Ecography

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Supplementary material

Appendix 1

Table A1. Percent covers of forest and agricultural land variables for each land-use unit (LUU) derived from remote-sensed data. Arable = arable land; Pasture = open pastures and pastures with scattered trees; Grassland = meadows; Other agr. = other types of agricultural land; Forest = forest land (with different successional stages); Scrub = scrub land; Wetland = bogs, ponds, etc.; Other = other habitat types (artificial surfaces, open water, etc.). Row sums may not make up exactly 100 because of rounding to the nearest integer.

Country	LUU	Arable	Pasture	Grassland	Other agr.	Forest	Scrub	Wetland	Other
Spain (ESP)	1	6	-	-	-	44	35	-	15
	2	-	-	-	-	99	1	-	-
	3	23	-	19	-	-	58	-	-
	4	-	-	37	11	38	6	-	8
	5	-	-	83	6	11	-	-	-
	6	59	-	25	-	-	16	-	-
Finland (FIN)	1	-	-	-	-	100	-	-	-
	2	-	-	-	-	100	-	-	-
	3	3	-	1	-	97	-	-	-
	4	7	-	2	8	83	-	-	-
	5	25	-	10	9	57	-	-	-
	6	57	-	3	-	40	-	-	-
France (FRA)	1	-	-	-	-	100	-	-	-
	2	-	-	-	-	100	-	-	-
	3	3	45	-	-	51	-	-	-
	4	5	81	-	-	14	-	-	-
	5	-	82	-	-	18	-	-	-
	6	16	84	-	-	-	-	-	-
Hungary (HUN)	1	-	-	-	-	100	-	-	-
	2	-	-	2	-	94	-	-	4
	3	27	-	13	-	60	-	-	-
	4	32	-	13	-	56	-	-	-
	5	-	-	91	-	9	-	-	-
	6	77	-	7	-	7	-	-	9
Ireland (IRE)	1	3	-	9	-	87	-	-	1
	2	-	-	11	-	89	-	-	-
	3	3	-	51	-	46	-	-	-
	4	46	-	13	-	38	-	-	3
	5	-	-	99	-	-	-	-	1
	6	86	-	12	-	1	-	-	1
Portugal (POR)	1	-	-	-	16	81	-	-	2

	2	-	-	-	-	100	-	-	-
	3	-	4	-	-	95	1	-	-
	4	-	-	-	-	100	-	-	-
	5	-	-	-	-	100	-	-	-
	6	-	19	-	81	-	-	-	-
Switzerland (SWZ)	1	-	-	6	-	91	-	-	4
	2	-	-	7	-	93	-	-	-
	3	-	-	46	-	54	-	-	-
	4	-	-	72	-	25	-	3	-
	5	-	-	75	-	16	-	-	9
	6	-	-	68	-	21	-	-	10
United Kingdom (UK)	1	-	-	-	-	100	-	-	-
	2	-	-	-	-	89	-	-	11
	3	-	-	17	-	65	18	-	-
	4	17	-	31	2	50	-	-	-
	5	35	-	58	-	7	-	-	-
	6	50	-	42	-	2	2	-	3

Spatial autocorrelation

We assessed the extent of spatial autocorrelation by calculating Moran's *I* based on residuals from the GAMs for each dependent variable using the Moran.I command in the package Ape (Paradis et al. 2017). Although country was included as a random variable in the models in order to account for larger scale spatial effects, the Moran's test suggested there was significant negative autocorrelation for the three estimates of species richness for the whole community, i.e. S_{obs}, S_{exp20} and S_{exp50} (Table A2). This suggests that sites closer together were less similar than those further apart. Negative autocorrelation values appear a norm in GAMs but strongly negative values may indicate over-fitting (Wood 2017). We attempted to overcome this issue by setting the maximum df = 2 and by using a smoothed interaction latitude × longitude instead of country, but the significant negative autocorrelation persisted. However, the results remained similar, with only marginal changes in test statistics, *p* and approximations of df, so the presented models were probably robust (unpubl. data). Nevertheless, we further explored the spatial distribution of residuals using bubble plots (as per Zuur et al. 2009). Fig. A1 shows that there was little evidence of obvious clustering of sites with particularly positive or negative residuals. However, it was clear that the Portuguese site (the most southerly in Fig. A1) had strongly negative residuals. When models were re-run without Portugal, there was no evidence of spatial autocorrelation (S_{obs} $I = -0.06$, $p = 0.376$; S_{exp20} $I = -0.06$, $p = 0.412$; S_{exp50} $I = -0.08$, $p = 0.282$). When dropping other countries in turn, the significant spatial autocorrelation remained, thus supporting the notion that the results in Table A2 were driven by data from a single country. GAMs were re-run without Portugal for S_{obs}, S_{exp20} and S_{exp50}. Results were broadly similar (Table S3), in that the form of the relationship (i.e., edf) and significance were similar (at least significant results in one data set was accompanied by a result that approached significance in the other, i.e., $p < 0.09$), although there was no longer a significant effect of forest fragmentation on species richness.

There was no evidence of spatial autocorrelation in the group-specific measure of species richness, with the exception of resident generalists where there was a weak negative autocorrelation (Table A2). For this group, by setting the maximum df = 2 and replacing Country with the smoothed interaction latitude × longitude accounted for the autocorrelation somewhat better ($I = -0.10$, $p = 0.079$), but the GAM results remained similar. Thus, generally, Country apparently accounted for spatial autocorrelation rather well.

In summary, the significant negative spatial autocorrelations observed appear to have been due to outlier effects, rather than genuine ecological effects across the whole sample. Omitting Portuguese data did not result in major differences in the effects of explanatory variables measuring the whole community. For resident generalists, incorporating continuous smoothed spatial coordinates reduced the extent of spatial autocorrelation, but there was little effect on the GAM results. We therefore conclude that, whilst there was statistically significant spatial autocorrelation, this was not ecologically significant and did not affect the interpretation of model outputs on bird community measures.

References

Paradis, E. et al. 2017. APE: analyses of phylogenetics and evolution. – url: http://ape-package.ird.fr/

Wood, S.N. 2017. *Generalized additive models. An introduction with R. Second edition*. – CRC Press, Taylor & Francis Group, Boca Raton.

Zuur, A. et al. 2009. *Mixed effects models and extensions in ecology with R*. – Springer, New York, NY, USA.

Table A2. GAM models (compare Tables 1−2) with associated Moran's test statistics (observed value, expected value with standard deviation, and probability for accepting the null hypothesis of no autocorrelation).

Model	**Obs.**	**Exp.**	**SD**	**p**
S_{obs}	-0.17	-0.01	0.04	<0.001
S_{exp20}	-0.18	-0.01	0.05	<0.001
S_{exp50}	-0.19	-0.01	0.05	<0.001
Resident forest species	-0.09	-0.01	0.05	0.114
Migratory forest species	-0.01	-0.01	0.05	0.930
Resident open-habitat species	-0.07	-0.01	0.05	0.266
Migratory open-habitat species	-0.05	-0.01	0.05	0.480
Resident generalists	-0.12	-0.01	0.05	0.031
Migratory generalists	0.04	-0.01	0.06	0.334
Resident urban species	-0.07	-0.01	0.05	0.223
Migratory urban species	0.04	-0.01	0.06	0.383

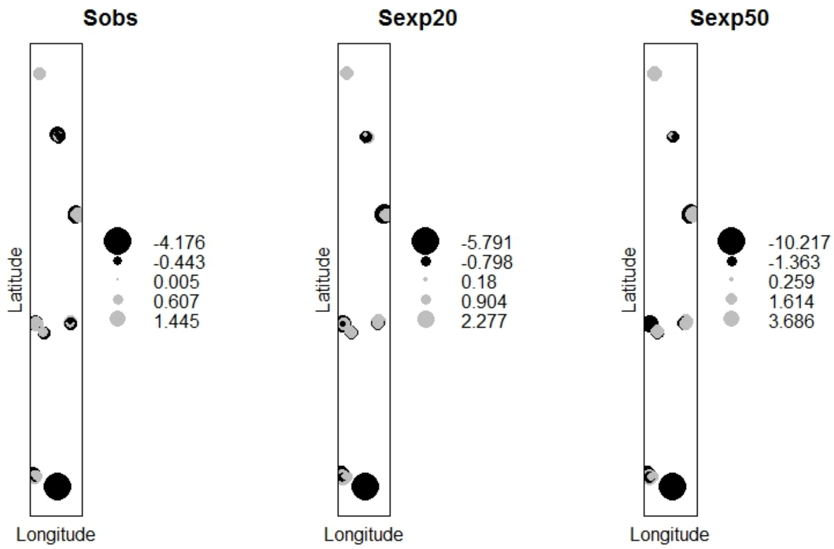

Fig. A1. Bubble plots of residuals plotted against geographic location. The order of the countries from north to south is: Finland, UK, Ireland, France, Hungary, Switzerland, Spain and Portugal.

Table A3. Model outputs for the whole sample (i.e., eight countries) and for a reduced data set without Portugal for the three dependent variables that showed evidence of relatively strong spatial autocorrelation; S_{obs}, S_{exp20} and S_{exp50}. edf indicates the estimated degrees of freedom, where 1 indicates a linear relationship, and higher values indicate increasingly non-linear associations. Statistic indicates χ^2 for S_{obs} (i.e., model specifying normal errors) and an *F* test for S_{exp20} and S_{exp50} (Gaussian errors).

		Whole sample			Without Portugal		
Dependent	Predictor	edf	Statistic	*p*	edf	Statistic	*p*
S_{obs}	Year	0.00	0.00	0.621	0.00	0.00	0.301
	Country	6.04	113.57	<0.001	5.25	104.94	<0.001
	Forest cover	1.00	0.12	0.729	1.00	1.471	0.225
	No. forest patches	1.00	5.43	0.022	1.00	2.38	0.123
	Landscape diversity	1.00	6.32	0.012	1.00	6.19	0.013
	NDVI	1.75	2.32	0.331	1.00	0.49	0.483
S_{exp20}	Year	0.00	0.00	0.480	0.00	0.01	0.023
	Country	5.18	6.60	<0.001	4.46	9.73	<0.001
	Forest cover	1.00	2.96	0.089	1.99	12.96	<0.001
	No. forest patches	1.00	3.20	0.078	1.09	2.87	0.087
	Landscape diversity	1.00	4.17	0.045	2.56	8.51	<0.001
	NDVI	2.57	3.15	0.032	1.88	8.15	<0.001
S_{exp50}	Year	0.00	0.00	0.668	0.00	0.00	0.085
	Country	5.42	8.03	<0.001	4.69	12.54	<0.001
	Forest cover	1.00	3.00	0.087	1.97	15.30	<0.001
	No. forest patches	1.00	4.53	0.037	1.00	3.62	0.062
	Landscape diversity	1.00	6.18	0.015	2.62	8.88	<0.001
	NDVI	2.37	1.95	0.133	1.68	2.52	0.089

Table A4. Spearman correlation coefficients (rho) and associated probabilities between growing degree days (source: https://www.atlas.impact2c.eu/en/climate/growing-season-length/) and 11 bird species groups (averages; n = 8).

Species group	**rho**	***p***
S_{obs}	0.18	0.670
S_{exp20}	-0.16	0.713
S_{exp50}	-0.23	0.588
Resident forest species	0.63	0.092
Migratory forest species	-0.77	0.024
Resident open-habitat species	0.89	0.003
Migratory open-habitat species	-0.80	0.016
Resident generalists	0.47	0.244
Migratory generalists	-0.61	0.111
Resident urban species	0.54	0.171
Migratory urban species	-0.85	0.008

Table A5. GAM for avian diversity measures and four specialist groups with only Year, Country and Forest cover as explanatory variables. Gaussian error distribution with associated chi-square statistics was applied for S_{exp20} and S_{exp50}; Poisson error distribution and F statistics for the rest. For more details concerning variables, see text.

Variable	edf	Statistic	p
S_{obs} (Full model deviance = 67.5%; R^2 = 0.68; n = 91)			
Year	0.0	0.0	0.636
Country	6.5	137.4	<0.001
Forest cover	2.1	10.2	0.007
S_{exp20} (Full model deviance = 40.9%; R^2 = 0.36; n = 91)			
Year	0.0	0.0	0.499
Country	5.6	6.0	<0.001
Forest cover	1.9	2.9	0.046
S_{exp50} (Full model deviance = 52.8%; R^2 = 0.48; n = 84)			
Year	0.0	0.0	0.655
Country	6.0	8.9	<0.001
Forest cover	2.0	5.9	0.004
Resident forest species (Full model deviance = 79.6%; R^2 = 0.82; n = 91)			
Year	0.7	2.8	0.044
Country	6.7	139.3	<0.001
Forest cover	2.5	31.1	<0.001
Migratory forest species (Full model deviance = 85.5%; R^2 = 0.93; n = 80)			
Year	0.0	0.0	0.974
Country	5.5	160.7	<0.001
Forest cover	1.5	5.4	0.039
Resident open-habitat species (Full model deviance = 69.7%; R^2 = 0.67; n = 91)			
Year	0.0	0	0.432
Country	6.3	92.28	<0.001
Forest cover	1.0	32.35	<0.001
Migratory open-habitat species (Full model deviance = 53%; R^2 = 0.47; n = 91)			
Year	0.0	0.0	0.518
Country	6.1	22.4	0.001
Forest cover	2.2	60.4	<0.001

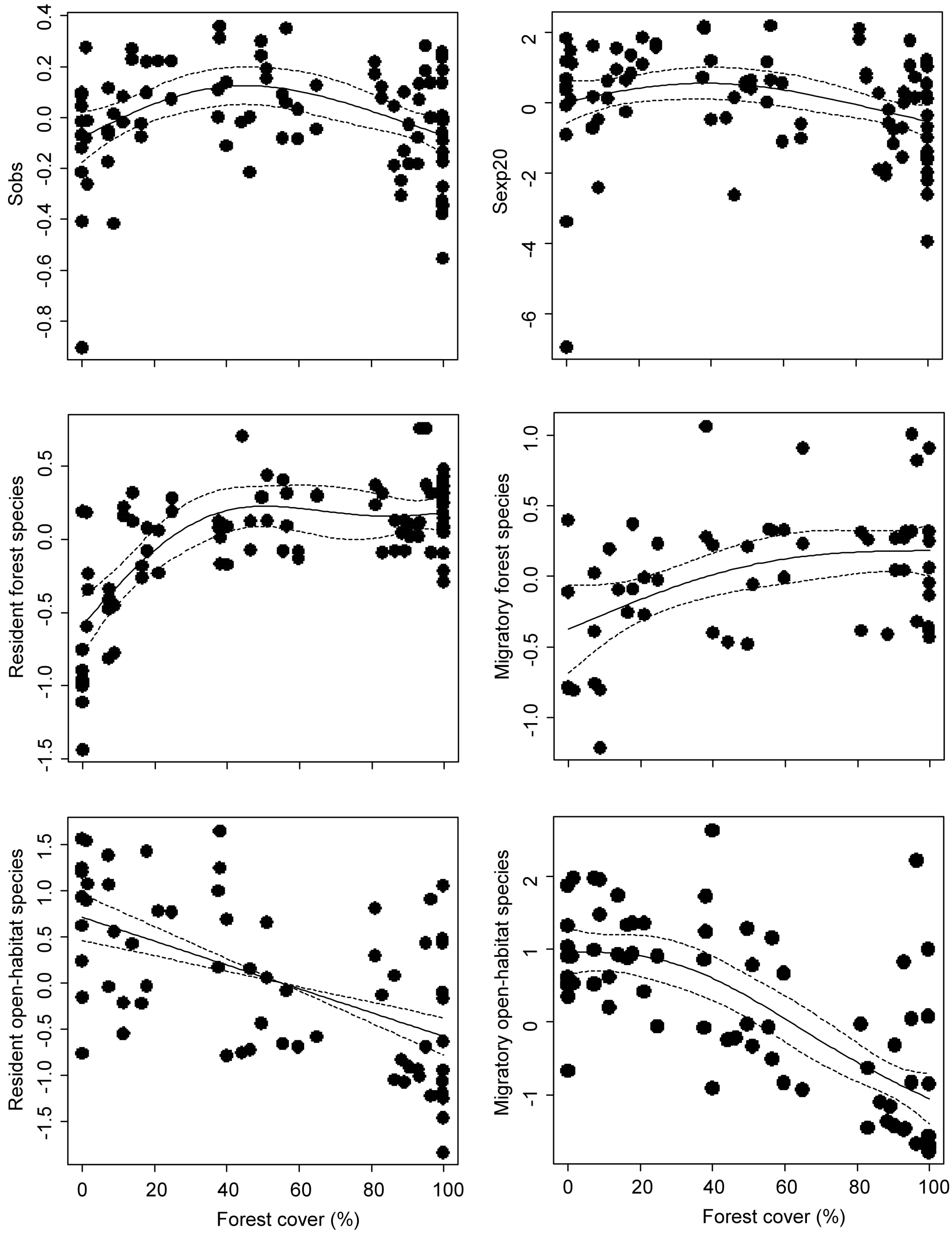

Fig. A2. GAM plots associated with Table A5. The curves (average and SE) are centered to Y-axis zero by the plotting default of mgcv (Wood 2017). Black dots are residuals for different combinations of year, country and LUU (see text).

Appendix 2. Species, their sample sizes (2001-2002 and six LUUs of each country pooled; note that only five LUUs were sampled in Ireland, Portugal and Spain in 2001), and country-specific trait classifications according to migratory strategy (R = resident, M = migratory), breeding habitat (F = forest, O = open habitat, G = forest/open-habitat generalist) and urbanization (U); for example, MOU = migratory open-habitat species, commonly occupies urban environments.

		Finland		**France**		**Hungary**		**Ireland**		**Portugal**		**Spain**		**Switzerland**		**UK**	
Species name	**Scientific name**	**n**	**Trait**	**n**	**Trait**	**n**	**Trait**	**n**	**Trait**	**n**	**Trait**	**n**	**Trait**	**n**	**Trait**	**n**	**Trait**
Hazel Grouse	*Bonasa bonasia*	8	RF	-		-		-		-		-		-		-	
Red-legged partridge	*Alectoris rufa*	-		3	RO	-		-		2	RO	17	RO	-		-	
Common Quail	*Coturnix coturnix*	-		-		-		-		62	MO	20	MO	-		-	
Common Pheasant	*Phasianus colchicus*	-		-		-		1	RO	-		-		-		-	
Common Buzzard	*Buteo buteo*	-		1	RF	-		-		1	RF	-		-		-	
Corn Crake	*Crex crex*	4	MO	-		-		-		-		-		-		-	
Oystercatcher	*Haematopus ostralegus*	-		-		-		-		-		-		-		1	MO
Northern Lapwing	*Vanellus vanellus*	-		-		-		-		-		-		-		3	MO
Woodcock	*Scolopax rusticola*	-		1	RF	-		-		-		-		2	MF	-	
Eurasian Curlew	*Numenius arquata*	1	MO	-		-		-		-		-		-		1	MO
Green Sandpiper	*Tringa ochropus*	1	MF	-		-		-		-		-		-		-	
Stock Dove	*Columba oenas*	2	MF	1	RF	-		1	RF	-		-		-		-	
Wood Pigeon	*Columba palumbus*	45	MFU	42	RFU	-		123	RGU	8	RFU	46	RFU	-		29	RFU
Turtle Dove	*Streptopelia turtur*	-		20	MO	-		-		9	MG	53	MG	-		-	
Collared Dove	*Streptopelia decaocto*	-		8	ROU	-		2	ROU	-		5	ROU	-		-	
Common Cuckoo	*Cuculus canorus*	2	MG	2	MG	-		1	MG	19	MG	17	MG	1	MG	-	
Scops Owl	*Otus scops*	-		-		-		-		-		1	MF	-		-	
Tawny Owl	*Strix aluco*	-		4	RF	-		-		-		-		-		-	
Hoopoe	*Upupa epops*	-		-		-		-		2	MO	13	MO	-		-	
Wryneck	*Jynx torquilla*	-		-		1	MG	-		-		-		-		-	
Green Woodpecker	*Picus viridis*	-		4	RF	-		-		1	RF	1	RF	-		-	
Black Woodpecker	*Dryocopus martius*	-		3	RF	-		-		-		-		-		-	

Great Spotted Woodpecker	*Dendrocopos major*	2	RF	25	RF	-		-		-		-		-		-	
Middle Spotted Woodpecker	*Dendrocopos medius*	-		3	RF	-		-		-		-		-		-	
Lesser Spotted Woodpecker	*Dendrocopos minor*	-		6	RF	-		-		3	RF	-		-		-	
Calandra Lark	*Melanocorypha calandra*	-		-		-		-		-		41	RO	-		-	
Short-toed Lark	*Calandrella brachydactyla*	-		-		-		-		14	MO	26	MO	-		-	
Crested Lark	*Galerida cristata*	-		-		6	RO	-		25	RO	62	RO	-		-	
Thekla Lark	*Galerida theklae*	-		-		-		-		1	RO	22	RO	-		-	
Wood Lark	*Lullula arborea*	-		44	RG	11	MF	-		86	RG	50	RG	-		-	
Sky Lark	*Alauda arvensis*	37	MO	44	RO	79	MO	33	RO	-	RO	-		-		47	MO
Barn Swallow	*Hirundo rustica*	-		6	MOU	1	MOU	7	MOU	2	MOU	-		2	MOU	3	MOU
Tree Pipit	*Anthus trivialis*	66	MF	35	MF	59	MF	-		-		-		19	MG	7	MF
Water Pipit	*Anthus spinoletta*	-		-		-		-		-		-		28	MO	-	
Meadow Pipit	*Anthus pratensis*	1	MO	2	RO	-		6	RO	-		-		-		3	MO
Tawny Pipit	*Anthus campestris*	-		-		6	MO	-		-		-		-		-	
Yellow Wagtail	*Motacilla flava*	-		-		1	MO	-		-		-		-		-	
Grey Wagtail	*Motacilla cinerea*	-		-		-		-		-		-		12	MW	3	MW
Pied Wagtail	*Motacilla alba*	-		-		-		-		-		-		1	MOU	1	MOU
Wren	*Troglodytes troglodytes*	30	MF	258	RGU	2	RF	358	RGU	149	RF	18	RF	128	MFU	136	RFU
Dunnock	*Prunella modularis*	69	MF	51	RGU	-		54	RGU	-		-		64	MF	24	RGU
Robin	*Erithacus rubecula*	192	MF	303	RFU	77	MF	126	RGU	1	RF	66	RF	113	MF	123	RFU
Thrush Nightingale	*Luscinia luscinia*	15	MO	-		-		-		-		-		-		-	
Rufous Nightingale	*Luscinia megarhynchos*	-		12	MO	46	MG	-		69	MO	17	MO	-		-	
Black Redstart	*Phoenicurus ochruros*	-		9	ROU	-		-		-		-		41	MOU	-	
Common Redstart	*Phoenicurus phoenicurus*	2	MF	-		-		-		2	MF	-		1	MG	11	MF
Whinchat	*Saxicola rubetra*	3	MO	-		2	MO	-		-		-		-		-	
Common Stonechat	*Saxicola rubicola*	-		9	RO	10	MO	-		52	RO	-		-		-	
Northern Wheatear	*Oenanthe oenanthe*	-		-		-		-		-		-		1	MO	1	MO
Black-eared Wheatear	*Oenanthe hispanica*	-		-		-		-		-		8	MO	-		-	
Ring Ouzel	*Turdus torquatus*	-		-		-		-		-		-		4	MO	-	
Blackbird	*Turdus merula*	26	MFU	195	RFU	53	RGU	62	RFU	86	RFU	60	RFU	28	MGU	17	RFU

Fieldfare	*Turdus pilaris*	-		-		-		-		-		-		2	MG	-	
Song Thrush	*Turdus philomelos*	39	MF	90	RF	15	MF	87	RFU	-		-		48	MF	40	RFU
Redwing	*Turdus iliacus*	28	MG	-		-		-		-		-		-		-	
Mistle Thrush	*Turdus viscivorus*	-		13	RF	1	RF	6	RG	-		7	RF	9	MF	7	RF
Grasshopper Warbler	*Locustella naevia*	1	MO	5	MO	-		-		-		-		-		-	
River Warbler	*Locustella fluviatilis*	1	MO	-		-		-		-		-		-		-	
Sedge Warbler	*Acrocephalus schoenobaenus*	2	MW	-		-		-		-		-		-		4	MW
Marsh Warbler	*Acrocephalus palustris*	4	MO	-		4	MO	-		-		-		-		-	
Zitting Cisticola	*Cisticola juncidis*	-		-		-		-		216	RO	-		-		-	
Icterine Warbler	*Hippolais icterina*	-		-		4	MG	-		-		-		-		-	
Melodious Warbler	*Hippolais polyglotta*	-		22	MO	-		-		21	MG	1	MG	-		-	
Blackcap	*Sylvia atricapilla*	35	MF	321	RG	115	MG	63	MF	8	RF	-		65	MG	-	
Garden Warbler	*Sylvia borin*	40	MG	51	MG	-		-		-		-		14	MG	3	MG
Orphean Warbler	*Sylvia hortensis*	-		-		-		-		-		18	MG	-		-	
Lesser Whitethroat	*Sylvia curruca*	16	MG	4	MO	6	MG	-		-		-		-		-	
Common Whitethroat	*Sylvia communis*	70	MO	80	MO	2	MO	11	MO	-		-		-		6	MO
Dartford Warbler	*Sylvia undata*	-		-		-		-		3	RO	24	RO	-		-	
Subalpine Warbler	*Sylvia cantillans*	-		-		-		-		-		25	MG	-		-	
Sardinian Warbler	*Sylvia melanocephala*	-		-		-		-		174	RO	45	RO	-		-	
Greenish Warbler	*Phylloscopus trochiloides*	6	MF	-		-		-		-		-		-		-	
Western Bonelli's Warbler	*Phylloscopus bonelli*	-		-		-		-		40	MF	1	MF	-		-	
Eastern Bonelli's Warbler	*Phylloscopus orientalis*	-		-		1	MF	-		-		-		-		-	
Wood Warbler	*Phylloscopus sibilatrix*	38	MF	40	MF	9	MF	-		-		-		-		-	
Common Chiffchaff	*Phylloscopus collybita*	26	MF	145	RG	148	RF	59	MF	-		-		26	MF	2	MF
Iberian Chiffchaff	*Phylloscopus brehmii*	-		-		-		-		10	RF	-		-		-	
Willow Warbler	*Phylloscopus trochilus*	105	MG	15	MG	6	MG	25	MG	-		-		-		163	MG
Goldcrest	*Regulus regulus*	76	MF	80	RF	-		133	RF	-		-		61	RF	31	RF
Firecrest	*Regulus ignicapillus*	-		48	RF	-		-		-		-		43	MF	-	
Spotted Flycatcher	*Muscicapa striata*	28	MG	-		-		-		-		-		6	MG	-	
Red-breasted Flycatcher	*Ficedula parva*	3	MF	-		-		-		-		-		-		-	

Pied Flycatcher	*Ficedula hypoleuca*	38	MF	-		-		-		-		-		-		-	
Long-tailed Tit	*Aegithalos caudatus*	-		-		-		-		7	RF	13	RF	-		-	
Marsh Tit	*Parus palustris*	-		15	RF	-		-		-		-		1	RF	-	
Willow Tit	*Parus montanus*	11	RF	7	RF	-		-		-		-		-		-	
Crested Tit	*Parus cristatus*	8	RF	10	RF	-		-		20	RF	41	RF	30	RF	-	
Coal Tit	*Parus ater*	20	RF	88	RF	1	RF	129	RF	-		5	RF	87	RF	68	RF
Blue Tit	*Parus caeruleus*	27	RFU	103	RGU	3	RFU	19	RFU	96	RFU	69	RFU	8	RFU	8	RFU
Great Tit	*Parus major*	93	RFU	129	RGU	34	RFU	16	RFU	82	RFU	48	RFU	23	RGU	28	RFU
European Nuthatch	*Sitta europaea*	-		60	RF	-		-		76	RF	1	RF	-		-	
Short-toed Treecreeper	*Certhia brachydactyla*	-		57	RF	8	RF	-		110	RF	37	RF	-		-	
Eurasian Treecreeper	*Certhia familiaris*	20	RF	-		-		-		-		-		19	RF	4	RF
Golden Oriole	*Oriolus oriolus*	-		2	MF	45	MG	-		11	MF	9	MF	-		-	
Red-backed Shrike	*Lanius collurio*	-		12	MO	-		-		-		-		1	MO	-	
Southern Grey Shrike	*Lanius meridionalis*	-		-		-		-		-		5	RO	-		-	
Woodchat Shrike	*Lanius senator*	-		-		-		-		4	MO	40	MO	-		-	
Eurasian Jay	*Garrulus glandarius*	-		3	RF	-		-		1	RF	2	RF	-		-	
Magpie	*Pica pica*	-		-		-		1	RGU	-		-		-		-	
Azure-winged Magpie	*Cyanopica cyanus*	-		-		-		-		-		4	RF	-		-	
Nutcracker	*Nucifraga caryocatactes*	5	RF	-		-		-		-		-		-		-	
Hooded Crow	*Corvus corone cornix*	4	RF	-		-		-		-		-		-		-	
Carrion Crow	*Corvus corone corone*	-		-		-		-		2	RFU	-		-		-	
Common Starling	*Sturnus vulgaris*	-		11	RGU	4	RGU	1	RGU	-		-		5	RGU	8	RGU
Spotless Starling	*Sturnus unicolor*	-		-		-		-		25	ROU	9	ROU	-		-	
House Sparrow	*Passer domesticus*	5	ROU	-		-	ROU	4	ROU	-		19	ROU	-		4	ROU
Spanish Sparrow	*Passer hispaniolensis*	-		-		-		-		-		27	RO	-		-	
Rock Sparrow	*Petronia petronia*	-		-		-		-		1	ROU	1	ROU	-		-	
Common Chaffinch	*Fringilla coelebs*	458	MF	402	RF	125	RG	150	RF	265	RF	109	RF	185	MF	280	RF
European Serin	*Serinus serinus*	-		3	RGU	-		-		155	RGU	17	RGU	15	MGU	-	
Greenfinch	*Carduelis chloris*	25	MGU	21	RGU	2	RGU	10	RGU	33	RGU	24	RGU	-		1	RGU
Goldfinch	*Carduelis carduelis*	-		5	RGU	1	RGU	-		66	RGU	5	RGU	8	RGU	1	RGU

Siskin	*Carduelis spinus*	33	MF	-		-		1	RF	-		-		-		-	
Linnet	*Carduelis cannabina*	-		15	ROU	1	ROU	-		2	ROU	5	RO	5	MO	-	
Common Crossbill	*Loxia curvirostra*	1	RF	-		-		-		-		-		-		-	
Common Rosefinch	*Carpodacus erythrinus*	12	MG	-		-		-		-		-		-		-	
Common Bullfinch	*Pyrrhula pyrrhula*	-		4	RF	-		-		-		-		4		-	
Hawfinch	*Coccothraustes coccothraustes*	-		1	RF	-		-		-		-		-		-	
Yellowhammer	*Emberiza citrinella*	36	RO	74	RO	46	RG	20	RO	-		-		8	RO	6	MO
Ortolan Bunting	*Emberiza hortulana*	1	MO	-		-		-		-		-		-		-	
Rock Bunting	*Emberiza cia*	-		-		-		-		-		12	RO	-		-	
Corn Bunting	*Emberiza calandra*	-		12	RO	19	RO	-		124	RO	223	RO	-		-	