

**Online Supplementary Material**

Table S1: Estimated activity space a) 50%; b) 95% Utilisation distribution (UD) of southern eagle rays (*Myliobatis tenuicaudatus*) and c) residency time level coefficients ( $\beta$ ) their standard errors (SE) and t-values of factors that were included in the top-ranked model (indicated for each variable).

Level	$\beta$	SE	t
<b>(a) UD_50 ~ Month</b>			
Intercept (January)	5.44	0.45	11.98
February	0.61	0.86	0.72
March	-2.81	1.04	-2.70
April	0.31	0.90	0.34
May	0.42	1.01	0.42
August	1.48	0.95	1.56
September	-0.02	0.99	-0.02
October	-0.43	1.02	-0.42
November	0.09	1.01	0.09
December	-1.45	1.29	-1.12
<b>(b) UD_95 ~ Month + Sex</b>			
Intercept (January   Female)	27.42	2.99	9.16
February	-0.92	3.73	-0.25
March	-22.15	4.54	-4.88
April	4.21	3.87	1.09
May	6.95	4.38	1.59
August	5.02	4.11	1.22
September	-4.39	4.31	-1.02
October	2.33	4.41	0.53
November	1.67	4.37	0.38
December	-14.90	5.63	-2.65
Male	-3.63	6.78	-0.54
<b>(c) Residency Time ~ Month + Area + Month : Area</b>			
Intercept (Brothers)	0.02	1.09	0.02
January	-0.01	1.58	-0.01
February	0.00	1.54	0.00
March	-0.00	1.54	0.00
April	-0.01	1.56	-0.01
May	0.01	1.58	0.01
June	-0.01	1.58	-0.01
July	-0.01	1.58	-0.01
August	-0.01	1.58	-0.01
September	0.02	1.58	0.01
October	-0.01	1.58	-0.01
November	-0.01	1.58	-0.01
December	-0.01	1.58	-0.01
Dutton	0.22	1.54	0.15
Kellidie	3.53	1.33	2.65
Long	3.71	1.54	2.41
Little Douglas	0.07	1.54	0.05
January : Dutton	-0.02	2.23	-0.01
February : Dutton	1.01	2.18	0.47

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March : Dutton	0.02	2.18	0.01
April : Dutton	0.00	2.20	0.00
May : Dutton	0.11	2.23	0.05
June : Dutton	-0.22	2.23	-0.10
July : Dutton	-0.22	2.23	-0.10
August : Dutton	-0.22	2.23	-0.10
September : Dutton	0.56	2.23	0.25
October : Dutton	1.54	2.23	0.69
November : Dutton	1.18	2.23	0.53
December : Dutton	-0.02	2.23	-0.01
January : Kellidie	-2.65	1.93	-1.37
February : Kellidie	3.91	1.88	2.08
March : Kellidie	3.95	1.88	2.10
April : Kellidie	2.09	1.91	1.10
May : Kellidie	-2.88	1.93	-1.49
June : Kellidie	-3.53	1.93	-1.83
July : Kellidie	-3.53	1.93	-1.83
August : Kellidie	-3.09	1.93	-1.60
September : Kellidie	1.31	1.93	0.68
October : Kellidie	7.26	1.93	3.76
November : Kellidie	7.02	1.93	3.64
December : Kellidie	5.43	1.93	2.81
January : Long	-3.57	2.23	-1.60
February : Long	3.38	2.18	1.55
March : Long	1.26	2.18	0.58
April : Long	-0.84	2.20	-0.38
May : Long	-2.71	2.23	-1.22
June : Long	-3.71	2.23	-1.66
July : Long	-3.71	2.23	-1.66
August : Long	-2.61	2.23	-1.17
September : Long	0.45	2.23	0.20
October : Long	-2.39	2.23	-1.07
November : Long	-3.06	2.23	-1.37
December : Long	-0.80	2.23	-0.36
September : Long	0.45	2.23	0.20
January : Little Douglas	-0.07	2.23	-0.03
February : Little Douglas	-0.04	2.18	-0.02
March : Long	1.26	2.18	0.59
April : Little Douglas	1.80	2.20	0.82
May : Little Douglas	0.69	2.23	0.31
June : Long	-3.71	2.23	-1.66
July : Long	-3.71	2.23	-1.66
August : Little Douglas	0.00	2.23	0.00
September : Little Douglas	-0.05	2.23	-0.02
October : Little Douglas	0.12	2.23	0.05
November : Little Douglas	-0.07	2.23	-0.03
December : Little Douglas	-0.08	2.23	-0.03

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Table S2: Estimated presence of southern eagle rays (*Myliobatis tenuicaudatus*) level coefficients ( $\beta$ ) their standard errors (SE) and z-values of factors that were included in the top-ranked model (indicated for each variable).

Level	$\beta$	SE	z
<b>Presence ~ Area : Tide + Hour : Area + Moon Phase</b>			
Intercept (New Moon)	-0.32	0.06	-5.79
First Half Moon	-0.17	0.04	-3.93
Full Moon	-0.32	0.04	-7.17
Last Half Moon	-0.23	0.04	-5.21
Brothers : Tide	-5.06	0.28	-17.89
Dutton : Tide	-2.90	0.13	-21.62
Kellidie : Tide	1.64	0.08	20.37
Long : Tide	-0.91	0.08	-11.67
Little Douglas : Tide	-3.48	0.16	-21.24
Brothers : Hour	-0.15	0.01	-11.38
Dutton : Hour	-0.06	0.01	-11.49
Kellidie : Hour	0.06	0.00	18.94
Long : Hour	-0.01	0.00	-3.50
Little Douglas : Hour	-0.09	0.01	-12.50

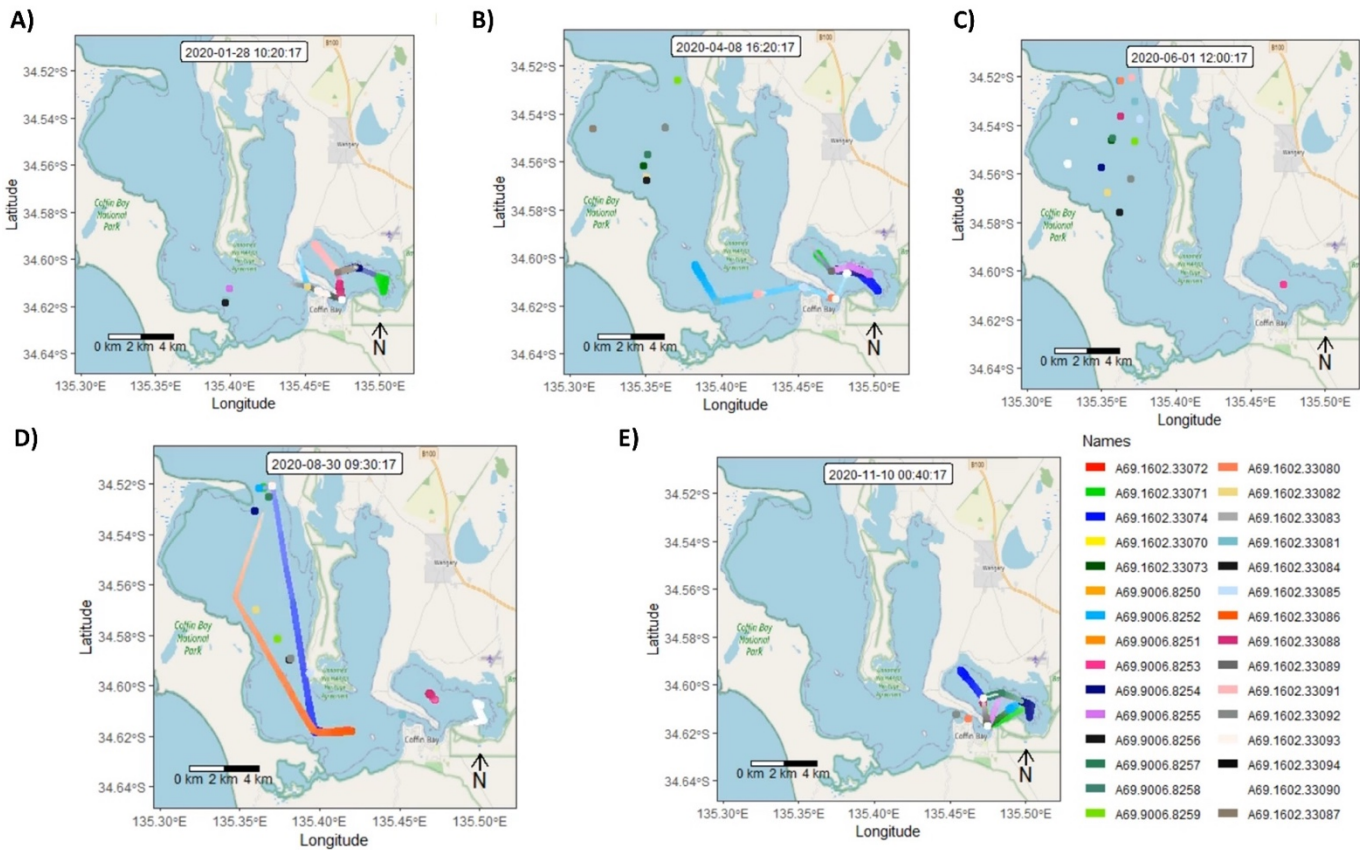


Figure S1: moveVis screenshots from five key events across the monitoring period A) ray detections constricted to Kellidie Bay, B) rays beginning to move out of Kellidie Bay and egress from the system, C) rays outside of the receiver array (stationary tags at the Little Douglas receivers), D) rays returning to the system, E) ray detections constricted to Kellidie bay.

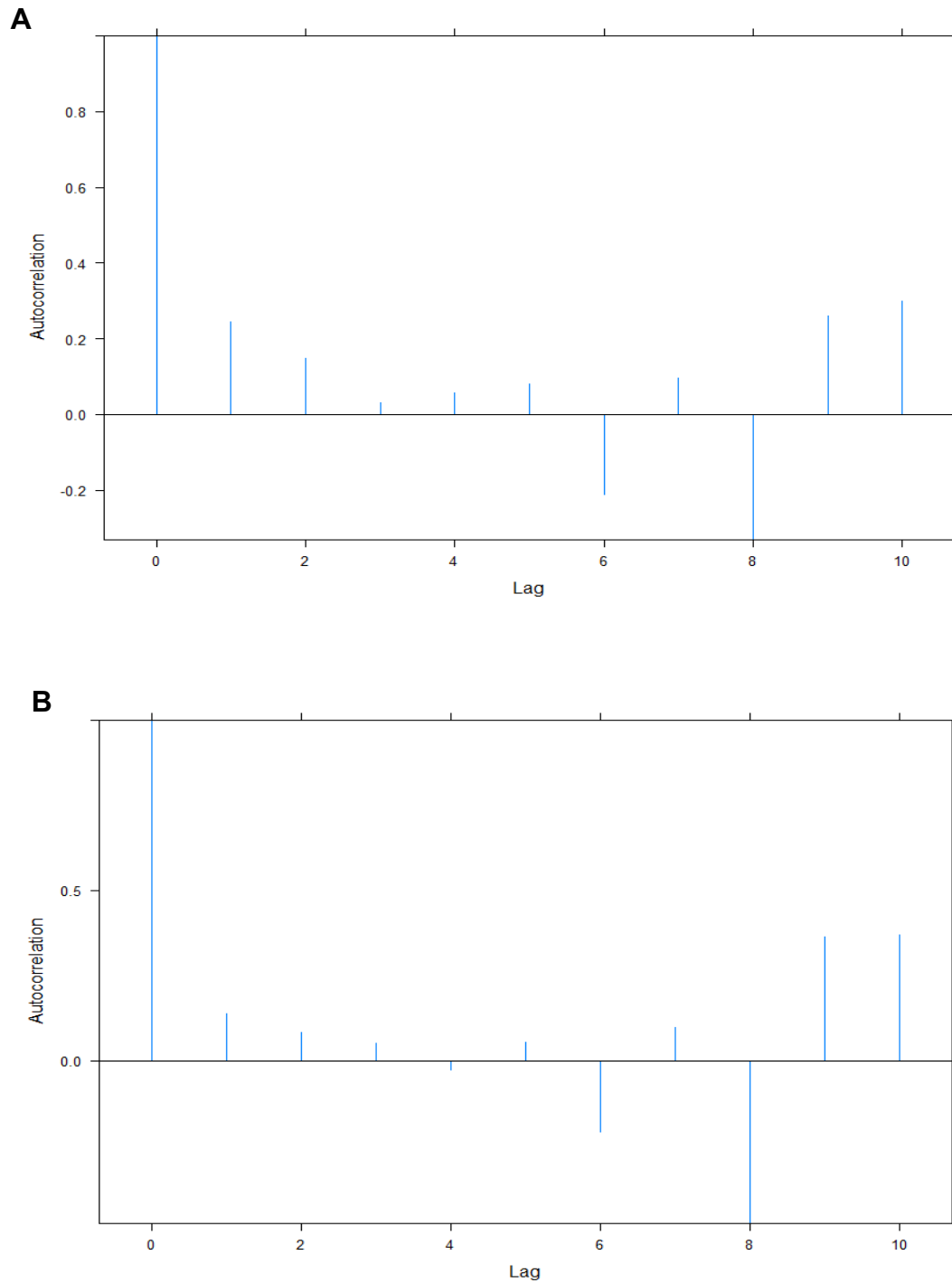


Figure S2: Autocorrelation Function Plot (ACF) of A) 50% Utilisation distribution and B) 95% utilisation distribution (space use) to test for the correlation between time lags of individual southern eagle rays (*Myliobatis tenuicaudatus*) between January and December 2020 in Coffin Bay, South Australia

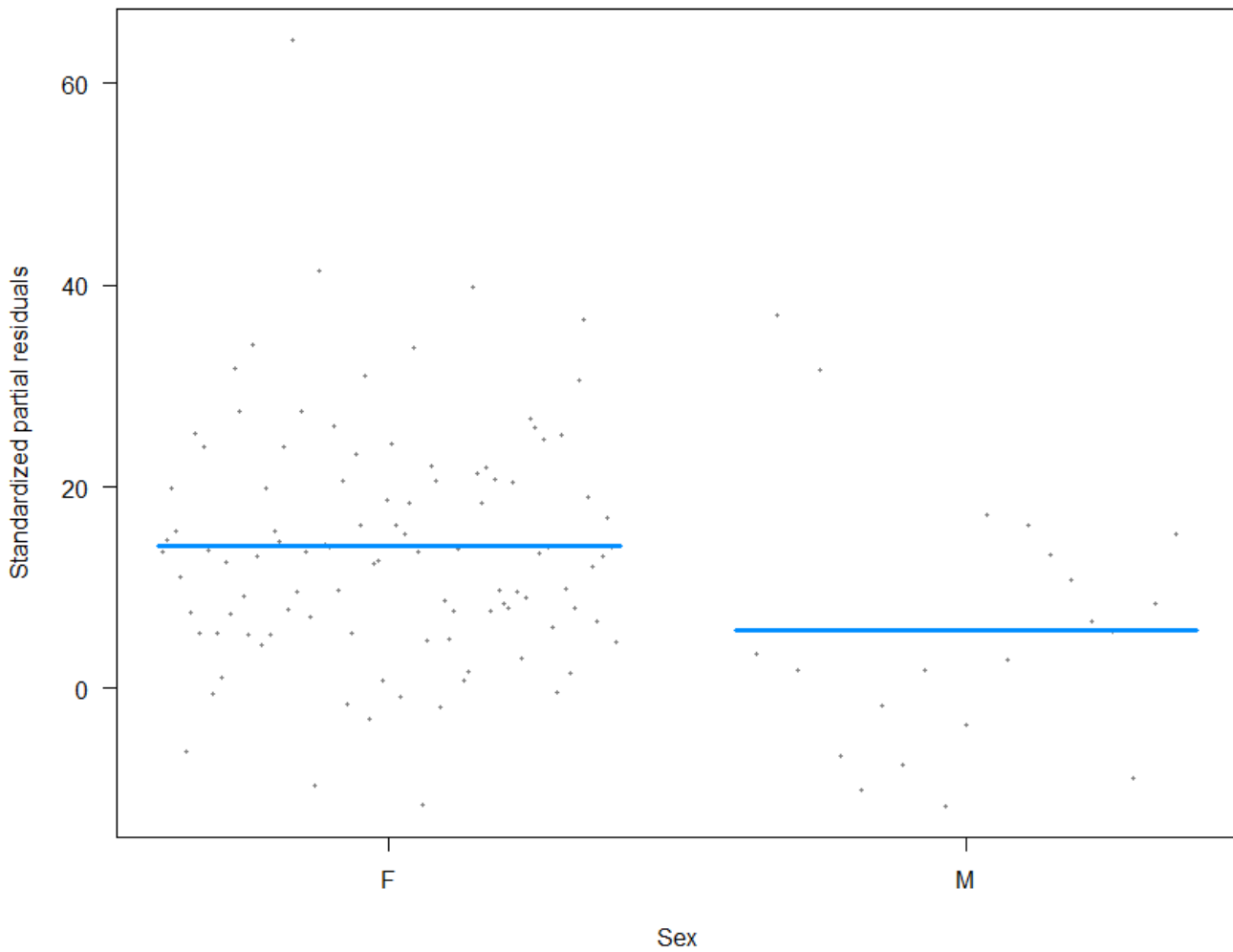


Figure S3: Linear Mixed-Effects Model (LMER) Activity space (95% UD) of southern eagle rays (*Myliobatis tenuicaudatus*) (n = 30) across 13 months in Coffin Bay, South Australia with mean Standardised partial residuals represented by the blue lines.

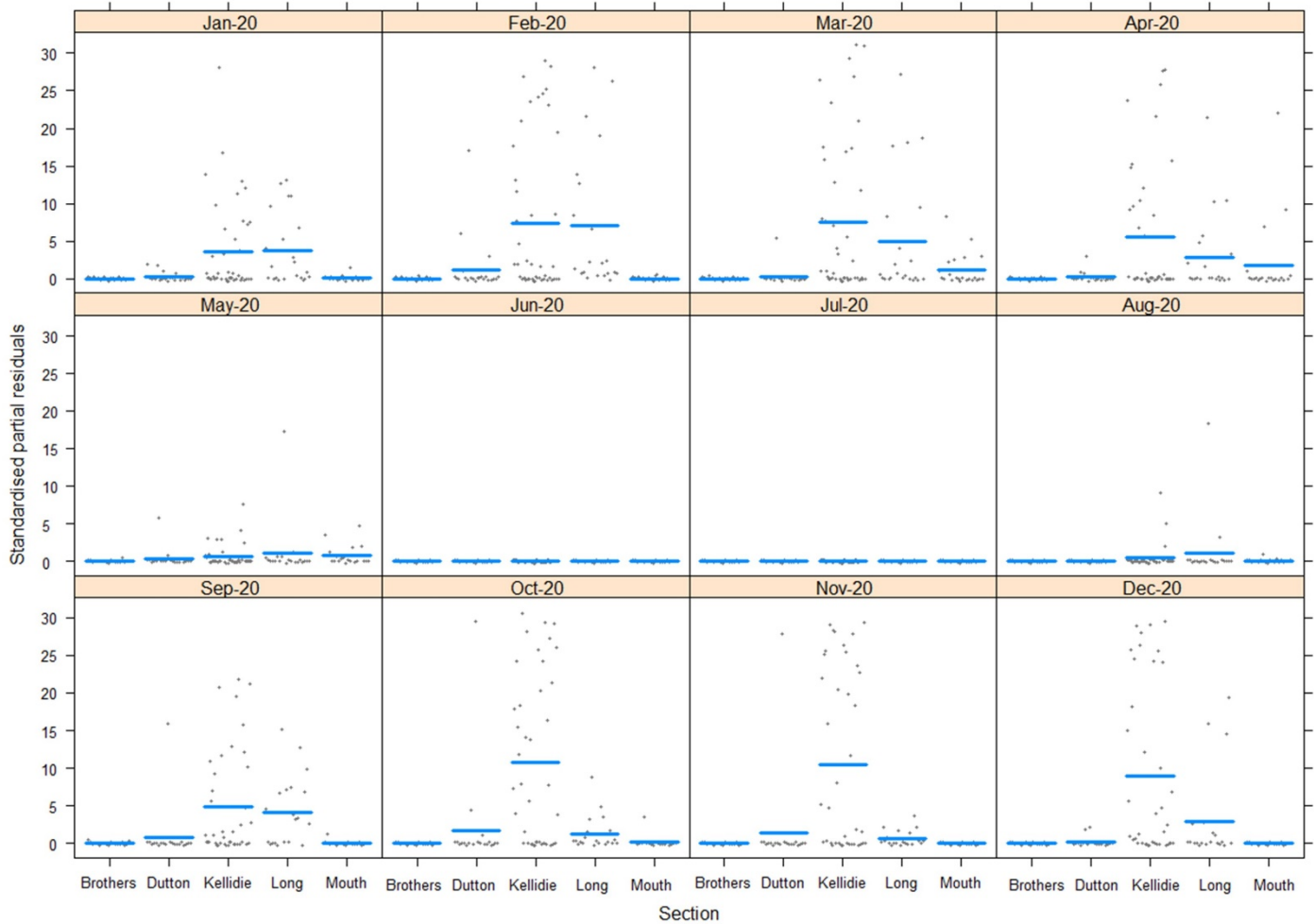


Figure S4: Linear Mixed-Effects Model (LMER) of southern eagle ray (*Myliobatis tenuicaudatus*) ( $n = 22$ ) residency time across five different areas of Coffin Bay, South Australia from January 2020 until December 2020, with mean Standardised partial residuals represented by the blue lines.