

CÁTEDRA
REN EM
BIODIVERSIDADE

POPULATION TRENDS AND THE IMPORTANCE OF ANTHROPOGENIC MORTALITY IN THE LITTLE BUSTARD

João Paulo Silva

REN

FCT

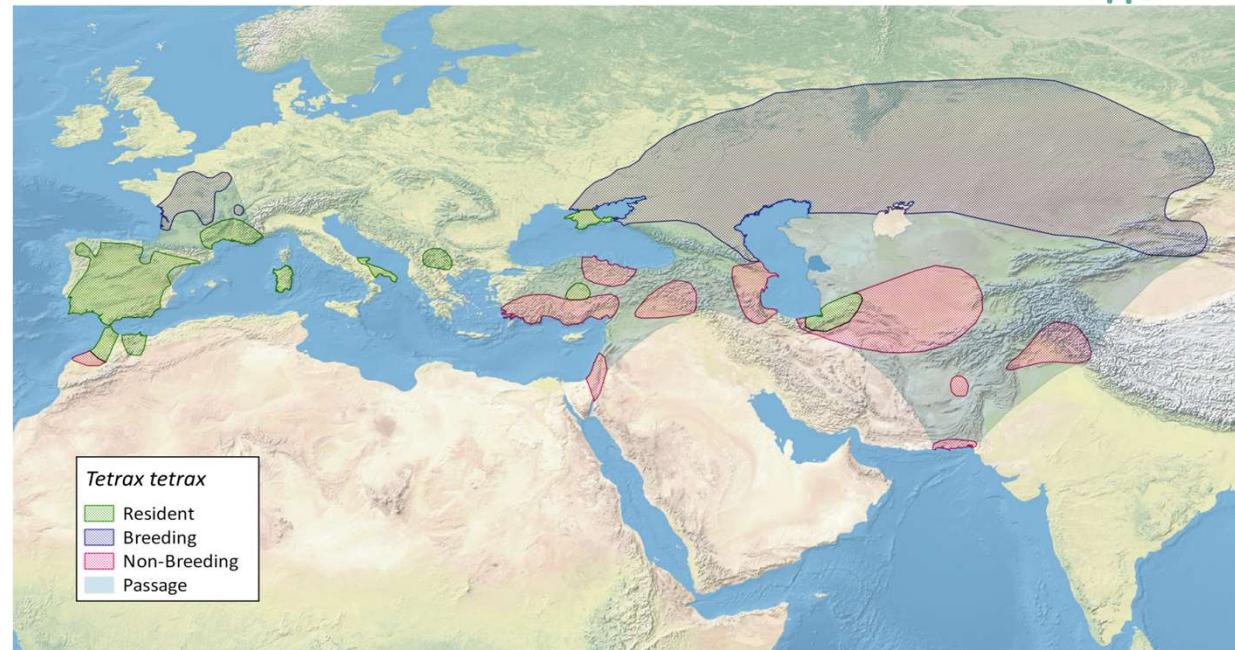
Fundação para a Ciência e a Tecnologia

U.PORTO

BACKGROUND

Conservation Status:

- Near Threatened (IUCN)
- Vulnerable in Europe (BirdLife)
- Priority species for conservation under EU Bird Directive



- It is a lekking bird, that depends mostly on grasslands during the breeding season
- Adults feed almost exclusively on green plants
- Performs migratory movements towards areas with greater food availability during summer and autumn

OBJETIVES



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Assess the population trends of the little bustard over the last 10 years and how it may relate to changes in the availability of breeding habitat

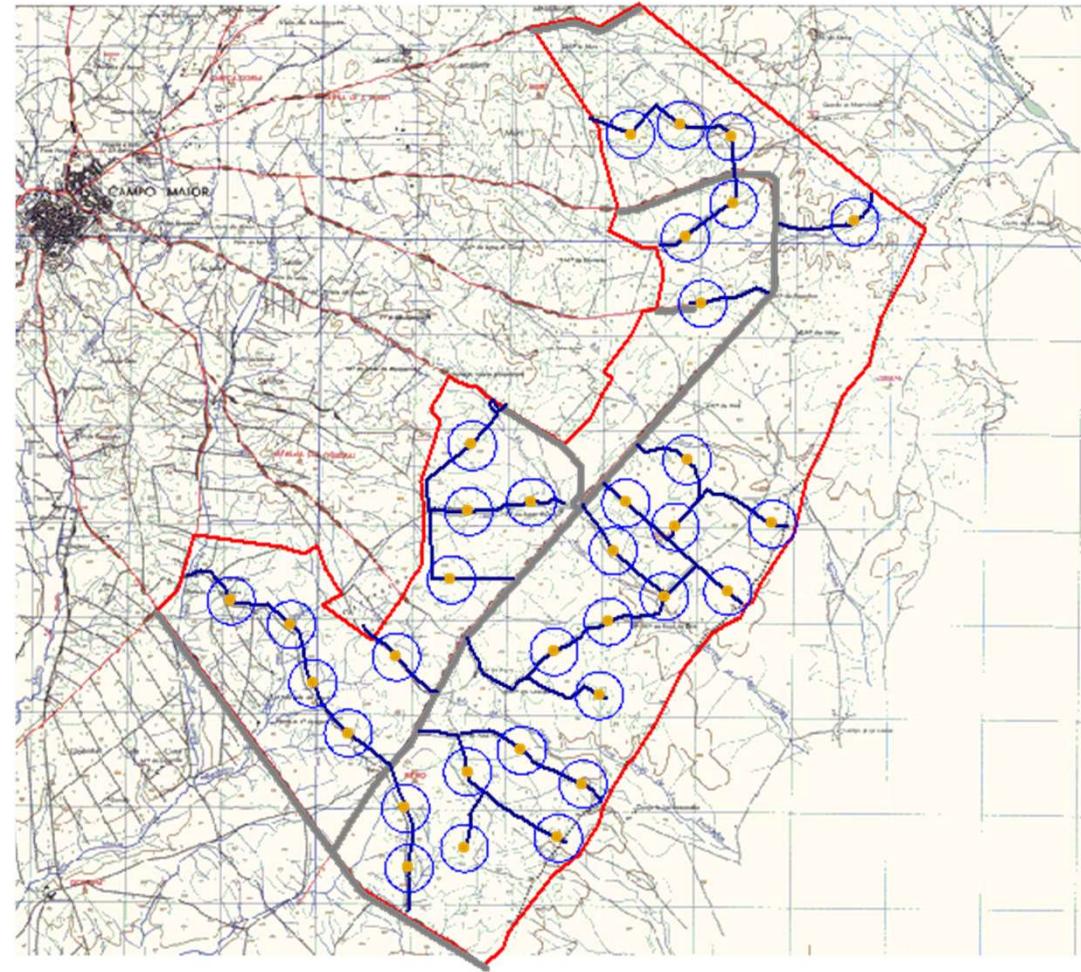
Determine what are the survival and cause specific mortality rates

TRENDS OF THE LITTLE BUSTARD

- In each survey point the number of breeding males was counted, and the proportion of different land uses estimated
- The average density is used to estimate the population of breeding males in each suited area
- The methodology was designed to be replicated
- Subsequent surveys replicate the exact survey points



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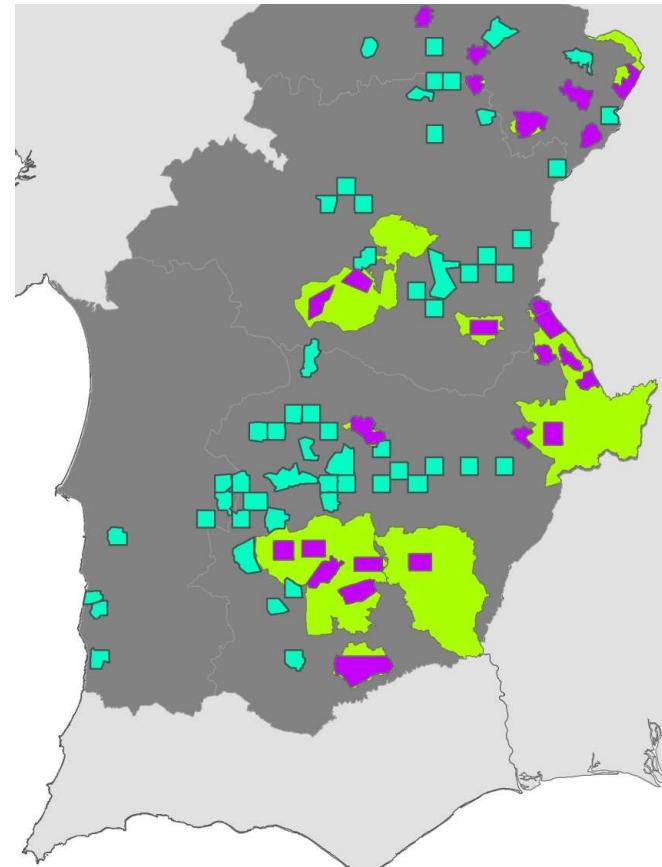
TRENDS OF THE LITTLE BUSTARD



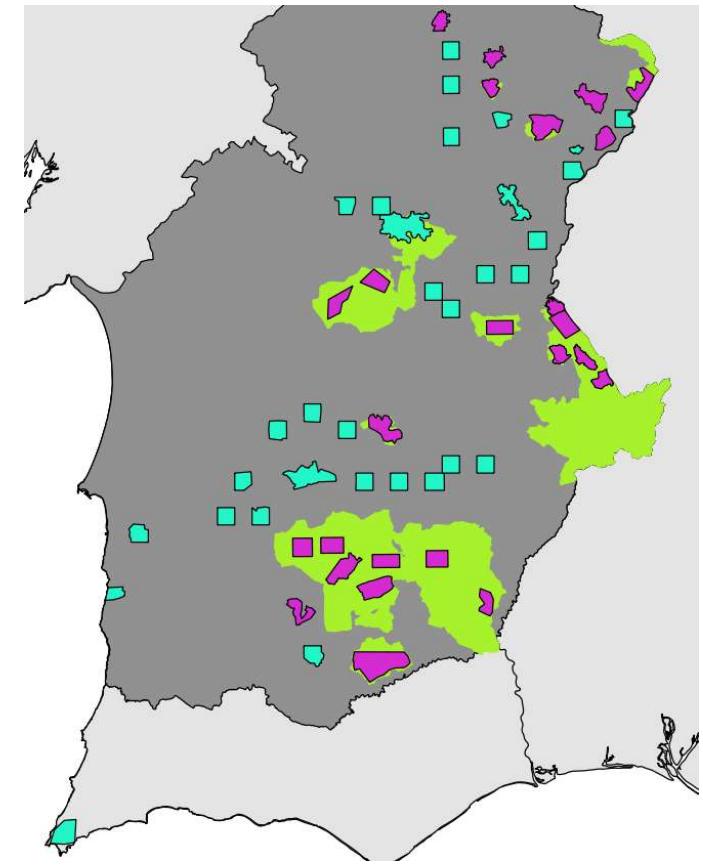
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- **2003-06** - A Life project carried out by ICN and SPEA enabled the first national survey
 - 12 Classe A areas;
 - 24 nuclei/ 823 survey points
 - 55 Classe B areas/ 1511 survey points
- **2016** - A joint effort between CIBIO/REN Chair, ICNF, SPEA, LPN, Quercus, Labor and volunteers
 - 13 Classe A areas
 - 25 nuclei / 818 survey points
 - 32 Classe B areas / 714 survey points

Survey 2003-2006



Survey 2016

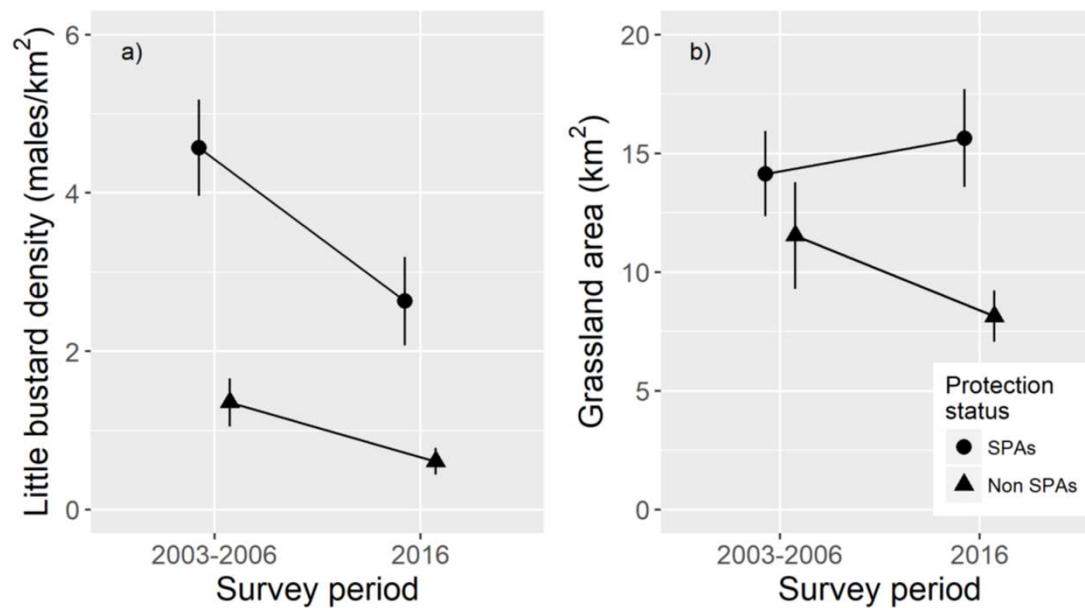


TRENDS OF THE LITTLE BUSTARD



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	2003 - 2006			2016			population variation in %	variation # individuals
	mean	min	max	mean	min	max		
SPA	6 695	3 875	9 514	5 008	2 701	7 790	-25,2	1 687
non-SPA	10 724	9 199	12 248	3 892	2 739	5 045	-63,7	6 831
Total	17 418	13 074	21 762	8 900	5 440	12 836	-48,9	-8 518



Variable	Estimate	Std. Error	p-Value
Little bustard density model			
Intercept	4.571	0.414	<0.001
Non SPAs	-1.938	0.412	<0.001
2016 Survey	-3.215	0.557	<0.001
Non SPAs : 2016 Survey	1.191	0.581	0.045
Grassland availability model			
Intercept	14.143	1.997	<0.001
Non SPAs	-2.601	2.604	0.321
2016 Survey	1.497	1.677	0.135
Non SPAs : 2016 Survey	-4.895	2.187	0.030

TRENDS OF THE LITTLE BUSTARD



Name of the SPA	area	2003-06						2016						trend	population variation in %	variation # individuals			
		density			estimates			density			estimates								
		mean	min	max	mean	min	max	mean	min	max	mean	min	max						
Castro Verde	79 066	5,8	3,8	7,8	3 390	2 237	4 544	5,3	3,3	7,3	3 090	1 966	4 222	=	-8,3	-300			
Évora	53 134	1,1	0,2	2,0	394	86	703	0,7	0,1	2,8	247	17	925	↓	-37,4	-147			
Mourão/Moura/Barrancos	89 825	3,7	1,2	6,3	828	293	1 364	0,6	0,0	1,2	188	0	384	↓	-83,7	-640			
Vale do Guadiana	76 578	2,7	1,3	4,1	368	178	557	3,5	1,7	5,2	640	312	969	↑	27,7	273			
Campo Maior	9 575	3,6	2,1	5,0	203	122	285	1,0	0,0	2,0	55	0	115	↓	-73,1	-149			
Cuba	5 049	8,1	6,1	10,2	350	260	439	8,2	5,3	11,1	353	228	477	=	0,8	3			
Vila Fernando	5 261	6,0	3,7	8,4	285	174	397	3,0	1,7	4,3	140	78	202	↓	-51,0	-146			
Veiros	1 960	3,6	1,7	5,6	66	31	101	2,4	0,9	4,0	44	16	72	↓	-33,0	-22			
Monforte	1 593	1,1	0,2	2,0	22	4	41	1,0	0,0	2,2	20	0	43	=	-9,1	-2			
Reguengos	8 141	4,3	2,8	5,9	252	164	340	2,2	0,9	3,6	112	45	179	↓	-48,3	-140			
S. Vicente	3 712	8,6	5,9	11,3	318	219	418	2,9	1,1	4,7	107	39	175	↓	-66,5	-212			
Torre da Bolsa	2 722	7,3	3,6	11,0	217	108	326	0,4	0,0	1,0	12	0	28	↓	-94,4	-205			
Total					6 695	3 875	9 514				5 008	2 701	7 790		-25,2	1 687			

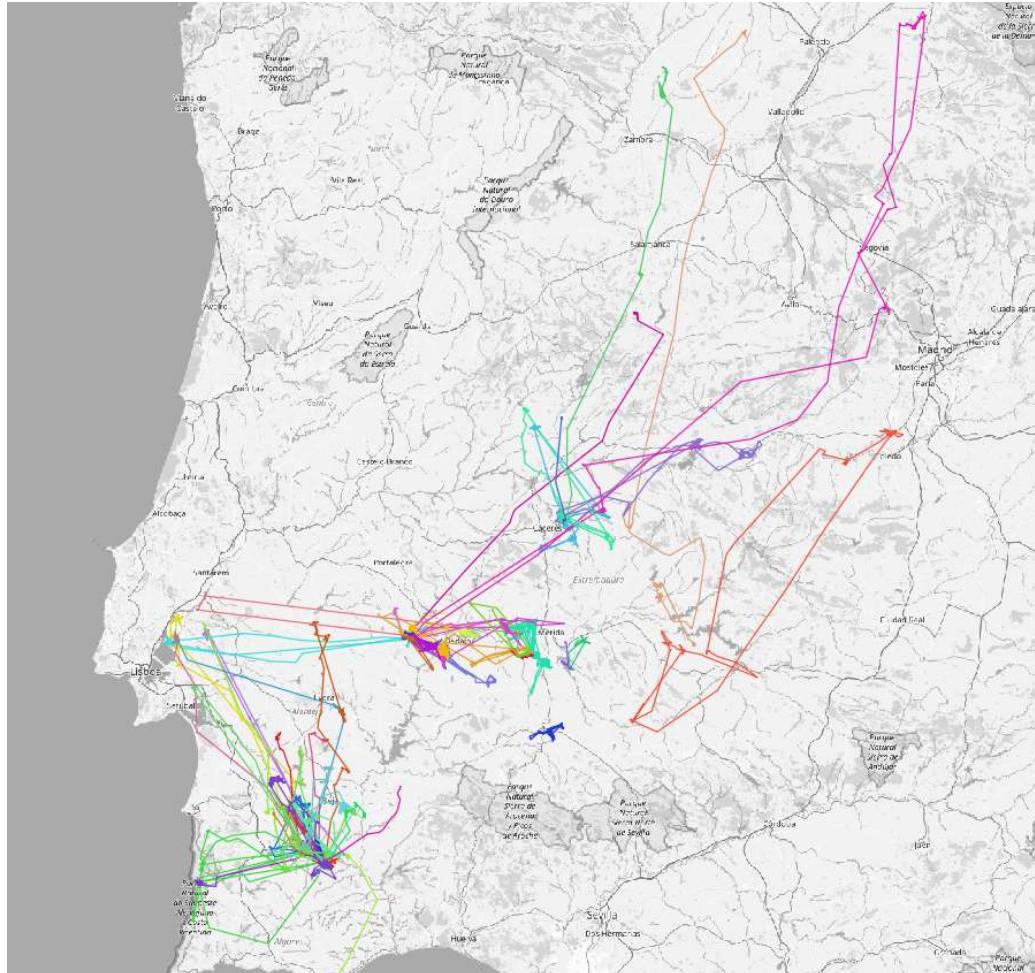
NATURAL AND NON-NATURAL MORTALITY



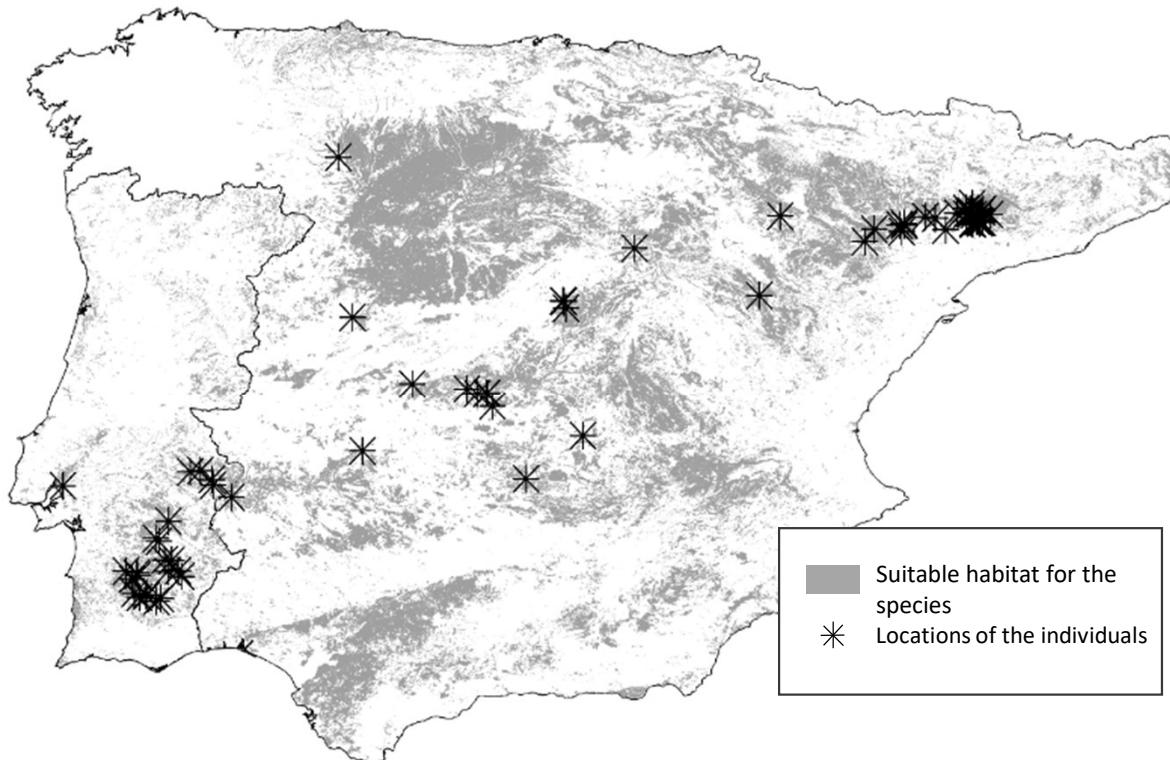
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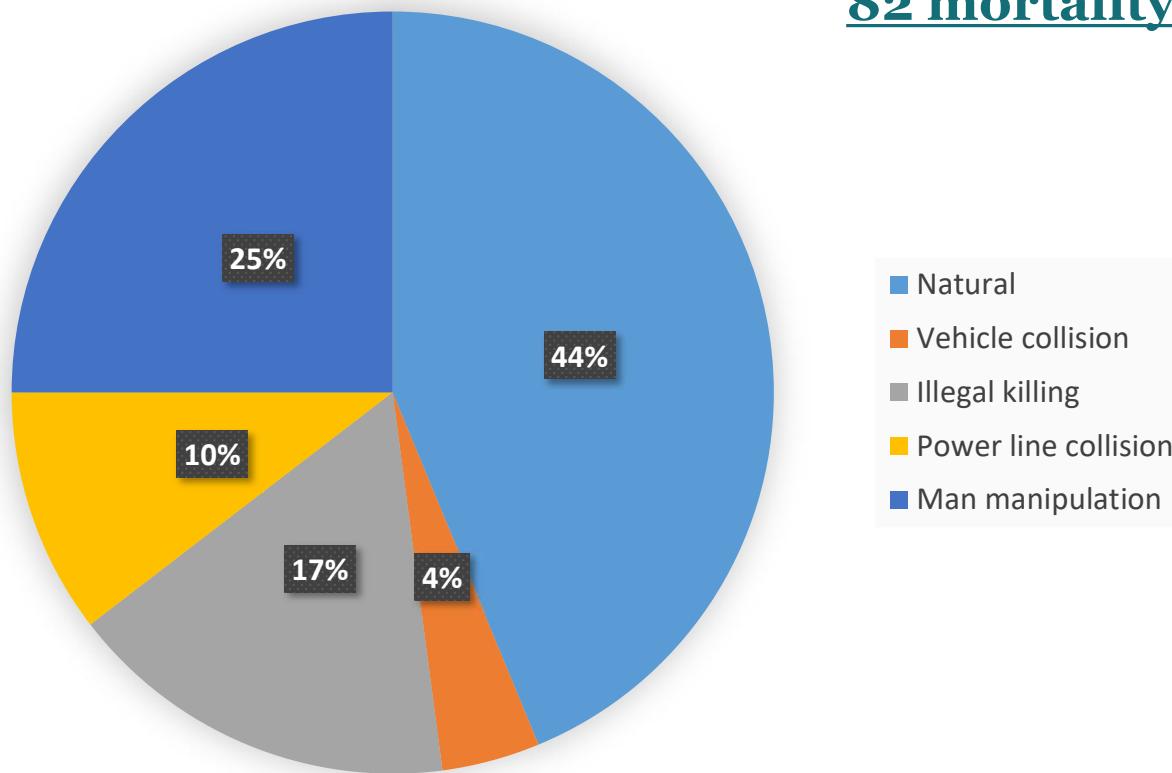
n= 151 tracked birds / 82 mortality events

NATURAL AND NON-NATURAL MORTALITY



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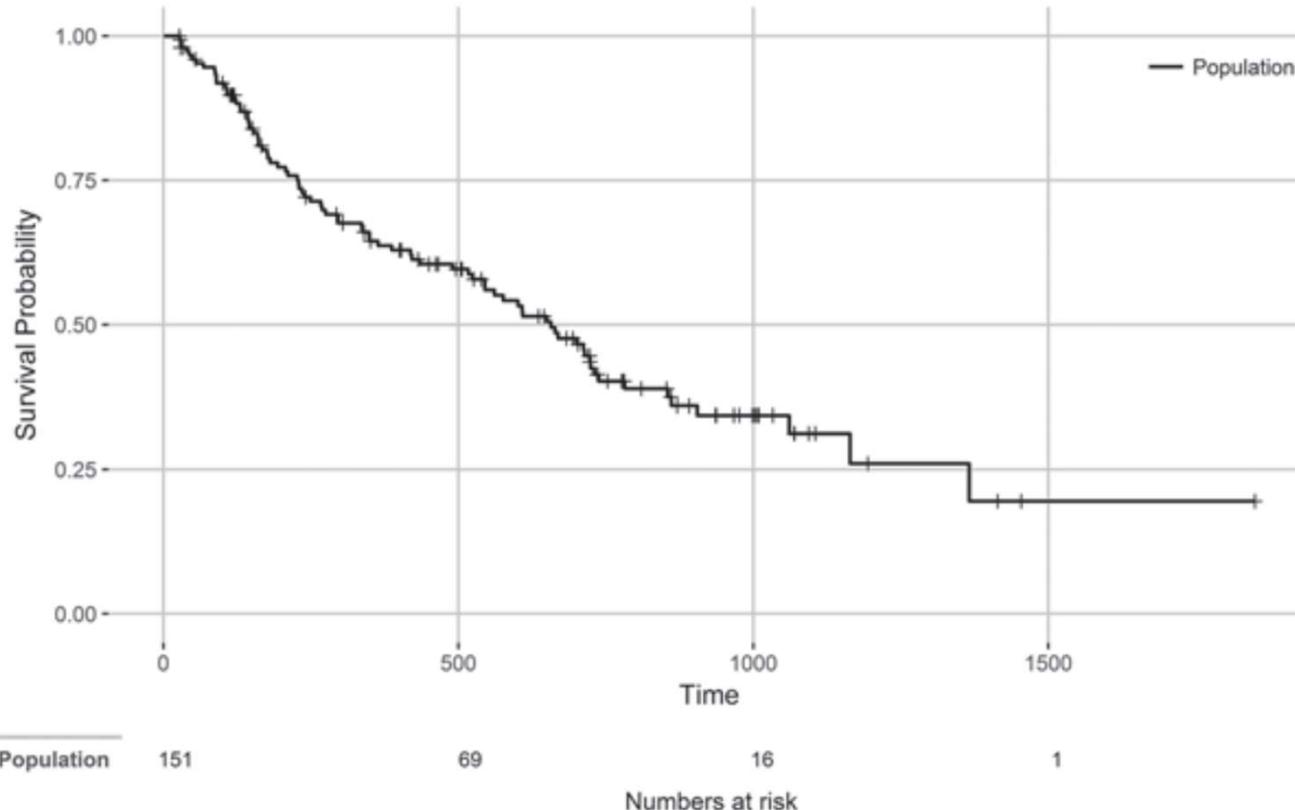
82 mortality events



NATURAL AND NON-NATURAL MORTALITY



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- overall annual survival rate of adult Little Bustards of just 67%
- 50% of our adult studied population showed a survival probability of ~ 2 years

NATURAL AND NON-NATURAL MORTALITY



Annual cause specific mortality rates (using the Heisey and Fuller estimator)

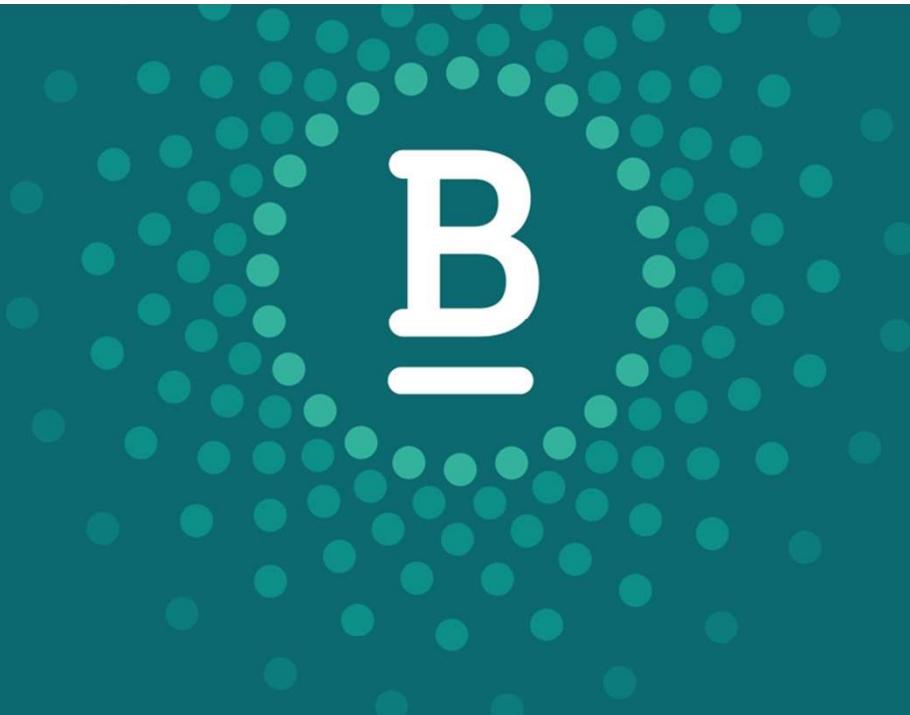
Cause of Death	Number of deaths	Annual Mortality Rates
Natural	21	8.7%
Anthropogenic		7.4%
Vehicle collision	2	1%
Illegal Killing	8	3%
Power line collision	5	3.4%
Undetermined	34	12.8%
With human manipulation	12	4.6%

NATURAL AND NON-NATURAL MORTALITY



DISCUSSION

- ✓ Strong evidence of significant decline of the little bustard national population
- ✓ Areas with more favorable habitat (habitat quality) seem to buffer the overall trend of decline
- ✓ SPAs are becoming islands
- ✓ Decline cannot be singly explained by breeding habitat quality - low survival rates are observed
- ✓ Annual mortality rates are likely unsustainable
- ✓ Anthropogenic mortality is likely to play an important role in this species decline
- ✓ Future research will be carrying out Population Viability Analysis and looking into the effects of climate on the habitat and mortality



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THANK YOU!

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