

Ecography

**E6839**

Siriwardena, G. M., Cooke, I. R. and Sutherland, W. J. 2011. Landscape, cropping and field boundary influences on bird abundance. – *Ecography* 34: xxx–xxx.

**Supplementary material**

**Appendix 1**

Siriwardena, G.M., Cooke, I.R. & Sutherland, W.J. 2011. Landscape, cropping and field boundary influences on bird abundance. - *Ecography* 00: 000-000.

## Supplementary material - key and notes

The tables below provide details of the modelling results for each species that are summarized in Table 5(a-c). Tables A1-A3 present the model-averaged parameter estimates, standard errors and variable-specific summed model weights for each predictor variable in the Landscape, Boundaries and Cropping variable sets, respectively. Separate values are shown for the modelling processes with each set of controls used. Variable-specific summed model weights of greater than 0.7, indicating more important variables, are shown in red.

Table A4 presents a species-specific summary of the results in Tables A1-A3 for ease of interpretation, divided into (a) landscape, (b) boundaries and (c) cropping. Parameter estimates are reduced to signs (+/-) and are only shown where the variable-specific summed model weight was greater than 0.7. Results for all variables in each variable set and the analyses with each set of controls are shown in the same table. These patterns are those that are summarized in Table 5(a-c).

Codes in Tables A1-A4 are explained as follows:

### Control sets

N	None
B	Boundaries
C	Cropping
L	Landscape
BC	Boundaries and cropping
BL	Boundaries and landscape
CL	Cropping and landscape

### Data types

PE	Model-averaged parameter estimate
SE	Model-averaged standard error
WT	Variable-specific summed model weight

Variable definitions are provided in Table 1.









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Species	Controls	Arable	Decidwood	Conifwood	Impgrass	Unimpgrass	Human	Midalt	Coastal	Habheterog	
Wren	N	PE	-0.008	0.004	0.002	0.000	0.000	0.000	-0.001	-0.616	0.113
		SE	0.002	0.003	0.005	0.004	0.004	0.004	0.001	0.146	0.015
		WT	<b>0.962</b>	0.686	0.401	0.323	0.324	0.329	0.612	<b>0.975</b>	<b>1.000</b>
	B	PE	-0.008	0.005	0.005	0.001	-0.001	0.001	-0.001	-0.628	0.088
		SE	0.003	0.004	0.006	0.005	0.005	0.005	0.001	0.155	0.016
		WT	<b>0.904</b>	0.692	0.545	0.375	0.383	0.392	0.699	<b>0.970</b>	<b>0.994</b>
	C	PE	-0.009	0.004	0.002	0.000	-0.001	0.000	-0.001	-0.661	0.108
		SE	0.002	0.003	0.005	0.004	0.004	0.004	0.001	0.145	0.019
		WT	<b>0.967</b>	0.672	0.386	0.321	0.334	0.326	0.561	<b>0.986</b>	<b>0.997</b>
	BC	PE	-0.008	0.005	0.004	0.001	-0.001	0.001	-0.001	-0.708	0.092
		SE	0.002	0.004	0.006	0.005	0.005	0.005	0.001	0.152	0.020
		WT	<b>0.927</b>	0.667	0.507	0.353	0.389	0.367	0.664	<b>0.989</b>	<b>0.977</b>
Yellow Wagtail	N	PE	0.042	-0.023	-0.013	0.009	0.056	-0.003	-0.015	-0.064	-0.230
		SE	0.018	0.037	0.063	0.029	0.023	0.032	0.003	0.696	0.087
		WT	<b>0.920</b>	0.508	0.322	0.475	<b>0.913</b>	0.377	<b>1.000</b>	0.283	<b>0.885</b>
	B	PE	0.037	-0.023	-0.011	0.007	0.050	-0.006	-0.005	-0.146	-0.142
		SE	0.019	0.039	0.061	0.030	0.024	0.032	0.004	0.771	0.115
		WT	<b>0.881</b>	0.493	0.307	0.460	<b>0.863</b>	0.405	<b>0.723</b>	0.308	0.664
	C	PE	0.042	-0.015	-0.009	0.003	0.066	-0.001	-0.012	-0.070	-0.202
		SE	0.016	0.037	0.061	0.029	0.021	0.030	0.003	0.696	0.147
		WT	<b>0.938</b>	0.421	0.294	0.376	<b>0.953</b>	0.338	<b>0.985</b>	0.280	0.694
	BC	PE	0.040	-0.011	-0.003	0.000	0.058	-0.003	-0.003	-0.176	-0.215
		SE	0.015	0.038	0.056	0.028	0.021	0.030	0.004	0.797	0.151
		WT	<b>0.922</b>	0.367	0.279	0.352	<b>0.914</b>	0.341	0.562	0.315	<b>0.706</b>
Yellowhammer	N	PE	0.019	-0.005	-0.014	0.011	0.013	-0.004	0.003	0.018	0.029
		SE	0.007	0.011	0.017	0.007	0.008	0.011	0.001	0.229	0.032
		WT	<b>0.960</b>	0.471	0.561	<b>0.799</b>	<b>0.776</b>	0.471	<b>0.999</b>	0.282	0.555
	B	PE	0.018	-0.004	-0.007	0.010	0.014	-0.003	0.003	0.058	0.010
		SE	0.006	0.011	0.016	0.007	0.007	0.010	0.001	0.260	0.031
		WT	<b>0.956</b>	0.432	0.407	<b>0.814</b>	<b>0.814</b>	0.429	<b>0.984</b>	0.310	0.343
	C	PE	0.017	-0.005	-0.011	0.008	0.012	-0.004	0.004	-0.010	-0.003
		SE	0.006	0.010	0.016	0.007	0.008	0.010	0.001	0.226	0.029
		WT	<b>0.945</b>	0.470	0.515	<b>0.743</b>	<b>0.761</b>	0.465	<b>0.999</b>	0.276	0.275
	BC	PE	0.017	-0.003	-0.006	0.008	0.014	-0.003	0.003	0.025	-0.002
		SE	0.006	0.010	0.016	0.007	0.007	0.010	0.001	0.239	0.030
		WT	<b>0.954</b>	0.416	0.387	<b>0.757</b>	<b>0.808</b>	0.424	<b>0.985</b>	0.282	0.271











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Species	Controls	Treehedge	Tallhedge	Shorthedge	Treeline	Woodedge	Allditch	Wateredge	Pathroad	Building	Fence	Noboundary	
Wren	N	PE	0.305	-0.007	-0.016	0.094	0.041	-0.132	0.500	-0.015	0.444	-0.007	-0.043
		SE	0.047	0.063	0.070	0.122	0.011	0.065	0.090	0.053	0.116	0.063	0.108
		WT	0.999	0.278	0.305	0.511	0.929	0.776	0.993	0.323	0.931	0.278	0.368
	C	PE	0.314	0.000	-0.011	0.071	0.042	-0.126	0.501	-0.009	0.541	-0.008	-0.021
		SE	0.048	0.060	0.066	0.120	0.011	0.068	0.091	0.049	0.111	0.064	0.093
		WT	1.000	0.269	0.288	0.447	0.933	0.750	0.993	0.293	0.977	0.279	0.302
	L	PE	0.317	0.018	-0.016	0.084	0.027	-0.028	0.481	-0.017	0.193	-0.037	-0.056
		SE	0.048	0.072	0.070	0.121	0.013	0.073	0.089	0.055	0.162	0.085	0.113
		WT	1.000	0.311	0.306	0.487	0.771	0.364	0.991	0.335	0.626	0.387	0.410
	CL	PE	0.323	0.022	-0.017	0.056	0.029	-0.030	0.537	-0.021	0.311	-0.034	-0.036
		SE	0.048	0.076	0.070	0.118	0.013	0.075	0.091	0.058	0.139	0.084	0.105
		WT	1.000	0.322	0.306	0.403	0.792	0.367	0.997	0.354	0.795	0.374	0.345
Yellow Wagtail	N	PE	-0.893	-1.831	-0.099	0.467	-0.366	1.340	0.518	0.100	-0.152	-0.939	-0.027
		SE	0.279	0.413	0.404	0.592	0.085	0.220	0.546	0.280	1.045	0.431	0.389
		WT	0.943	0.998	0.321	0.535	0.998	1.000	0.578	0.369	0.291	0.849	0.276
	C	PE	-0.777	-1.785	-0.193	0.403	-0.324	1.115	0.751	0.081	-0.225	-0.940	-0.020
		SE	0.323	0.447	0.475	0.632	0.086	0.242	0.559	0.287	1.123	0.461	0.413
		WT	0.864	0.991	0.391	0.484	0.987	0.994	0.676	0.337	0.309	0.828	0.274
	L	PE	-0.560	-1.804	0.010	0.540	-0.221	0.580	0.155	0.051	-0.043	-0.258	0.004
		SE	0.354	0.460	0.392	0.612	0.095	0.275	0.553	0.261	1.155	0.558	0.424
		WT	0.740	0.989	0.273	0.563	0.864	0.817	0.334	0.304	0.274	0.419	0.274
	CL	PE	-0.298	-1.827	-0.054	0.674	-0.254	0.363	0.084	0.096	-0.145	-0.141	0.035
		SE	0.428	0.493	0.422	0.601	0.092	0.340	0.543	0.315	1.239	0.542	0.464
		WT	0.509	0.980	0.285	0.628	0.912	0.619	0.294	0.344	0.284	0.328	0.275
Yellowhammer	N	PE	0.702	0.602	0.376	-0.053	-0.001	-0.003	-0.016	0.005	-0.547	-0.342	-0.018
		SE	0.070	0.084	0.082	0.168	0.017	0.074	0.164	0.065	0.270	0.104	0.127
		WT	1.000	1.000	0.982	0.341	0.274	0.270	0.276	0.274	0.798	0.926	0.284
	C	PE	0.632	0.497	0.253	-0.043	-0.005	-0.006	-0.018	-0.012	-0.425	-0.374	-0.056
		SE	0.073	0.087	0.095	0.164	0.020	0.078	0.171	0.071	0.300	0.103	0.157
		WT	1.000	0.999	0.858	0.322	0.310	0.273	0.277	0.290	0.694	0.949	0.356
	L	PE	0.617	0.468	0.242	-0.079	-0.001	-0.019	0.005	0.000	-0.185	-0.336	-0.020
		SE	0.073	0.087	0.098	0.184	0.017	0.089	0.169	0.066	0.340	0.107	0.131
		WT	1.000	0.997	0.836	0.390	0.270	0.301	0.271	0.270	0.440	0.910	0.286
	CL	PE	0.586	0.399	0.184	-0.058	-0.004	-0.015	-0.002	-0.011	-0.132	-0.326	-0.039
		SE	0.076	0.089	0.113	0.176	0.020	0.089	0.173	0.072	0.328	0.109	0.148
		WT	1.000	0.979	0.723	0.345	0.295	0.291	0.270	0.285	0.380	0.898	0.319











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Species	Controls	Barley	Wheat	Allbrassica	Allegume	Beetpots	Setaside	Springcrop	Farmbuild	Scrub	Farmyard	Farmheterog		
Wren	N	PE	0.011	-0.096	-0.155	0.008	-0.022	0.019	-0.034	-0.126	0.544	0.017	0.011	
	N	SE	0.067	0.053	0.064	0.075	0.102	0.030	0.074	0.359	0.168	0.200	0.019	
	N	WT	0.295	0.751	0.836	0.280	0.313	0.453	0.404	0.350	0.890	0.274	0.447	
	B	PE	-0.003	-0.074	-0.035	0.084	0.017	0.043	-0.025	-0.699	0.339	0.043	0.006	
	B	SE	0.063	0.061	0.080	0.110	0.104	0.028	0.071	0.351	0.227	0.225	0.018	
	B	WT	0.276	0.637	0.393	0.509	0.293	0.692	0.354	0.771	0.685	0.292	0.353	
	L	PE	0.023	0.005	-0.018	0.046	0.041	0.024	-0.010	-0.189	0.020	-0.038	0.019	
	L	SE	0.074	0.045	0.067	0.102	0.120	0.031	0.062	0.393	0.186	0.230	0.019	
	L	WT	0.331	0.281	0.323	0.392	0.354	0.506	0.294	0.403	0.277	0.287	0.582	
	BL	PE	0.016	-0.004	0.002	0.091	0.035	0.039	-0.015	-0.550	-0.021	-0.014	0.012	
	BL	SE	0.069	0.045	0.055	0.108	0.117	0.029	0.065	0.383	0.193	0.214	0.019	
	BL	WT	0.304	0.278	0.274	0.532	0.333	0.651	0.309	0.679	0.277	0.272	0.453	
	Yellow Wagtail	N	PE	0.061	0.928	0.036	1.489	-0.210	-0.278	0.794	-3.478	-1.598	0.325	0.010
		N	SE	0.328	0.207	0.280	0.246	0.517	0.302	0.244	2.423	1.516	1.127	0.068
		N	WT	0.301	0.993	0.286	0.999	0.404	0.606	0.942	0.726	0.636	0.335	0.304
B		PE	0.117	0.632	-0.091	0.733	-0.086	-0.579	0.178	-3.461	-1.227	0.060	0.097	
B		SE	0.408	0.243	0.390	0.363	0.523	0.326	0.375	2.681	1.743	1.003	0.094	
B		WT	0.343	0.883	0.333	0.804	0.313	0.823	0.425	0.694	0.524	0.276	0.633	
L		PE	0.041	0.274	-0.163	1.133	-0.088	-0.321	0.117	-5.021	-0.391	0.497	0.058	
L		SE	0.356	0.325	0.402	0.291	0.530	0.345	0.343	2.313	1.706	1.324	0.091	
L		WT	0.285	0.560	0.400	0.970	0.311	0.612	0.365	0.851	0.322	0.371	0.498	
BL		PE	0.032	0.095	-0.357	0.396	-0.293	-0.592	0.144	-4.234	-0.053	0.182	0.179	
BL		SE	0.378	0.313	0.441	0.428	0.645	0.333	0.406	2.431	1.472	1.146	0.088	
BL		WT	0.284	0.354	0.558	0.583	0.429	0.819	0.381	0.781	0.277	0.290	0.830	
Yellowhammer		N	PE	0.383	0.388	0.368	0.014	-0.071	0.005	-0.011	-0.135	0.260	0.236	0.064
		N	SE	0.086	0.065	0.080	0.120	0.171	0.037	0.087	0.499	0.336	0.398	0.019
		N	WT	0.980	1.000	0.989	0.285	0.389	0.285	0.290	0.324	0.517	0.455	0.929
	B	PE	0.376	0.343	0.306	0.046	-0.025	0.001	0.021	-0.103	0.123	0.102	0.032	
	B	SE	0.094	0.074	0.087	0.148	0.158	0.033	0.095	0.492	0.333	0.340	0.026	
	B	WT	0.963	0.992	0.940	0.344	0.300	0.270	0.312	0.301	0.361	0.333	0.661	
	L	PE	0.254	0.203	0.172	0.027	-0.020	0.006	0.021	-0.182	0.492	0.089	0.048	
	L	SE	0.111	0.086	0.115	0.136	0.161	0.035	0.097	0.550	0.361	0.358	0.025	
	L	WT	0.828	0.851	0.716	0.310	0.296	0.293	0.313	0.348	0.671	0.314	0.788	
	BL	PE	0.227	0.145	0.167	0.021	-0.007	0.002	0.008	-0.357	0.293	0.049	0.029	
	BL	SE	0.119	0.098	0.115	0.133	0.148	0.032	0.085	0.618	0.406	0.320	0.028	
	BL	WT	0.779	0.718	0.708	0.298	0.283	0.273	0.282	0.451	0.500	0.286	0.610	



Continued

		a) Landscape								
Species	Controls	Arable	Decidwood	Conifwood	Impgrass	Unimpgrass	Human	Midalt	Coastal	Hahheterog
Starling	N	-	-	-						
	B	-	-	-						
	C	-	-	-						
	BC	-	-	-						
Stock Dove	N	+						-		
	B	+						-		
	C	+						-		
	BC	+	-					-		
Swallow	N	+				+				+
	B	+				+	-			+
	C					+				
	BC					+				
Tree Sparrow	N	+	-				-	-	+	+
	B	+	-			-	-	-	+	+
	C	+	-				-	-	+	+
	BC	+	-				-	-	+	+
Turtle Dove	N									
	B									
	C									
	BC									
Whitethroat	N		-	-			-			
	B		-	-			-			
	C		-	-			-			
	BC		-	-			-			
Woodpigeon	N					+		-		+
	B					+		-		+
	C					+		-		
	BC					+		-		
Wren	N	-	+					-	-	+
	B	-	+	+				-	-	+
	C	-	+					-	-	+
	BC	-	+	+				-	-	+
Yellow Wagtail	N	+	-			+		-		-
	B	+				+		-		-
	C	+				+		-		-
	BC	+				+		-		-
Yellowhammer	N	+		-	+	+		+		+
	B	+			+	+		+		
	C	+		-	+	+		+		
	BC	+			+	+		+		

b) Boundaries												
Species	Controls	Treehedge	Tallhedge	Shorthedge	Treeline	Woodedge	Allditch	Wateredge	Pathroad	Building	Fence	Noboundary
Blackbird	N	+	+				-		+	+		
	C	+	+				-		+	+		+
	L	+	+				-		+		-	
	CL	+	+				-		+			
Bullfinch	N	+				+	-	+			-	
	C	+				+		+			-	
	L	+						+			-	
	CL	+						+			-	
Carrion Crow	N						-					+
	C						-					+
	L						-					+
	CL						-					+
Chaffinch	N	+	+			+	-					
	C	+	+			+	-					
	L	+	+			+	-	+				
	CL	+	+			+	-	+				
Corn Bunting	N	-	-	-		-	+		+		+	
	C	-	-	-		-	+		+		+	
	L	-	-	-		-			+		+	
	CL	-	-	-		-			+		+	
Dunnock	N	+	+	+		+	-	+				
	C	+	+	+		+	-	+				
	L	+	+	+		+	-	+				
	CL	+	+	+		+	-	+				
Goldfinch	N	+	+						+			
	C	+	+									
	L	+	+					-				
	CL	+	+					-				
Greenfinch	N	+	+	+					+	+		
	C	+	+	+						+		
	L	+	+	+	+					+		
	CL	+	+	+						+		
Grey Partridge	N	-		+		-			+	-		+
	C	-	-	+		-			+	-		
	L	-		+					+	-		
	CL	-	-	+					+	-		
Jackdaw	N				+		-				+	
	C			+	+		-				+	
	L				+		-				+	
	CL			+	+		-				+	
Kestrel	N		-									
	C		-									
	L		-									
	CL		-									
Lapwing	N		-		-		+	+			-	
	C		-		-		+				-	
	L		-		-		+				-	
	CL		-		-		+				-	
Linnet	N		+			-	+		+			+
	C		+			-	+					+
	L		+			-						+
	CL		+			-						+
Long-tailed Tit	N	+				+					-	-
	C	+				+					-	-
	L	+				+					-	-
	CL	+				+					-	-
Magpie	N	+				-	-	+				
	C	+				-	-	+		+		
	L	+						+				
	CL	+					-					
Mistle Thrush	N	+	-						+			
	C	+							+			
	L	+							+			
	CL	+							+			
Reed Bunting	N	-	-	-	-	-	+	+	+		-	
	C	-	-	-	-	-	+	+	+		-	
	L	-	-	-	-	-	+	+	+		-	
	CL	-	-	-	-	-	+	+	+		-	
Robin	N	+				+	-	+		+		
	C	+				+	-	+		+		
	L	+				+	-	+				
	CL	+				+	-	+				
Rook	N	+				-	+				+	
	C					-	+				+	
	L					-	+				+	
	CL					-	+				+	
Skylark	N	-				-	+		+	-		+
	C	-		-		-	+		+	-		+
	L	-		-		-	+		+	-		+
	CL	-		-		-			+	-		+
Song Thrush	N	+			+	+	-			+		
	C	+	+		+	+	-			+		
	L	+	+		+	+						
	CL	+	+		+	+						

b) Boundaries												
Species	Controls	Treehedge	Tallhedge	Shorthedge	Treeline	Woodedge	All ditch	Wateredge	Pathroad	Building	Fence	Noboundary
Starling	N	-	-		-	-	+				+	
	C	-	-		-	-	+		+		+	+
	L	-	-		-	-	+		+		+	+
	CL	-	-		-	-	+		+		+	+
Stock Dove	N											
	C											
	L											
	CL											
Swallow	N	+	-							+		
	C	+	-							+		
	L	+	-							+		
	CL	+	-							+		
Tree Sparrow	N	+		+	-	-			+		+	
	C	+			-		-		+	-	+	
	L	+				-	-	-	+	-	+	-
	CL	+					-		+	-	+	-
Turtle Dove	N									+		
	C									+		
	L									+	+	
	CL									+		
Whitethroat	N	+	+	+			+	+				
	C	+	+	+			+	+				
	L	+	+	+				+				
	CL	+	+	+				+				
Woodpigeon	N	+			+		+					
	C	+			+		+					+
	L	+			+		+					
	CL	+			+		+					
Wren	N	+			+	+	-	+		+		
	C	+				+	-	+		+		
	L	+				+		+		+		
	CL	+				+		+		+		
Yellow Wagtail	N	-	-		+	-	+	+				-
	C	-	-			-	+	+				-
	L	-	-		+	-	+					
	CL	-	-		+	-	+					
Yellowhammer	N	+	+	+						-	-	
	C	+	+	+						-	-	
	L	+	+	+						-	-	
	CL	+	+	+						-	-	

c) Cropping												
Species	Controls	Barley	Wheat	Allbrassica	Allegume	Beetpots	Setaside	Springcrop	Farmbuild	Scrub	Farmyard	Farmheterog
Blackbird	N		-					-		+	+	
	B	-		-					-	+		
	L	-	-									
	BL	-	-									
Bullfinch	N		-		-			-	+	+		
	B	-						-				
	L	-					+	-	+			
	BL	-					+	-				
Carrion Crow	N	+	-	-				+	-		+	
	B	+	-	-				+	-		+	
	L	+	-	-				+	-		+	
	BL	+	-	-				+	-		+	
Chaffinch	N					-		-		+		+
	B		-					-		+		
	L							-				
	BL			-				-	-			
Corn Bunting	N	+		+	+		-	+				
	B	+		+	+		-			+	+	
	L	+			+				-	+		
	BL	+			+				-	+		
Dunnock	N									+		+
	B	-								+		
	L											+
	BL	-										+
Goldfinch	N				-		-		+		+	
	B						-	+			+	
	L						-	+	+		+	
	BL						-		+		+	
Greenfinch	N					+		-		+	+	
	B			+				-		+	+	
	L			+				-			+	
	BL			+				-			+	
Grey Partridge	N										+	+
	B										+	
	L										+	
	BL								+		+	
Jackdaw	N		-	-	-		+				+	
	B						+					
	L						+					
	BL						+					
Kestrel	N	+										
	B											
	L											
	BL											
Lapwing	N	-	-	-	-				-		-	+
	B	-	-	-	-						-	+
	L	-	-	-	-					+	-	+
	BL	-	-	-	-						-	+
Linnet	N			+	-						+	
	B			+	-					+	+	
	L			+						+	+	
	BL			+	-					+	+	
Long-tailed Tit	N		-				+			+		
	B		-				+			+		
	L		-				+					
	BL		-				+					
Magpie	N	-	-	-		-				+	+	
	B	-	-	-		+				+	+	
	L	-	-	-		+				+		
	BL	-	-	-		+				+		
Mistle Thrush	N		-	-						+		
	B	-	-	-					-	+		
	L											
	BL											
Reed Bunting	N	-	+	+					-			
	B			+			-		-			
	L			+					-		+	
	BL			+			-		-			
Robin	N	-	-	-		-		-		+		
	B	-	-	-				-		+		
	L			-				-				
	BL	-		-				-				
Rook	N				-	-		+			+	
	B					-		+	+		+	
	L					-		+			+	
	BL					-					+	
Skylark	N	+	+	+			+		-			+
	B	+	+	+					-			+
	L		+	+					-	+		+
	BL		+				+		-	+		+
Song Thrush	N	-	-	-				-		+		
	B	-	-	-		+		-		+		-
	L					+		-				
	BL	-				+		-				

