Estimated baseline density of a post-war spotted hyaena population in central Mozambique

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SUPPLEMENTARY MATERIAL 1 SECR input files and R Code.

All SECR input files and R Code can be accessed at https://github.com/WillemBriersLouw/ZD_SpottedHyaenaDensity.git.

SUPPLEMENTARY TABLE 1 Covariates hypothesized to influence spotted hyaena detection and density in the Zambezi Delta of central Mozambique.

Driver	Covariate	Descriptor	Data type	Hypothesis	Transformation	Covariate type	Resolution	Reference
Anthropogenic	Distance to community	Comm_log	Distance of camera traps stations to nearest human settlements	(–) Hyaena density is negatively affected by human disturbance	Distance to community calculated in meters and log-transformed. (Scaled to have a mean of 0 and standard deviation of 1)	Density/ mask	20 m	M'soka et al. 2016; Searle et al. 2023
	Human activity index	HumanIndex	Relative abundance index of humans per camera station	(–) Hyaena detection is negatively affected by human activity	None	Detection	Trap station	Boydston et al. 2003; Kolowski et al. 2007; Kolowski & Holekamp, 2009
Biological	Habitat (landscape-level)	TreeCover	Proportion of tree cover	(+) Hyaena density is positively affected by tree cover as habitats vary in productivity	Proportion of tree cover in a 7km buffer around each mask point (Scaled to have a mean of 0 and standard deviation of 1)	Density/ mask	20 m	Mills et al. 2001; Rich et al. 2019; Jones et al. 2021; Mwampeta et al. 2021
	Habitat (site-level)	Habitat	Habitat type (i.e., tree cover or open vegetation) around each camera trap station	(+) Hyaena detection is positively influenced by the extent of tree cover	Floodplain, shrubland, and pan vegetation classes were pooled as open. Forest, woodland, and riparian vegetation classes were pooled as tree cover.	Detection	1 km^2	Vissia et al. 2021; Kolowski & Holekamp, 2009
	Prey relative abundance index	PreyIndex	Relative abundance index of preferred prey per camera station	(+) Hyaena detection is positively influenced by the relative abundance of preferred prey	None	Detection	Trap station	Jones et al. 2021

SUPPLEMENTARY TABLE 2 Two-class (h2) spatial capture-recapture models for hyaena density for Coutada 11 of the Zambezi Delta, central Mozambique in 2021, ranked according to Akaike Information Criterion corrected for sample sizes (AIC_c). Potential covariates for density (D) and probability of detection (g0) were included in the models. A spatial scale parameter (σ) was included in the detection function.

Model	df	AIC_c	ΔAIC_c	Weight
D~1, g0~(h2+ HumanIndex), σ~h2	7	1167.20	0.00	0.83
D~1, g0~(h2+Habitat+HumanIndex), σ~h2	8	1170.37	3.17	0.17
D~1, g0~ h2, σ~h2	6	1218.62	51.41	0.00
D~1, g0~(h2+Habitat), σ~h2	7	1218.62	51.41	0.00
D~Comm_log, g0~h2, σ~h2	7	1221.60	54.40	0.00
D~TreeCover, g0~h2, σ~h2	7	1222.82	55.62	0.00
D~TreeCover+Comm_log, g0~h2, σ~h2	8	1226.42	59.22	0.00
D~TreeCover*Comm_log, g0~h2, σ~h2	9	1233.15	65.95	0.00

SUPPLEMENTARY TABLE 3 Specifications of the top ranked two-class SECR model. *N* for Coutada 11 calculated at a conservative 1,800km^2 for suitable hyaena habitat.

Model parameters	
N_{C11}	23 (23–35)
D ± SE	1.25 ± 0.28
95% CI	0.81–1.93
GOF	0.99
	h2 = 1
g0 ± SE	0.01 ± 0.00
σ ± SE	5078 ± 304
pmix	0.94
	h2 = 2
g0 ± SE	0.10 ± 0.04
σ ± SE	7143 ± 1075
pmix	0.06

SUPPLEMENTARY TABLE 4 Two-class (h2) spatial capture-recapture models for hyaena density (excluding the outlier individual) for Coutada 11 of the Zambezi Delta, central Mozambique in 2021, ranked according to Akaike Information Criterion corrected for sample sizes (AIC_c). Potential covariates for density (D) and probability of detection (g0) were included in the models. A spatial scale parameter (σ) was included in the detection function.

Model	df	AIC_c	ΔAIC_c	Weight
D~1, g0~(h2+ HumanIndex), σ~h2	7	993.94	0.00	0.93
D~1, g0~(h2+Habitat+HumanIndex), σ~h2	8	999.10	5.16	0.07
D~1, g0~h2, σ~h2	6	1015.65	21.71	0.00
D~Comm_log, g0~h2, σ~h2	7	1018.77	24.83	0.00
D~1, g0~(h2+Habitat), σ~h2	7	1019.57	25.63	0.00
D~TreeCover, g0~h2, σ~h2	7	1019.99	26.06	0.00
D~TreeCover+Comm_log, g0~h2, σ~h2	8	1023.90	29.96	0.00
D~TreeCover*Comm_log, g0~h2, *σ*~h2	9	1029.32	35.39	0.00

SUPPLEMENTARY TABLE 5 Specifications of the top ranked two-class SECR model excluding the outlier individual. *N* for Coutada 11 calculated at a conservative 1,800km^2 for suitable hyaena habitat.

Model parameters	
N_{C11}	23 (23–36)
D ± SE	1.28 ± 0.29
95% CI	0.82–1.99
GOF	0.92
	h2 = 1
g0 ± SE	0.02 ± 0.00
σ ± SE	4820 ± 308
pmix	0.61
	h2 = 2
g0 ± SE	0.00 ± 0.00
σ ± SE	5969 ± 934
pmix	0.39

SUPPLEMENTARY TABLE 6 Informal review of spotted hyaena population density estimates across their range. Multiple density estimates per location were considered if (i) surveys were ≥5 years apart or conducted in different seasons to account for temporal variation in estimates, (ii) different regions within large study areas to account for spatial variation in density estimates and (iii) multiple methods were used to account for methodological variation.

Location	Country	Land use type	Survey year	Density (hyaenas/100 km²)		Habitat type	Framework (Inference, *Package*)	Reference
				Mean ± SE	95% CI			
Serengeti National Park (wet season)	Tanzania	Protected area	1986	214.5	15.5–297.8	Grassland, woodland, marshes	Distance sampling (DISTANCE)	Durant et al. 2011
Amboseli National Park	Kenya	Protected area	2002-2005	165	–	Semi-arid savanna	Observations	Watts & Holekamp 2008
Serengeti National Park (short-grass wet)	Tanzania	Protected area	–	161.7	–	Grassland, woodland, marshes	Observations	Funston et al. 2010
Ngorongoro Conservation Area	Tanzania	Protected area	1965-1967	143	–	Grassland, forest, woodland	Observations	Kruuk 1972
Aberdare National Park	Kenya	Protected area	1986-1987	134	–	Afro-alpine vegetation	Call-ups	Sillero-Zubiri & Gottelli, 1992
Serengeti National Park (wet season)	Tanzania	Protected area	2005	130.9	93.9–182.4	Grassland, woodland, marshes	Distance sampling (DISTANCE)	Durant et al. 2011
Maswa Game Reserve	Tanzania	Mixed-use landscape	2017	126.4 ± 18.3	95.6–161.2	Woodland	Call-ups (N-mixture models)	Mwampeta et al. 2021
Damota (community managed forest)	Ethiopia	Mixed-use landscape	2020	113 ± 51	–	Forest and agricultural land	Distance sampling (*DISTANCE*)	Deneke et al. 2022
Serengeti National Park (long-grass wet)	Tanzania	Protected area	–	99.6	–	Grassland, woodland, marshes	Spoor	Funston et al. 2010
Masai Mara National Reserve	Kenya	Protected area	1988-2008	95	–	Savanna	Observations	Watts & Holekamp 2008
Senkele Swayne's Hartebeest Sanctuary	Ethiopia	Protected area	2018	95	–	Montane savanna	Call-ups	Tamarat et al. 2020
Ngorongoro Conservation Area	Tanzania	Protected area	1996-2003	89 ± 26	–	Grassland, forest, woodland	Observations	Höner et al. 2005
Masai Mara National Reserve	Kenya	Protected area	1979-1987	86	–	Savanna	Observations	Frank 1986
Serengeti National Park	Tanzania	Protected area	1985-1991	82	–	Grassland, woodland, marshes	Observations	Hofer & East 1993a; Hofer & East, 1993b
Serengeti National Park (long-grass dry)	Tanzania	Protected area	–	77	–	Grassland, woodland, marshes	Spoor	Funston et al. 2010

Mekelle	Ethiopia	Non-protected area	2019	71.46	–	Degraded land, Acacia and Eucalyptus spp.	Call-ups	Sonawane et al. 2021
Tigray	Ethiopia	Non-protected area	2011	54	30–80	Agricultural land with patches of Afromontane forest	Call-ups	Yirga et al. 2015
Kruger National Park (southern)	South Africa	Protected area	2017	53.63	–	Bushveld, savanna, shrub, sandveld	Call-ups	Ferreira & Viljoen 2022
Wukro district	Ethiopia	Non-protected area	2011	52	–	Rural (highly degraded), Acacia, Eucaluptus & African olive	Call-ups	Yirga et al. 2013
Timbavati Game Reserve	South Africa	Protected area	1973-1975	48	–	Woodland and savanna	Observations	Bearder 1977
Mara ecosystem	Kenya	Mixed-use landscape	2003	46.3	37.9–55.0	Grassland and shrubland	Call-ups	Ogutu et al. 2005
Hluhluwe	South Africa	Protected area	1975-1977	46	–	Thornveld and savanna	Call-ups	Whateley & Brooks 1978
Chobe National Park	Botswana	Protected area	1986-1988	40	–	Savanna woodland	Observations	Cooper 1989
Hwange National Park	Zimbabwe	Protected area	–	38.9	–	Woodland, bushland savanna	Spoor	Funston et al. 2010
Umfolozi Game Reserve	South Africa	Protected area	1979-1981	36	–	Thornveld and savanna	Call-ups	Whateley 1981
Hluhluwe-iMfolozi Park	South Africa	Protected area	2003-2004	35.7	25.9–48.1	Thornveld and savanna	Call-ups	Graf et al. 2009
Serengeti National Park (short-grass dry)	Tanzania	Protected area	–	35.6	–	Grassland, woodland, marshes	Spoor	Funston et al. 2010
Serengeti National Park (dry season)	Tanzania	Protected area	2005	34	23.5–49	Grassland, woodland, marshes	Distance sampling (*DISTANCE*)	Durant et al. 2011
Greater Liuwa Ecosystem	Zambia	Protected area	2010-2013	32.5	13–52	Seasonally flooded grassland with patches of broad-leafed woodlands	Observations	M'Soka et al. 2016
Selous Game Reserve	Tanzania	Protected area	1991-1992	32	–	Dense thickets, open grasslands	Call-ups	Creel & Creel, 1996
Maswa Game Reserve (border to communities)	Tanzania	Mixed-use landscape	2017	30 ± 16.7	6.7–76.5	Woodland	Call-ups (N-mixture models)	Mwampeta et al. 2021

Malilangwe Wildlife Reserve	Zimbabwe	Protected area	2017	25.1	18.6–33.7	Riverine, hill miombo, mopane veld, thorn thicket and open woodland	SECR (Maximum likelihood, *DENSITY*)	Tarugara & Clegg, 2022
Tsavo East & West National Parks	Kenya	Protected area	2013	18.75 ± 2.47	–	Acacia-Commiphora savanna, woodlands, scrub thickets	Spoor	Henschel et al. 2020
Kruger National Park	South Africa	Protected area	2005–2006	17.42	16.29–18.55	Bushveld, savanna, shrub, sandveld	Call-ups	Ferreira & Funston 2016
Serengeti National Park	Tanzania	Protected area	1967-1979	17	–	Grassland, woodland, marshes	Observations	Kruuk 1972; Burrows et al. 1994
Odzala-Kokoua National Park	Congo	Protected area	2007	15.89 ± 3.92	–	Forest-savanna mosaic	Capture-recapture (*CAPTURE*)	Henschel et al. 2014
Central Tuli	Botswana	Mixed-use landscape	2019-2020	14.9 ± 2.23	–	Riverine woodland and shrub savanna	SECR (Maximum likelihood, *secr*)	Vissia et al., 2021
Moremi Game Reserve	Botswana	Protected area	2007-2010	14.4	12.3–16.9	Floodplain, mixed and mopane	Call-ups	Cozzi et al., 2013
Queen Elizabeth Conservation Area: South	Uganda	Protected area	2018	14.07 ± 2.79	8.52–18.54	Grassland and wooded grassland	SECR (Bayesian, *SCRbayes*)	Braczkowski et al., 2022a
Salambala Conservancy	Namibia	Wildlife management area	2016	14	0.0–30	Floodplains and open woodland	Spoor	Ahlswede et al. 2019
Queen Elizabeth Conservation Area: North	Uganda	Protected area	2018	13.44 ± 2.51	9.01–18.81	Grassland and wooded grassland	SECR (Bayesian, *SCRbayes*)	Braczkowski et al., 2022a
Kgalagadi Transfrontier Park (Mosimane)	South Africa/Botswana	Protected area	–	13.3	–	Thorny dune bushveld	Spoor	Funston et al. 2010
Kruger National Park	South Africa	Protected area	1982-1984	13	–	Open woodland	Observations	Henschel & Skinner 1987
Mkuze Game Reserve	South Africa	Protected area	1989	13	–	Savanna, woodland, grassland, forest	Call-ups	Skinner et al. 1992
Kruger National Park	South Africa	Protected area	1985	12.17	11.96–12.39	Bushveld, savanna, shrub, sandveld	Call-ups	Ferreira & Funston 2016
Mole National Park	Ghana	Protected area	2006–2009	12	–	Savanna woodland	Call-ups/sign surveys/camera traps	Burton et al. 2011

Moremi Game Reserve & Cattle matrix	Botswana	Mixed-use landscape	2015	11.8 ± 2.6	–	Floodplain, savanna grasslands, and mopane shrub and woodlands	SECR (Maximum likelihood, *secr*)	Rich et al., 2019
Chobe Enclave	Botswana	Mixed-use landscape	2014-2016	11.5 ± 1.11	–	Forest, grassland and riverine	Spoor	Dunnink et al. 2020
Bouba Ndjida National Park	Cameroon	Protected area	2014	11.1 ± 3.1	–	Open wooded savanna	Call-ups	Kirsten et al. 2017
Lake Mburo National Park	Uganda	Protected area	2018	11 ± 0.32	5.57–17.09	Acacia savanna, woodlands, thickets and swamps	SECR (Bayesian, *SCRbayes*)	Braczkowski et al., 2022b
Tuli Safari Area	Zimbabwe	Wildlife management area	2009	10.82	–	Wooded savanna	Call-ups	Groom et al. 2014
Ruaha National Park	Tanzania	Protected area	2018-2019	10.80 ± 1.08	8.89–13.13	Acacia-Commiphora bushland and open grasslands	SECR (Maximum likelihood, *secr*)	Searle et al. 2023
Masai Mara National Reserve (Talek region)	Kenya	Protected area	2012-2014	10.63	7.92–13.86	Open rolling grasslands with ephemeral wetlands	Distance sampling (*JAGS*)	Farr et al. 2019
uMhkuze Game Reserve	South Africa	Protected area	2013	10.59 ± 2.1	6.69–14.86	Bushveld	SECR (Bayesian, *SPACECAP*)	De Blocq, 2014
Kgalagadi Transfrontier Park & surrounding landscape	Botswana	Mixed-use landscape	–	10	0–20	Desert	Distance sampling (Formozov-Malyshev-Pereleshin)	Keeping 2014
Gonarezhou National Park	Zimbabwe	Protected area	2017	9.7	7.6–12.4	Wooded savanna	Spoor	Groom & Watermeyer, 2017
Queen Elizabeth Protected Area	Uganda	Protected area	2008	8.79 ± 1.04	–	Woodland, grassland, forest, swamp	Call-ups	Omoya et al. 2013
Ongava Game Reserve	Namibia	Protected area	2009	8.1	–	Mopane shrub and woodland and savanna	SECR (Bayesian, *SPACECAP*)	Stratford et al. 2019
Gonarezhou National Park	Zimbabwe	Protected area	2010	8.06	–	Wooded savanna	Call-ups	Groom et al. 2014
Hwange National Park	Zimbabwe	Protected area	1999-2003	7	–	Woodland and bushland savanna	Call-ups	Salnicki 2004

Savé Valley Conservancy	Zimbabwe	Mixed-use landscape	2022	6.93	–	Deciduous woodland savanna	Spoor	Watermeyer & Groom, 2022
Bénoué Complex (National parks)	Cameroon	Protected area	2015	6.39	5.88–6.89	Wooded savanna	Spoor	Bauer et al. 2015
Nechisar National Park	Ethiopia	Protected area	2009	6	4–8	Savanna grassland	Call-ups	Yirga et al. 2014
Kgalagadi Transfrontier Park (Mabuasehube)	South Africa/Botswana	Protected area	–	5.9	–	Thorny dune bushveld	Spoor	Funston et al. 2010
Rungwa Game Reserve	Tanzania	Wildlife management area	2018-2019	5.82 ± 0.75	4.52–7.49	Miombo woodland	SECR (Maximum likelihood, *secr*)	Searle et al. 2023
Savé Valley Conservancy	Zimbabwe	Mixed-use landscape	2015	5.62	–	Deciduous woodland savanna	Spoor	Watermeyer & Groom, 2022
Bénoué Complex (Hunting areas)	Cameroon	Wildlife management area	2015	5.49	5.37–5.61	Wooded savanna	Spoor	Bauer et al. 2015
Chinko	CAR	Protected area	2017	5.2	–	Savanna and lowland rainforest	Spoor	Aebischer et al. 2020
Kgalagadi Transfrontier Park (Other-tree)	South Africa/Botswana	Protected area	–	5.2	–	Thorny dune bushveld	Spoor	Funston et al. 2010
Kidepo Valley National Park	Uganda	Protected area	2009	5.20 ± 2.29	–	Grassland, savanna, woodland	Call-ups	Omoya et al. 2013
MBOMIPA Wildlife Management Area	Tanzania	Wildlife management area	2018-2019	5.11 ± 0.81	3.75–6.97	Acacia-Commiphora bushland	SECR (Maximum likelihood, *secr*)	Searle et al. 2023
Etosha National Park	Namibia	Protected area	1982-1986	5	–	Saline desert pan and mopane woodland	Observations	Gasaway et al. 1989
Mpala Ranch	Kenya	Mixed-use landscape	2008	4.93 ± 1.7	2.68–9.03	Acacia woodland and grassland	SECR (Maximum likelihood, *DENSITY*)	O'Brien & Kinnaird, 2011
Kgalagadi Transfrontier Park (Dune north)	South Africa/Botswana	Protected area	–	4.7	–	Thorny dune bushveld	Spoor	Funston et al. 2010
Savé Valley Conservancy (Private land)	Zimbabwe	Wildlife management area	2008	4.51	3.46–5.56	Deciduous woodland savanna	Spoor	Williams et al. 2016

Chinko	CAR	Protected area	2017	4.4	–	Savanna and lowland rainforest	Call-ups	Aebischer et al. 2020
Kgalagadi Transfrontier Park (Sesatswe)	South Africa/Botswana	Protected area	–	4	–	Thorny dune bushveld	Spoor	Funston et al. 2010
Bouba Ndjida National Park	Cameroon	Protected area	2004	3.7	–	Open wooded savanna	Call-ups	Bauer 2007
Ruaha National Park (Miombo woodland)	Tanzania	Protected area	2018-2019	3.55 ± 0.72	2.39–5.25	Miombo woodland	SECR (Maximum likelihood, *secr*)	Searle et al. 2023
Nakuru Wildlife Conservancy	Kenya	Mixed-use landscape	1996-2015	3.53 ± 1.87	–	Forest, grassland, bushland, waterbodies	Distance sampling (Unobserved components model)	Ogutu et al. 2017
Masai Mara NR (Mara Triangle)	Kenya	Protected area	2012-2014	3.49	2.71–4.46	Open rolling grasslands with ephemeral wetlands	Distance sampling (*JAGS*)	Farr et al. 2019
Kgalagadi Transfrontier Park (Dune south)	South Africa/Botswana	Protected area	–	3.4	–	Thorny dune bushveld	Spoor	Funston et al. 2010
Bénoué Complex (Hunting areas)	Cameroon	Wildlife management area	2007-2010	2.75	2.07–3.43	Wooded savanna	Spoor	Croes et al. 2011
Majete Game Reserve	Malawi	Protected area	2016	2.62 ± 0.36	2.06–3.34	Miombo woodland and mixed woodland	SECR (Bayesian, *SPACECAP*)	Briers-Louw, 2017
Bénoué Complex (National parks)	Cameroon	Protected area	2007-2010	2.43	1.23–3.13	Wooded savanna	Spoor	Croes et al. 2011
Etosha National Park	Namibia	Protected area	2008	2.1	0.9–3.1	Saline desert pan and mopane woodland	Call-ups	Trinkel et al., 2009
Dinder National Park	Sudan	Protected area	2018	1.8 ± 0.18	–	Woodland and riverine	Call-ups	Mohammed et al. 2019
Niokolo Kob National Park	Senegal	Protected area	2018	2.65	1.77–3.53	Woodland savanna and seasonal wetlands	Call-ups	Gueye et al. 2022
Limpopo National Park	Mozambique	Protected area	2012	1.57	–	Open woodland savanna, bushlands and wetlands	Call-ups	Everatt et al. 2019

Limpopo National Park	Mozambique	Protected area	2017	1.49	–	Open woodland savanna, bushlands and wetlands	Call-ups	Everatt et al. 2019
Chinko	CAR	Protected area	2017	1.4	–	Savanna and lowland rainforest	Distance sampling (*DISTANCE*)	Aebischer et al. 2020
Bwabwata National Park	Namibia	Protected area	2017	1.38	1.21–1.69	Floodplain, and mixed woodland	Spoor	Hanssen et al. 2017
Coutada 11, Zambezi Delta	Mozambique	Wildlife management area	2021	1.33 ± 0.31	0.85–2.08	Forest, woodland, savanna, grassland	SECR (Maximum likelihood, *secr*)	This study
Bwabwata National Park	Namibia	Protected area	2014	1.22	–	Floodplain, mixed woodland	Spoor	Hanssen et al. 2017
Kasungu National Park	Malawi	Protected area	2016-2018	1.15 ± 0.42	0.72–1.82	Miombo woodland	SECR (*SPIM*)	Davis et al., 2021
Luengue-Luiana & Mavinga National Parks	Angola	Protected area	2015-2016	0.92	0.51–1.33	Mixed woodland, shrubland, grassland, riparian forest, floodplain	Spoor	Funston et al. 2017
Tsauchab River Valley	Namibia	Mixed-use landscape	2015-2017	0.85 ± 0.14	0.64–1.11	Nama Karoo	SECR (Bayesian, *SPACECAP*)	Fouché et al., 2020
Kgalagadi Transfrontier Park (Kalahari Gemsbok NP)	South Africa	Protected area	1979-1984	0.8	–	Desert	Call-ups	Mills 1990
Murchison Falls Conservation Area	Uganda	Protected area	2009	0.75 ± 0.14	–	Woodland, savanna, forest, grassland	Call-ups	Omoya et al. 2013
Savé Valley Conservancy (Resettlement land)	Zimbabwe	Non-protected area	2008	0.61	0.17–1.05	Deciduous woodland savanna	Spoor	Williams et al. 2016
Naukluft National Park	Namibia	Protected area	1977-1979	0.6	0.4–0.85	Desert, with sparse grassland	Observations	Tilson & Henschel 1986
Platjan	South Africa	Mixed-use landscape	2017	0.22 ± 0.17	0.06–0.81	Bushveld	SECR (Maximum likelihood, *secr*)	Faure et al. 2021

SUPPLEMENTARY TABLE 7 Prey-based spotted hyaena carrying capacity estimates for Coutada 11 and the Delta landscape using the Hayward et al. (2007) model, where A = preferred prey species and B = preferred prey weight range (Briers-Louw & Leslie, 2020).

Area	Year	Estimated density (hyaenas/100 km^2)		Estimated hyaena abundance	
		A	B	A	B
Zambezi Delta	2019	11.89	11.53	1160	1125
	2021	12.44	11.84	1213	1154
Coutada 11	2019	9.33	11.30	180	218
	2020	9.27	11.25	179	217
	2021	10.18	11.54	196	223

SUPPLEMENTARY TABLE 8 Annual trophy hunting quota and actual offtake (in parentheses) of spotted hyaenas across the Zambezi Delta between 2017–2021.

Location	2017	2018	2019	2020	2021
Coutada 10	2 (2)	2 (2)	2 (2)	2 (2)	2 (2)
Coutada 11	2 (2)	2 (2)	2 (2)	2 (1)	2 (1)
Coutada 12	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Coutada 14	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Marromeu National Reserve	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	4 (4)	4 (4)	4 (4)	4 (3)	4 (3)

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