

Delayed predator–prey collapses: the case of black-legged kittiwakes and Iberian sardines

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Table S1. Number of black-legged kittiwake pairs observed breeding at Sisargas Islands from 1975–2017 (Sisargas) and also at a small colony located 37 km away (Cape Vilán). (–): absence of information. The ‘Sisargas simulated’ vector contains the mean posterior estimates (in *italics*) of missing data for the Sisargas time series of counts as obtained by means of a Bayesian state-space model.

	Breeding pairs		
	Sisargas	Sisargas simulated	Cape Vilán
1975	51	51	–
1976	70	70	–
1977	90	90	–
1978	83	83	–
1979	98	98	–
1980	120	120	–
1981	152	152	52
1982	–	<i>133</i>	–
1983	100	100	–
1984	75	75	–
1985	105	105	–
1986	105	105	–
1987	110	110	–
1988	103	103	–
1989	105	105	–
1990	111	111	–
1991	122	122	–
1992	142	142	44
1993	10	10	>30
1994	4	4	47
1995	–	<i>37</i>	25
1996	–	<i>32</i>	26
1997	–	<i>28</i>	27
1998	–	<i>24</i>	34
1999	4	4	56
2000	–	<i>18</i>	–
2001	3	3	–

2002	–	13	–
2003	4	4	18
2004	5	5	14
2005	8	8	16
2006	13	13	16
2007	11	11	10
2008	9	9	9
2009	5	5	1
2010	0	0	1
2011	7	7	1
2012	4	4	0
2013	5	5	0
2014	0	0	0
2015	1	1	0
2016	0	0	0
2017	2	2	0

Table S2. Posterior parameter estimates obtained from the state-space model fitted to the black-legged kittiwake count data. α , β_1 , and β_2 are the intercept and slopes of the change-point model for population size N (see methods). σ is the temporal random standard deviation for population size, and θ the change point. Estimates for population size at year t are denoted by $N[t]$.

	mean	sd	2.5%	50%	97.5%
α	4.651	0.408	3.891	4.633	5.514
β_1	-0.964	4.932	-11.16	-0.948	9.016
β_2	-13.605	5.432	-23.85	-13.754	-2.321
σ	0.752	0.136	0.528	0.738	1.056
θ	0.135	0.053	0.061	0.129	0.312
$N[1]$	52.322	7.125	39.308	52.032	67.124
$N[2]$	70.743	8.294	55.318	70.452	87.938
$N[3]$	90.073	9.404	72.359	89.795	109.159
$N[4]$	83.353	9.059	66.812	83.002	102.052
$N[5]$	98.044	9.872	79.551	97.715	118.569
$N[6]$	119.644	10.781	99.521	119.267	141.412
$N[7]$	151.217	12.219	127.906	150.973	176.154
$N[8]$	132.689	135.838	19.829	95.822	475.037
$N[9]$	99.808	9.922	81.232	99.438	120.211
$N[10]$	75.424	8.526	59.575	75.159	92.979
$N[11]$	104.655	10.118	85.631	104.349	125.463
$N[12]$	104.646	10.149	85.725	104.306	125.155
$N[13]$	109.377	10.412	89.976	108.998	130.941
$N[14]$	102.431	10.025	83.8	102.15	122.954
$N[15]$	104.018	10.176	85.05	103.715	124.667
$N[16]$	109.755	10.384	90.275	109.419	131.038

N[17]	120.183	10.888	99.798	119.795	142.616
N[18]	139.623	11.866	117.281	139.242	163.594
N[19]	14.77	3.694	8.462	14.449	22.842
N[20]	6.97	2.544	2.933	6.661	12.721
N[21]	37.108	37.11	5.616	27.058	128.114
N[22]	32.271	31.524	4.869	23.647	111.359
N[23]	27.693	27.127	4.165	20.481	94.312
N[24]	24.283	23.57	3.637	17.923	83.936
N[25]	5.908	2.195	2.423	5.646	10.934
N[26]	17.912	17.549	2.646	13.267	60.875
N[27]	4.799	1.941	1.827	4.528	9.355
N[28]	13.396	12.921	2.006	9.885	46.487
N[29]	5.129	1.989	2.058	4.842	9.76
N[30]	5.666	2.089	2.403	5.397	10.491
N[31]	7.769	2.52	3.692	7.476	13.51
N[32]	11.655	3.194	6.348	11.32	18.669
N[33]	9.764	2.902	5.025	9.451	16.332
N[34]	7.868	2.562	3.762	7.561	13.708
N[35]	4.672	1.853	1.86	4.402	9.072
N[36]	1.561	0.909	0.345	1.384	3.813
N[37]	5.713	2.115	2.43	5.426	10.595
N[38]	3.465	1.55	1.202	3.217	7.228
N[39]	3.922	1.682	1.45	3.639	7.925
N[40]	1.123	0.712	0.224	0.962	2.926
N[41]	1.408	0.837	0.332	1.223	3.516
N[42]	0.95	0.635	0.179	0.801	2.559
N[43]	1.623	0.924	0.411	1.426	3.93
