

Appendix

Table A1. Year-by-year estimates of the apparent adult survival (in per cent) of five species of seabirds at Hornøya, northern Norway (weighted averaged estimate^a \pm unconditional standard error^b; sample size^c in brackets).

Period	Common guillemot <i>Uria aalge</i>	Brünnich's guillemot <i>Uria lomvia</i>	Razorbill <i>Alca torda</i>	Atlantic puffin <i>Fratercula arctica</i>	Black-legged kittiwake <i>Rissa tridactyla</i>
1989–90	97.6 \pm 2.4 (42)	89.6 \pm 7.1 (19)	—	—	—
1990–91	98.2 \pm 1.9 (55)	98.2 \pm 2.2 (46)	—	100.0 \pm 0.0 (37)	95.8 \pm 3.2 (99)
1991–92	98.4 \pm 1.7 (63)	92.1 \pm 3.9 (52)	—	90.8 \pm 2.8 ^b (259)	98.2 \pm 5.0 (91)
1992–93	98.5 \pm 1.6 (67)	99.0 \pm 1.8 (60)	—	97.9 \pm 3.9 ^b (234)	93.7 \pm 9.4 (82)
1993–94	98.7 \pm 1.6 (66)	90.2 \pm 4.3 (59)	—	92.7 \pm 3.7 (208)	60.8 \pm 5.2 (128)
1994–95	95.6 \pm 2.8 (65)	88.9 \pm 4.8 (53)	—	94.0 \pm 2.3 (406)	81.2 \pm 5.0 (87)
1995–96	90.6 \pm 3.7 (66)	83.6 \pm 5.2 (57)	93.3 \pm 3.3 (58)	94.9 \pm 2.5 (375)	93.1 \pm 1.5 (374)
1996–97	97.0 \pm 2.2 (66)	90.7 \pm 4.1 (54)	97.3 \pm 2.3 (64)	96.2 \pm 3.1 (314)	94.0 \pm 1.5 (448)
1997–98	97.3 \pm 2.1 (70)	95.0 \pm 3.4 (54)	91.2 \pm 3.6 (67)	94.4 \pm 3.9 (198)	86.8 \pm 1.6 (570)
1998–99	94.7 \pm 2.7 (76)	85.9 \pm 4.7 (59)	89.0 \pm 3.8 (73)	84.1 \pm 5.8 (197)	86.0 \pm 2.0 (585)
1999–00	96.4 \pm 2.3 (80)	97.0 \pm 2.5 (59)	92.3 \pm 3.2 (76)	99.4 \pm 7.8 (188)	85.4 \pm 2.4 (554)
2000–01	94.2 \pm 2.7 (86)	93.0 \pm 4.2 (71)	90.6 \pm 3.6 (74)	93.0 \pm 10.2 (159)	92.4 \pm 2.9 (454)
2001–02	94.3 \pm 2.8 (91)	82.0 \pm 5.6 (71)	93.0 \pm 3.3 (75)	75.2 \pm 8.3 (132)	93.8 \pm 5.5 (394)
2002–03	93.8 \pm 3.5 (96)	—	90.5 \pm 4.1 (78)	[12.8 \pm 4.4 (102)] ^d	[62.0 \pm 4.4 (294)] ^d

^a Estimates have been obtained by model averaging. The models used in model averaging are all models with time-dependent survival rates provided in Table A2.

^b Except for the second and third estimate of puffin survival (where model choice was responsible for 2% and 10% of the variability, respectively), less than two per cent of variance were attributable to model uncertainty.

^c Sample sizes provided are the numbers of birds known to have been alive in the first year of each period.

^d In cases where survival rate and re-sighting rate cannot be estimated separately, their product is given in square brackets.

Table A2. Model selection. The optimal model, its neighbourhood, and some further relevant models are shown for each species, sorted by decreasing ΔAIC_C (n_P , number of estimable parameters; DEV, deviance; ΔAIC_C , difference between the AIC_C of the current model and the minimum AIC_C ; w , AIC_C weight).

Species	Model ^a		n_P	DEV	ΔAIC_C	w
	ϕ	p				
Common guillemot	t	$t+h2$	29	381.97	20.24	0.000
	t	$h3$	18	404.94	19.89	0.000
	t	$h1$	16	408.23	19.02	0.000
	t	$h2$	17	404.94	17.81	0.000
	•	•	2	429.79	11.97	0.000
	•	$h3$	5	415.88	4.12	0.018
	•	$h1$	3	419.13	3.32	0.026
	•	$h2$	4	415.88	2.09	0.049
	T	$h3$	6	411.76	2.03	0.125
	T	$h1$	4	415.04	1.26	0.184
	T	$h2$	5	411.76	0.00	0.345
Brünnich's guillemot	t	$h2$	16	443.33	6.69	0.008
	t	t	25	422.62	5.16	0.017
	t	$h1$	15	443.86	5.12	0.017
	t	•	14	444.25	3.42	0.041
	•	$t+h1$	15	441.39	2.66	0.060
	T	t	15	441.15	2.41	0.067
	•	$h1$	3	465.28	1.85	0.089
	T	$h1$	4	463.16	1.75	0.094
	•	t	14	441.52	0.69	0.159
	•	•	2	465.54	0.10	0.215
	T	•	3	463.43	0.00	0.225

Table A2 (continued).

Species	Model ^a		n_p	DEV	ΔAIC_C	w
	ϕ	p				
Razorbill	t	$t+h2$	18	330.07	23.01	0.000
	t	$t+h1$	17	330.40	21.19	0.000
	t	•	9	343.10	17.07	0.000
	•	$t+h1$	10	334.45	10.49	0.002
	t	$h1$	10	334.22	10.26	0.002
	t	$h2$	11	332.13	10.26	0.002
	•	•	2	347.06	6.72	0.014
	T	$h1$	4	337.60	1.30	0.204
	•	$h2$	4	336.32	0.03	0.385
	•	$h1$	3	338.32	0.00	0.391
Puffin	•	$h4$	6	1863.92	106.89	0.000
	t	$t+h5$	30	1715.94	7.68	0.010
	t	$t+h4$	29	1715.97	5.66	0.025
	•	$t+h3$	17	1738.53	3.73	0.066
	•	$t+h5$	19	1732.64	1.90	0.164
	T	$t+h4$	19	1731.45	0.71	0.297
	•	$t+h4$	18	1732.77	0.00	0.424
Kittiwake	t	$h2$	16	5773.06	66.83	0.000
	T	$t+h2$	17	5762.85	58.64	0.000
	•	$t+h2$	16	5762.85	56.62	0.000
	t	$t+h1$	26	5690.70	4.70	0.040
	t	$t+h4$	29	5682.01	2.10	0.145
	t	$t+h3$	28	5682.01	0.07	0.400
	t	$t+h2$	27	5683.97	0.00	0.415

^a Abbreviations used: ϕ , apparent survival rate; p , re-sighting rate; •, no effect (constant rate); +, additive effect of several variables; t , time (year) effect; T , linear trend; hn , trap dependence spanning n years after the previous re-sighting.