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## Appendix A. Adult analysis

### Umbrella model

The AS umbrella model  $\{S_t^r, p_t^s, \Psi_t^{rs}\}$  is expressed using matrix notation as:

$$S_t = \begin{matrix} S_t^B & \Psi_t = & \Psi_t^{B-B} & \Psi_t^{B-NB} & \Psi_t^{B-NU} \\ S_t^{NB=NU} & \Psi_t^{NB-B} & \Psi_t^{NB-NB} & \Psi_t^{NB-NU} \\ S_t^{NB=NU} & \Psi_t^{NU-B} & \Psi_t^{NU-NB} & \Psi_t^{NU-NU} \end{matrix}$$

$$P_t = \begin{pmatrix} p_t^B & p_t^{NB} & 0 \end{pmatrix}$$

States are; breeders (B), non-breeders present (NB) or not at the colony a given year (NU) (Fig. A1). This umbrella model showed a higher AIC than the model without an unobservable state NU ( $\Delta QAIC = 130.4$ ). This suggests that skipping breeding sites is very low for established breeders and thus, an unobservable state is not included further in the model selection.

### Goodness of fit test

The data consist of 908 capture histories of adult Cory's shearwaters captured in Lavezzi Island from 1978 to 2004. The JMV model GOF tests indicate a good fit of the data ( $p = 0.132$ , Table A1b). However, two specific components of the test, namely the test 3G and test M (see Pradel et al. 2003 for more details) are significant ( $p = 0.003$  and  $p = 0.016$  respectively, Table A1a), indicating the presence of heterogeneity in the detection probability and the presence of transients, i.e. animals never seen after marking. These effects can be taken into account by adding specific parameters into the model (Pradel et al. 2003). Given the overall fit and redundancy problems linked to complex models, the model selection starts with the JMV umbrella model  $\{S_t^r, p_t^s, \Psi_t^{rs}\}$  and trap dependence and transients effects are tested further.

Table A1. Goodness-of-fit (GOF) tests of the JollyMove (JMV). The JMV GOF test involves several components detailed below in (a) (see Pradel et al. 2003 for more details) that led to testing models detailed below in (b). JMV assumes that survival, transitions and detection probabilities are solely time and state dependent. Additionally, transient models allow survival to differ between newly marked and previously marked animals. Trap dependent models assume that detection probabilities may differ for animals that were caught or not during the previous occasion.

(a)

WBA			3GSR			3GSM			MITEC			MLTEC		
DF	$\chi^2$	P	DF	$\chi^2$	p	DF	$\chi^2$	p	DF	$\chi^2$	p	DF	$\chi^2$	p
36	19.7	0.988	26	50.4	<b>0.003</b>	144	148.2	0.389	28	46.3	<b>0.016</b>	28	23.2	0.723

(b)

JMV			Transient			Trap dependent			Transient + TD		
DF	$\chi^2$	P	DF	$\chi^2$	p	DF	$\chi^2$	p	DF	$\chi^2$	p
262	287.8	0.132	236	237.4	0.463	234	241.5	0.355	208	191.1	0.794

## Parameter estimation

As suggested by the GOF test, a model taking into account an additive trap dependence effect, model A4 (Table A2), provides a better fit of the data ( $\Delta\text{QAIC} = 32.8$ , Table A2). Trap-dependence effect is present in the non-breeding state only. Non-breeders detection probabilities vary greatly over time (Fig. A1). The mean detection probabilities for non-breeders captured and missed the previous year were  $0.21 \pm 0.14$  and  $0.10 \pm 0.09$ , respectively. Detection probability of breeders is homogeneous and constant over time,  $0.81 \pm 0.02$  (model A9, Fig. A2a).

The state affects the probability of breeding (model A9, Table A2, Fig. 5b) and the transitions between the two reproductive states varies over time. Non-breeders have a lower probability of breeding the following year compared to breeders,  $0.62 \pm 0.22$  and  $0.28 \pm 0.14$ , respectively.

The model that takes into account the additive transient effect for survival, has a lower AIC (model A14, Table A2,  $\Delta\text{QAIC} = 6.3$ ) especially when adult survival variations are similar between states (model A15,  $\Delta\text{QAIC} = 28.45$ ). Adult survival varies greatly between years (Fig. 5a). There is little evidence for a state-specific survival, as models without state-specific survival parameters, describe the data equally well (Table A2:  $\Delta\text{QAIC} = 1.36$ ). The final estimates are thus obtained by model averaging. Survival of newly marked birds, i.e. transients, is 0.87 ( $\text{IC}_{95\%} = [0.85, 0.89]$ ) and survival of birds already marked is 0.89 ( $\text{IC}_{95\%} = [0.88, 0.90]$ ). State-specific survival rates are 0.91 ( $\text{IC}_{95\%} = [0.89, 0.94]$ ) for breeding birds and 0.86 ( $\text{IC}_{95\%} = [0.83, 0.88]$ ) for non-breeders.

Table A2 Modeling detection, transitions and survival probabilities.

Model	Number and name of the model	k	dev	AIC
JMV	A1. $S_{\tau}^r, p_{\tau}^{rs}, \Psi_{\tau}^{rs}$	200	9637.22	10037.22
AS	A2. $S_{\tau}^r, p_{\tau}^s, \Psi_{\tau}^{rs}$	152	9699.09	10003.09
<b>1. Modeling detection probabilities</b>				
trap dependence effect	A3. $S_{\tau}^r, p_{\tau}^{s+m}, \Psi_{\tau}^{rs}$	202	9609.26	10013.26
additive state effect according to time	A4. $S_{\tau}^r, p_{\tau}^{s+*m}, \Psi_{\tau}^{rs}$	155	9669.23	9979.23
additive trap dependence effect according to time	A5. $S_{\tau}^r, p_{\tau}^{s+m+}, \Psi_{\tau}^{rs}$	156	9658.31	9970.31
Additive effect of trap dependence and state according to time	A6. $S_{\tau}^r, p_{\tau}^{s+m}, \Psi_{\tau}^{rs}$	133	9695.83	9961.83
Constant detection probabilities	A7. $S_{\tau}^r, p_{\tau}^{s+m}, \Psi_{\tau}^{rs}$	106	9811.01	10023.01
time effect only for non breeder state	A8. $S_{\tau}^r, p_{\tau}^{NB+m}, p_{\tau}^{B+m}, \Psi_{\tau}^{rs}$	133	9687.60	9953.60
Additive trap dependence effect according to time only for non breeder state	A9. $S_{\tau}^r, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs}$	130	9691.20	9951.20
<b>2. Modeling transition probabilities</b>				
no state effect	A10. $S_{\tau}^r, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}$	105	9865.01	10075.01
additive state effect according to time	A11. $S_{\tau}^r, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs+}$	105	9865.00	10075.00
no time effect	A12. $S_{\tau}^r, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs}$	81	10094.77	10256.77
<b>3. Modeling survival probabilities</b>				
transient effect for survival	A13. $S_{\tau}^{a2+r}, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs}$	179	9618.14	9976.14
additive transient effect according to time	A14. $S_{\tau}^{a2+*r}, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs}$	130	9684.87	9944.87
additive transient and state effects according to time	A15. $S_{\tau}^{a2+r}, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs}$	107	9708.75	9922.75
no state effect according to time	A16. $S_{\tau}^{a2+}, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs}$	106	9709.40	9921.40
no time effect	A17. $S_{\tau}^{a2}, p_{\tau}^{NB+m}, p_{\tau}^B, \Psi_{\tau}^{rs}$	81	9799.80	9961.80

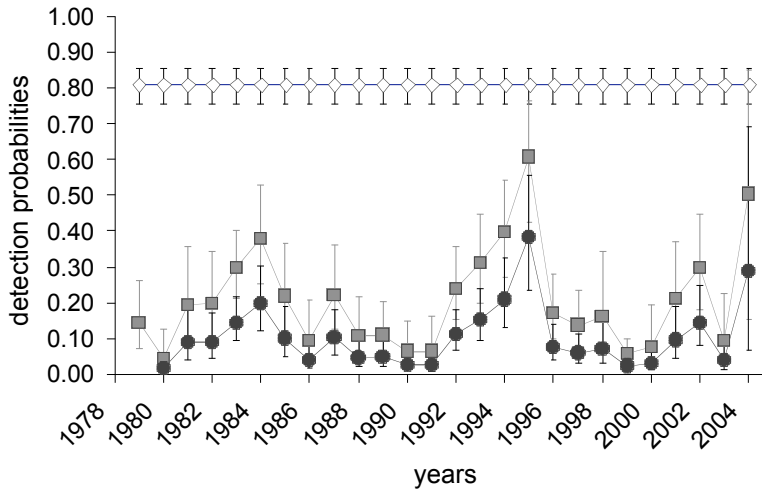
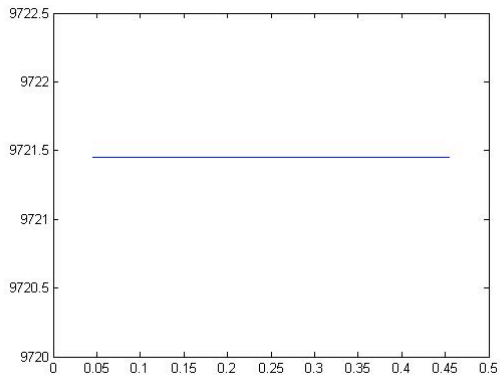


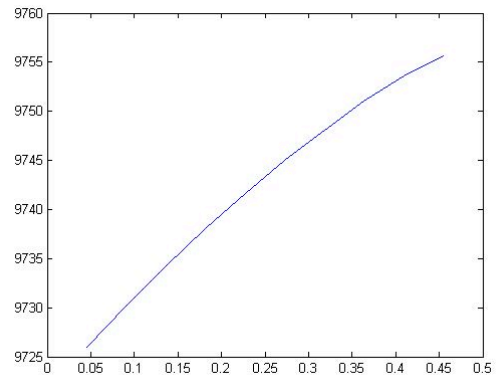
Fig. A1. Detection probability variations of the adult Cory's shearwater breeding at Lavezzi Island between 1978 and 2004. The diamonds denote detection probability of breeders, the grey square denote non-breeders captured on the previous occasion and the black dots denote non-breeders not captured on the previous occasion (trap happy effect, Results). The average estimations come from the two best models  $\{S^{a2+r}, p^{NB+m}, p^B, \Psi^{rs}\}$  and  $\{S^{a2+}, p^{NB+m}, p^B, \Psi^{rs}\}$  and error bars represent the 95% CI.

(a)

Transitions for non breeders, year 1978



Transitions for non breeders, year 1998



(b)

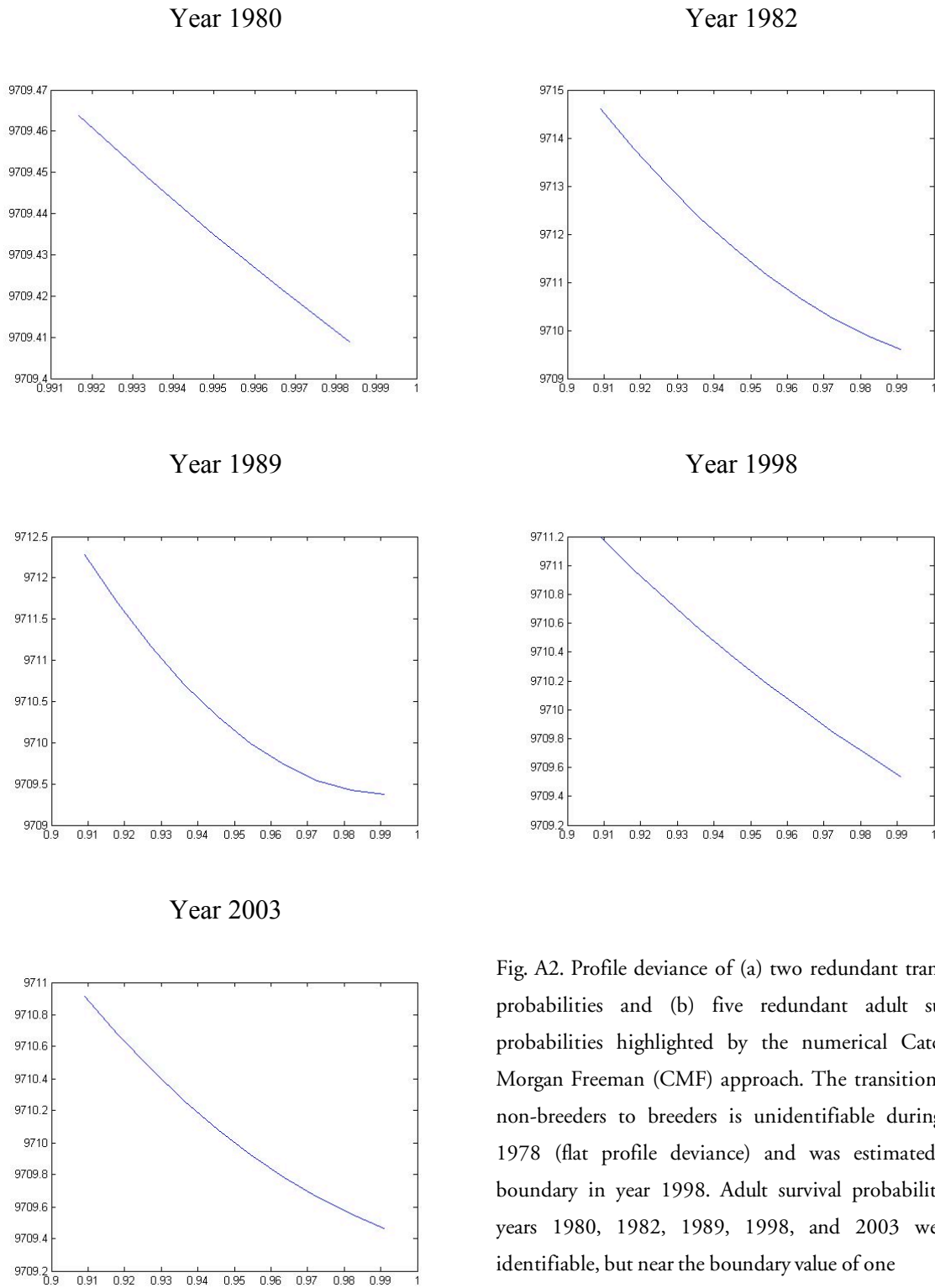


Fig. A2. Profile deviance of (a) two redundant transition probabilities and (b) five redundant adult survival probabilities highlighted by the numerical Catchpole Morgan Freeman (CMF) approach. The transition from non-breeders to breeders is unidentifiable during year 1978 (flat profile deviance) and was estimated at a boundary in year 1998. Adult survival probabilities in years 1980, 1982, 1989, 1998, and 2003 were all identifiable, but near the boundary value of one

## Appendix B. Recruitment model with delayed maturity and propection

Table B1. Notation in the M-SURGE command language for the starting models and best models (highlighted in bold) for model G  $\{S^{r+}, p^s, \psi^{a11+rs}\}$ , and model R

$\{S^{r+}, p^{a11+PB+}, p^A, \psi^{a11+r}\}$ . State 1 refers to state C, state 2 refers to state PU, state 3 refers to state PB, and state 4 refers to state A.

Name	Detection probabilities	Survival probabilities	Transitions probabilities	Transitions pattern
$S^{r+}$	[to(3).a(3:26).t(4_26)]+	[f(1:4).t(10_26)+	[f(2).to(3,4).a(3_10, 11:26)]+	1 0 1 1
$p^s$	[to(4).a(4:26).t(5_26)]+	f(2 3, 4).t(10:26)]+	[f(3).to(2,4).a(4_10,11:26)]+	1 0 1 1
$\psi^{a11+rs}$	others	f(1).t(1_9)+	others	1 1 0 1
	Others fixed to 0	f(2 3 4).t(1:9)	Others fixed to 0	1 1 1 0
<b><math>S^{C, PU=PB, A}</math></b>	[to(3).a(3:26).t(4_26)]+	f(2 3 4).t(1:9)+	[f(2).to(3).a(3:26)+	
<b><math>\psi^{(qf(a7)+rPB, PU-A, qf(a7)+PB-A)}</math></b>	[to(4).a(4:26).t(5_26)]+	f(2 3,4).t(10:26)+	f(2).to(3).a(3_6,7:26)*x(1)+	
	others	f(1).t(1:26)	f(2).to(3).a(3_6,7:26)*x(2)]+	
			[f(3).to(2,4).a(4:26)+	
			f(3).to(2,4).a(4_6,7:26)*x(5)+	
			f(3).to(2,4).a(4_6,7:26)*x(6)]+	
			[f(2).to(4).a(3:26)]+	
			[f(2).to(3 4).a(3:26).t(1:9,10_26)	
			&f(3).to(2 4).a(4:26).t(1:9,10_26)]	
			+others	
			x(1) and x(5) are the covariate of age	
			x(2) and x(6) are the covariate of square age	

Name	Detection probabilities	Survival probabilities	Transitions probabilities	Transitions pattern
$S^{r+}$ $P^{a_{11}^{1+}PB+}$ $\Psi^{a_{11}^{1+}r}$	to(3).a(3:26).t(4_26)+ a(3_10,11:26)]+ to(4).a(4:26).t(5_26)+ others	[f(1:4).t(10_26)+ f(2 3, 4).t(10:26)]+ f(1).t(1_9)+ f(2 3 4).t(1:9)	f(3).to(4).a(4_10,11:26)+ f(2).to(3).a(3)+others	1 0 1 1 1 0 1 1 1 1 0 1 1 1 1 0
	Others fixed to 0		Others fixed to 0 f(2).to(3).a(3) fixed to 1	
$S^{C, PU=PB, A}$ $P^{qf(a9)^{PB+}}$ $\Psi^{qf(a9)^{r}}$	[to(3).a(3:26).t(4_26)+ to(3).t(4:26).a(3_8,9:26)*x(7)+ to(3).t(4:26).a(3_8,9:26)*x(8)+ to(3).t(4:26).a(3:26)]+ [to(4).a(4:26).t(5_26)]+others x(7) is the covariate of age x(8) is the covariate of square age	[f(2 3 4).t(1:9)+ f(2 3, 4).t(10:26)]+ [f(1).t(1:26)]	[f(3).to(4).a(4:26).[a(4:26)+a(4_8,9:26)*x(3)+ a(4_8,9:26)*x(4)]]+ [f(2).to(3).a(3)]+others  x(3) is the covariate of age x(4) is the covariate of square age	

Table B2. Model selection for (a) models G and (b) model R. Multi-state capture–recapture models include three kinds of state-specific parameters: recapture probability  $P_{\tau}^s$ , survival probability;  $S_{\tau}^i$ , and conditional transition probability;  $\Psi_{\tau}^{s_i}$ . The superscripts of transition probabilities are always two, with the first denoting the state of departure and the second denoting the state of arrival (Pradel 2003). Superscripts of re-sighting and survival probabilities are single, except for the JollyMoVe (JMV) model (Brownie et al. 1993) where re-sighting probabilities depend both on the current and previous state. K refers to the number of parameters, dev to the deviance of the model and QAIC to Akaike information criterion (AIC) corrected for the effective sample size and overdispersion coefficient (here equal to 1, see GOF).

a) Models G

1. Modeling the age structure of the pre-breeder life cycle	Number and description of the model	k	dev	QAIC
Full age model: age class from 1 to 11+	G1. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rs}$	108	4220.07	4436.07
Selection of the age structure for transitions from states PU or PB to A				
age class from 1 to 10+	G2. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{a10*rA}$	106	4223.88	4435.88
age class from 1 to 9+	G3. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{a9*rA}$	104	4227.09	4435.09
age class from 1 to 8+	G4. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{a8*rA}$	102	4227.97	4431.97
age class from 1 to 7+	G5. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{a7*rA}$	100	4428.63	4628.63
age class from 1 to 6+	G6. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{a6*rA}$	98	4230.59	4426.59
age class from 1 to 5+	G7. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{a5*rA}$	96	4234.94	4426.94
age class from 1 to 4+	G8. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{a4*rA}$	94	4238.52	4426.52
simple age class	G9. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a11*rPB}, \Psi^{rA}$	93	4242.15	4428.15
Selection of the age structure for transitions from state PU or PB to PB, with no age effect on transitions from states PU or PB to A				
age class from 1 to 10+	G10. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a10*rPB}, \Psi^{rA}$	91	4244.18	4426.18
age class from 1 to 9+	G11. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a9*rPB}, \Psi^{rA}$	89	4245.41	4423.41
age class from 1 to 8+	G12. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a8*rPB}, \Psi^{rA}$	87	4248.12	4422.12
age class from 1 to 7+	G13. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a7*rPB}, \Psi^{rA}$	85	4248.48	4418.48
age class from 1 to 6+	G14. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a6*rPB}, \Psi^{rA}$	83	4262.65	4428.65
age class from 1 to 5+	G15. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a5*rPB}, \Psi^{rA}$	81	4289.17	4451.17
age class from 1 to 4+	G16. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{a4*rPB}, \Psi^{rA}$	79	4298.70	4456.70
simple age class	G17. $S_{\tau}^{r+}, p_{\tau}^s, \Psi^{rPB}, \Psi^{rA}$	78	4371.38	4527.38

Testing an age effect according to state of departure	Number and description of the model	k	dev
Age class from 1 to 7+ on $\Psi$ from PU or PB to PB, from PB to A	G18. $S_{t,t}^{r+}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{a7*PB-A}$	88	4241.36
Modeling a quadratic effect of age on transitions			
Quadratic function of age for 1 to 7+ age class on $\Psi$ from PU or PB to PB	G19. $S_{t,t}^{r+}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{rA}$	82	4250.86
<b>Quadratic function of age for 1 to 7+ age class on <math>\Psi</math> from PU or PB to PB, and <math>\Psi</math> from PB to A</b>	<b>G20. <math>S_{t,t}^{r+}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}</math></b>	<b>84</b>	<b>4242.17</b>

2. Modeling detection probabilities	Number and description of the model	k	dev	QAIC
Additive age effect for PB with seven age classes according to time	G21. $S_{t,t}^{r+}, p_{t,t}^{PB:a7+}, p_{t,t}^A, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	89	4247.62	4425.62
Additive effect of state	G22. $S_{t,t}^{r+}, p_{t,t}^{s+}, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	64	4341.92	4469.92
Constant detection probability for A	G23. $S_{t,t}^{r+}, p_{t,t}^{PB}, p_{t,t}^A, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	63	4330.94	4456.94
Constant detection probability for PB	G24. $S_{t,t}^{r+}, p_{t,t}^{PB}, p_{t,t}^A, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	62	4352.79	4476.79
<b>3. Modeling survival probabilities</b>				
Time effect for each state with PB = PU constraint	G25. $S_{t,t}^r, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	113	4200.63	4426.63
Additive time effect only for PB = PU and A	G26. $S_{t,t}^{CH}, S_{t,t}^{PU=PB,A+}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	100	4221.75	4421.75
Time effect for C, constant survival for PB = PU and A	G27. $S_{t,t}^{CH}, S_{t,t}^{PU=PB,A}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	82	4243.25	4407.25
Constant survival for C and PB = PU and A	G28. $S_{t,t}^{CH, PU=PB,A}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	59	4278.79	4396.79
Constant survival for C and PB = PU = A	G29. $S_{t,t}^{CH, PU=PB=A}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	58	4283.51	4399.51
Constant survival for C and A and age effect with seven age classes on PB = PU	G30. $S_{t,t}^{CH, PU=PB*a7,A}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	67	4269.99	4412.20
<b>4. Modeling transition probabilities</b>				
Additive time effect according to state and age for $\Psi$ from state PU or PB to PB	G31. $S_{t,t}^{CH, PU=PB,A}, p_{t,t}^s, \Psi^{(qf(a7)*rPB, PU-A, qf(a7)*PB-A)+}$	76	4237.80	<b>4389.80</b>
Additive time effect according to state and age for $\Psi$ from state PU or PB to PB, except for $\Psi$ from PU to A modeled as constant.	G32. $S_{t,t}^{CH, PU=PB,A}, p_{t,t}^s, \Psi^{qf(a7)*rPB}, \Psi^{PU-A}, \Psi^{qf(a7)*PB-A}$	110	4194.70	4414.70
Additive time according to state of departure and age for $\Psi$ from state PU or PB to PB	G33. $S_{t,t}^{CH, PU=PB,A}, p_{t,t}^s, \Psi^{qf(a7)*rPB, r+A}$	93	4234.19	4420.19
Additive time effect according to state of arrival and age for transitions from state PU or PB to PB	G34. $S_{t,t}^{CH, PU=PB,A}, p_{t,t}^s, \Psi^{qf(a7)*rPB+ rA+}$	93	4234.81	4420.81

## (b) Models R

1. Modeling the age structure of the pre-breeder life cycle	Number and description of the model	k	dev	QAIC
Full age model: age class from 1 to 11+	R1. $S^{r+}, p^{a11*PB+}, P^A, \Psi^{a11*r}$	91	4273.26	4455.26
age class from 1 to 10+	R2. $S^{r+}, p^{a10*PB+}, P^A, \Psi^{a10*r}$	89	4275.59	4453.59
age class from 1 to 9+	R3. $S^{r+}, p^{a9*PB+}, P^A, \Psi^{a9*r}$	87	4278.63	4452.63
age class from 1 to 8+	R4. $S^{r+}, p^{a8*PB+}, P^A, \Psi^{a8*r}$	85	4292.45	4462.45
age class from 1 to 7+	R5. $S^{r+}, p^{a7*PB+}, P^A, \Psi^{a7*r}$	83	4304.46	4470.46
age class from 1 to 6+	R6. $S^{r+}, p^{a6*PB+}, P^A, \Psi^{a6*r}$	81	4329.54	4491.54
Quadratic function of age for 1 to 9+ age class	R7. $S^{r+}, p^{a9*PB+}, P^A, \Psi^{qf(a9)*r}$	84	4279.17	4447.17
<b>2. Modeling detection probabilities</b>				
Additive effect of state	R8. $S^{r+}, p^{a9*PB, A+}, \Psi^{qf(a9)*r}$	64	4373.77	4501.77
Constant detection probability for A	R9. $S^{r+}, p^{a9*PB+}, P^A, \Psi^{qf(a9)*r}$	63	4446.37	4572.37
Constant detection probability for PB	R10. $S^{r+}, p^{a9*PB}, P^A, \Psi^{qf(a9)*r}$	61	4400.14	4522.14
No age effect on PB	R11. $S^{r+}, p^s, \Psi^{qf(a9)*r}$	77	4455.66	4609.66
Quadratic function of age for 1 to 9+ age class	R12. $S^{r+}, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)*r}$	79	4285.45	4443.45
<b>3. Modeling survival probabilities</b>				
Time effect for each state with PB=PU constraint	R13. $S^r, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)*r}$	109	4241.38	4459.38
Additive time effect only for PB=PU and A	R14. $S^{CH}, S^{PU=PB, A+}, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)*r}$	93	4256.12	4442.12
Time effect for C, constant survival for PB=PU and A	R15. $S^{CH}, S^{PU=PB, A}, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)*r}$	77	4283.41	4437.41
Constant survival for C and PB=PU and A	<b>R16. <math>S^{CH, PU=PB, A}, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)*r}</math></b>	<b>54</b>	<b>4318.62</b>	<b>4426.62</b>
Constant survival for C and PB=PU=A	R17. $S^{CH, PU=PB=A}, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)*r}$	53	4323.22	4429.22
Constant survival for C and A and age effect with nine age classes on PB = PU	R18. $S^{CH, PU=PB*a7, A}, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)*r}$	61	4311.40	4433.40
<b>4. Modeling transition probabilities</b>				
Additive time effect according to age	R9. $S^{CH, PU=PB, A}, p^{qf(a9)*PB+}, P^A, \Psi^{qf(a9)+r+}$	71	4288.62	4430.62