

Supplementary Material: Habitat use, residency, and connectivity of bull sharks (*Carcharhinus leucas*) in the Bazaruto Seascape, Mozambique

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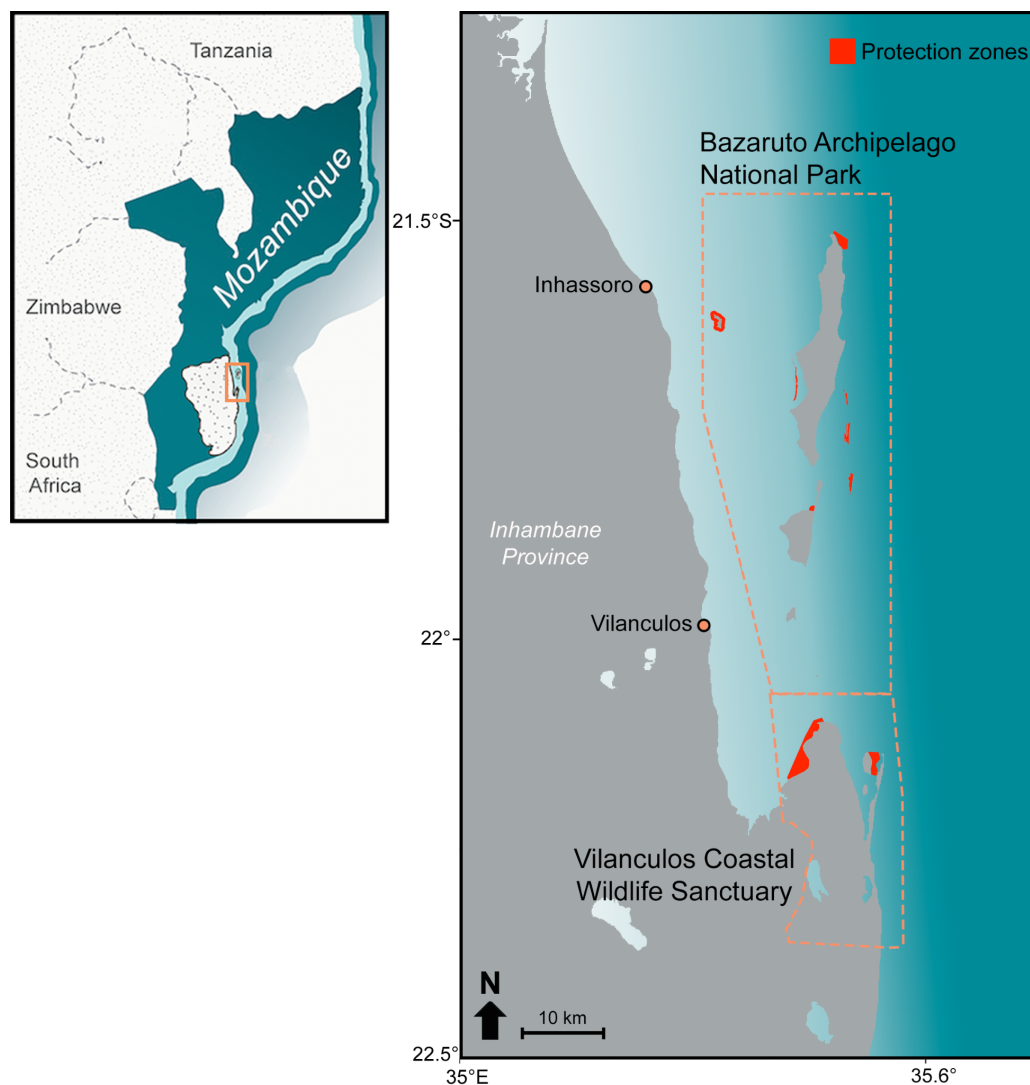


Figure S1. Map showing existing protected area boundaries (orange dashed lines) and current protection zones within each area (shaded red). The zones have varying fishing regulations, from total protection in some areas to with gear restrictions (e.g., no netting) in others.

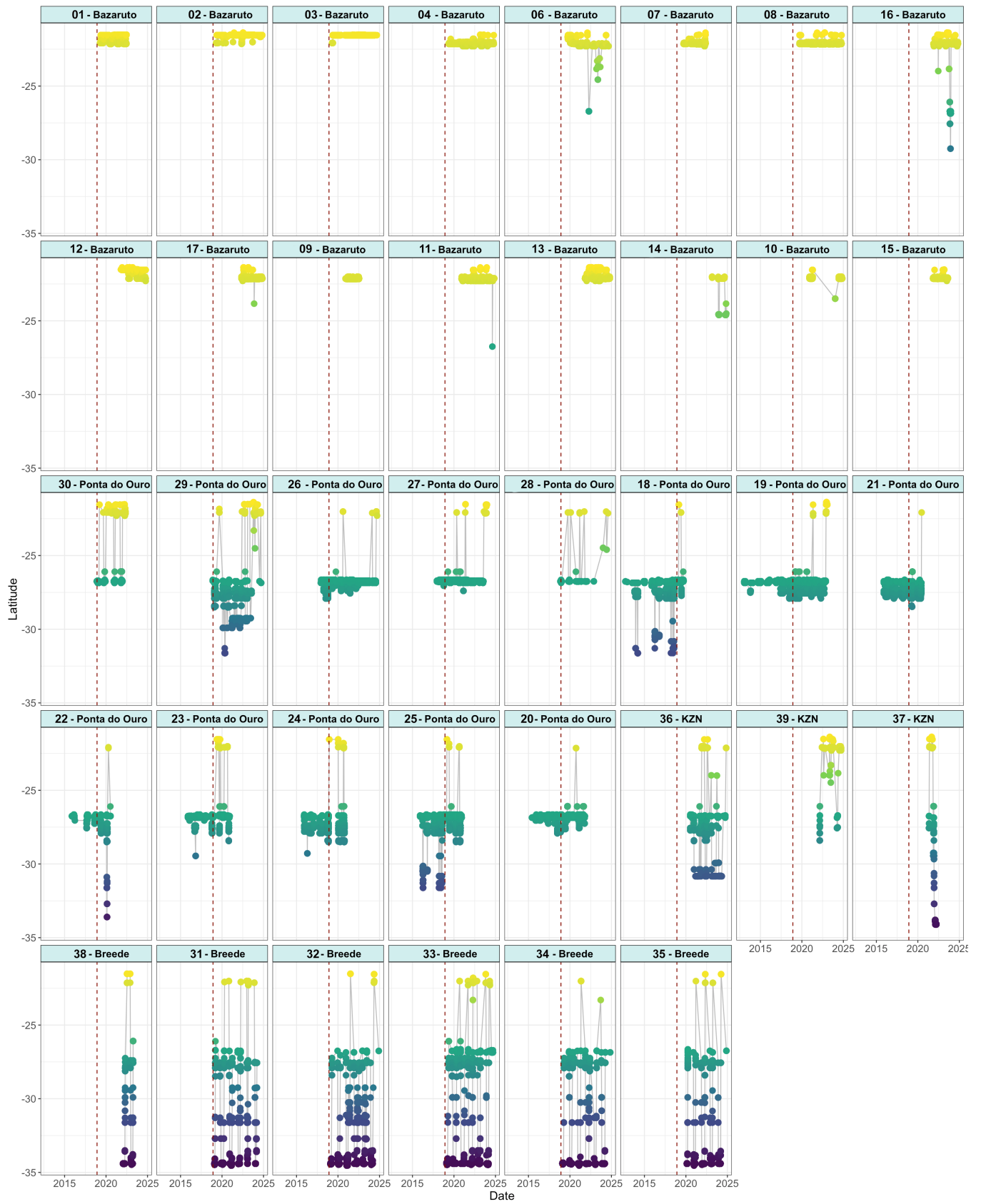


Figure S2. Individual acoustic detection histories of all tagged bull sharks ($n = 38$) at all receivers between 2012 and 2024. Points are coloured by latitude; the red dashed line indicates the deployment date of acoustic receivers in the Bazaruto Seascape.

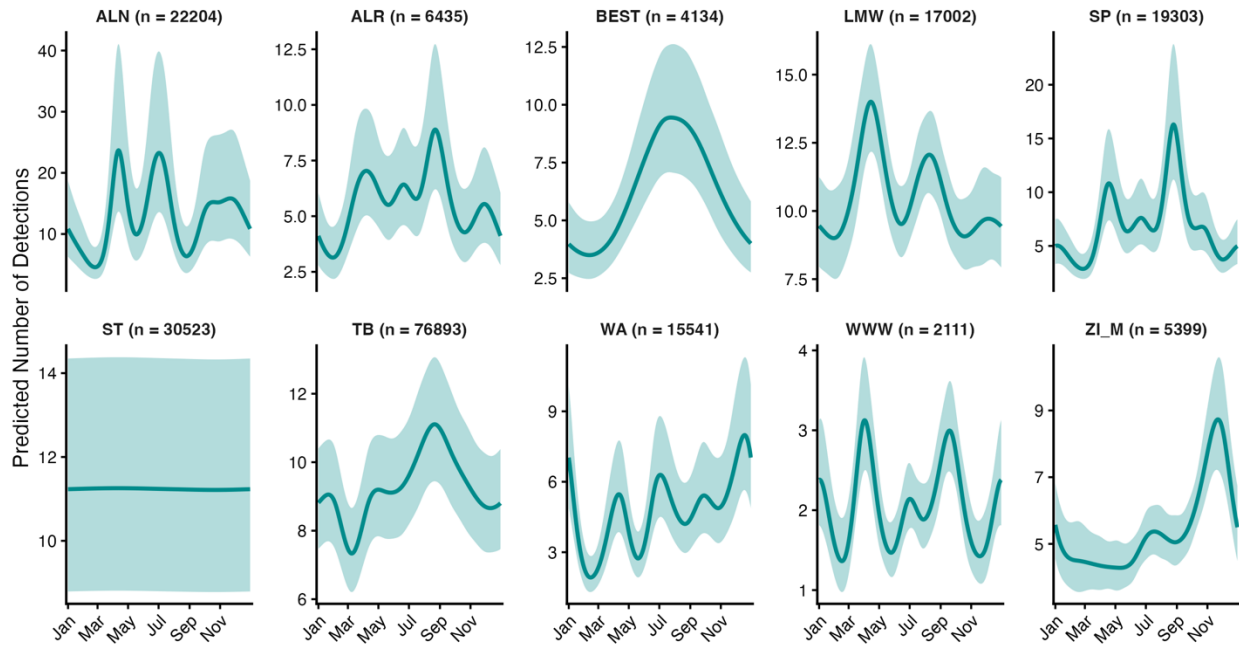


Figure S3. Model predicted monthly detections of bull sharks tagged in the Bazaruto Seascape (excluding tag #03; $n = 15$) at the ten most-visited receivers in the Bazaruto Seascape from 2019 to 2024. The solid line shows predicted number of detections from a negative binomial GAMM, and shaded areas represent 95% confidence intervals. n = total detections over the study period.

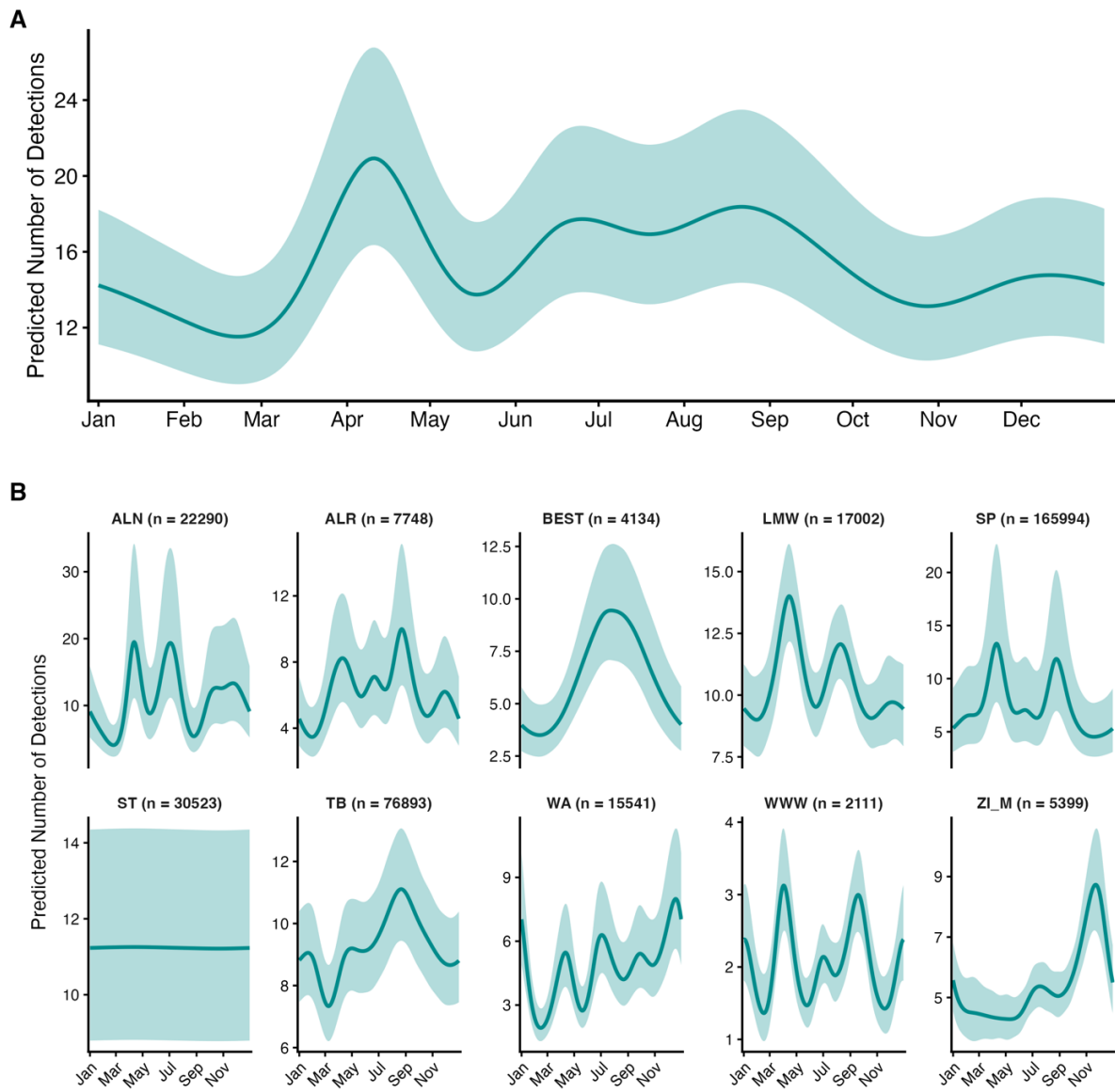


Figure S4. Model predicted monthly detections of all bull sharks tagged in the Bazaruto Seascape ($n = 16$) from 2019 to 2024 (A) combined across all receivers in the Bazaruto Seascape. (B) at the ten most-visited receivers in the Bazaruto Seascape. Solid lines show predicted number of detections from a negative binomial GAMM, and shaded areas represent 95% confidence intervals.

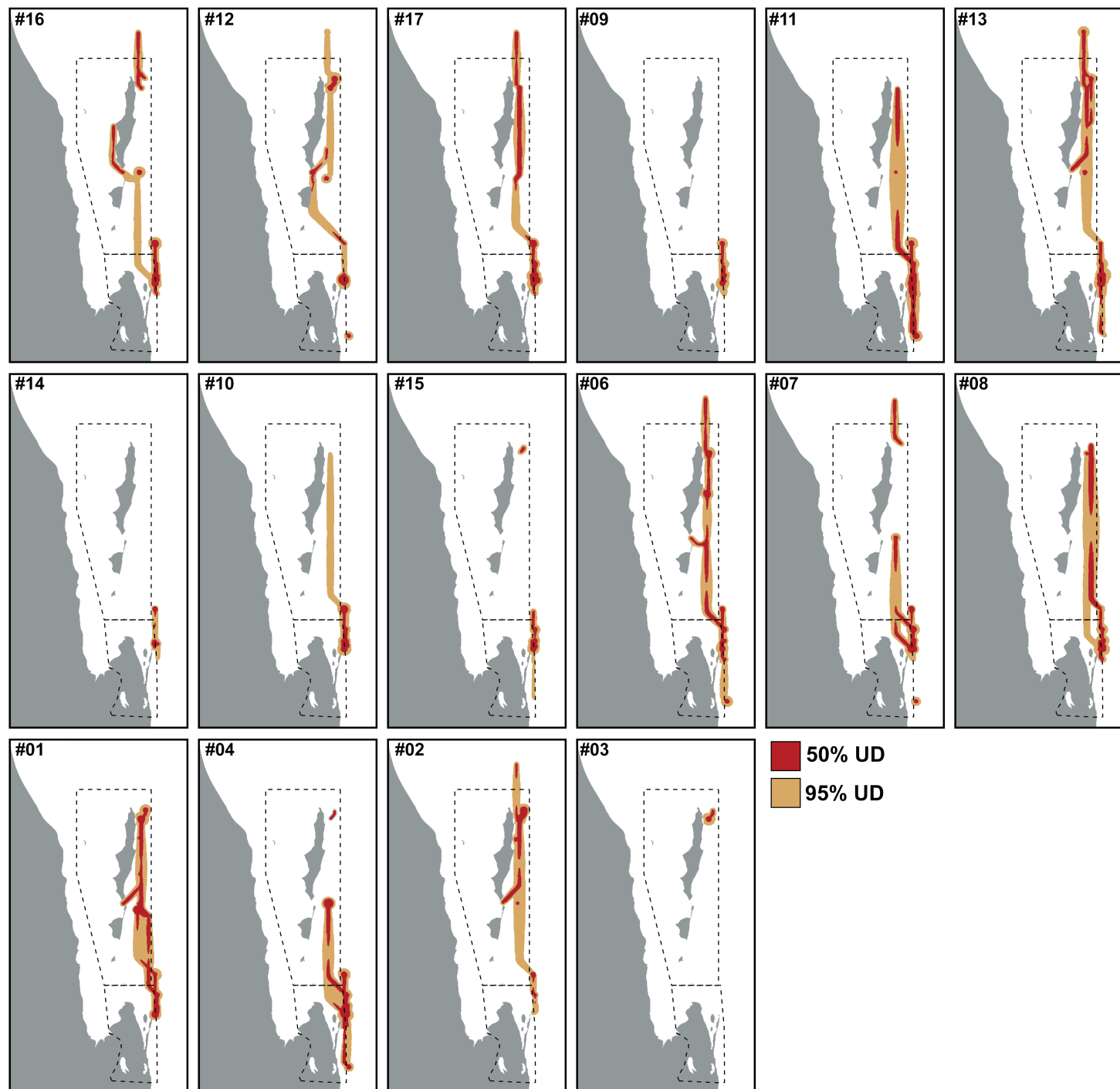


Figure S5. Core and extent habitats – 50% and 95% utilisation distributions (UD), respectively – derived from dynamic Brownian Bridge Movement Models (dBBMMs) for individual bull sharks tagged in the Bazaruto Seascape ($n = 16$). Black dashed lines indicate the boundaries of the Bazaruto Archipelago National Park (BANP) and Vilanculos Coastal Wildlife Sanctuary (VCWS).

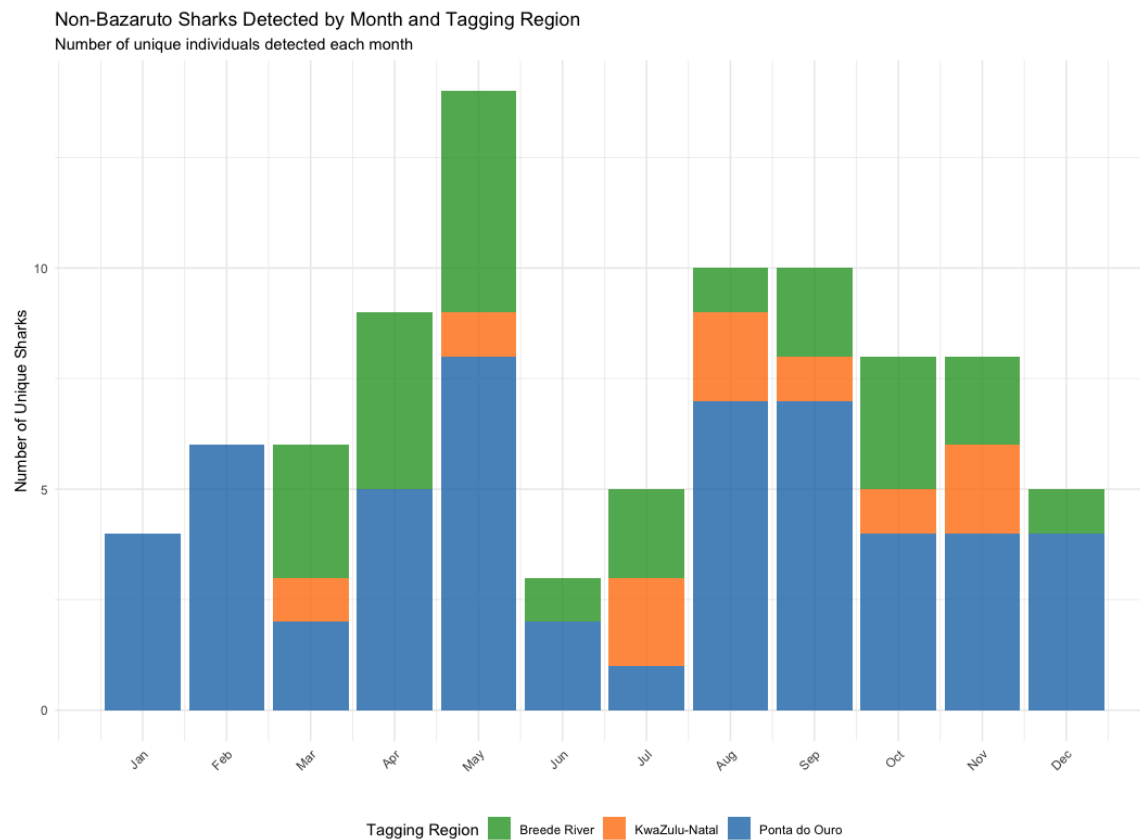


Figure S6. Monthly detections of bull sharks tagged outside of the Bazaruto Seascape ($n = 22$). Bars show the number of unique individuals detected each month at Bazaruto receivers from 2019, stacked by tagging region.

Table S1. Receiver summary statistics, ordered by latitude (north to south) for the two acoustic detection datasets (A) bull sharks tagged in the Bazaruto Seascape ($n = 16$), and (B) all bull sharks tagged throughout Mozambique and South Africa, including Bazaruto-tagged sharks ($n = 38$). * indicates receivers retrieved mid-way through the study; **indicates receivers deployed mid-way through the study. $R_{\max\text{Site}}$ = pooled site-level residency; MZ = Mozambique, SA = South Africa; MAD = Madagascar.

(A)

Receiver	Region	Country	First deployed	Last retrieved	First detection	Last detection	Total detections	% of total detections	No. sharks detected	$R_{\max\text{Site}}$
GB	Bazaruto	MZ	26/3/2021	3/11/2024	15/6/2021	14/12/2023	336	0.10	9	0.003
ALN	Bazaruto	MZ	10/1/2021	11/11/2023	10/1/2021	4/11/2023	22,290	6.37	10	0.11
SP	Bazaruto	MZ	1/12/2018	1/11/2024	17/5/2019	31/10/2024	165,994	47.44	14	0.129
PR	Bazaruto	MZ	15/4/2019	1/11/2024	-	-	0	0.00	0	-
SB	Bazaruto	MZ	17/10/2021	3/11/2024	18/10/2021	13/8/2024	4	0.00	2	0.002
ZP	Bazaruto	MZ	3/1/2021	22/5/2024	17/5/2024	18/5/2024	5	0.00	1	0.002
NM	Bazaruto	MZ	5/5/2019	30/10/2024	7/6/2019	29/8/2024	57	0.02	5	0.006
FM	Bazaruto	MZ	17/10/2021	30/10/2024	10/1/2022	17/9/2023	8	0.00	4	0.004
TM_N	Bazaruto	MZ	30/7/2019	19/11/2023	11/8/2019	28/3/2023	231	0.07	8	0.005
GAP	Bazaruto	MZ	4/5/2021	29/10/2024	7/10/2019	28/5/2024	96	0.03	7	0.002
TM_S	Bazaruto	MZ	30/7/2019	19/11/2023	11/8/2019	4/4/2023	113	0.03	8	0.003
MW**	Bazaruto	MZ	10/6/2023	30/10/2024	-	-	0	0.00	0	-
SV*	Bazaruto	MZ	5/5/2019	12/5/2020	15/5/2019	23/9/2019	24	0.01	1	0.024
BEST	San Sebastian	MZ	8/5/2020	29/10/2024	22/5/2020	26/10/2024	4134	1.18	15	0.019
ALR	San Sebastian	MZ	7/5/2019	7/11/2024	12/4/2019	14/11/2023	7748	2.21	15	0.036
WA	San Sebastian	MZ	10/7/2021	7/11/2024	10/7/2021	30/8/2024	15,541	4.44	15	0.088
ZI_N**	San Sebastian	MZ	10/6/2023	8/11/2024	-	-	0	0.00	0	-
ZI_M**	San Sebastian	MZ	6/6/2023	7/11/2024	6/6/2023	8/11/2024	5399	1.54	11	0.159
LMW**	San Sebastian	MZ	26/6/2023	8/11/2024	26/6/2023	8/11/2024	17,002	4.86	11	0.241
WWW	San Sebastian	MZ	4/1/2021	7/11/2024	18/1/2021	7/11/2024	2111	0.60	13	0.053
ST*	San Sebastian	MZ	27/5/2021	12/7/2022	27/5/2021	8/7/2022	30,523	8.72	12	0.197
TB	San Sebastian	MZ	24/5/2020	6/11/2024	24/5/2020	6/11/2024	76,893	21.98	15	0.226
FPN*	San Sebastian	MZ	7/5/2019	24/5/2020	13/5/2019	24/10/2020	391	0.11	4	0.142
TPN	San Sebastian	MZ	27/11/2020	6/11/2024	6/12/2020	27/6/2024	838	0.24	11	0.029
BUMP	San Sebastian	MZ	28/12/2020	6/11/2024	14/1/2021	9/10/2024	171	0.05	9	0.007
MAT	Morrungulo	MZ	13/4/2023	8/12/2023	2/8/2023	2/8/2023	1		1	
BM	Morrungulo	MZ	7/10/2021	7/12/2023	21/4/2023	21/4/2023	3		1	
AM	Praia do Tofo	MZ	28/4/2023	12/10/2023	17/5/2023	17/5/2023	1		1	
OF	Praia do Tofo	MZ	12/5/2022	16/11/2023	28/8/2023	28/8/2023	1		1	
GC	Praia do Tofo	MZ	18/9/2020	17/12/2024	15/3/2023	2/11/2024	6		4	
RB	Praia do Tofo	MZ	18/9/2020	26/4/2024	17/6/2022	17/6/2022	1		1	
XTC	Praia do Tofo	MZ	5/5/2023	5/4/2024	-	-	0		0	
PN	Praia do Tofo	MZ	22/4/2023	12/2/2024	-	-	0		0	
TN	Zavora	MZ	14/6/2023	18/5/2024	-	-	0		0	
WS	Zavora	MZ	20/6/2023	4/9/2024	-	-	0		0	
RS	Zavora	MZ	13/1/2021	4/9/2024	-	-	0		0	
SC	Zavora	MZ	7/9/2023	22/11/2024	14/11/2024	14/11/2024	1		1	
YO	Zavora	MZ	6/4/2023	9/1/2024	3/12/2023	3/12/2023	1		1	
DE	Zavora	MZ	7/4/2023	8/1/2024	15/5/2023	6/1/2024	8		2	
DRS	Zavora	MZ	5/8/2020	18/11/2024	19/12/2023	28/10/2024	97		1	
MC	Zavora	MZ	18/7/2023	20/7/2024	-	-	0		0	
FS	Zavora	MZ	19/8/2023	17/1/2024	-	-	0		0	
Santa Maria Inshore	Ponta do Ouro	MZ	22/3/2021	23/5/2024	7/11/2023	7/11/2023	6		1	
Mamoli 1	Ponta do Ouro	MZ	28/11/2015	2/12/2023	14/4/2022	20/12/2023	34		2	
Pinnacles 3	Ponta do Ouro	MZ	8/12/2011	30/11/2023	17/8/2024	17/8/2024	1		1	
MOZ002	Ponta do Ouro	MZ	30/11/2012	1/12/2023	27/11/2023	20/12/2023	23		1	
MOZ001	Ponta do Ouro	MZ	30/11/2012	1/12/2023	23/11/2023	20/12/2023	27		1	
JP002	iSimangaliso	SA	3/12/2013	9/5/2024	14/11/2023	14/11/2023	6		1	
Seola Point	Durban	SA	18/3/2021	27/4/2024	5/12/2023	11/12/2023	2		1	
TOL	Madagascar	MAD	-	-	6/1/2024	6/1/2024	6		1	

(B)

Receiver	Region	Country	First detection	Last detection	Total detections	No. tags detected
GB	Bazaruto	MZ	15/6/2021	14/12/2023	358	13
ALN	Bazaruto	MZ	10/1/2021	4/11/2023	22,362	18
SP	Bazaruto	MZ	14/12/2018	31/10/2024	166,211	28
SB	Bazaruto	MZ	18/10/2021	13/8/2024	4	2
ZP	Bazaruto	MZ	17/5/2024	18/5/2024	5	1
NM	Bazaruto	MZ	7/6/2019	29/8/2024	64	8
FM	Bazaruto	MZ	10/1/2022	17/9/2023	8	4
TM_N	Bazaruto	MZ	11/8/2019	28/3/2023	256	11
GAP	Bazaruto	MZ	7/10/2019	28/5/2024	103	9
TM_S	Bazaruto	MZ	11/8/2019	4/4/2023	116	9
SV	Bazaruto	MZ	15/5/2019	23/9/2019	34	4
BEST	San Sebastian	MZ	22/5/2020	26/10/2024	4349	31
ALR	San Sebastian	MZ	12/4/2019	14/11/2023	7936	30
WA	San Sebastian	MZ	10/7/2021	1/9/2024	15,618	23
ZI_M	San Sebastian	MZ	6/6/2023	8/11/2024	5448	15
LMW	San Sebastian	MZ	26/6/2023	8/11/2024	17,302	18
WWW	San Sebastian	MZ	18/1/2021	7/11/2024	2128	19
ST	San Sebastian	MZ	27/5/2021	8/7/2022	30,750	17
TB	San Sebastian	MZ	24/5/2020	6/11/2024	77,488	29
FPN	San Sebastian	MZ	13/5/2019	24/10/2020	394	6
TPN	San Sebastian	MZ	6/12/2020	27/6/2024	842	13
BUMP	San Sebastian	MZ	14/1/2021	9/10/2024	191	16
MAT	Morrungulo	MZ	2/8/2023	2/8/2023	1	1
BM	Morrungulo	MZ	14/4/2022	1/11/2023	26	5
TOL	Madagascar	MAD	6/1/2024	6/1/2024	6	1
AM	Praia do Tofo	MZ	17/5/2023	17/5/2023	1	1
OF	Praia do Tofo	MZ	17/5/2023	28/8/2023	2	2
GC	Praia do Tofo	MZ	15/3/2023	2/11/2024	7	5
RB	Praia do Tofo	MZ	17/6/2022	17/5/2023	5	3
XTC	Praia do Tofo	MZ	26/9/2023	26/9/2023	2	1
TN	Zavora	MZ	27/6/2023	30/12/2023	3	2
SC	Zavora	MZ	23/12/2023	14/11/2024	2	2
YO	Zavora	MZ	3/12/2023	3/12/2023	1	1
DE	Zavora	MZ	15/5/2023	6/1/2024	8	2
DRS	Zavora	MZ	19/12/2023	28/10/2024	98	2
Santa Maria Inshore	Ponta do Ouro	MZ	17/9/2019	7/11/2023	79	8
Santa Maria North	Ponta do Ouro	MZ	19/3/2019	14/10/2022	45	8
Santa Maria Mid	Ponta do Ouro	MZ	19/3/2019	16/1/2021	26	9
Santa Maria South	Ponta do Ouro	MZ	17/3/2019	14/11/2020	46	13
Techobanine 2	Ponta do Ouro	MZ	6/2/2016	5/11/2021	62	11
Techobanine 3	Ponta do Ouro	MZ	11/12/2015	21/11/2021	722	16
Techobanine 1	Ponta do Ouro	MZ	6/12/2015	16/9/2021	128	8
Mamoli 1	Ponta do Ouro	MZ	4/12/2015	29/9/2024	9,986	19
Pinnacles 2	Ponta do Ouro	MZ	27/1/2013	17/11/2024	35,116	21
Pinnacle Temp. 3	Ponta do Ouro	MZ	25/11/2015	27/1/2019	29,726	12
Pinnacle Temp. 2	Ponta do Ouro	MZ	25/11/2015	14/3/2019	40,216	13
Pinnacle Temp. 1	Ponta do Ouro	MZ	25/11/2015	3/4/2019	41,619	13
Pinnacles 1	Ponta do Ouro	MZ	18/9/2012	29/11/2024	90,451	19
Malongane	Ponta do Ouro	MZ	25/11/2015	7/11/2022	2367	15
Pinnacles 4	Ponta do Ouro	MZ	8/12/2012	29/1/2013	6	2
Pinnacles 3	Ponta do Ouro	MZ	27/1/2013	29/9/2024	48,094	22
MOZ004	Ponta do Ouro	MZ	22/7/2013	30/10/2013	10	1
MOZ005	Ponta do Ouro	MZ	24/1/2013	23/3/2014	33	2
MOZ002	Ponta do Ouro	MZ	25/1/2013	29/9/2024	17,431	22
MOZ003	Ponta do Ouro	MZ	24/2/2013	19/1/2016	2085	4
MOZ001	Ponta do Ouro	MZ	25/1/2013	8/11/2024	8687	17
RR001	iSimangaliso	SA	17/11/2015	28/5/2022	122	10
RR002	iSimangaliso	SA	17/11/2015	14/7/2022	180	14
ISR001	iSimangaliso	SA	11/1/2017	11/9/2022	379	16
ISR002	iSimangaliso	SA	17/12/2016	11/9/2022	2365	16
9 mile 1	iSimangaliso	SA	15/10/2013	16/10/2022	894	15
9 mile 2	iSimangaliso	SA	15/10/2013	14/10/2023	1328	18
DCP001	iSimangaliso	SA	24/4/2022	22/6/2022	35	1
2 mile 2	iSimangaliso	SA	22/10/2013	17/12/2023	495	13
2 mile 1	iSimangaliso	SA	16/10/2013	24/4/2024	554	11
2MRR2	iSimangaliso	SA	7/8/2016	31/3/2017	136	3
2MRR1	iSimangaliso	SA	15/8/2016	3/2/2018	86	6

2MRR3	iSimangaliso	SA	22/7/2016	5/3/2017	52	4
2MRR4	iSimangaliso	SA	22/7/2016	1/4/2017	458	5
QM001	iSimangaliso	SA	26/9/2021	22/11/2022	45	5
JP001	iSimangaliso	SA	26/12/2013	15/10/2023	4576	18
JP002	iSimangaliso	SA	26/12/2013	3/4/2024	6129	20
JP003	iSimangaliso	SA	20/11/2015	3/4/2024	3682	19
Sod1_30m	iSimangaliso	SA	24/5/2018	31/5/2020	1903	15
Sod1_20m	iSimangaliso	SA	24/5/2018	11/5/2020	742	12
Canyon001	iSimangaliso	SA	28/6/2018	17/5/2020	3681	12
RSB001	iSimangaliso	SA	24/1/2018	22/2/2021	239	10
RSB002	iSimangaliso	SA	22/5/2019	22/4/2021	577	13
Red Sands_SAEON	iSimangaliso	SA	13/10/2018	26/3/2019	30	6
RSR001	iSimangaliso	SA	10/12/2015	24/2/2016	10	2
RSR002	iSimangaliso	SA	9/2/2016	30/4/2016	95	2
RSR003	iSimangaliso	SA	14/2/2016	22/3/2016	29	2
RSR004	iSimangaliso	SA	16/2/2016	30/4/2016	9	2
Red sands 1	iSimangaliso	SA	2/12/2013	20/3/2023	379	14
Red sands 2	iSimangaliso	SA	21/3/2014	14/12/2022	182	13
Canyon002	iSimangaliso	SA	1/7/2018	7/5/2020	472	11
Leven Deep	iSimangaliso	SA	18/6/2021	22/3/2023	157	10
Leven Mid	iSimangaliso	SA	8/10/2021	20/3/2023	81	7
Leven	iSimangaliso	SA	23/7/2016	4/5/2022	380	14
Sod3_30m	iSimangaliso	SA	24/5/2018	30/5/2020	348	15
Canyon003	iSimangaliso	SA	28/6/2018	7/5/2020	324	12
Cape Vidal	iSimangaliso	SA	23/3/2022	11/7/2022	49	6
MAP001	iSimangaliso	SA	3/8/2018	30/10/2022	264	13
MAP002	iSimangaliso	SA	4/11/2018	20/12/2020	231	7
MAP003	iSimangaliso	SA	4/11/2018	28/2/2020	30	6
MAP004	iSimangaliso	SA	7/11/2018	7/11/2020	29	5
Seola Point	Durban	SA	26/3/2021	2/4/2024	100	7
TUK30m	Durban	SA	6/11/2022	20/12/2023	9	2
Zinkwazi	Durban	SA	22/4/2016	22/4/2016	3	1
TUK80m	Durban	SA	16/12/2022	16/12/2022	3	1
Tinley Manor_ORI	Durban	SA	13/3/2021	18/3/2023	392	7
Tinley Manor	Durban	SA	28/10/2016	31/5/2018	14	3
Umdloti_ORI	Durban	SA	13/3/2021	15/3/2022	47	2
TB001	Durban	SA	13/3/2021	26/11/2023	10	2
BR001	Durban	SA	7/3/2021	28/2/2022	9	1
BR002	Durban	SA	25/10/2019	27/10/2023	729	6
Bluff 30m	Durban	SA	28/2/2022	21/12/2023	96	6
Bluff 60m	Durban	SA	2/5/2022	14/12/2023	21	4
Bluff 80m	Durban	SA	15/3/2022	27/8/2023	22	3
Umgababa	Durban	SA	13/4/2016	13/4/2016	5	2
Black Rock	Durban	SA	31/3/2016	31/3/2016	20	2
Green Point	Durban	SA	12/4/2016	12/4/2016	2	1
ALS004	Durban	SA	1/3/2021	2/4/2023	66	4
ALS002	Durban	SA	23/3/2021	21/6/2022	6	3
Park Rynie	Durban	SA	1/4/2016	1/4/2016	12	1
ALS003	Durban	SA	24/12/2020	30/4/2023	16	3
Pennington	Durban	SA	14/10/2016	18/10/2016	17	2
Ifafa	Durban	SA	30/3/2016	14/10/2016	54	2
Mtwalume	Durban	SA	30/3/2016	17/10/2016	36	2
Hibberdene	Durban	SA	12/4/2016	12/4/2016	5	2
Umzumbe	Durban	SA	3/6/2021	21/6/2022	16	5
Umtentweni	Durban	SA	1/4/2016	11/4/2016	9	2
Shelly Beach shallow	Durban	SA	13/12/2021	11/3/2024	73	5
Shelly Beach deep	Durban	SA	6/4/2021	24/2/2024	54	6
PR001	Durban	SA	22/3/2018	21/7/2018	14	2
Protea Banks	Durban	SA	4/3/2021	26/4/2024	835	2
Canyon006	Durban	SA	5/2/2020	5/2/2020	4	1
Mzamba	Durban	SA	11/4/2016	11/4/2016	5	1
CAS001	Durban	SA	23/12/2020	1/4/2023	5	2
PON002	Durban	SA	22/7/2018	11/6/2023	22	7
PON001	Durban	SA	22/7/2018	6/3/2023	17	6
GG001	Durban	SA	9/12/2013	31/3/2023	148	11
GG002	Durban	SA	21/3/2018	6/3/2023	59	8
PSJ001	Durban	SA	10/4/2016	7/2/2024	419	11
PSJ002	Durban	SA	13/3/2014	5/3/2024	134	7
PSJ003	Durban	SA	13/3/2014	2/5/2023	57	3
Vubu 1	Durban	SA	29/3/2023	2/5/2023	15	2
KM001	Wild Coast	SA	1/3/2019	22/2/2024	120	6
KM002	Wild Coast	SA	7/11/2019	22/2/2024	44	3

KM003	Wild Coast	SA	20/12/2021	22/2/2024	28	3
AMA008	Wild Coast	SA	8/5/2023	22/2/2024	37	2
KLM008	Wild Coast	SA	23/3/2022	18/3/2024	63	5
KLM006	Wild Coast	SA	21/11/2022	9/3/2024	7	2
KLM007	Wild Coast	SA	7/4/2022	27/2/2024	31	5
KLM004	Wild Coast	SA	23/3/2022	9/3/2024	19	4
KLM005	Wild Coast	SA	7/4/2022	9/3/2024	51	5
KLM002	Wild Coast	SA	23/3/2022	18/3/2024	83	5
KLM003	Wild Coast	SA	7/4/2022	10/4/2022	7	2
KLM001	Wild Coast	SA	7/4/2022	9/2/2023	13	3
PA002	Wild Coast	SA	27/2/2024	27/2/2024	15	1
PA003	Wild Coast	SA	12/2/2020	27/2/2024	11	2
PA001	Wild Coast	SA	27/2/2024	27/2/2024	7	1
ATAP_Sundays Mouth	Algoa Bay	SA	12/3/2020	12/3/2020	2	1
Woody Cape West	Algoa Bay	SA	5/12/2020	24/3/2023	15	2
Sundays Offshore 1	Algoa Bay	SA	7/2/2023	7/2/2023	6	1
AB001	Algoa Bay	SA	23/3/2023	1/3/2024	9	2
Hougham Park	Algoa Bay	SA	26/12/2019	26/12/2019	2	1
AB002	Algoa Bay	SA	1/3/2024	1/3/2024	1	1
ATAP_Hougham	Algoa Bay	SA	10/12/2020	29/11/2023	6	1
Coega	Algoa Bay	SA	20/3/2021	4/2/2022	24	2
Jahleel	Algoa Bay	SA	26/12/2019	23/11/2022	37	5
Bird Island 1	Algoa Bay	SA	13/3/2020	13/3/2020	1	1
Brenton shallow	Algoa Bay	SA	21/3/2021	21/3/2021	2	1
AB007	Algoa Bay	SA	14/12/2023	14/12/2023	1	1
St Croix_ATAP	Algoa Bay	SA	7/12/2020	3/12/2023	23	2
St. Georges	Algoa Bay	SA	26/12/2019	26/12/2019	1	1
Black Rocks inside	Algoa Bay	SA	14/12/2023	14/12/2023	19	1
ATAP_Wells	Algoa Bay	SA	8/12/2020	8/3/2024	95	5
Bird Island 2	Algoa Bay	SA	19/1/2023	19/1/2023	2	1
Bird Island 80	Algoa Bay	SA	31/1/2022	31/1/2022	5	1
Goodsheds	Algoa Bay	SA	8/12/2020	22/3/2023	2	2
Central 80m	Algoa Bay	SA	3/4/2021	3/4/2021	2	1
St Francis - BHB	Algoa Bay	SA	21/2/2021	21/2/2021	2	1
Cape Recife Offshore 1	Algoa Bay	SA	26/2/2022	20/1/2023	18	2
Schoen 80m	Algoa Bay	SA	8/3/2023	8/3/2023	8	1
St Francis - Thys	Algoa Bay	SA	28/12/2019	6/3/2024	17	1
CSF009	Algoa Bay	SA	16/4/2022	16/4/2022	1	1
CSF003	Algoa Bay	SA	25/11/2022	25/11/2022	2	1
PLB004	Mossel Bay	SA	29/12/2019	4/12/2023	54	4
PLB003	Mossel Bay	SA	29/12/2019	20/12/2023	77	5
PLB002	Mossel Bay	SA	10/3/2020	20/12/2023	58	4
GB001	Mossel Bay	SA	15/3/2019	3/2/2023	79	4
Knysna 002	Mossel Bay	SA	9/3/2020	9/3/2020	32	1
GB002	Mossel Bay	SA	8/3/2021	25/3/2022	15	2
GB003	Mossel Bay	SA	20/2/2019	2/3/2022	35	4
MB001	Mossel Bay	SA	8/3/2021	4/3/2023	107	4
MB002	Mossel Bay	SA	31/12/2019	4/3/2023	121	5
PLB001	Mossel Bay	SA	20/12/2023	20/12/2023	5	1
MB003	Mossel Bay	SA	20/2/2019	4/3/2023	94	4
MB004	Mossel Bay	SA	11/3/2021	4/3/2023	47	3
MB005	Mossel Bay	SA	3/1/2021	4/3/2023	52	3
MB006	Mossel Bay	SA	3/1/2021	4/3/2023	22	2
MB007	Mossel Bay	SA	4/3/2023	4/3/2023	7	1
CSB001	Mossel Bay	SA	25/3/2019	28/11/2022	12	2
CSB002	Mossel Bay	SA	16/12/2019	22/2/2023	17	3
CSB003	Mossel Bay	SA	16/12/2020	12/4/2022	11	2
KAN001	Mossel Bay	SA	18/2/2019	18/2/2019	6	1
UNIM007b	Breede River	SA	15/11/2019	10/3/2021	258	5
BLB001	Breede River	SA	28/1/2022	18/2/2024	30	3
Breede*	Breede River	SA	2/2/2019	11/3/2024	260,343	6
BRD000	Breede River	SA	7/2/2019	2/3/2020	445	4
BRE02	Breede River	SA	2/2/2019	25/3/2020	7026	5
BRD002	Breede River	SA	2/2/2019	11/3/2024	8900	6
UNIM001	Breede River	SA	18/3/2019	23/3/2019	247	2
UNIM002	Breede River	SA	5/2/2019	21/3/2019	162	4
BRD004	Breede River	SA	3/2/2019	27/2/2024	688	6
DEH003	Breede River	SA	3/3/2019	22/2/2021	6	2
BRD005	Breede River	SA	5/2/2019	27/2/2021	76	4
UNIM003	Breede River	SA	5/2/2019	21/3/2019	126	4
UNIM004b	Breede River	SA	18/2/2020	29/2/2020	32	2

UNIM004	Breede River	SA	19/3/2019	19/3/2019	4	1
DEH002	Breede River	SA	19/3/2019	17/2/2024	47	2
UNIM006	Breede River	SA	5/2/2019	3/3/2019	15	2
DEH004	Breede River	SA	20/1/2021	20/1/2021	7	1
UNIM003b	Breede River	SA	16/2/2021	21/2/2021	4	1
UNIM005	Breede River	SA	18/1/2020	19/2/2020	19	2
DEH001	Breede River	SA	5/2/2019	19/2/2024	95	6
UNIM008b	Breede River	SA	22/12/2020	1/3/2021	66	4

Table S2. Receiver summary statistics for detections of bull sharks tagged outside the Bazaruto Seascape ($n = 22$) on receivers in the Bazaruto Seascape, ordered by total number of detections.

Receiver	No. sharks detected	Total detections	% detections
TB	14	595	28.9
LMW	7	300	14.6
ST	5	227	11.0
SP	14	217	10.5
BEST	16	215	10.5
ALR	15	188	9.1
WA	8	77	3.7
ALN	8	72	3.5
ZI_M	4	49	2.4
TM_N	3	25	1.2
GB	4	22	1.1
BUMP	7	20	1.0
WWW	6	17	0.8
SV	3	10	0.5
GAP	2	7	0.3
NM	3	7	0.3
TPN	2	4	0.2
FPN	2	3	0.2
TM_S	1	3	0.2

Table S3. Summary statistics of ‘visits’ to the Bazaruto Seascape by individual bull sharks tagged outside the Bazaruto Seascape ($n = 22$). A ‘visit’ was defined as a period of detections at receivers in the Bazaruto Seascape, without any detections at receivers outside the region.

Shark ID	Visit no.	Year	First detection	Last detection	Total duration (days)	Detected days	Detections	Tagging location
18	1	2019	26/2/2019 03:57	26/2/2019 04:05	1	1	3	Ponta do Ouro
18	2	2019	31/5/2019 17:05	31/5/2019 17:08	1	1	3	Ponta do Ouro
19	1	2021	8/5/2021 2:30	9/5/2021 12:55	2.4	2	4	Ponta do Ouro
19	2	2022	30/11/2022 20:28	9/12/2022 7:33	9.5	8	49	Ponta do Ouro
19	3	2022	17/12/2022 19:34	1/1/2023 3:06	15.3	6	26	Ponta do Ouro
19	4	2023	13/1/2023 19:26	22/1/2023 03:27	9.3	5	14	Ponta do Ouro
21	1	2020	15/6/2020 23:01	15/6/2020 23:01	1	1	1	Ponta do Ouro
22	1	2020	15/4/2020 15:07	15/4/2020 17:48	1.1	1	2	Ponta do Ouro
23	1	2019	20/5/2019 20:08	20/5/2019 20:20	1	1	5	Ponta do Ouro
23	2	2019	30/5/2019 22:06	30/5/2019 23:32	1.1	1	21	Ponta do Ouro
23	3	2019	12/7/2019 20:48	26/7/2019 15:35	14.8	6	27	Ponta do Ouro
23	4	2019	4/8/2019 5:48	6/8/2019 4:35	2.9	3	11	Ponta do Ouro
23	5	2019	4/10/2019 15:51	18/10/2019 05:44	14.6	5	21	Ponta do Ouro
23	6	2020	12/4/2020 9:03	12/4/2020 9:50	1	1	9	Ponta do Ouro
23	7	2020	5/5/2020 11:45	13/5/2020 22:01	9.4	3	8	Ponta do Ouro
23	8	2020	30/8/2020 02:12	30/8/2020 03:50	1.1	1	6	Ponta do Ouro
24	1	2018	14/12/2018 06:15	14/12/2018 06:21	1	1	3	Ponta do Ouro
24	2	2020	9/1/2020 17:21	10/1/2020 13:52	1.9	2	6	Ponta do Ouro
24	3	2020	30/8/2020 22:43	31/8/2020 09:46	1.5	2	4	Ponta do Ouro
24	4	2020	16/9/2020 07:22	16/9/2020 10:32	1.1	1	7	Ponta do Ouro

25	1	2019	26/2/2019 03:57	26/2/2019 04:10	1	1	4	Ponta do Ouro
25	2	2019	31/5/2019 00:20	31/5/2019 17:10	1.7	1	5	Ponta do Ouro
25	3	2020	9/8/2020 13:52	9/8/2020 13:58	1	1	4	Ponta do Ouro
25	4	2020	25/8/2020 21:54	25/8/2020 23:37	1.1	1	5	Ponta do Ouro
20	1	2020	26/9/2020 07:30	26/9/2020 07:33	1	1	3	Ponta do Ouro
30	1	2019	16/3/2019 19:07	16/3/2019 19:08	1	1	2	Ponta do Ouro
30	2	2019	4/9/2019 18:30	4/9/2019 18:31	1	1	2	Ponta do Ouro
30	3	2020	10/1/2020 16:51	10/1/2020 16:51	1	1	1	Ponta do Ouro
30	4	2020	1/2/2020 2:19	8/2/2020 2:50	8	4	6	Ponta do Ouro
30	5	2020	14/4/2020 09:00	17/4/2020 10:24	4.1	4	16	Ponta do Ouro
30	6	2020	3/9/2020 11:24	3/9/2020 19:17	1.3	1	14	Ponta do Ouro
30	7	2020	10/9/2020 22:27	11/9/2020 6:15	1.3	2	27	Ponta do Ouro
30	8	2020	9/10/2020 19:01	15/10/2020 22:30	7.1	2	6	Ponta do Ouro
30	9	2020	24/11/2020 22:25	25/11/2020 19:48	1.9	2	5	Ponta do Ouro
30	10	2021	14/2/2021 19:02	20/2/2021 06:56	6.5	2	9	Ponta do Ouro
30	11	2021	28/2/2021 09:35	8/3/2021 20:34	9.5	4	15	Ponta do Ouro
30	12	2021	26/3/2021 08:07	16/4/2021 02:45	21.8	8	20	Ponta do Ouro
30	13	2021	5/9/2021 7:29	5/9/2021 7:37	1	1	7	Ponta do Ouro
30	14	2021	27/12/2021 17:41	30/12/2021 15:50	3.9	4	28	Ponta do Ouro
30	15	2022	23/1/2022 18:33	28/1/2022 12:18	5.7	4	11	Ponta do Ouro
30	16	2022	13/2/2022 13:39	16/2/2022 08:08	3.8	3	39	Ponta do Ouro
30	17	2022	21/3/2022 00:35	6/5/2022 12:51	47.5	20	222	Ponta do Ouro
29	1	2019	2/9/2019 0:57	6/9/2019 12:08	5.5	2	7	Ponta do Ouro
29	2	2022	3/6/2022 7:15	3/6/2022 7:28	1	1	5	Ponta do Ouro
29	3	2022	7/9/2022 0:12	7/9/2022 2:41	1.1	1	5	Ponta do Ouro
29	4	2022	14/9/2022 05:34	15/9/2022 02:26	1.9	2	7	Ponta do Ouro
29	5	2022	29/9/2022 04:23	4/10/2022 1:01	5.9	5	33	Ponta do Ouro
29	6	2023	4/2/2023 12:18	4/2/2023 13:24	1	1	10	Ponta do Ouro
29	7	2023	7/5/2023 16:09	7/5/2023 16:14	1	1	5	Ponta do Ouro
29	8	2023	19/10/2023 23:19	19/10/2023 23:29	1	1	2	Ponta do Ouro
29	9	2023	5/11/2023 23:00	8/11/2023 6:02	3.3	4	86	Ponta do Ouro
29	10	2023	30/11/2023 22:28	1/12/2023 0:51	1.1	2	2	Ponta do Ouro
29	11	2024	5/1/2024 7:41	5/1/2024 9:14	1.1	1	6	Ponta do Ouro
29	12	2024	24/2/2024 17:32	24/2/2024 17:32	1	1	1	Ponta do Ouro
29	13	2024	4/4/2024 14:50	4/4/2024 14:55	1	1	6	Ponta do Ouro
29	14	2024	18/4/2024 06:48	21/4/2024 11:56	4.2	3	38	Ponta do Ouro
29	15	2024	1/9/2024 11:48	1/9/2024 19:14	1.3	1	5	Ponta do Ouro
02	1	2020	9/8/2020 8:37	9/8/2020 10:56	1.1	1	3	Ponta do Ouro
26	2	2024	15/2/2024 06:21	15/2/2024 06:21	1	1	1	Ponta do Ouro
26	3	2024	14/8/2024 21:25	18/8/2024 16:47	4.8	4	65	Ponta do Ouro
26	4	2024	15/9/2024 18:09	15/9/2024 18:09	1	1	1	Ponta do Ouro
27	1	2020	28/4/2020 22:29	28/4/2020 22:31	1	1	3	Ponta do Ouro
27	2	2021	10/5/2021 22:46	10/5/2021 22:46	1	1	1	Ponta do Ouro
27	3	2021	23/5/2021 16:21	23/5/2021 17:15	1	1	4	Ponta do Ouro
27	4	2023	13/8/2023 06:45	13/8/2023 06:45	1	1	1	Ponta do Ouro
27	5	2023	26/9/2023 17:04	26/9/2023 17:04	1	1	1	Ponta do Ouro
27	6	2023	7/11/2023 15:50	18/11/2023 13:13	11.9	5	9	Ponta do Ouro
27	7	2023	27/11/2023 16:02	29/11/2023 13:29	2.9	2	6	Ponta do Ouro
27	8	2023	21/12/2023 14:34	21/12/2023 14:36	1	1	3	Ponta do Ouro
28	1	2019	4/10/2019 3:20	4/10/2019 3:20	1	1	1	Ponta do Ouro
28	2	2020	1/2/2020 20:57	1/2/2020 20:58	1	1	2	Ponta do Ouro
28	3	2021	4/3/2021 2:34	4/3/2021 5:41	1.1	1	3	Ponta do Ouro
28	4	2021	22/9/2021 16:57	22/9/2021 16:57	1	1	2	Ponta do Ouro
28	5	2024	13/5/2024 18:50	13/5/2024 18:50	1	1	1	Ponta do Ouro
28	6	2024	3/8/2024 22:45	3/8/2024 22:45	1	1	1	Ponta do Ouro
36	1	2021	29/11/2021 11:34	29/11/2021 17:54	1.3	1	19	KZN
36	2	2022	18/3/2022 19:06	20/3/2022 02:52	2.3	3	21	KZN
36	3	2022	27/7/2022 18:04	27/7/2022 18:05	1	1	2	KZN
36	4	2022	15/8/2022 05:53	16/8/2022 09:17	2.1	2	3	KZN
36	5	2024	6/11/2024 15:01	6/11/2024 15:08	1	1	8	KZN
39	1	2022	4/6/2022 21:12	4/6/2022 21:16	1	1	4	KZN
39	2	2022	22/7/2022 07:47	22/7/2022 07:54	1	1	2	KZN
39	3	2022	7/8/2022 0:33	8/8/2022 5:10	2.2	2	7	KZN

39	4	2022	30/9/2022 20:37	14/10/2022 03:17	14.3	9	199	KZN
39	5	2022	28/10/2022 06:07	28/10/2022 11:25	1.2	1	17	KZN
39	6	2023	29/4/2023 21:19	1/5/2023 10:26	2.5	2	5	KZN
39	7	2023	9/5/2023 7:05	11/5/2023 6:11	3	2	11	KZN
39	8	2023	25/7/2023 13:59	29/7/2023 02:33	4.5	4	25	KZN
39	9	2023	5/8/2023 7:42	9/8/2023 13:42	5.3	3	17	KZN
39	10	2023	18/8/2023 12:59	16/9/2023 05:54	29.7	18	140	KZN
39	11	2023	24/9/2023 03:53	15/10/2023 20:20	22.7	5	106	KZN
39	12	2024	30/6/2024 17:38	17/7/2024 00:45	17.3	9	115	KZN
39	13	2024	7/8/2024 21:44	10/8/2024 1:33	3.2	4	72	KZN
39	14	2024	3/9/2024 14:25	3/9/2024 20:42	1.3	1	13	KZN
39	15	2024	22/9/2024 04:08	24/9/2024 13:18	3.4	2	7	KZN
38	1	2022	13/7/2022 15:48	14/7/2022 12:01	1.8	2	9	Breede River
38	2	2022	27/11/2022 03:42	28/11/2022 04:50	2	2	5	Breede River
37	1	2021	23/5/2021 23:24	24/5/2021 22:46	2	2	5	KZN
37	2	2021	31/8/2021 16:51	1/9/2021 23:50	2.3	2	10	KZN
37	3	2021	1/10/2021 11:25	2/10/2021 10:21	2	2	7	KZN
37	4	2021	24/10/2021 06:39	24/10/2021 06:39	1	1	1	KZN
31	1	2020	20/4/2020 14:37	20/4/2020 14:46	1	1	5	Breede River
31	2	2020	27/10/2020 17:18	27/10/2020 17:22	1	1	4	Breede River
31	3	2022	9/4/2022 5:51	9/4/2022 5:56	1	1	4	Breede River
31	4	2022	22/12/2022 01:23	22/12/2022 01:43	1	1	8	Breede River
31	5	2023	3/3/2023 8:59	3/3/2023 15:17	1.3	1	10	Breede River
31	6	2023	22/11/2023 05:54	22/11/2023 05:56	1	1	3	Breede River
32	1	2021	2/7/2021 2:27	2/7/2021 2:33	1	1	6	Breede River
32	2	2024	4/5/2024 22:42	11/5/2024 6:17	7.3	4	17	Breede River
33	1	2020	8/9/2020 9:28	8/9/2020 9:31	1	1	5	Breede River
33	2	2021	12/9/2021 10:00	12/9/2021 23:18	1.6	1	5	Breede River
33	3	2022	19/4/2022 18:33	24/4/2022 02:18	5.3	5	37	Breede River
33	4	2022	2/5/2022 14:38	6/5/2022 6:36	4.7	4	47	Breede River
33	5	2022	13/10/2022 02:45	13/10/2022 02:45	1	1	1	Breede River
33	6	2023	1/11/2023 8:50	2/11/2023 18:50	2.4	2	11	Breede River
33	7	2024	29/3/2024 23:22	29/3/2024 23:33	1	1	8	Breede River
33	8	2024	20/4/2024 16:36	22/4/2024 17:50	3.1	3	23	Breede River
33	9	2024	1/5/2024 21:20	1/5/2024 21:20	1	1	1	Breede River
34	1	2021	5/5/2021 11:16	5/5/2021 11:29	1	1	8	Breede River
35	1	2021	15/3/2021 07:08	15/3/2021 07:08	1	1	1	Breede River
35	2	2022	30/4/2022 15:15	1/5/2022 15:29	2	2	10	Breede River
35	3	2023	1/4/2023 5:35	1/4/2023 5:42	1	1	4	Breede River
35	4	2024	29/3/2024 03:38	29/3/2024 03:40	1	1	3	Breede River