

Supplementary material

Appendix 1

Table A1. Results of testing between-season and within-season partner change by using approach of the sequential simplification of each parameter at the time with the proposed models of multievent models (MECMR) to obtain the best structure of recapture (p) survival (ϕ) and pair fidelity parameters (ψ) of male Blackbirds (*Turdus merula*). The best models are bolded.

Model terms for males											
	p	ϕ -within	ϕ -between	ψ -within	ψ -between	k	dev	QAICc	Δ_i	w_i	
I step for p	s	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	245	5814.26	5403.74	0.00	1.00	
	s+t					275	5772.16	5447.93	44.19	0.00	
	w + b					245	5876.62	5455.71	51.97	0.00	
	t					272	5806.86	5468.80	65.06	0.00	
	.					244	6054.83	5601.63	197.88	0.00	
II step for survival ϕ	s	s*w	(s*ad+s*nad)*t _b	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	203	5679.84	5185.19	0.00	1.00	
		s*w+t _w				221	5638.92	5196.13	10.95	0.00	
		w				202	5733.02	5227.03	41.84	0.00	
		t _w				220	5693.60	5239.17	53.99	0.00	
		s*t _w				238	5638.52	5239.19	54.00	0.00	
		(s*ad+imm)*w				204	5844.00	5324.46	139.28	0.00	
		(s+imm)*w				203	5868.30	5342.24	157.06	0.00	
		(ad+imm)*t _w				227	5839.48	5378.48	193.30	0.00	
		(s*ad+imm)*t _w				245	5814.26	5403.74	218.56	0.00	
		s	s*w	s*b	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	137	5794.85	5123.30	0.00	0.64
				(ad+s*nad)*w			138	5795.70	5126.31	3.01	0.14
				(s*ad+s*nad)*w			138	5795.70	5126.31	3.02	0.14
				(s*ad+nad)w			138	5799.04	5129.09	5.79	0.04
			w			136	5805.08	5129.51	6.21	0.03	
			t _b			153	5760.42	5131.81	8.51	0.01	
			s*t _b			171	5727.74	5147.21	23.91	0.00	
			(ad+nad)*t _b			170	5738.22	5153.55	30.25	0.00	
			(s*ad+nad)*t _b			170	5739.07	5154.26	30.96	0.00	
			(ad+s*nad)*t _b			167	5749.34	5155.66	32.36	0.00	
			s*b+t _b			153	5802.34	5166.75	43.45	0.00	
			(s*ad+s*nad)*t _b			185	5714.81	5170.18	46.88	0.00	
III step for transition ψ	s	s*w	s*b	s*w	(s*ad+s*nad)*t _b	84	5688.96	4916.23	0.00	0.68	
				w		83	5693.63	4917.95	1.71	0.29	
				s*w+t _w		102	5648.46	4922.10	5.87	0.04	
				t _w		101	5658.37	4928.13	11.90	0.00	
				s*t _w		119	5630.73	4945.42	29.19	0.00	
				(s*ad+imm)*w		85	5880.69	5078.19	161.96	0.00	
				(ad+imm)*w		84	5885.88	5080.34	164.11	0.00	
				(ad+imm)*t _w		119	5816.82	5100.50	184.27	0.00	
				(s*ad+imm)*t _w		137	5794.85	5123.30	207.06	0.00	
		s	s*w	s*b	s*w	(s*ad+nad)*b	18	5766.68	4841.91	0.00	0.28
					s*w	(s*ad+s*nad)*b	19	5764.99	4842.54	0.63	0.20
					w	(s*ad+nad)*b	17	5770.70	4843.22	1.31	0.15

s*w	s*b	17	5771.06	4843.53	1.62	0.12
w	s*ad+s*nad	18	5769.15	4843.97	2.06	0.10
w	s*b	16	5775.41	4845.11	3.20	0.06
s*w	(ad+s*nad)*b	18	5770.86	4845.39	3.48	0.05
w	(ad+s*nad)*b	17	5774.73	4846.59	4.68	0.03
s*w	b	16	5780.93	4849.72	7.81	0.01
w	b	15	5784.76	4850.87	8.97	0.00
s*w	s*b+t _b	34	5738.90	4851.63	9.72	0.00
w	s*b+t _b	33	5743.33	4853.25	11.34	0.00
s*w	t _b	33	5749.61	4858.48	16.57	0.00
w	t _b	32	5753.51	4859.67	17.76	0.00
s*w	s*t _b	51	5721.07	4872.28	30.37	0.00
w	s*t _b	50	5724.99	4873.43	31.52	0.00
s*w	(ad+nad)*t _b	50	5731.69	4879.02	37.11	0.00
w	(ad+nad)*t _b	49	5735.57	4880.15	38.24	0.00
s*w	(s*ad+nad)*t _b	68	5702.87	4893.24	51.33	0.00
w	(s*ad+nad)*t _b	67	5707.11	4894.63	52.72	0.00
s*w	(ad+s*nad)*t _b	66	5717.80	4901.40	59.49	0.00
w	(ad+s*nad)*t _b	65	5722.11	4902.85	60.94	0.00
s*w	(s*ad+s*nad)*t _b	84	5688.96	4916.23	74.33	0.00
w	(s*ad+s*nad)*t _b	83	5693.63	4917.95	76.04	0.00

. – constant parameter, s – state of bird, ad – adult birds older than 3, imm – immature birds at age 2 when breeding for the first time in the first part of the breeding season, nad – immature birds at age 2 when breeding for the first time in the second part of the breeding season, t – time parameters, but in case of survival and fidelity parameters to distinguish the within-season time from between-season time we constrained parameters for first part of the breeding season by using syntax $t_w = t(1, 3, 5, 7, \dots, 37)$ and for second part of season by syntax $t_b = t(2, 4, 6, 8, \dots, 36)$, w – constant time parameter for within-season, b – constant time parameter for between-season, k – number of parameters estimated, dev – deviance, QAICc – Akaike Information Criterion for a smaller sample size.

Table A2. Results of testing between-season and within-season partner change effect by using approach of the sequential simplification of each parameter at the time with the proposed models of multi-event models (MECMR) to obtain the best structure of recapture (p) survival (ϕ) and pair fidelity parameters (ψ) of female Blackbirds (*Turdus merula*)

Model terms for females										
	p	ϕ -within	ϕ -between	ψ -within	ψ -between	k	dev	QAICc	Δ_i	w_i
I step for p	s	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	248	6214.03	4016.17	0.00	1.00
	w+b					248	6257.58	4040.37	24.20	0.00
	s+t					280	6174.38	4078.32	62.15	0.00
	t					277	6209.92	4090.05	73.87	0.00
	.					247	6509.72	4177.86	161.69	0.00
II step for survival ϕ	s	s*w	(s*ad+s*nad)*t _b	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	204	6168.49	3879.86	0.00	1.00
		s*w+t _w				222	6129.00	3902.69	22.83	0.00
		w				203	6239.70	3916.96	37.10	0.00
		(s*ad+imm)*w				205	6250.50	3927.88	48.02	0.00
		t _w				221	6202.56	3941.05	61.19	0.00
		(ad+imm)*w				204	6285.67	3944.96	65.10	0.00
		s*t _w				239	6128.91	3945.74	65.88	0.00
		(ad+imm)*w				234	6248.17	3999.24	119.38	0.00
		(s*ad+imm)*t				248	6214.11	4016.22	136.36	0.00
		s	s*w	s*b	(s*ad+imm)*t _w	(s*ad+s*nad)*t _b	139	6264.63	3778.55	0.00
			(ad+s*nadult)*b			140	6266.48	3781.87	3.33	0.11
			(s*ad+s*nadult)*b			141	6262.33	3781.88	3.33	0.11
			b			138	6275.22	3782.13	3.59	0.10
			(s*ad+nadult)*b			140	6266.98	3782.16	3.61	0.10
			s*b+t _b			156	6228.57	3797.96	19.42	0.00
			t _b			155	6239.98	3801.96	23.42	0.00
			s*t _b			173	6204.41	3824.70	46.15	0.00
			(ad+nad)*t _b			171	6219.72	3828.44	49.89	0.00
			(ad+s*nadult)*t _b			186	6199.86	3853.37	74.82	0.00
			(s*ad+nadult)*t _b			189	6188.33	3854.23	75.68	0.00
			(s*ad+s*nadult)*t _b			204	6168.10	3879.64	101.10	0.00
III step for transition ψ	s	s*w	s*b	w	(s*ad+s*nad)*t _b	85	6147.87	3592.87	0.00	0.71
				s*w		86	6147.25	3594.70	1.83	0.29
				t _w		103	6118.10	3615.86	22.99	0.00
				s*w+t _w		104	6118.01	3618.03	25.16	0.00
				s*t _w		121	6099.86	3645.99	53.12	0.00
				(ad+imm)*w		86	6346.69	3705.49	112.63	0.00
				(s*ad+imm)*w		87	6343.03	3705.64	112.78	0.00
				(ad+imm)*t _w		121	6289.30	3751.23	158.37	0.00
				(s*ad+imm)*t _w		139	6264.63	3778.55	185.68	0.00
III	s	s*w	s*b	w	(s*ad+nad)*b	17	6225.05	3492.66	0.00	0.45
				s*w	(s*ad+nad)*b	18	6224.85	3494.58	1.92	0.17
				w	(s*ad+s*nad)*b	18	6225.01	3494.67	2.01	0.16
				w	s*b	16	6234.78	3496.03	3.37	0.08

s*w	(s*ad+s*nad)*b	19	6224.80	3496.60	3.94	0.06
s*w	s*b	17	6234.54	3497.93	5.28	0.03
w	b	15	6243.44	3498.81	6.16	0.02
s*w	b	16	6243.09	3500.65	7.99	0.01
w	(ad+s*nad)*b	17	6241.25	3501.66	9.00	0.00
s*w	(ad+s*nad)*b	18	6240.89	3503.49	10.84	0.00
w	s*b+t _b	33	6200.37	3511.75	19.09	0.00
s*w	s*b+t _b	34	6200.13	3513.69	21.03	0.00
w	t _b	32	6209.17	3514.57	21.92	0.00
s*w	t _b	33	6208.82	3516.45	23.79	0.00
w	s*t _b	50	6184.15	3538.17	45.51	0.00
w	(ad+nad)*t _b	50	6184.16	3538.18	45.52	0.00
s*w	(ad+nad)*t _b	51	6183.64	3539.99	47.33	0.00
s*w	s*t _b	51	6183.69	3540.01	47.36	0.00
w	(s*ad+nad)*t _b	68	6160.75	3563.33	70.68	0.00
s*w	(s*ad+nad)*t _b	69	6160.42	3565.29	72.63	0.00
w	(ad+s*nad)*t _b	67	6171.33	3567.07	74.41	0.00
s*w	(ad+s*nad)*t _b	68	6170.41	3568.70	76.04	0.00
w	(s*ad+s*nad)*t _b	85	6147.87	3592.87	100.21	0.00
s*w	(s*ad+s*nad)*t _b	86	6147.24	3594.69	102.03	0.00

. – constant parameter, s – state of bird, ad – adult birds older than 3, imm – immature birds at age 2 when breeding for the first time in the first part of the breeding season, nad – immature birds at age 2 when breeding for the first time in the second part of the breeding season, t – time parameters, but in case of survival and fidelity parameters to distinguish the within-season time from between-season time we constrained parameters for first part of the breeding season by using syntax $t_w = t(1, 3, 5, 7, \dots, 37)$ and for second part of season by syntax $t_b = t(2, 4, 6, 8, \dots, 36)$, w – constant time parameter for within-season, b – constant time parameter for between-season, k – number of parameters estimated, dev – deviance, QAICc – Akaike Information Criterion for a smaller sample size.