MULTI–STATE CAPTURE–RECAPTURE MODELS FOR IRREGULARLY SAMPLED DATA

Supplement to 'Multi–state capture–recapture models for irregularly sampled data'

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Section A: Additional information on the results in the case study

Table A1: Estimates and 95% confidence intervals obtained in the case study on bottlenose dolphins. The model parameters are the transition intensities $\beta_{jk0}^{(z)}$, $\beta_{jk1}^{(z)}$, and $\beta_{jk2}^{(z)}$ for $j, k = 1, 2$ and $j \neq k$ (with $z = 0$ for females and $z = 1$ for males), the intercept β_{30} and difference β_{31} in mortality rates and the detection probabilities p_1 and p_2 for SAC and T&F, respectively.

	$\beta_{120}^{(0)}$	$\beta_{121}^{(0)}$	$\beta_{122}^{(0)}$	$\beta_{210}^{(0)}$	$\beta_{211}^{(0)}$	$\beta_{212}^{(0)}$
estimate	-6.843	-0.799	-0.738	-7.482	-0.296	-2.198
95% CI	[-7.07; -6.62]	[-1.11; -0.49]	[-1.01; -0.47]	[-7.83; -7.14]	[-0.58; -0.02]	[-2.64; -1.76]
	$\beta_{120}^{(1)}$	$\beta_{121}^{(1)}$	$\beta_{122}^{(1)}$	$\beta_{210}^{(1)}$	$\beta_{211}^{(1)}$	$\beta_{212}^{(1)}$
estimate	-6.929	-1.254	-0.952	-7.469	-0.200	-2.519
95% CI	[-7.26; -6.60]	[-1.64; -0.87]	[-1.28; -0.63]	[-7.88; -7.06]	[-0.49; 0.09]	[-3.02; -2.02]
	p_1	p_2	β_{30}	β_{31}		
estimate	0.203	0.187	-9.083	-0.071		
95% CI	[0.199; 0.208]	[0.179; 0.195]	[-9.34; -8.83]	[-0.45; 0.31]		

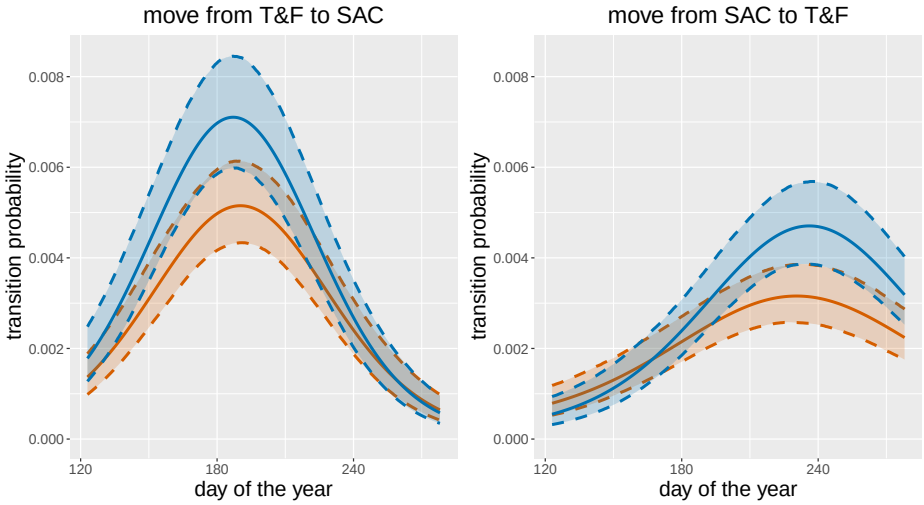

Figure A1: Estimated transition probabilities (mean and 95% CI) of the discrete-time model as a function of the covariate *day of the year* plotted for the period from May to October. Left plot shows the transition probabilities to move from T&F to SAC and right plot vice versa. Blue is for male bottlenose dolphins and orange for female ones. CIs for the transition probabilities were obtained based on Monte Carlo simulation from the estimators' approximate distribution as implied by maximum likelihood theory.

Section B: Additional information for the simulation experiments

Table A2: True and estimated parameter values in the simulation experiment for different interval lengths l used for the likelihood approximation. For $l \leq 8$ the estimated parameter values do not change anymore (up to third decimal).

Int. length	β_{120}	β_{121}	β_{122}	β_{210}	β_{211}	β_{212}	β_{30}	p_1	p_2
89	-6.658	-0.841	-0.113	-6.984	0.627	-0.346	-9.001	0.401	0.198
55	-6.666	-0.830	-0.179	-6.992	0.647	-0.359	-9.001	0.401	0.198
34	-6.662	-0.819	-0.169	-6.994	0.653	-0.361	-9.001	0.401	0.198
21	-6.664	-0.821	-0.176	-6.989	0.640	-0.354	-9.001	0.401	0.198
13	-6.663	-0.821	-0.171	-6.988	0.638	-0.351	-9.001	0.401	0.198
8	-6.662	-0.818	-0.172	-6.988	0.637	-0.350	-9.001	0.401	0.198
5	-6.662	-0.818	-0.172	-6.988	0.637	-0.350	-9.001	0.401	0.198
3	-6.662	-0.818	-0.172	-6.988	0.637	-0.350	-9.001	0.401	0.198
2	-6.662	-0.818	-0.172	-6.988	0.637	-0.350	-9.001	0.401	0.198
true values	-6.5	-0.7	-0.2	-7.0	0.7	-0.4	-9	0.4	0.2

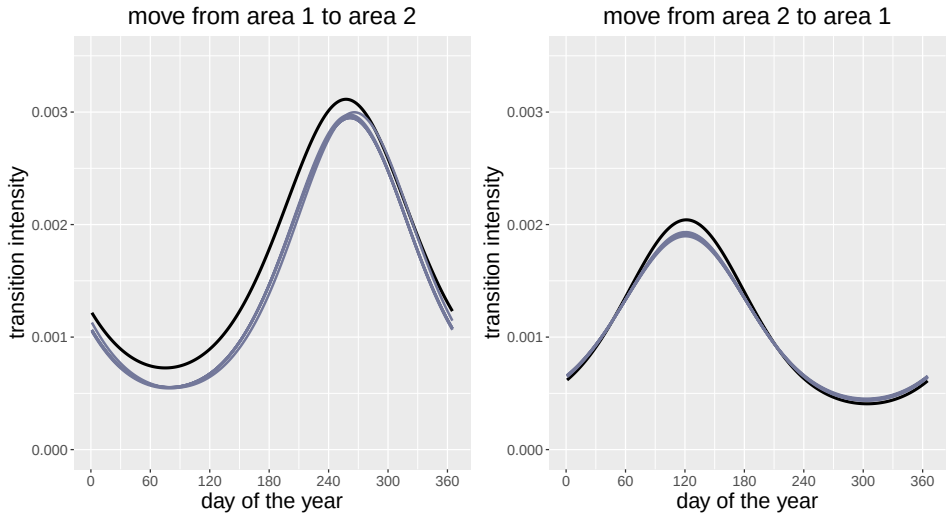

Figure A2: True (black) and estimated (coloured lines) transition intensities of the simulation experiment as a function of the covariate *day of the year*. The left plot shows the intensities to move from area 1 to area 2 and the right plot vice versa. The estimated intensities for different interval lengths used for the likelihood approximation are almost identical visually. The estimated coefficients underlying this figure are provided in Table A2.