Supplementary Information

Assessing the efficacy of a marine reserve to protect sharks with differential habitat use

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APPENDIX 1

These oceanographic variables were: sea surface temperature (SST) obtained from the NOAA's Optimum Interpolated SST (0.25o x0.25o resolution, o Celsius) (Reynolds et al. 2007); Chlorophyll a data from the Moderate Resolution Imaging Spectroradiometer (Modis)-Aqua satellites (4 km · 8-day composite, mg/m3) (Maccherone & Frazier 2015); and the eddy kinetic energy (EKE) derived from the TOPEX / Poseidon and ERS-2 altimeters (0.2° spatial resolution, m2s2) (Fu et al. 1994). Shark locations were also matched with seafloor depth (depth) from a custom made bathymetric profile compiled from Chadwick (2001), Peñaherrera-Palma et al. (2013) and the 2-Minute Gridded Bathymetry and Global Relief Data (ETOPO2v2) (Smith 1997).

References

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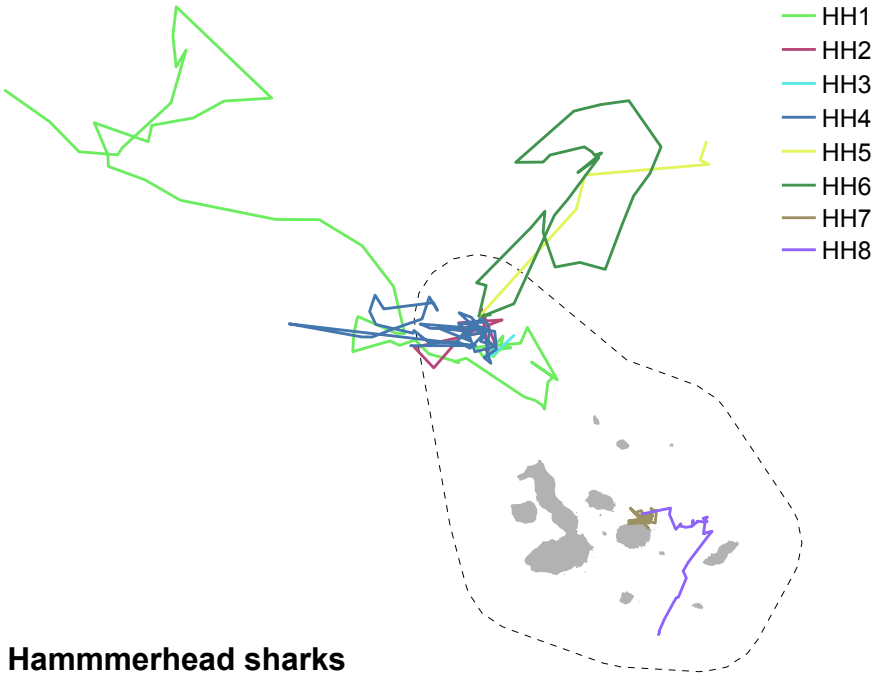
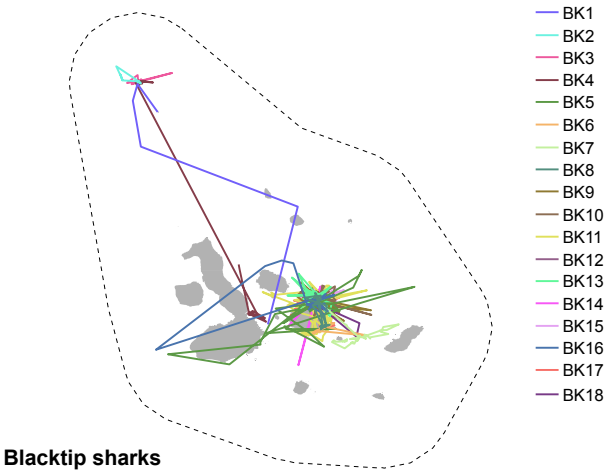
APPENDIX 2.





Appendix 2. Hammerhead sharks (above) and blacktip sharks (below) trajectories in and around the GMR. Black circles denote the locations cut-off where two tags (one hammerhead and one blacktip shark) started constant daily transmissions with high-speed movements (>2 ms-1) and linear trajectories.

APPENDIX 3.

Appendix 3.1. Global descriptive statistics (mean ± standard deviation) and significance tests (Kruskal-Wallis) of the differences in environmental preferences of satellite tracked hammerhead sharks (HHS) with blacktip sharks (BKT). Bold numbers indicate significant differences of $p < 0.05$.

Species	Average ± S.D	*Kruskal-Wallis* X2	*p*
Depth			
HHS	-1581 ± 927	67.10	**<0.01**
BKT	-436 ± 268		
SST			
HHS	25.1 ± 1.8	344.10	**<0.01**
BKT	25.7 ± 1.2		
Chlorophyll			
HHS	0.336 ± 0.23	25.50	**<0.01**
BKT	0.682 ± 0.68		
EKE			
HHS	132.2 ± 190.8	14.70	**<0.01**
BKT	34.7 ± 15.5		

Appendix 3.2. Summary descriptive statistics (mean ± standard deviation) and significance tests (Kruskal-Wallis) of the seasonal environmental preferences of satellite tracked hammerhead sharks and blacktip sharks. Bold numbers indicate significant differences of $p<0.05$.

	Seasons			*Kruskal-Wallis*	
	Cold	Transition	Warm	X^2	*p*
Hammerhead sharks					
Depth	-1937 ± 745	-2213 ± 546	-1371 ± 1017	25.80	**<0.00**
SST	25.8 ± 0.6	24.4 ± 1.0	25.0 ± 2.0	23.30	**<0.01**
Chlorophyll	0.248 ± 0.02	0.174 ± 0.02	0.341 ± 0.24	12.40	**<0.01**
EKE	119.9 ± 134.4	66.7 ± 34.2	144.0 ± 213.1	2.60	0.26
Blacktip sharks					
Depth	-188 ± 455	-59 ± 184	-151 ± 299	62.00	**<0.01**
SST	24.9 ± 0.9	25.7 ± 1.8	25.9 ± 1.1	467.70	**<0.01**
Chlorophyll	1.497 ± 1.50	0.153 ± 0.15	0.483 ± 0.48	39.80	**<0.01**
EKE	42.3 ± 30.4	33.0 ± 7.8	33.1 ± 9.7	11.10	**<0.01**