

The following supplement accompanies the article

## Movement and residency patterns of reef manta rays *Mobula alfredi* in the Amirante Islands, Seychelles

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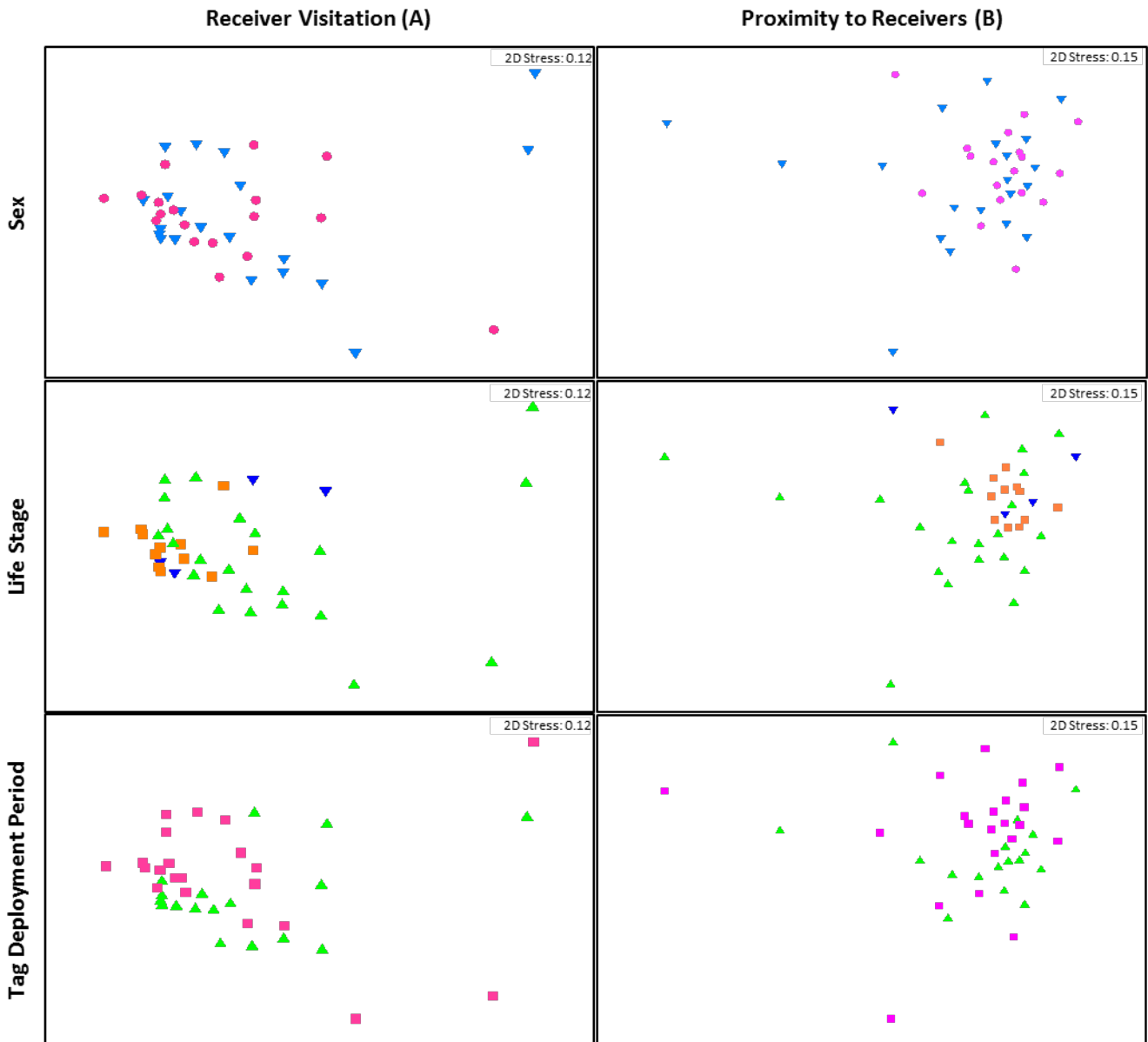
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**Table S1.** Correlation matrix for continuous predictors considered in generalised additive mixed models (GAMMs) of reef manta ray (*Mobula alfredi*) occurrence at D'Arros Island and St. Joseph Atoll, Seychelles.

	Day of year	Time of day	Fraction of moon illuminated	Time to high tide	Tidal range	$\sqrt{\text{Wind Speed}}$	Water temperature	Wind direction
Day of year	1	-0.01	-0.02	0.01	-0.04	0.05	-0.30	-0.17
Time of day	-0.01	1	0.00	0.02	0.02	-0.01	0.02	0.01
Fraction of moon illuminated	-0.02	0.00	1	0.00	0.02	-0.02	-0.06	-0.12
Time to high tide	0.01	0.02	0.00	1	0.01	0.00	0.00	-0.01
Tidal range	-0.04	0.02	0.02	0.01	1	-0.10	0.01	-0.03
$\sqrt{\text{Wind speed}}$	0.05	-0.01	-0.02	0.00	-0.10	1	-0.27	0.07
Water temperature	-0.30	0.02	-0.06	0.00	0.01	-0.27	1	0.10
Wind direction	-0.17	0.01	-0.12	-0.01	-0.03	0.07	0.10	1

**Table S2.** Top ten candidate GAMMs for predicting the occurrence of acoustically tagged reef manta rays (*Mobula alfredi*) within 2.5 km of D’Arros Island and St. Joseph Atoll, Seychelles. Best model (highlighted in bold) selected using differences in Akaike’s Information Criteria corrected for sample size (AICc) among models ( $\Delta$ AICc), and AICc weights (wAICc). Variables considered in models include: day of year (Dy), time of day (Hr), fraction of moon illuminated (Mn), time to high tide (Th), tidal range (Tr), wind speed (Ws), water temperature (Tp), sex (Sx), wingspan (Sp), and manta ray ID (Id).

<b>Candidate Model Set</b>	<b>AICc</b>	<b><math>\Delta</math>AICc</b>	<b>wAICc</b>
<b>Dy + Hr + Mn + Th + Tr + Ws + Tp + Wd + Id</b>	<b>48,499.77</b>	<b>0</b>	<b>0.215</b>
Sx + Dy + Hr + Mn + Th + Tr + Ws + Tp + Wd + Id	48,499.84	0.069	0.208
Dy + Hr + Mn + Th + Tr + Ws + Tp + Wd + Sp + Id	48,500.06	0.285	0.187
Sx + Dy + Hr + Mn + Th + Tr + Ws + Tp + Wd + Sp + Id	48,500.06	0.287	0.187
Dy + Hr + Mn + Th + Tr + Tp + Wd + Id	48,502.49	2.724	0.055
Sx + Dy + Hr + Mn + Th + Tr + Tp + Wd + Id	48,502.55	2.782	0.054
Dy + Hr + Mn + Th + Tr + Tp + Wd + Sp + Id	48,502.84	3.066	0.046
Sx + Dy + Hr + Mn + Th + Tr + Tp + Wd + Sp + Id	48,502.84	3.068	0.046
Dy + Hr + Mn + Th + Tr + Ws + Tp + Id	48,513.12	13.346	0
Sx + Dy + Hr + Mn + Th + Tr + Ws + Tp + Id	48,513.19	13.421	0



**Fig. S1.** Non-metric multidimensional scaling plots of acoustically tagged reef manta ray (*Mobula alfredi*) visitation frequency (number of days; A) and proximity to (number of detections; B) receivers at the Amirante Island Group, Seychelles. Patterns examined with respect to individual sex (female, pink circle; male, blue triangle), life stage (juvenile, blue triangle; sub-adult, orange square; adult, green triangle), and the year of tag deployment (2013, green triangle; 2016, pink square). Data based on a Bray-Curtis similarity matrix with 9,999 permutations.



**Fig. S2.** Detections over time for acoustically tagged reef manta rays (*Mobula alfredi*) relative to the latitude of detection within the Amirantes receiver array. Latitude of northern-most (African Banks) and southern-most (Desnoeufs) acoustic receivers are indicated by red and purple horizontal lines, respectively. Orange horizontal lines represent latitude of receiver at Remire. Yellow horizontal lines represent northern- and southern-most receivers of D'Arros Island and St. Joseph Atoll. Green horizontal lines represent northern- and southern-most receivers of Poivre. Light and dark blue horizontal lines represent latitude of receivers at Boudeuse and Marie Louise, respectively.