Appendix 1

Figure A1. Correlogram showing spatial correlation in little bustard abundance data. White dots represent little bustard abundance raw data, red dots represent the residuals of the non-spatial GLMM (see text for more details).

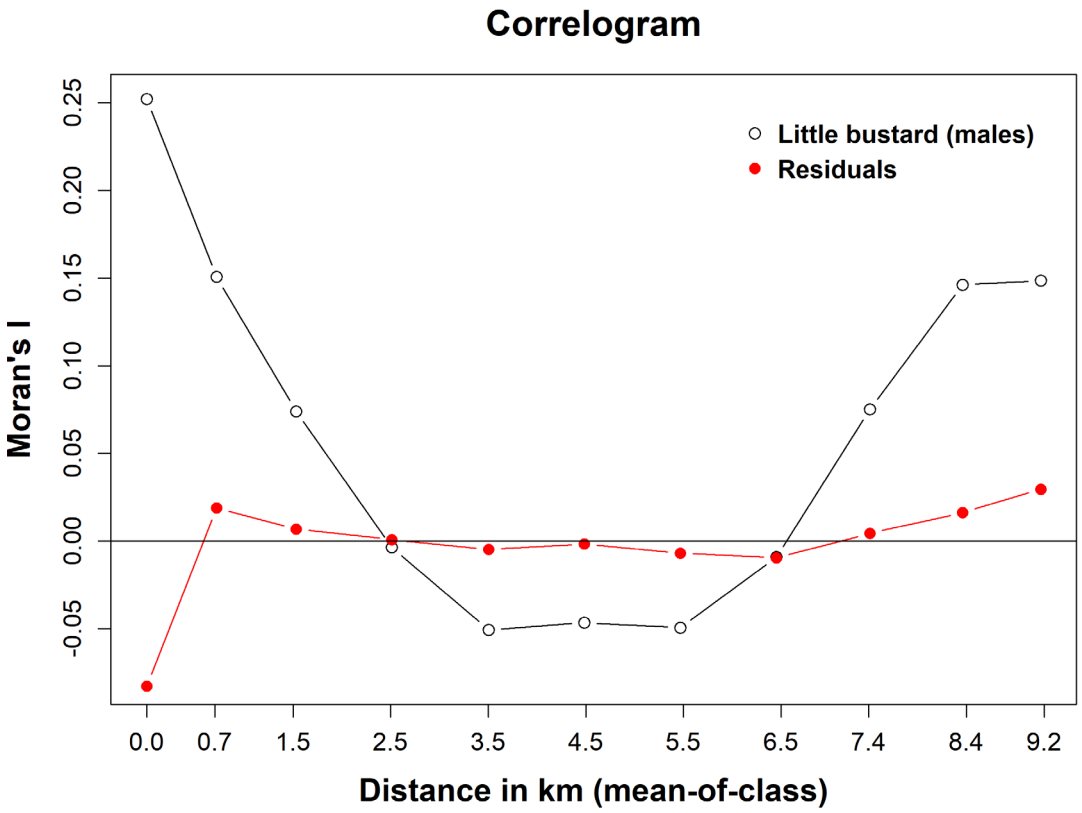

Table A1. Values for vegetation requirements (vegetation cover -C - and height - H) used in the resource-based model.

activity	foraging	foraging	nesting
Period	spring	summer	spring
C_0-5	0.5	0.5	0
C_5-25	0.5	0.5	0
C_25-50	1	1	0
C_50-75	1	1	1
C_75-100	1	1	0.5
H_1-25	1	1	0
H_25-50	0.5	0.5	0.5
H_50-100	0	0	1
H_>100	0	0	0

Table A2. Food requirement values used in the resource-based model.

period	seeds	plants	invertebrates	vertebrates
spring	0.5	1	0.5	0
summer	0.5	1	1	0

Table A3. Availability of vegetation height and cover categories in different land uses and months. A “0” indicates that a particular cover or height category is never present in that month for that land use. A “0.5” indicates that the category occurs sometimes. A “1” indicates that the category occurs frequently.

Land use	Production system	Month	C_0-5	C_5-25	C_25-50	C_50-75	C_75-100	H_1-25	H_25-50	H_50-100	H_>100
Alfalfa	Irrigated	April	0	0	0.5	1	1	1	1	0	0
Alfalfa	Irrigated	May	0	0	0	1	1	1	1	0	0
Alfalfa	Irrigated	June	0	0	0	1	1	1	1	0	0
Alfalfa	Irrigated	July	0	0	0	1	1	1	1	0	0
Alfalfa	Irrigated	August	0	0	0	1	1	1	1	0	0
Alfalfa	Irrigated	Sept.	0	0	0	1	1	1	1	0	0
Fallow-ploughed	Rain-fed	April	1	0.5	0	0	0	1	0	0	0
Fallow-ploughed	Rain-fed	May	1	0.5	0	0	0	1	0	0	0
Fallow-ploughed	Rain-fed	June	1	0.5	0	0	0	1	0	0	0
Fallow-ploughed	Rain-fed	July	1	0.5	0	0	0	1	0	0	0
Fallow-ploughed	Rain-fed	August	1	0.5	0	0	0	1	0	0	0
Fallow-ploughed	Rain-fed	Sept.	1	0.5	0.5	0	0	1	0	0	0
Fallow-not ploughed	Rain-fed	April	0	0	1	1	1	1	1	0.5	0
Fallow-not ploughed	Rain-fed	May	0	0	1	1	1	1	1	0.5	0
Fallow-not ploughed	Rain-fed	June	0	0	1	1	0.5	1	1	0.5	0
Fallow-not ploughed	Rain-fed	July	0	0.5	1	0.5	0.5	1	0.5	0	0
Fallow-not ploughed	Rain-fed	August	0	0.5	1	0.5	0	1	0.5	0	0
Fallow-not ploughed	Rain-fed	Sept.	0	0.5	1	0.5	0	1	0	0	0
Cereal	Rain-fed	April	0	0	0	0.5	1	0	1	0.5	0
Cereal	Rain-fed	May	0	0	0	0	1	0	0.5	1	0.5
Cereal	Rain-fed	June	0	0	0	0.5	1	0.5	0.5	1	0.5
Cereal	Rain-fed	July	0	0	0.5	1	0.5	1	0.5	0.5	0.5
Cereal	Rain-fed	August	0	0	0.5	1	0	1	0	0	0
Cereal	Rain-fed	Sept.	0	0	0.5	1	0	1	0	0	0
Cereal-Vetch	Rain-fed	April	0	0	0	0.5	1	0.5	0	1	0
Cereal-Vetch	Rain-fed	May	0.5	0	0	0	1	0.5	0	1	0
Cereal-Vetch	Rain-fed	June	0	0	0.5	1	0	1	0	0	0
Cereal-Vetch	Rain-fed	July	0	0	0.5	1	0	1	0	0	0
Cereal-Vetch	Rain-fed	August	0	0	0.5	1	0	1	0	0	0
Cereal-Vetch	Rain-fed	Sept.	0	0	0.5	1	0	1	0	0	0
Cereal-no tillage	Rain-fed	April	0	0	0	0	1	0.5	1	0.5	0
Cereal-no tillage	Rain-fed	May	0	0	0	0	1	0	1	1	0.5
Cereal-no tillage	Rain-fed	June	0	0	0	0	1	0.5	0.5	1	0.5
Cereal-no tillage	Rain-fed	July	0	0	0	0.5	1	1	0	0	0
Cereal-no tillage	Rain-fed	August	0	0	0	0.5	1	1	0	0	0
Cereal-no tillage	Rain-fed	Sept.	0	0	0	0.5	1	1	0	0	0
Peas	Rain-fed	April	0	0	0.5	0.5	1	1	0.5	0	0
Peas	Rain-fed	May	0	0	0	0.5	1	1	1	0	0
Peas	Rain-fed	June	0	1	0	0.5	1	1	1	0	0
Peas	Rain-fed	July	0.5	1	0.5	0	0	1	0	0	0
Peas	Rain-fed	August	0.5	1	0.5	0	0	1	0	0	0
Peas	Rain-fed	Sept.	1	0.5	0	0	0	1	0	0	0

Maize	Irrigated	April	0.5	0.5	1	0.5	0	1	0	0	0
Maize	Irrigated	May	0	0	0.5	1	0.5	0.5	1	0.5	0
Maize	Irrigated	June	0	0	0	0.5	1	0	0.5	0.5	1
Maize	Irrigated	July	0	0	0	0	1	0	0	0.5	1
Maize	Irrigated	August	0	0	0	0	1	0	0	0	1
Maize	Irrigated	Sept.	0	0	0	0	1	0	0	0	1
Olive trees	Rain-fed	April	1	0.5	0	0	0	1	0	0	0
Olive trees	Rain-fed	May	1	0.5	0	0	0	1	0	0	0
Olive trees	Rain-fed	June	1	0.5	0	0	0	1	0	0	0
Olive trees	Rain-fed	July	1	0.5	0	0	0	1	0	0	0
Olive trees	Rain-fed	August	1	0.5	0	0	0	1	0	0	0
Olive trees	Rain-fed	Sept.	1	0.5	0	0	0	1	0	0	0
Pastures	Rain-fed	April	0	0	0.5	1	0.5	1	0.5	0	0
Pastures	Rain-fed	May	0	0	0.5	1	0.5	1	0.5	0	0
Pastures	Rain-fed	June	0	0	0.5	1	0.5	1	0.5	0	0
Pastures	Rain-fed	July	0	0	0.5	1	0	1	0.5	0	0
Pastures	Rain-fed	August	0	0	0.5	1	0	1	0.5	0	0
Pastures	Rain-fed	Sept.	0	0	0.5	1	0	1	0.5	0	0
Beetroot	Irrigated	April	1	1	0.5	0	0	1	0	0	0
Beetroot	Irrigated	May	0.5	1	1	0.5	0	1	0	0	0
Beetroot	Irrigated	June	0	0.5	1	1	0.5	1	0.5	0	0
Beetroot	Irrigated	July	0	0	0.5	1	1	1	0.5	0	0
Beetroot	Irrigated	August	0	0	0	0.5	1	0.5	1	0	0
Beetroot	Irrigated	Sept.	0	0	0	0	1	0	1	0	0
Vineyards-trellised	Irrigated	April	1	0.5	0	0	0	1	0	0	0
Vineyards-trellised	Irrigated	May	1	0	0	0	0	1	0	0	0
Vineyards-trellised	Irrigated	June	1	0	0	0	0	1	0	0	0
Vineyards-trellised	Irrigated	July	1	0	0	0	0	1	0	0	0
Vineyards-trellised	Irrigated	August	1	0	0	0	0	1	0	0	0
Vineyards-trellised	Irrigated	Sept.	1	0	0	0	0	1	0	0	0
Vineyards- not trellised	Rain-fed	April	1	0.5	0.5	0.5	0	1	0	0	0
Vineyards- not trellised	Rain-fed	May	1	0.5	0.5	0	0	1	0	0	0
Vineyards- not trellised	Rain-fed	June	1	1	0.5	0	0	1	0	0	0
Vineyards- not trellised	Rain-fed	July	1	1	1	1	0.5	1	1	0	0
Vineyards- not trellised	Rain-fed	August	1	1	1	1	0.5	1	1	0	0
Vineyards- not trellised	Rain-fed	Sept.	1	1	1	1	0.5	1	1	0	0

Table A4. Food availability values used in the resource-based model, and parameters used to calculate them. Specifically, we note for each land use and period (spring, Sp; and summer, Su) whether agricultural practices applied are likely to negatively influence food resources (seeds, plants, invertebrates and vertebrates) (✓) or not (empty cells) (the latter may reflect the practice not being applied, or not leading to loss of food supplies). We then summarize the total number of practices that may negatively affect availability of different food types (n), and the intensification scale used (f). Availability of seeds, plants, invertebrates and vertebrates is calculated as 1 / (n • f + 1).

		Unmanag Fallow		Manag fallow		Dry cereal		Alfalfa*		Maize		Cereal+Legum		Legum.		Beetroot		Olive trees		Trell. Vine		Trad. Vine		Pastures	
Practice	Key impacts	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su	Sp	Su
Agro-chemicals	Loss of crop plant material					✓		✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		
	Loss of seeds					✓		✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		
	Loss of crop invertebrates							✓		✓						✓	✓	✓	✓	✓	✓	✓	✓		
Irrigation	Loss of crop plant material							✓	✓	✓	✓					✓	✓			✓	✓				
	Loss of crop invertebrates							✓	✓	✓	✓					✓	✓			✓	✓				
Ploughing	Loss of crop invertebrates			✓	✓		✓						✓		✓			✓	✓	✓	✓	✓	✓		
	Loss of crop plant material			✓	✓		✓						✓		✓			✓	✓	✓	✓	✓	✓		
	Loss of seeds			✓	✓		✓						✓		✓			✓	✓	✓	✓	✓	✓		
	Loss of crop vertebrates			✓	✓		✓						✓		✓			✓	✓	✓	✓	✓	✓		
Harvest	Loss of crop invertebrates						✓	✓	✓			✓	✓		✓										
	Loss of crop plant materia						✓	✓	✓			✓	✓		✓										
	Loss of seeds							✓	✓			✓	✓		✓										
	Loss of crop vertebrates						✓	✓	✓			✓	✓		✓										
Number of practices that negatively affect the availability of:																									
Seeds		0	0	1	1	1	1	2	1	1	1	2	2	1	2	1	1	2	2	2	2	2	2	0	0
Plants		0	0	1	1	1	2	0	0	2	1	2	2	1	2	2	2	2	2	3	3	2	2	0	0
Invertebrates		0	0	1	1	0	2	3	2	2	1	1	2	0	2	2	2	2	2	3	3	2	2	0	0
Vertebrates		0	0	1	1	0	2	1	1	1	1	1	1	0	2	0	0	1	1	1	1	1	1	0	0
Intensification Scale (Expert criterion)		1	1	1	1	2	2	3	3	8	8	2	2	2	2	8	8	3	3	6	6	2	2	1	1
Seed availability[1]		1.00	1.00	0.50	0.50	0.33	0.33	0.14	0.25	0.11	0.11	0.20	0.20	0.33	0.20	0.11	0.11	0.14	0.14	0.08	0.08	0.20	0.20	1.00	1.00
Plant availability[1]		1.00	1.00	0.50	0.50	0.33	0.20	1.00	1.00	0.06	0.11	0.20	0.20	0.33	0.20	0.06	0.06	0.14	0.14		0.05	0.20	0.20	1.00	1.00
Invertebrate availability[1]		1.00	1.00	0.50	0.50	1.00	0.20	0.10	0.14	0.06	0.11	0.33	0.20	1.00	0.20	0.06	0.06	0.14	0.14	0.05	0.05	0.20	0.20	1.00	1.00
Vertebrate avilability[1]		1.00	1.00	0.50	0.50	1.00	0.20	0.25	0.25	0.11	0.11	0.33	0.33	1.00	0.20	1.00	1.00	0.25	0.25	0.14	0.14	0.33	0.33	1.00	1.00

*In the case of alfalfa, negative effects of agricultural practices were only considered to affect seeds, invertebrates and vertebrates, but not plant material since the crop by itself could be consumed by plant-eaters.

Table A5. Proportion of the study area covered by different land uses in each study year, and suitability values attributed to each of them

	2002	2003	2004	2005	2006	2008	2009	2010	2011	Nesting suitability	Foraging suitability (April-August)
Cereal	42.93	52.73	53.26	55.71	53.60	62.07	52.91	49.77	48.57	0.363	0.322
Cereal mixed with leguminous crops	0.00	0.18	0.39	0.35	0.00	0.00	1.13	0.26	1.26	0.222	0.350
Ploughed Fallow	28.41	22.01	23.41	20.01	18.00	14.61	17.77	17.11	17.40	0.000	0.500
Unploughed Fallow	6.34	3.56	2.74	3.59	7.99	2.49	4.81	6.30	6.24	0.200	0.656
Olive groves	3.71	3.68	3.68	4.01	3.99	4.41	4.94	5.05	5.10	0.000	0.157
Trellis vineyard	2.40	2.37	2.85	3.10	3.17	3.17	3.20	2.16	2.16	0.000	0.000
Trad. Vineyard	2.61	2.29	2.08	1.96	1.80	1.58	1.28	0.90	0.90	0.000	0.271
Pastures	8.34	7.79	5.76	5.71	5.73	5.21	5.20	5.20	2.40	0.104	0.833
Alfalfa	0.12	0.12	0.08	0.08	0.06	0.05	0.05	0.03	0.05	0.175	0.750
Other leguminous crops	0.05	0.53	0.33	0.62	0.13	0.63	0.85	2.40	5.54	0.117	0.562
Maize	0.17	0.00	0.10	0.03	0.00	0.33	0.00	0.00	0.00	0.188	0.041
Beetroot	0.51	0.27	0.67	0.04	0.00	0.00	0.00	0.00	0.00	0.023	0.113
Riverine vegetation	0.53	0.53	0.53	0.48	0.48	0.48	0.48	0.48	0.48	0.000	0.000
Urban Land	2.29	2.32	2.53	2.71	3.11	3.34	3.34	3.34	3.34	0.000	0.000
Tracks-roads	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	0.000	0.000