

Supplementary Materials

Home-Range Size and Space Use of Territorial Bonelli's Eagles (*Aquila fasciata*) Tracked by High-Resolution GPS/GSM Telemetry

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Table S1. Summary information of the 51 Bonelli's eagles tracked by GPS/GSM satellite telemetry in eastern Spain.

Individual	Territory	Sex	Tagging Date	End Day of Data	No. of Locations
				Transmission or Data Analysis	
Abel	1	Male	19/05/2015	02/09/2016	70,070
Adan	1	Male	31/01/2017	16/06/2020	202,346
Aura	1	Female	19/05/2015	21/05/2021	233,314
Berta	2	Female	10/06/2015	04/07/2015	4,366
Blas	2	Male	10/06/2015	27/06/2016	60,636
Boira	2	Female	06/11/2015	28/06/2016	26,501
Boj	2	Male	11/04/2017	19/06/2017	11,235
Bruma	2	Female	11/04/2017	21/05/2021	228,029
Carbo	3	Male	28/10/2015	25/03/2020	194,875
Carla	3	Female	28/10/2015	30/11/2018	105,168
Dino	4	Male	29/10/2015	21/03/2018	123,451
Dora	4	Female	29/10/2015	21/03/2018	135,077
Enebro	5	Male	07/06/2016	06/07/2020	219,785
Faig	6	Male	08/06/2016	21/05/2021	257,640
Fauna	6	Female	18/05/2017	21/05/2021	134,853
Flora	6	Female	08/06/2016	14/12/2016	26,633
Garra	7	Female	07/10/2016	24/02/2019	128,447
Gel	7	Male	07/10/2016	21/05/2021	234,500
Haeckel	8	Male	20/04/2017	01/04/2018	53,850
Helios	8	Male	06/10/2016	26/01/2017	14,033
Hydra	8	Female	06/10/2016	07/03/2018	74,598
Iris	9	Female	09/12/2016	27/03/2017	11,567
Isis	9	Male	09/12/2016	20/01/2017	4,352
Jara	10	Female	14/06/2017	21/05/2021	215,518
Juan	10	Male	05/06/2017	13/11/2020	164,822
Karma	11	Female	06/06/2017	29/03/2018	42,589
Koko	11	Male	13/09/2017	29/03/2018	26,490
Linneo	12	Male	11/07/2017	21/05/2021	217,907
Lucy	12	Female	11/07/2017	31/12/2019	108,127
Margulis	13	Female	06/06/2018	21/05/2021	156,689
Mendel	13	Male	06/06/2018	21/05/2021	173,427
Newton	14	Male	07/06/2018	31/03/2019	46,076
Nube	14	Female	06/06/2018	31/12/2018	34,708
Ochoa	15	Male	08/06/2018	21/05/2021	169,997
Olympia	15	Female	11/06/2018	21/05/2021	181,436
Pino	16	Male	23/06/2020	06/07/2020	1,016
Pluma	16	Female	28/01/2019	21/05/2021	55,635
Popper	16	Male	28/01/2019	16/10/2019	24,800
Rosalind	17	Female	03/06/2019	21/05/2021	43,955
Rutherford	17	Male	03/06/2019	21/05/2021	47,904
Sabina	18	Female	13/06/2019	21/02/2020	17,333
Salvia	18	Female	09/06/2020	21/05/2021	16,543
Sauce	18	Male	12/06/2019	21/05/2021	46,935
Taiga	19	Female	21/06/2019	21/05/2021	37,701

Tejo	19	Male	15/06/2019	21/05/2021	46,985
Ulex	20	Male	08/10/2019	31/12/2020	18,147
Uva	20	Female	08/10/2019	01/01/2021	17,727
Vera	21	Female	07/11/2019	21/05/2021	33,424
Verdi	21	Male	07/11/2019	21/05/2021	43,456
Villena Female	22	Female	17/05/2018	31/12/2019	77,923
Villena Male	22	Male	17/05/2018	21/05/2021	168,484

Table S2. Summary statistics of daily home-range size (km²) per individual according to three different spatial estimators (i.e., K95%, K75%, and K50%).

Individual	Territory	Count	K95%		K75%		K50%	
			Mean	SD	Mean	SD	Mean	SD
Abel	1	471	43.395	47.510	18.422	16.327	8.307	7.536
Adan	1	1233	66.091	30.852	30.946	15.362	14.370	7.661
Aura	1	2091	54.255	45.832	24.498	20.482	11.120	9.712
Berta	2	26	51.02	31.939	21.986	13.934	10.076	6.526
Blas	2	384	40.174	37.932	16.358	14.764	7.269	6.587
Boira	2	225	28.576	32.807	11.777	14.767	5.237	6.896
Boj	2	64	43.774	34.008	18.767	14.162	8.693	6.657
Bruma	2	1417	44.546	52.184	17.804	18.223	7.882	7.858
Carbo	3	1608	54.514	42.297	23.610	17.820	10.672	8.344
Carla	3	777	50.018	37.346	21.694	17.278	9.686	8.016
Dino	4	805	49.670	22.164	22.639	11.500	10.248	5.654
Dora	4	875	41.344	26.916	18.191	13.391	8.159	6.377
Enebro	5	1491	55.802	55.802	24.064	18.623	10.906	8.783
Faig	6	1728	74.152	45.246	33.396	22.319	15.288	10.918
Fauna	6	1353	88.845	55.017	40.668	27.495	18.715	13.665
Flora	6	190	57.079	40.610	26.090	19.470	12.194	9.417
Garra	7	870	46.310	37.288	19.439	16.658	8.654	7.750
Gel	7	1623	51.922	35.989	22.026	16.558	9.786	7.808
Haeckel	8	346	33.634	23.892	13.803	9.263	6.235	4.260
Helios	8	113	28.549	18.421	12.796	8.739	5.789	4.096
Hydra	8	518	26.092	19.678	10.452	8.312	4.592	3.859
Iris	9	109	25.638	39.296	10.284	16.874	4.671	7.774
Isis	9	46	22.436	38.279	10.140	18.755	4.714	8.941
Jara	10	1347	35.313	22.431	15.239	9.698	6.898	4.604
Juan	10	1104	45.310	43.165	19.222	16.269	8.795	7.645
Karma	11	297	51.317	47.636	22.593	21.574	10.533	10.382
Koko	11	198	56.860	63.937	25.366	30.092	11.881	14.785
Linneo	12	1343	83.835	53.175	36.635	24.242	16.388	11.573
Lucy	12	839	84.428	121.653	37.260	60.360	16.644	28.069
Margulis	13	951	53.009	39.655	23.524	18.337	10.849	8.931
Mendel	13	1013	56.498	30.099	25.371	14.804	11.646	7.247
Newton	14	298	88.771	80.323	38.958	36.567	17.869	17.141
Nube	14	208	78.713	76.146	33.419	36.339	15.053	17.484
Ochoa	15	1018	59.204	75.709	25.779	35.131	11.934	16.729
Olympia	15	1011	62.806	142.687	26.971	65.035	12.343	30.213
Pino	16	14	80.206	30.202	41.094	17.422	20.742	9.572
Pluma	16	691	35.723	32.428	16.015	14.322	7.432	6.948
Popper	16	232	51.428	41.383	22.711	18.865	10.429	8.685
Rosalind	17	560	25.524	22.142	11.085	9.299	5.124	4.427
Rutherford	17	559	27.298	20.835	12.183	9.805	5.659	4.866
Sabina	18	227	63.970	66.833	28.629	29.228	13.258	14.231
Salvia	18	220	71.536	63.769	32.325	30.010	15.094	14.423
Sauce	18	593	82.029	65.745	38.277	31.558	17.797	15.206
Taiga	19	572	35.502	57.337	14.893	17.241	6.810	7.697
Tejo	19	589	46.890	217.078	20.872	102.214	9.661	48.038
Ulex	20	396	116.106	214.752	56.422	108.062	27.323	54.364
Uva	20	396	95.413	181.324	47.788	99.890	23.093	50.092
Vera	21	385	45.181	37.823	19.846	16.618	9.064	7.937
Verdi	21	431	56.519	74.680	25.067	31.749	11.399	13.448
YHembra	22	535	57.245	56.452	21.720	22.900	9.250	10.257

Table S3. ANOVA results of interannual variation in monthly average daily home-range size according to the 95% kernel by individual. Significant variables are highlighted in bold.

Individual	Variable	Df	Sum Sq	Mean Sq	F Value	Pr(>F)
Abel	year	1	0	0.4	0.001	0.973
	Residuals	14	4472	319.4		
Adan	year	3	10005	3335.0	19.180	< 0.001
	Residuals	38	6607	174.0		
Aura	year	6	17914	2985.6	5.773	< 0.001
	Residuals	65	33618	517.2		
Blas	year	1	64.6	64.6	0.483	0.500
	Residuals	12	1605.6	133.8		
Boira	year	1	473.6	473.6	1.661	0.245
	Residuals	6	1711.3	285.2		
Bruma	year	4	2360	589.9	1.962	0.118
	Residuals	43	12931	300.7		
Carbo	year	5	2570	514.0	2.517	0.042
	Residuals	48	9801	204.2		
Carla	year	3	680	226.7	0.817	0.496
	Residuals	26	7211	277.4		
Dino	year	3	2422	807.4	11.380	< 0.001
	Residuals	25	1773	70.9		
Dora	year	3	4122	1374.2	5.103	0.007
	Residuals	26	7002	269.3		
Enebro	year	4	4174	1043.5	2.719	0.041
	Residuals	45	17268	383.7		
Faig	year	5	7513	1502.6	4.217	0.003
	Residuals	53	18886	356.3		
Fauna	year	4	7242	1810.6	5.700	0.001
	Residuals	42	13341	317.6		
Garra	year	3	2633	877.6	1.802	0.173
	Residuals	25	12178	487.1		
Gel	year	5	3549	709.9	1.953	0.103
	Residuals	48	17444	363.4		
Haeckel	year	1	354.6	354.6	1.491	0.248
	Residuals	11	2615.5	237.8		
Helios	year	1	5.95	6.0	0.083	0.801
	Residuals	2	143.97	72.0		
Hydra	year	2	271	135.5	1.516	0.249
	Residuals	16	1430	89.4		
Iris	year	1	14.43	14.4	0.119	0.763
	Residuals	2	242.61	121.3		
Jara	year	4	1474	368.4	3.497	0.015
	Residuals	41	4319	105.3		
Juan	year	3	3231	1076.9	6.217	0.002
	Residuals	35	6062	173.2		
Koko	year	1	3058.4	3058.4	19.380	0.007
	Residuals	5	789.1	157.8		
Karma	year	1	45.4	45.4	0.153	0.706
	Residuals	8	2377.7	297.2		
Linneo	year	4	2162	540.5	2.544	0.054
	Residuals	40	8499	212.5		
Lucy	year	2	6957	3479.0	3.505	0.044
	Residuals	27	26798	993.0		
Margulis	year	3	198	66.0	0.147	0.931
	Residuals	30	13438	447.9		
Mendel	year	3	559	186.4	1.013	0.401
	Residuals	30	5520	184.0		
Newton	year	1	1119	1119.0	3.031	0.120
	Residuals	8	2953	369.1		
Ochoa	year	3	7675	2558.0	3.068	0.043

Individual	Variable	Df	Sum Sq	Mean Sq	F Value	Pr(>F)
Olympia	Residuals	30	25019	834.0		
	year	3	18026	6009.0	2.380	0.089
Pluma	Residuals	30	75725	2524.0		
	year	2	223	111.7	0.488	0.620
Rosalind	Residuals	25	5721	228.8		
	year	2	15.4	7.7	0.087	0.917
Rutherford	Residuals	19	1672.2	88.0		
	year	2	57.8	28.9	0.537	0.593
Sabina	Residuals	19	1022.5	53.8		
	year	1	4118	4118.0	3.374	0.109
Sauce	Residuals	7	8543	1220.0		
	year	2	2321	1160.0	0.899	0.423
Salvia	Residuals	20	25814	1291.0		
	year	1	3553	3553.0	2.907	0.132
Taiga	Residuals	7	8556	1222.0		
	year	2	663	331.5	1.082	0.359
Tejo	Residuals	19	5824	306.5		
	year	2	2541	1270.0	0.595	0.561
Ulex	Residuals	19	40548	2134.0		
	year	1	6767	6767.0	0.664	0.430
Uva	Residuals	13	132535	10195.0		
	year	1	71745	71745.0	29.310	< 0.001
Vera	Residuals	13	31821	2448.0		
	year	2	1160	579.9	3.626	0.054
Verdi	Residuals	14	2239	159.9		
	year	2	1237	618.3	1.584	0.240
Villena Female	Residuals	14	5464	390.3		
	year	1	671	671.3	0.728	0.405
Villena Male	Residuals	17	15668	921.6		
	year	3	32495	10832.0	0.931	0.437
	Residuals	32	372154	11630.0		

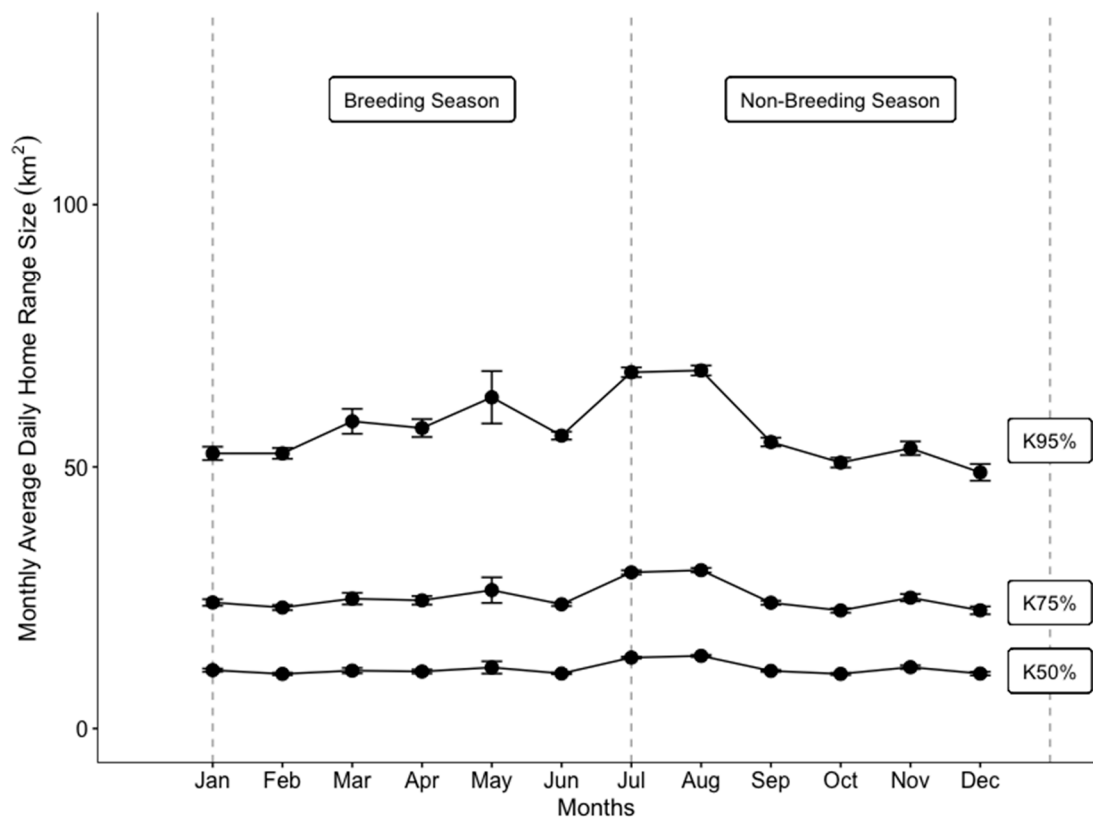


Figure S1. Monthly average of the daily home-range size at three different levels (K95%, K75%, and K50%).

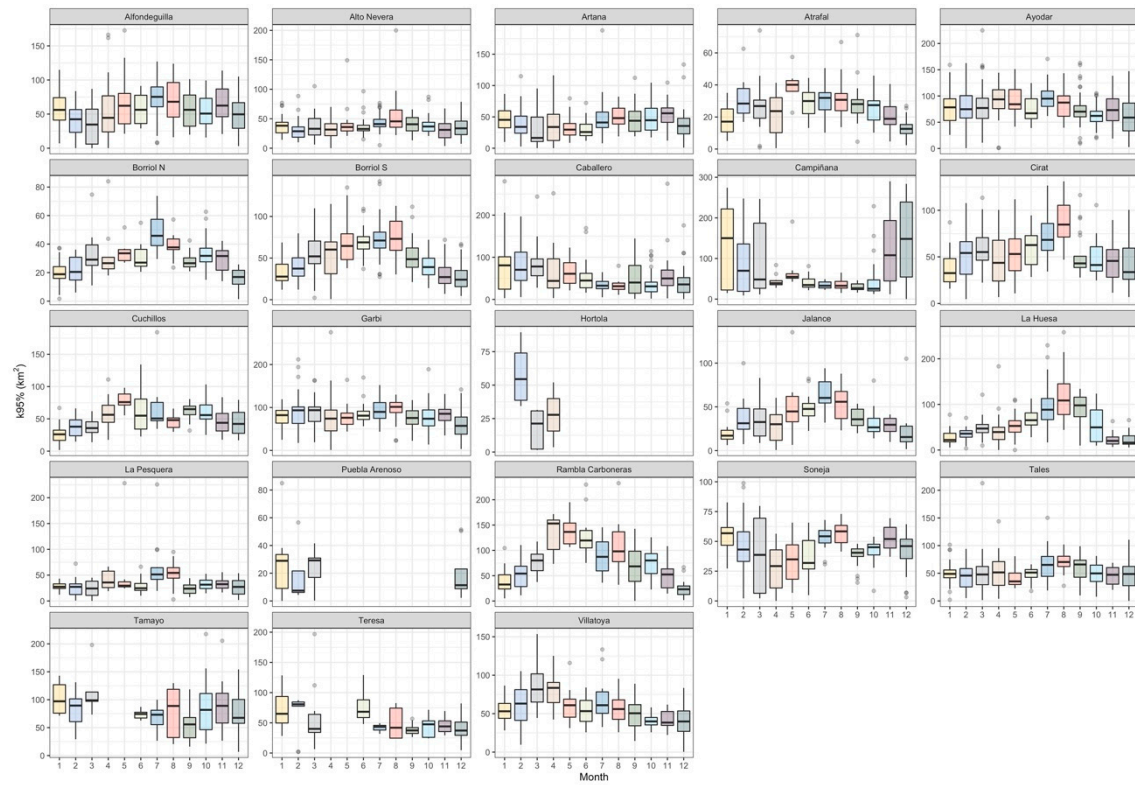


Figure S2. Boxplot of the monthly average of the daily home-range size (K95%) per territory.

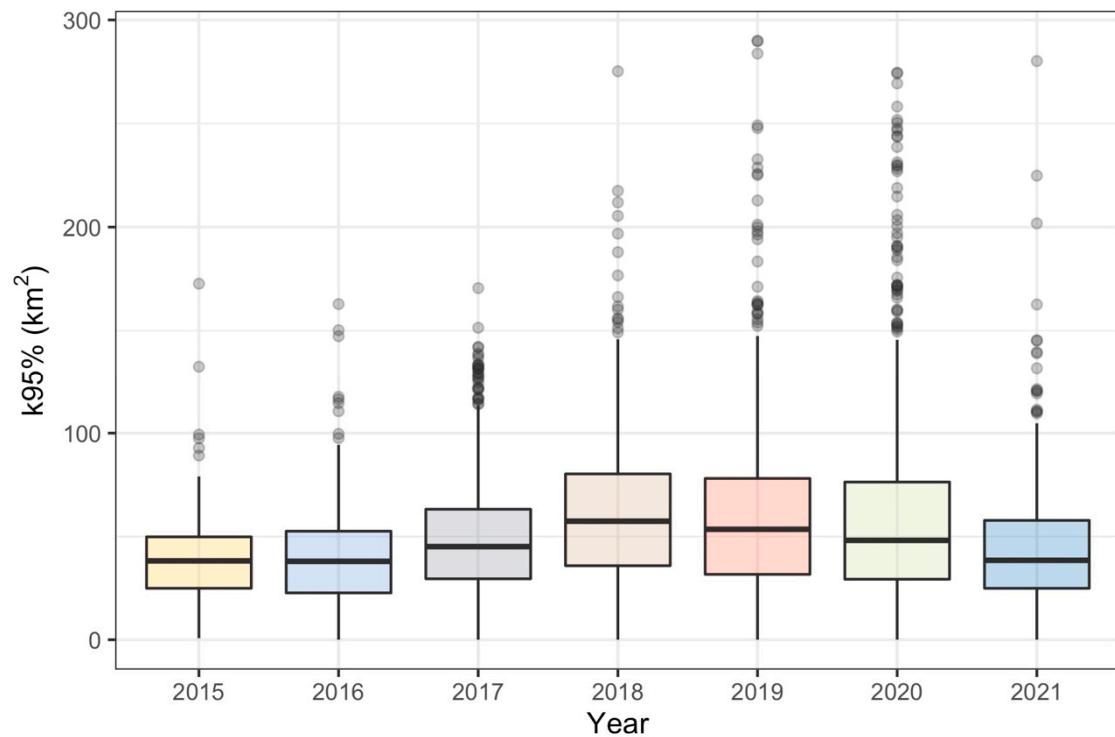


Figure S3. Differences in daily home-range size (K95%) among years.

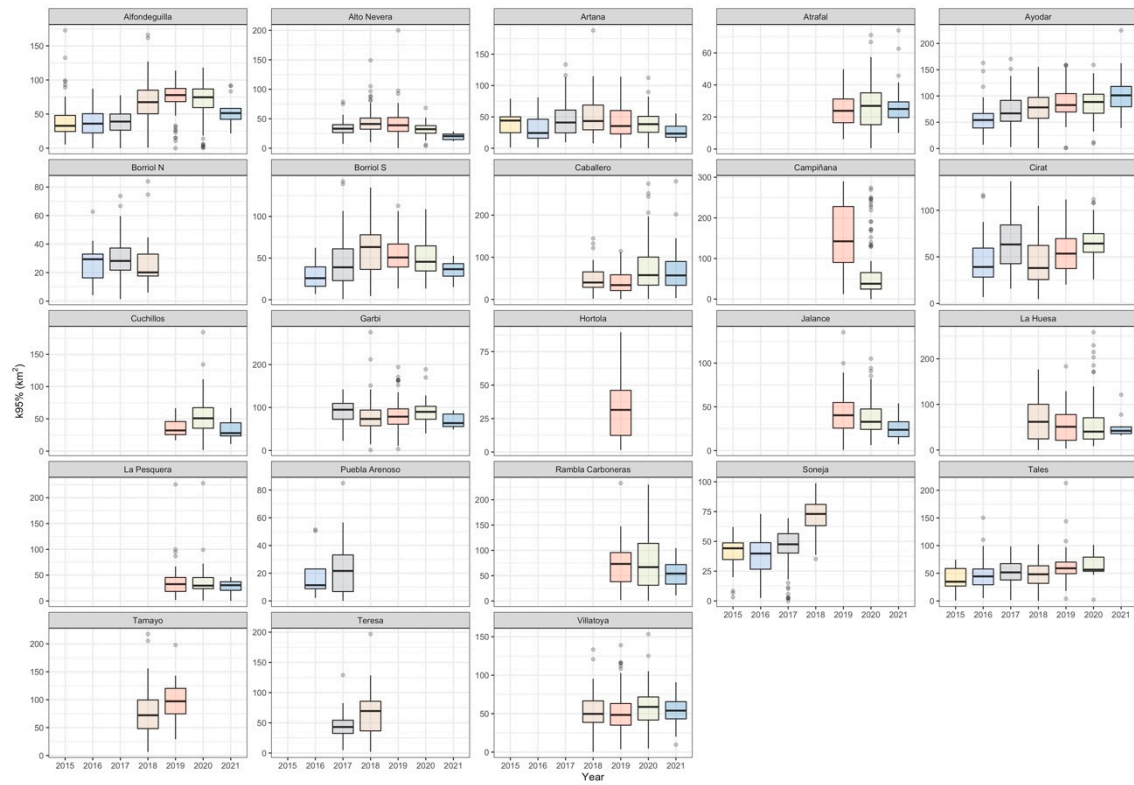


Figure S4. Differences in daily home-range size (K95%) among years and territories.

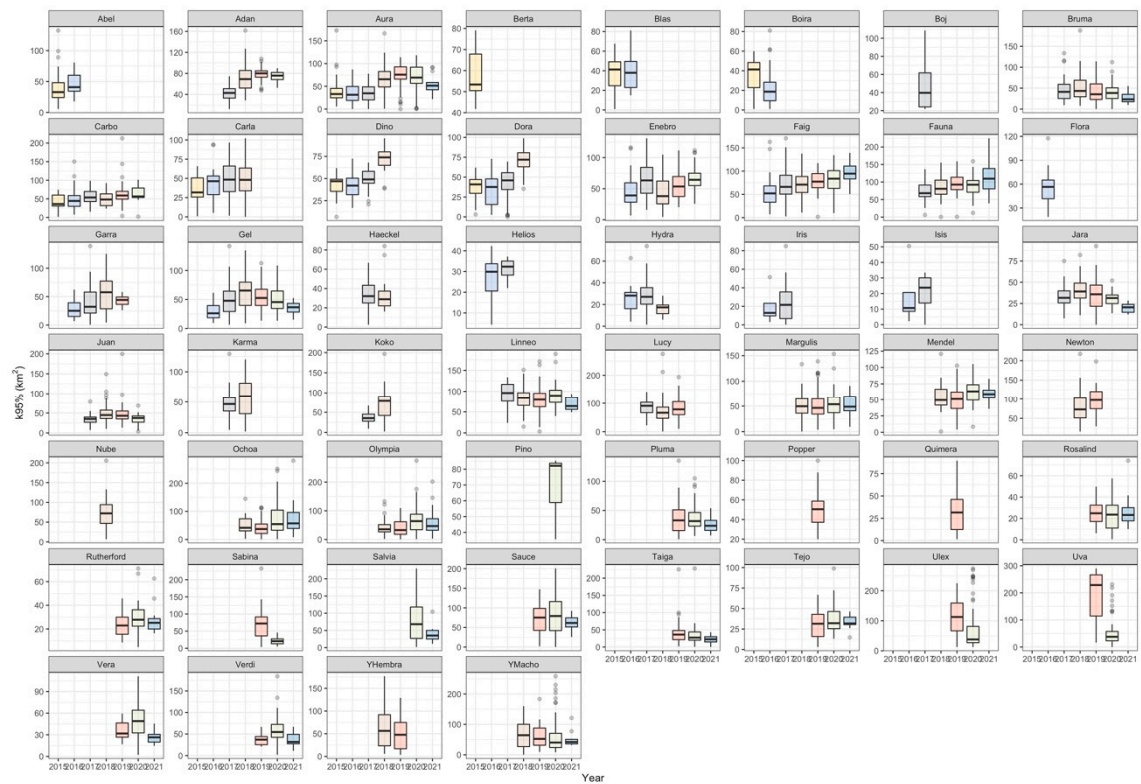


Figure S5. Differences in daily home-range size (K95%) among years per individual.

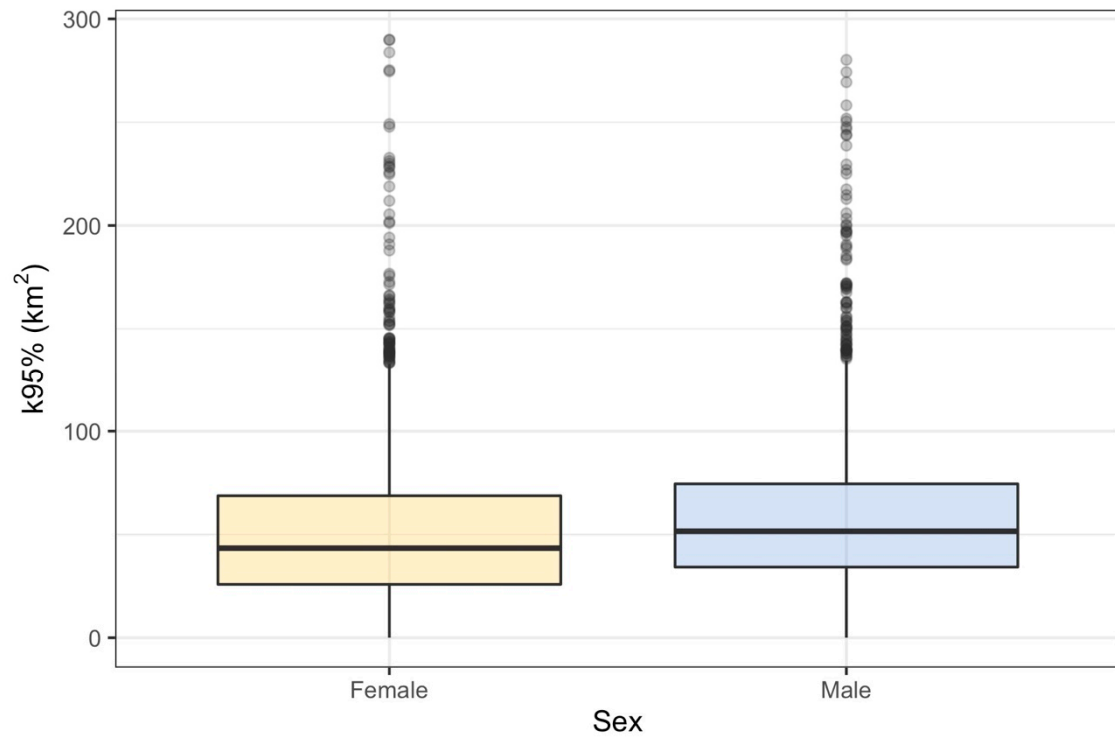


Figure S6. Differences in daily home-range size (K95%) between sexes.

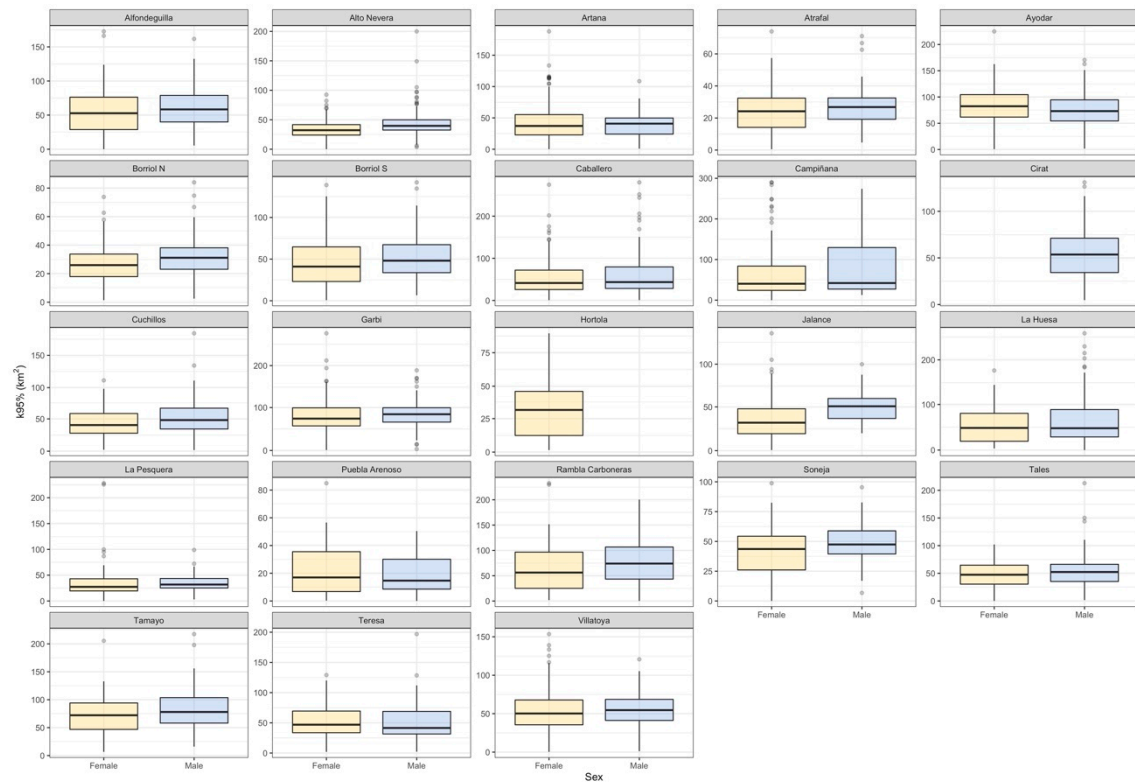


Figure S7. Differences in daily home-range size (K95%) between sexes and territories.

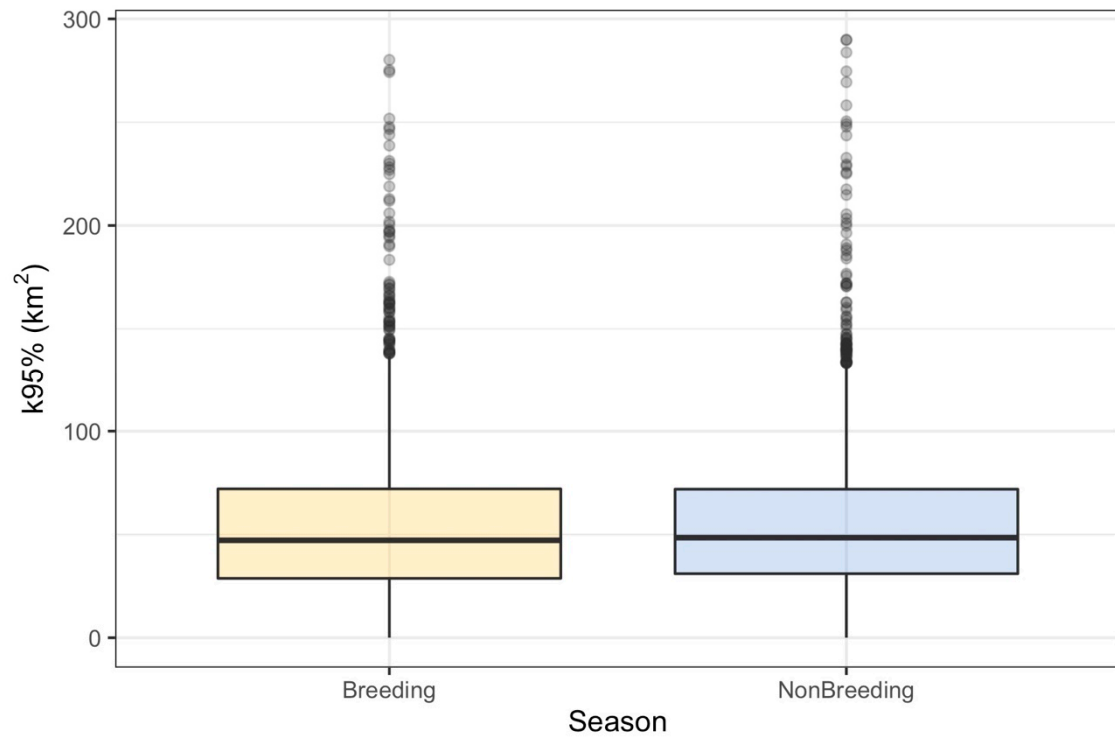


Figure S8. Differences in daily home-range size (K95%) between seasons.

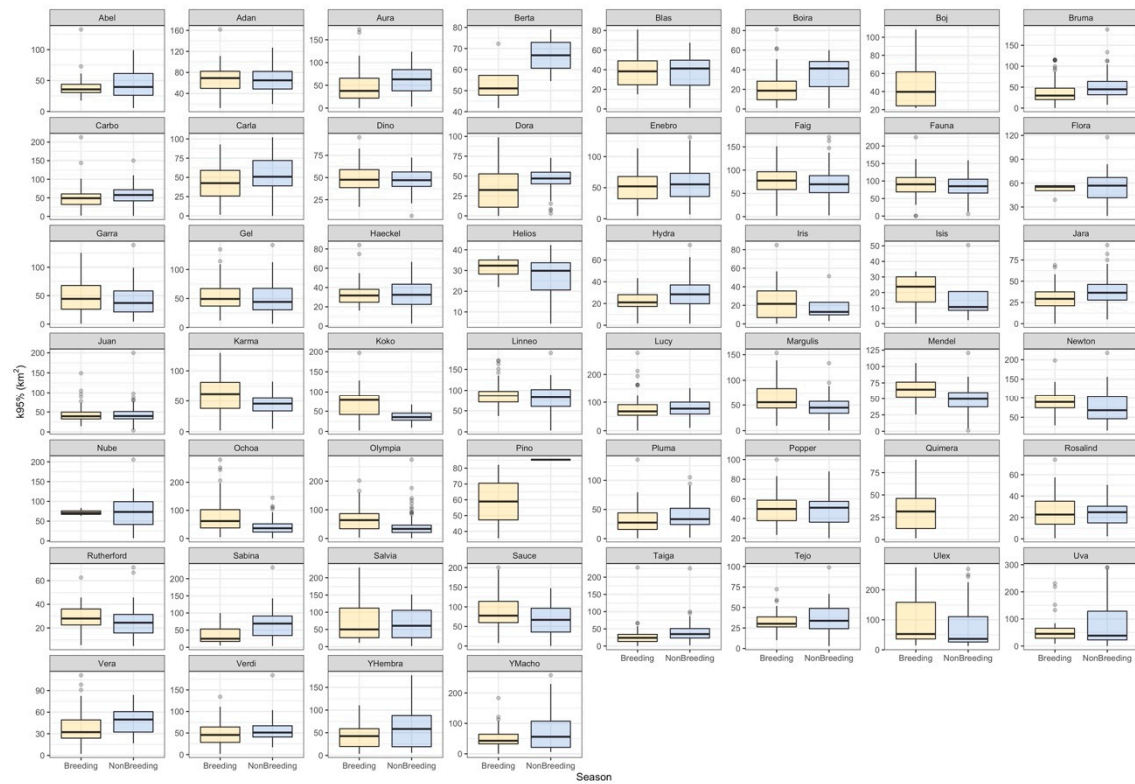


Figure S9. Differences in daily home-range size (K95%) between seasons and territories.

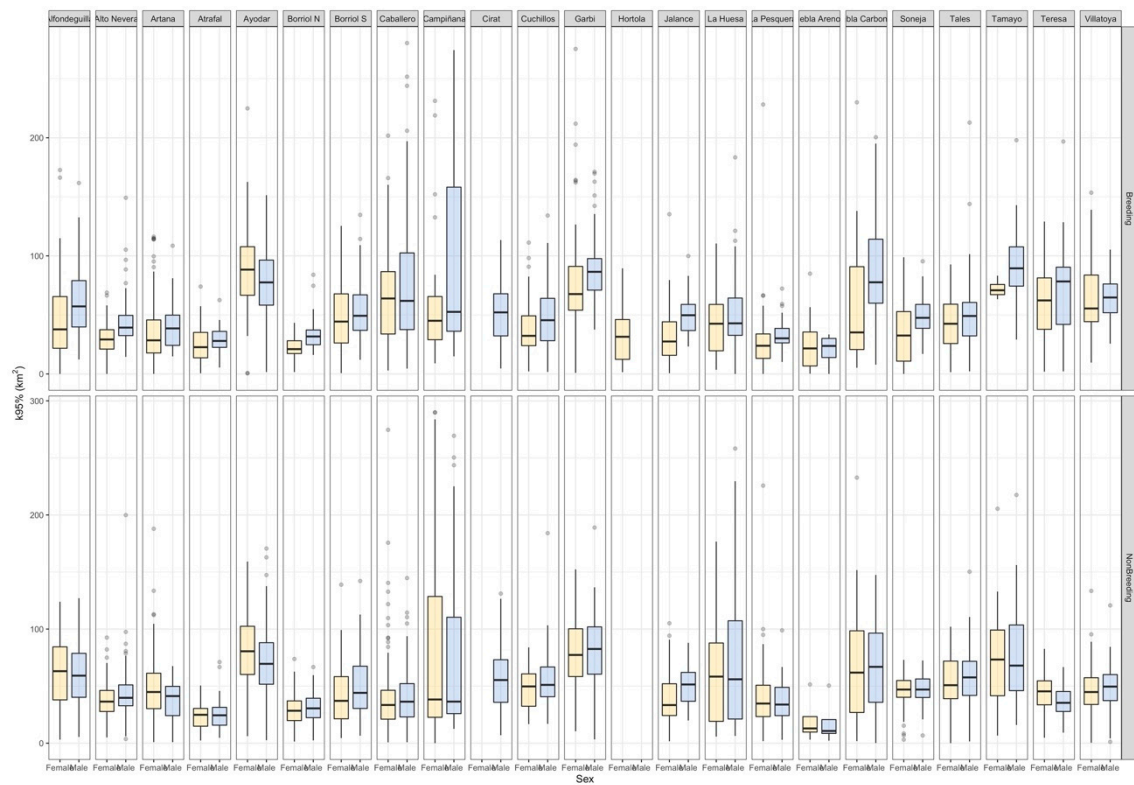


Figure S10. Differences in daily-home range size (K95%) between sexes, seasons, and territories.

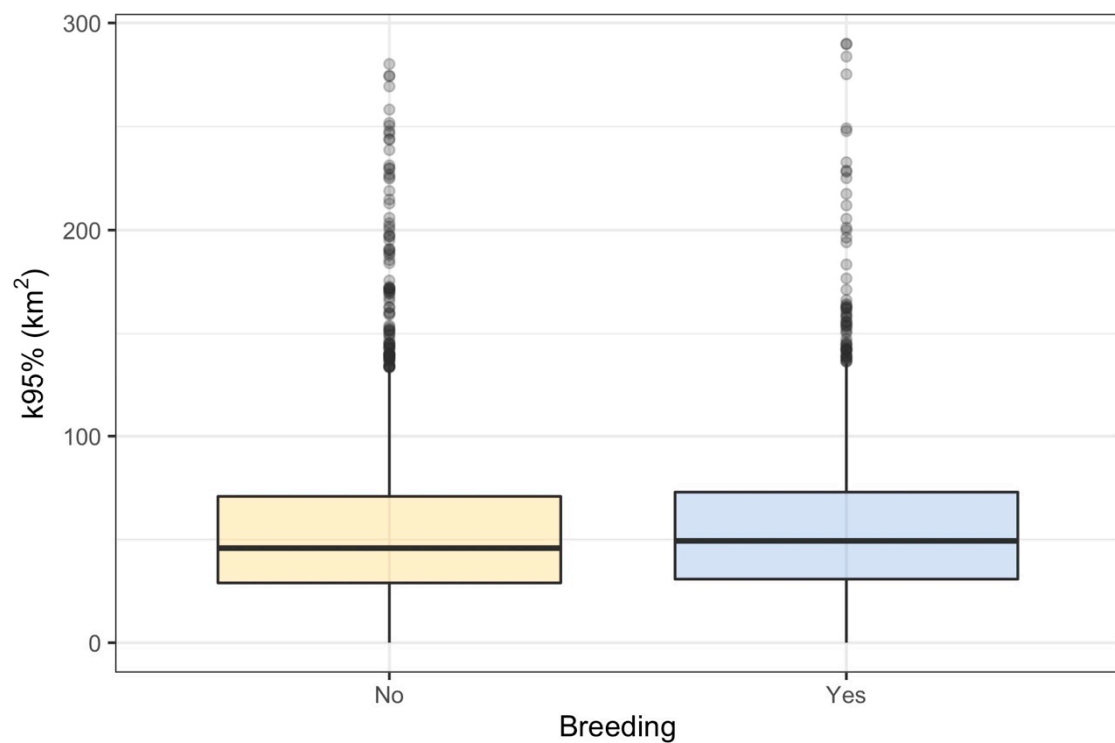


Figure S11. Differences in daily home-range size (K95%) between breeding status.

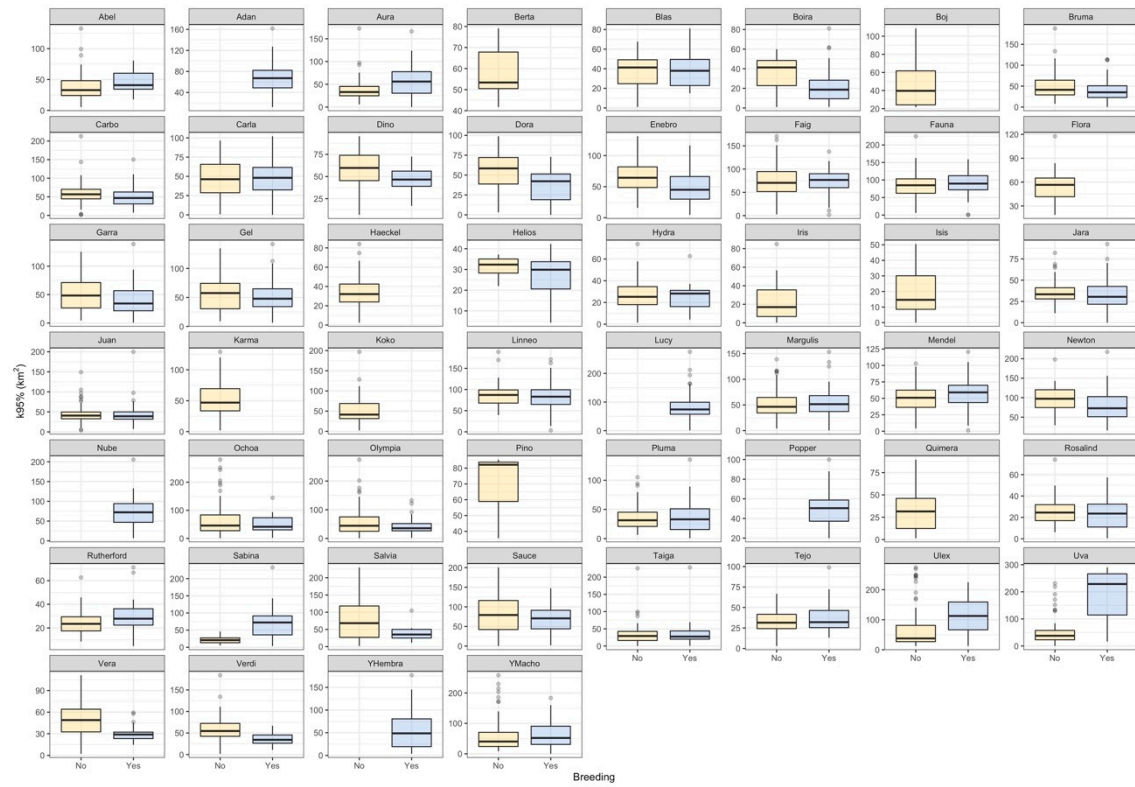


Figure S12. Differences in daily home-range size (K95%) between breeding status and individuals.