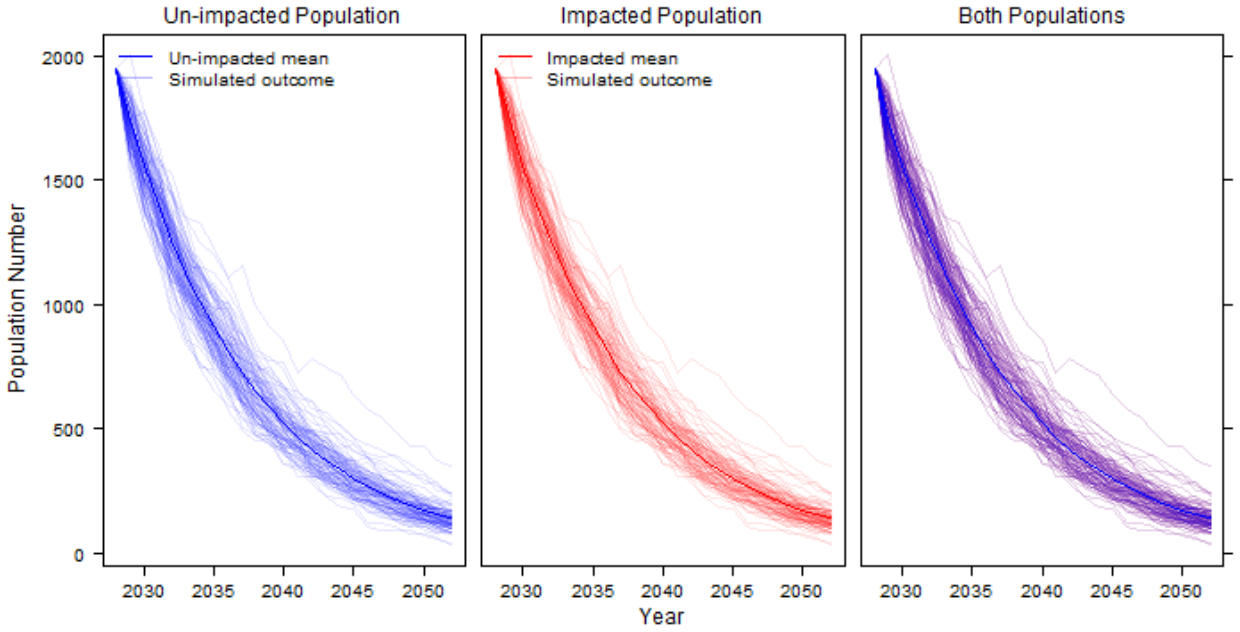

Figure 3-8: Predicted population trajectories for the un-impacted (baseline) and impacted harbour seal iPCoD simulations for the NC&O SMU (concurrent installation).

ES SMU

3.5.1.5 The results of the cumulative iPCoD modelling show that the impacted population for harbour seals in the ES SMU is predicted to continue at a stable trajectory, the same as the un-impacted population, and at 100% the size of the un-impacted population (Table 3-17 and Figure 3-9).

Table 3-17: Results of cumulative iPCoD modelling for harbour seals (concurrent installation; ES SMU)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
2026	386	386	100%
2028	387	387	100%
2030	387	387	100%
2033	388	388	100%
2034	387	387	100%
2039	388	388	100%
2045	387	387	100%
Note, time point descriptions are provided in Table 3-4.			

Figure 3-9: Predicted population trajectories for the un-impacted (baseline) and impacted harbour seal iPCoD simulations for the ES SMU (concurrent installation).

Cumulative Sequential Installation Scenario (No Gap)

MF SMU

3.5.1.6 The results of the cumulative iPCoD modelling show that the impacted population for harbour seals in the MF SMU is predicted to continue at a stable trajectory, the same as the un-impacted population, and at 100% the size of the un-impacted population (Table 3-18 and Figure 3-10).

Table 3-18: Results of cumulative iPCoD modelling for harbour seals (sequential installation with no gap; MF SMU)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Start 2028	1,360	1,360	100%
End 2028	1,359	1,359	100%
2030	1,361	1,361	100%
2032	1,362	1,362	100%
2033	1,363	1,363	100%
2038	1,363	1,363	100%
2044	1,367	1,367	100%
2050	1,369	1,369	100%
Note, time point descriptions are provided in Table 3-2.			

Figure 3-10: Predicted population trajectories for the un-impacted (baseline) and impacted harbour seal iPCoD simulations for the MF SMU (sequential installation with no gap).

NC&O SMU

3.5.1.7 The results of the cumulative iPCoD modelling show that the impacted population for harbour seals in the NC&O SMU is predicted to continue on a declining trajectory, the same as the un-impacted population, and at 100% the size of the un-impacted population (Table 3-19 and Figure 3-11).

Table 3-19: Results of cumulative iPCoD modelling for harbour seals (sequential installation with no gap; NC&O SMU)

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
Start 2028	1,950	1,950	100%
End 2028	1,745	1,745	100%
2032	1,120	1,120	100%
2033	1,004	1,004	100%
2034	898	898	100%
2039	517	517	100%
2045	268	268	100%
2051	138	138	100%
Note, time point descriptions are provided in Table 3-3.			

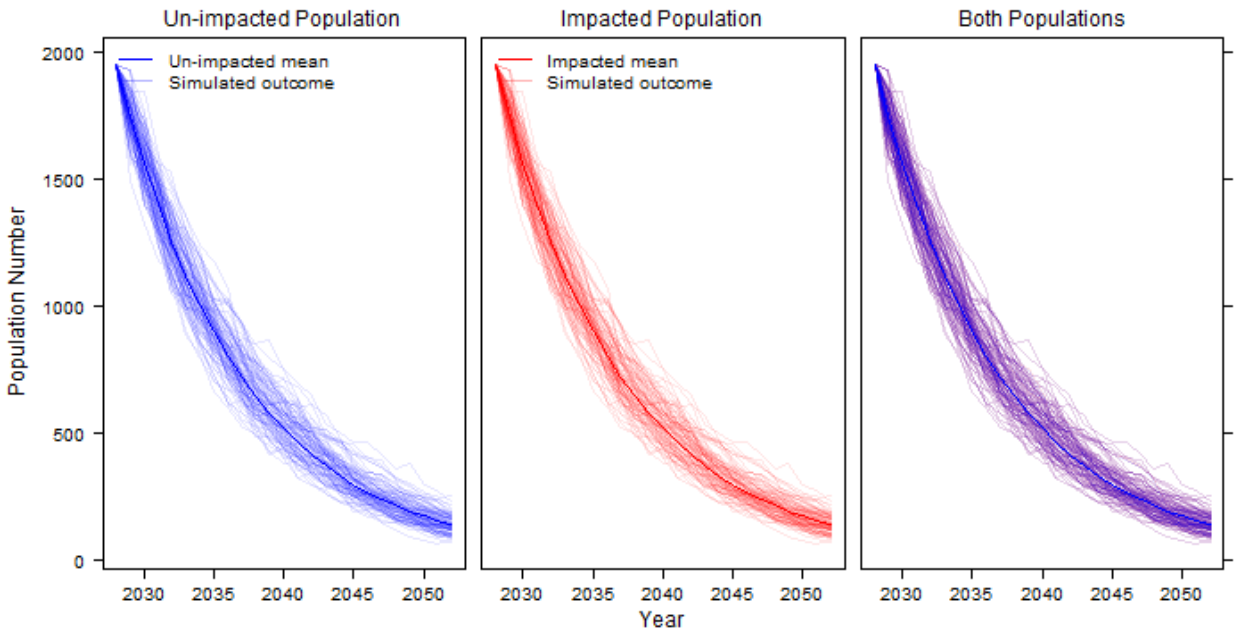

Figure 3-11: Predicted population trajectories for the un-impacted (baseline) and impacted harbour seal iPCoD simulations for the NC&O SMU (sequential installation with no gap).

ES SMU

3.5.1.8 The results of the cumulative iPCoD modelling show that the impacted population for harbour seals in the ES SMU is predicted to continue at a stable trajectory, the same as the un-impacted population, and at 100% the size of the un-impacted population (Table 3-20 and Figure 3-12).

Table 3-20: Results of cumulative iPCoD modelling for harbour seals (sequential installation with no gap; ES SMU).

Time Point	Unimpacted Population Mean Size	Impacted Population Mean Size	Impacted Population as a Proportion of the Unimpacted Population
2026	386	386	100%
2028	387	387	100%
2032	386	386	100%
2033	388	388	100%
2034	387	387	100%
2039	389	389	100%
2045	388	388	100%
Note, time point descriptions are provided in Table 3-4.			

Figure 3-12: Predicted population trajectories for the un-impacted (baseline) and impacted harbour seal iPCoD simulations for the ES SMU (sequential installation with no gap).

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