

COUNTER-STRATEGIES TO INFANTICIDE: THE IMPORTANCE OF CUBS IN DETERMINING LION
HABITAT SELECTION AND SOCIAL INTERACTIONS

Appendix S3. Pride male-female association

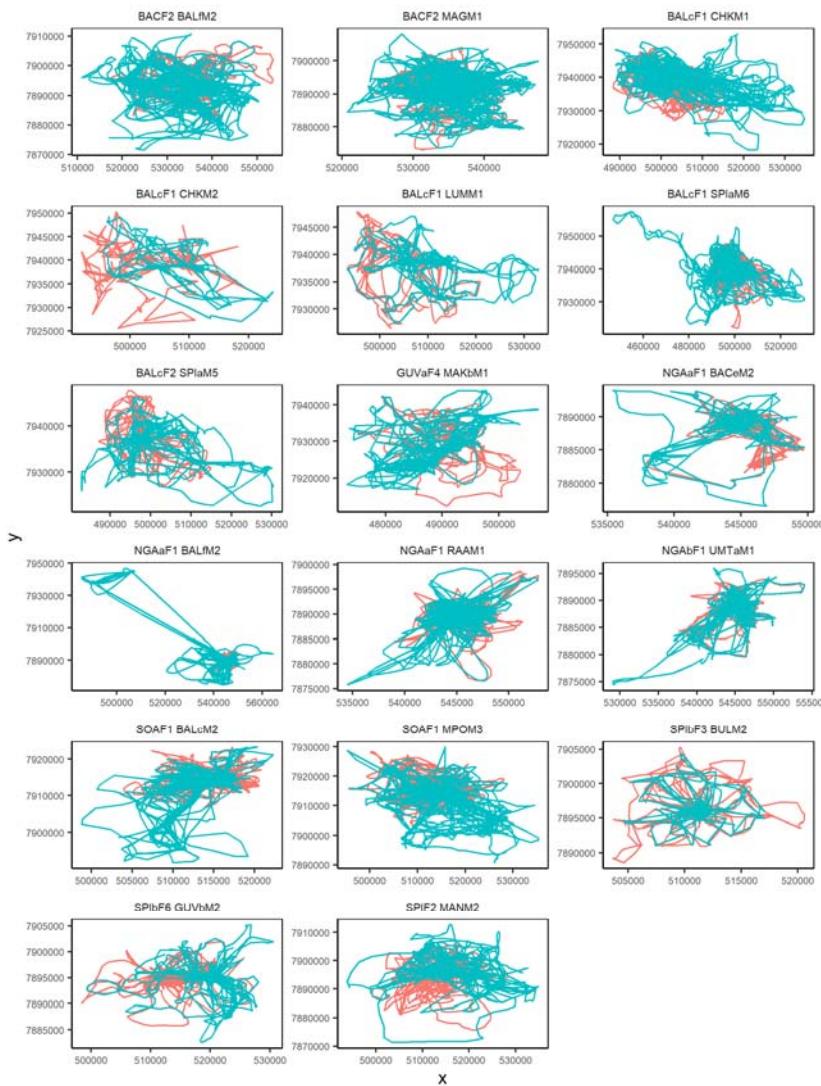


Figure S3.1. Locations and core home ranges of pride males (blue) and females (red), delineated from the 50% utilization distribution of a kernel-based home range estimate, using the *adehabitatHR* package (Calenge 2007). Similar overlaps between pride male and female home ranges were observed from the 90% utilization distribution of a kernel-based home range estimate.

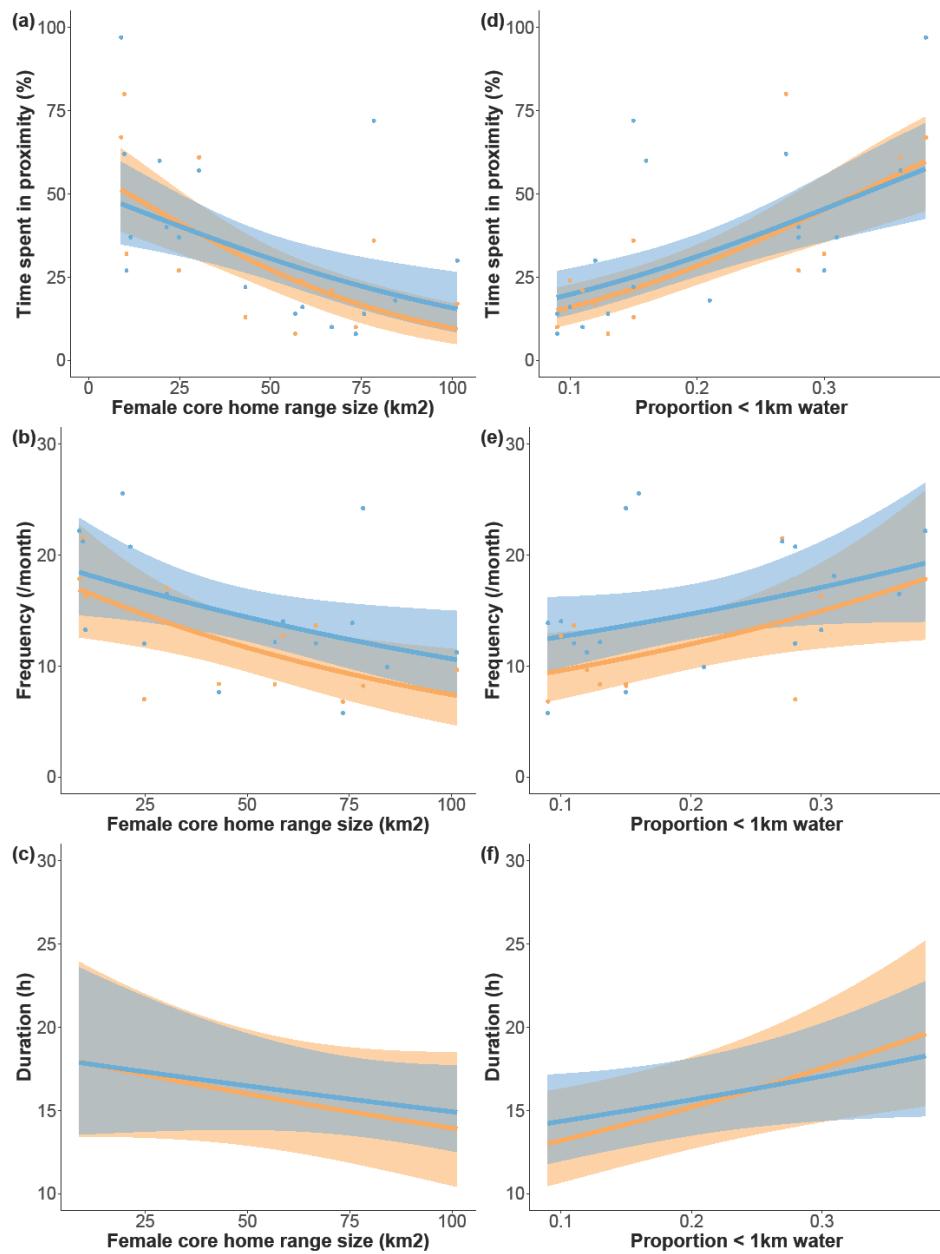


Figure S3.2 Temporal dynamic of pride male and female proximity events as a function to the size of the female core home range and to the proportion of habitats close to waterholes (i.e. <1km) within it, according to the presence (blue) and absence (orange) of cubs within the pride. We found high negative correlations between the mean habitat openness in the female home range with its size (Pearson correlation = -0.74; $p < 0.001$) and with the proportion of habitats close to waterholes (Pearson correlation = 0.85; $p < 0.001$).

Table S3.1. Coefficients (β) and standard errors (SE) for selection ratio model of lioness habitat selection for distance to water (WATER), open habitats (OPEN), and distance to the home range centroid (HR) accounting for the presence/absence of cubs within the pride (CUB ; without cub = 0, with cub = 1). Main effects estimate selection strength by females without cubs, and interaction terms estimate the additional effect on selection strength from having cubs in a pride. All continuous variables were scaled to compare their strength of selection.

Model – cubs < 12 months	β	SE	z-value	p-value
Intercept	-2,41	0,09	-27,75	<0.001
WATER	-0,20	0,01	-26,22	<0.001
OPEN	0,44	0,01	65,32	<0.001
HR	-0,27	0,01	-36,68	<0.001
CUB	-0,07	0,01	-6,63	<0.001
WATER x CUB	0,05	0,01	5,00	<0.001
OPEN x CUB	-0,06	0,01	-6,47	<0.001
HR x CUB	-0,34	0,01	-33,95	<0.001

Table S3.2 Coefficients (β) and standard errors (SE) for selection ratio models of pride male habitat selection for distance to water (WATER), open habitats (OPEN), and distance to the home range centroid (HR) accounting for the presence/absence of cubs within the pride (CUB ; without cub = 0, with cub = 1) and for the presence/absence of females in proximity (FEM ; without female = 0, with female = 1). Main effects estimate selection strength by pride males without cubs but with females in proximity, and interaction terms estimate the additional effect on selection strength from having cubs in a pride. All continuous variables were scaled to compare their strength of selection.

Model – cubs < 12 months	β	SE	z-value	p-value
(Intercept)	-2,98	0,18	-16,61	<0.001
WATER	-0,66	0,05	-12,31	<0.001
OPEN	0,62	0,04	15,87	<0.001
HR	-0,92	0,06	-15,77	<0.001
(FEM & CUB)	0,08	0,07	1,21	0.23
(no FEM & no CUB)	0,36	0,06	6,39	<0.001
(no FEM & CUB)	0,39	0,06	6,80	<0.001
WATER x (FEM & CUB)	0,04	0,06	0,64	0.52
WATER x (no FEM & no CUB)	0,46	0,06	7,84	<0.01
WATER x (no FEM & CUB)	0,18	0,06	3,12	<0.001
OPEN x (FEM & CUB)	-0,22	0,05	-4,87	<0.001
OPEN x (no FEM & no CUB)	0,08	0,04	1,86	0.06
OPEN x (no FEM & CUB)	-0,07	0,04	-1,60	0.11
HR x (FEM & CUB)	-0,05	0,07	-0,69	0.49
HR x (no FEM & no CUB)	0,41	0,06	6,65	<0.001
HR x (no FEM & CUB)	0,59	0,06	9,69	<0.001

Table S3.3. Coefficients (β) and standard errors (SE) for the GLMMs testing the influence of the mean habitat openness (OPEN) and the presence of cubs (CUB) on (a) the percentage of time pride males spent in proximity with pride females, (b) the frequencies and (c) the duration of male-female proximity events.

Model – cubs < 12 months	β	SE	z-value	p-value
(a) Percentage of time spent in proximity – logistic regression				
(Intercept)	-0,80	0,16	-4,92	<0.001
CUB	0,11	0,02	4,61	<0.001
OPEN	0,62	0,15	4,04	<0.001
CUB x OPEN	-0,14	0,02	-6,19	<0.001
(b) Frequency of proximity events – Poisson regression				
(Intercept)	2,49	0,10	24,85	<0.001
CUB	0,20	0,11	1,87	0.06
OPEN	0,26	0,10	2,73	<0.01
CUB x OPEN	-0,12	0,10	-1,18	0.24
(c) Duration of proximity events – negative binomial regression				
(Intercept)	2,86	0,07	42,44	<0.001
CUB	0,02	0,06	0,24	0.81
OPEN	0,08	0,05	1,47	0.14
CUB x OPEN	-0,02	0,06	-0,32	0.75