

Biodiversity-food trade-offs when agricultural land is spared from production

Appendix: Additional Figures and Tables

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Acknowledgements: We thank Ben Balmford, Carlo Fezzi, Steve Gibbons, Nick Hanley, Isabel Günther, David Maddison, Ted Pinchbeck, Marilena Pollicino, Martin Quaas, Sefi Roth, Gregor Singer, Jan Tore Solstad, Eduardo Souza-Rodrigues, and Diana Weinhold for useful feedback, as well as participants at seminars organised by the UK's Department for Environment, Food and Rural Affairs (DEFRA), the German Centre for Integrative Biodiversity Research (iDiv), ETH Zurich, the London School of Economics (LSE), Stirling University, and the Hertie School (Berlin), as well as the BIOECON (Tilburg), NSS-LSE (London) and WCERE (Gothenburg) conferences. We also thank the UK Data Service for allowing extended access to Farm Business Survey data, Paul Wilson for helpful discussion about these data, Simon Gillings for the provision of and discussions about the Breeding Bird Survey data, and Piero Montebruno for excellent research assistance. All remaining errors are our own.

Additional Figures

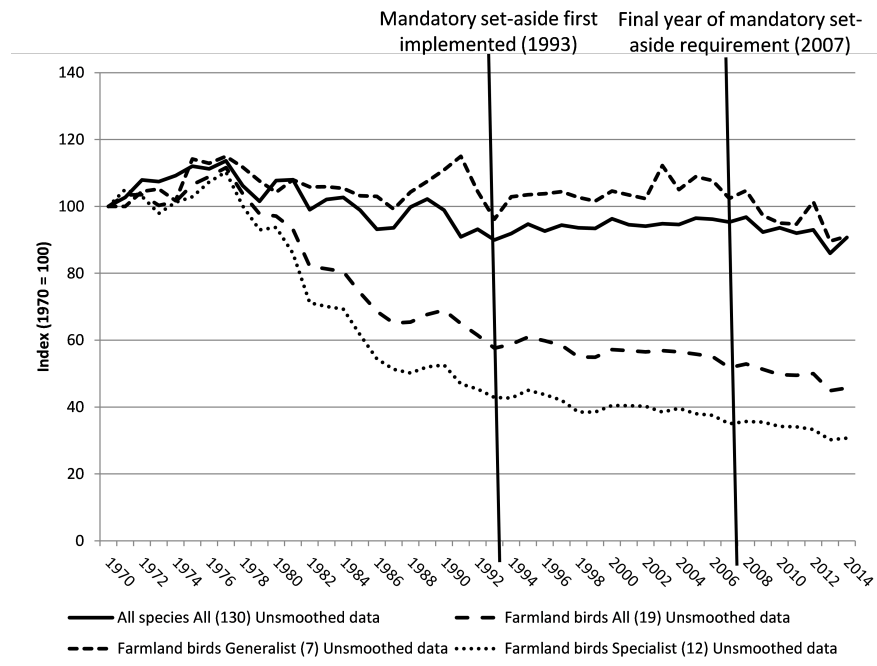
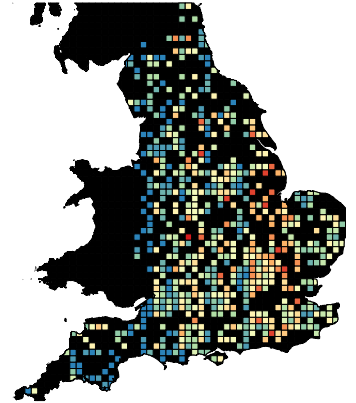
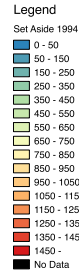
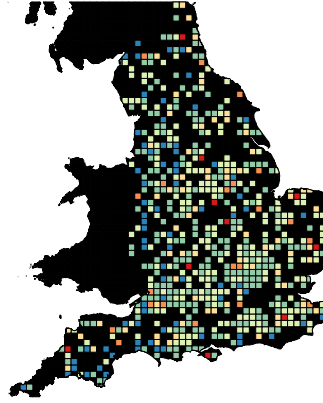


Figure A1: Populations of wild birds in the UK, 1970-2014. *Note:* The figure shows unsmoothed trends; figures in legend brackets show the number of species. *Source:* British Trust for Ornithology (BTO), Joint Nature Conservation Committee (JNCC), Royal Society for the Protection of Birds (RSPB), Department for Environment, Food and Rural Affairs (DEFRA)



(a) Spatial distribution of All Species (counts)

(b) Spatial distribution of set-aside (ha)

Figure A2: Spatial distribution of Breeding Bird Survey (BBS) data for All Species and June Survey data for set-aside in England, 1994 *Note:* All estimates are at the 10km-by-10km landscape scale. BBS data from the British Trust of Ornithologists (BTO) are extrapolated from counts in the randomly assigned 1km-by-1km transects used for the BBS. Set-aside data are taken from the annual June Survey.

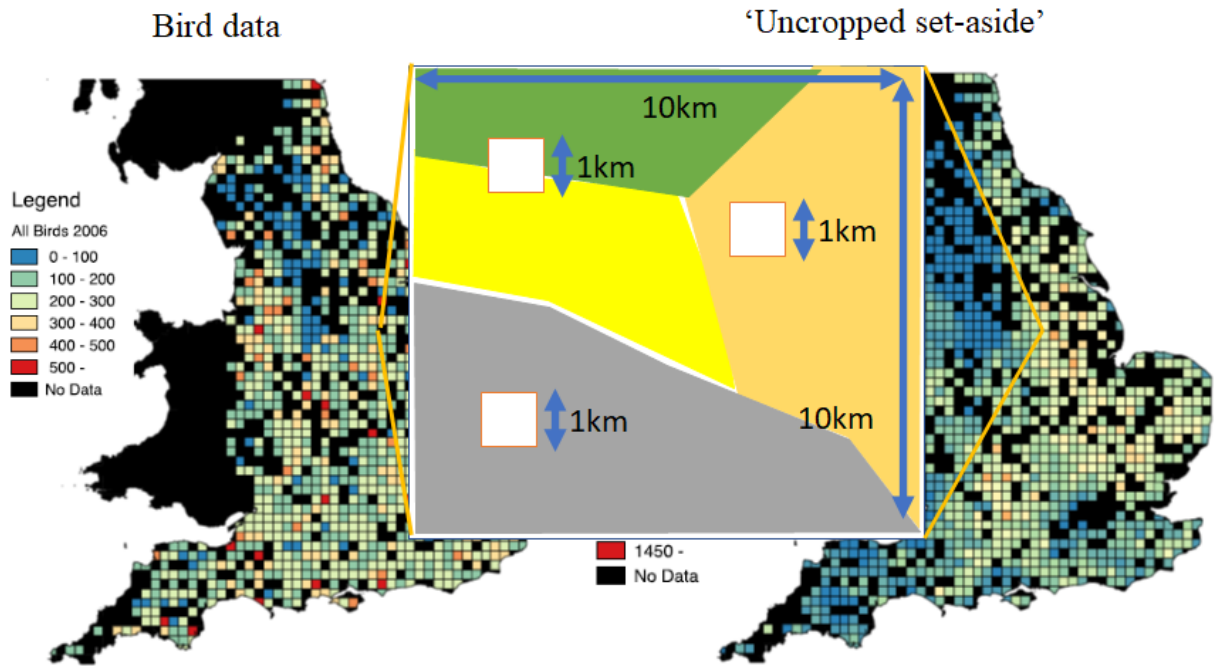


Figure A3: Illustrating how the bird and land-use data are integrated. *Note:* Green shading denotes ‘agricultural land’ and the other colours denote ‘non-agricultural land’. In this illustration, our focus on bird counts that took place on agricultural land only implies that the BBS transect in the top-left corner of the grid cell is the one used to generate biodiversity measures at the landscape scale. Counts of birds in 10km-by-10km grids are extrapolated from the sample of 1km-by-1km BBS transects that fall within agricultural land in the landscape. The different types of agricultural land use within the grids are known, with the data sourced from the June Survey. The spatial distribution of the transects and the land use/crop types within the grids is not known.

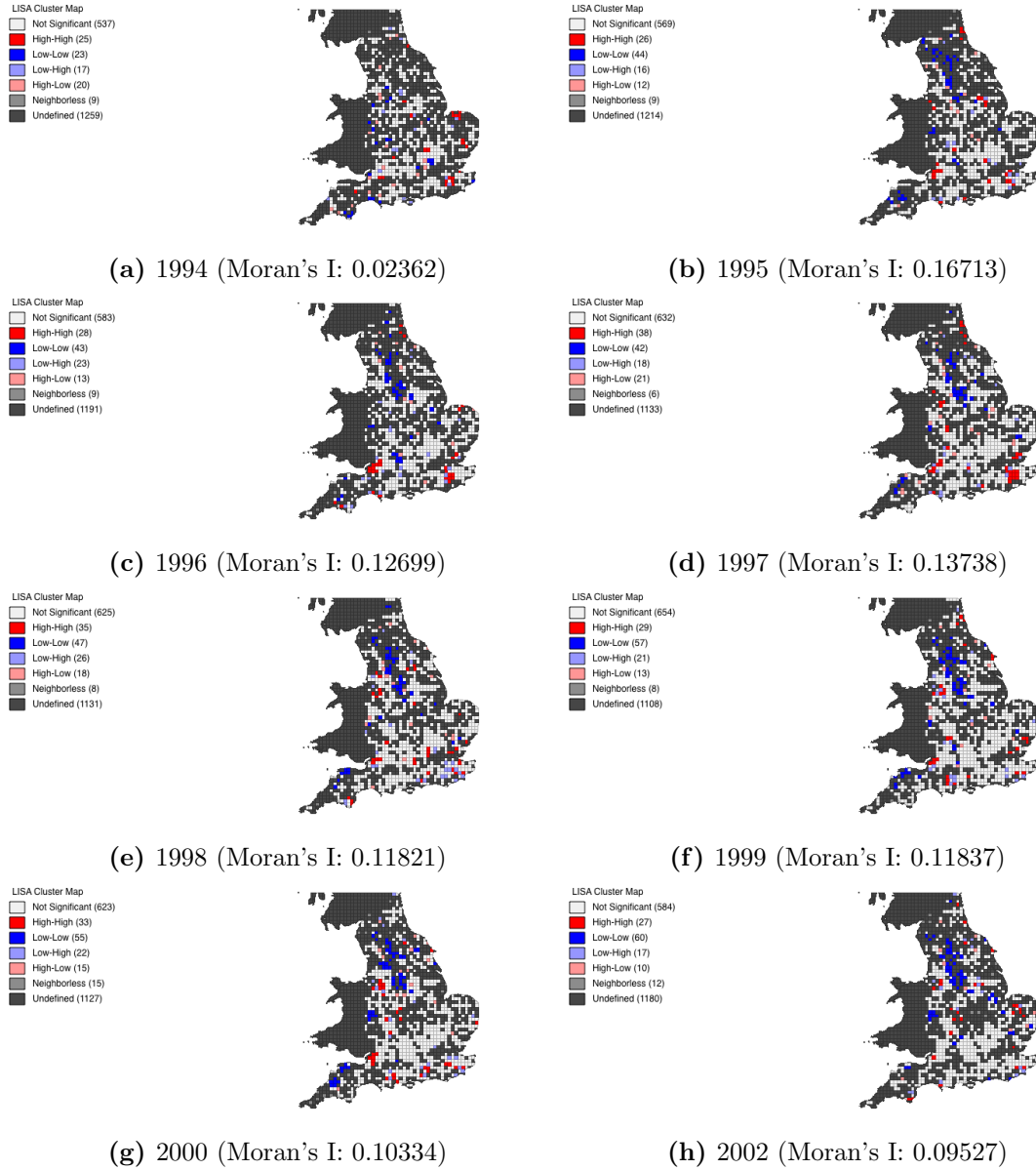


Figure A4: Spatial autocorrelation of species abundance: Local Indicators of Spatial Association (LISA) cluster maps at the grid cell scale for All Species, 1994-2002. *Note:* Data are included for all agricultural grid cells in the unbalanced sample. Data for 2001 are excluded due to low coverage brought about by foot and mouth disease access restrictions. High-high (shaded red) means that abundance is high in contiguous cells while low-low (shaded blue) indicates that abundance is low in contiguous cells. The Moran's I statistic indicates overall low spatial autocorrelation if it is close to zero. Results are similar across all of the bird groups.

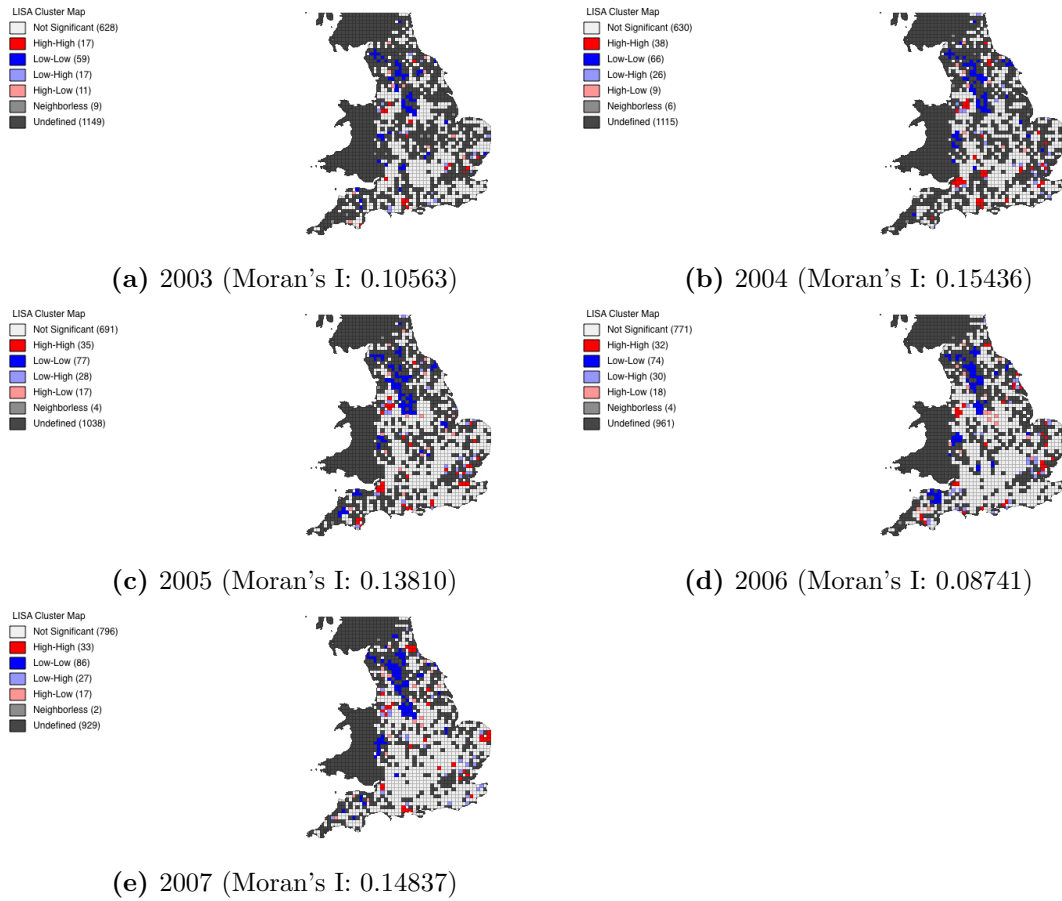
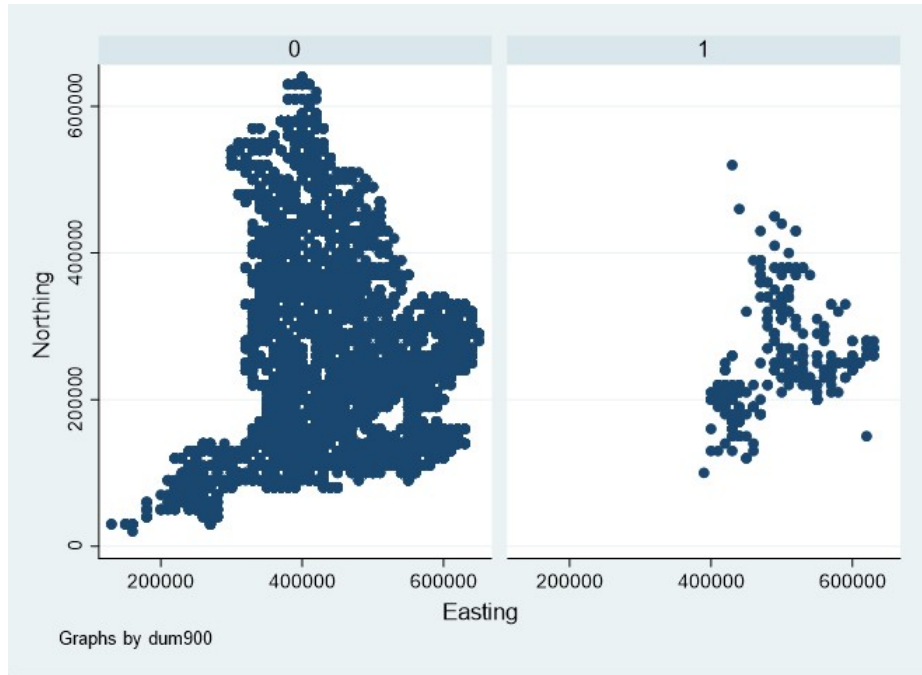
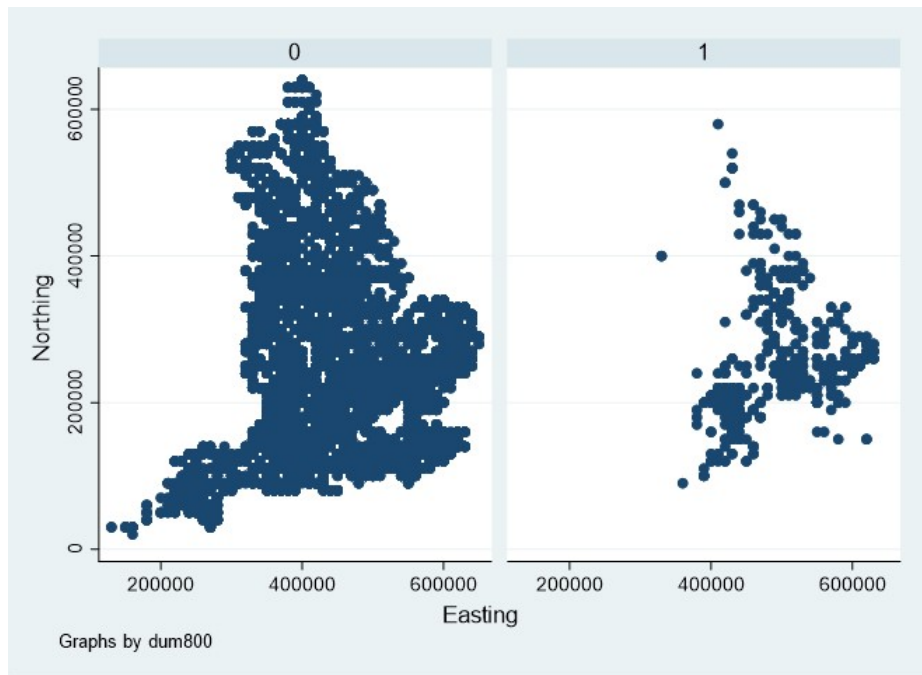


Figure A5: Spatial autocorrelation of species abundance: Local Indicators of Spatial Association (LISA) cluster maps at the grid cell scale for All Species, 2003-2007. *Note:* Data are included for all agricultural grid cells in the unbalanced sample. High-high (shaded red) means that abundance is high in contiguous cells while low-low (shaded blue) indicates that abundance is low in contiguous cells. The Moran's I statistic indicates overall low spatial autocorrelation if it is close to zero. Results are similar across all of the bird groups.

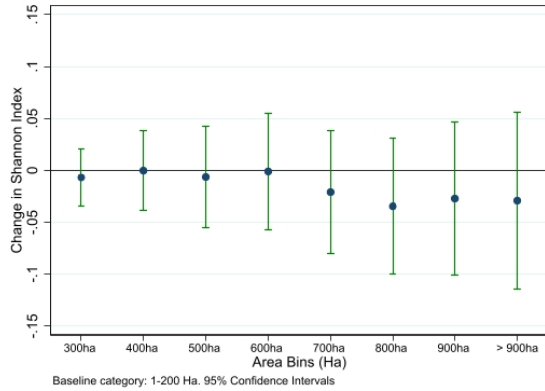


(a) Spatial distribution of set-aside areas of 900+ hectares

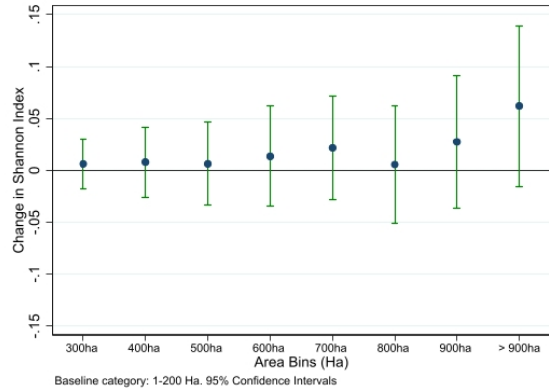


(b) Spatial distribution of set-aside areas of 800+ hectares

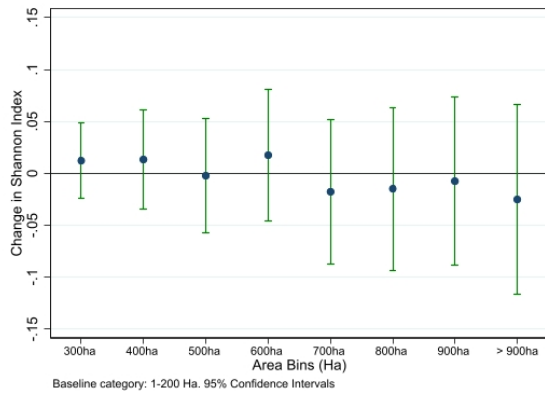
Figure A6: Spatial distribution of large areas of set-aside in England, 1992-2007.
Note: The right-hand side of each panel indicates the location of grid cells with greater than 900ha (a) and 800ha (b) of set-aside. The left-hand side shows all other grid cells in the balanced panel.



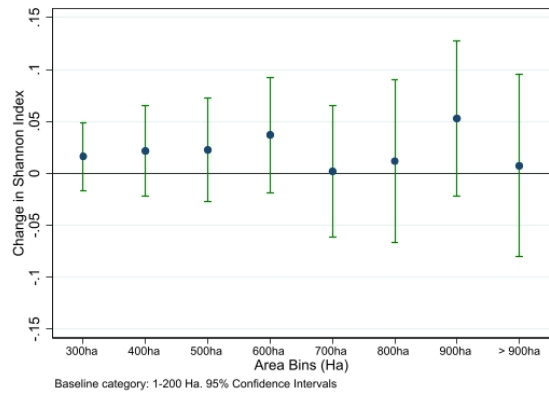
(a) All Species



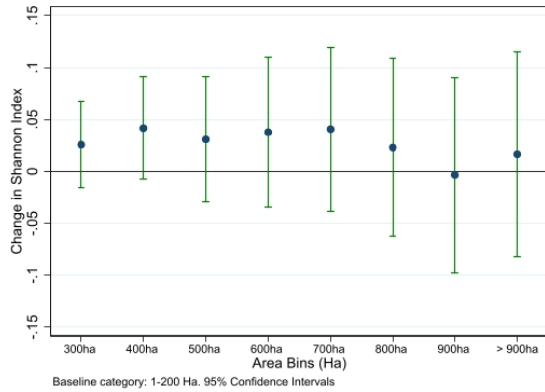
(b) Non-farmland



(c) Farmland

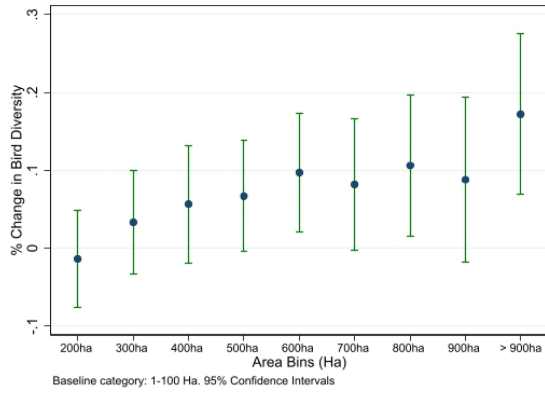


(d) Farmland Generalists

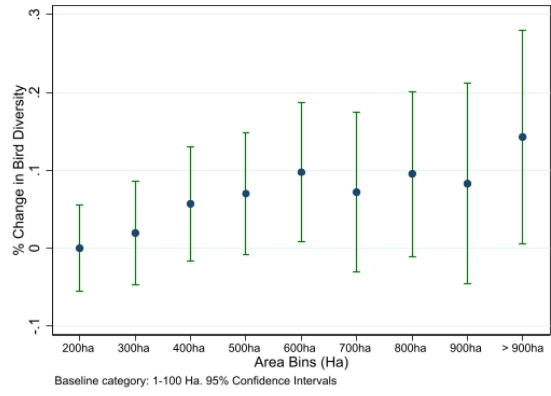


(e) Farmland Specialists

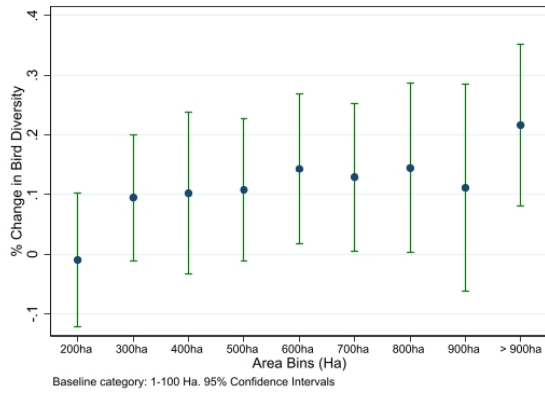
Figure A7: Diversity (Shannon-Wiener Index): Non-parametric estimation results. *Note:* 300ha area bin denotes set-aside range of 201ha to 300ha; 400ha denotes 301-400ha; 500ha denotes 401-500ha; 600ha denotes 501-600ha; 700ha denotes 601-700ha; 800ha denotes 701-800ha; and, 900ha denotes 801-900ha. The Shannon-Wiener Index does not respond in any statistically significant way to changes in set-aside. Since the Index is a function of relative abundance and species richness, this also means that the Index does not respond to the changes in these components that *are* affected by set-aside. Standard errors are two-way clustered at the region-by-year level (309 clusters in total).



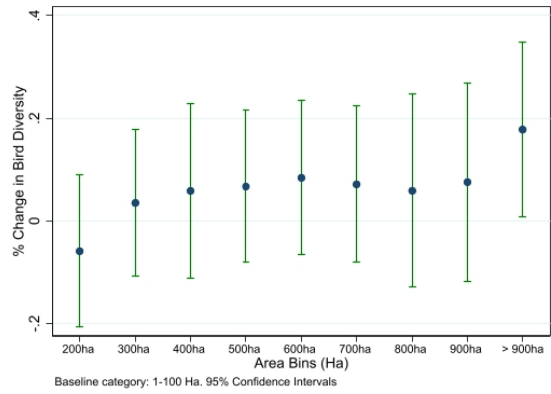
(a) All Species



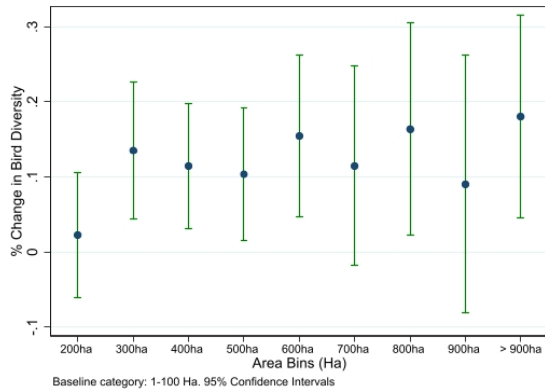
(b) Non-farmland



(c) Farmland

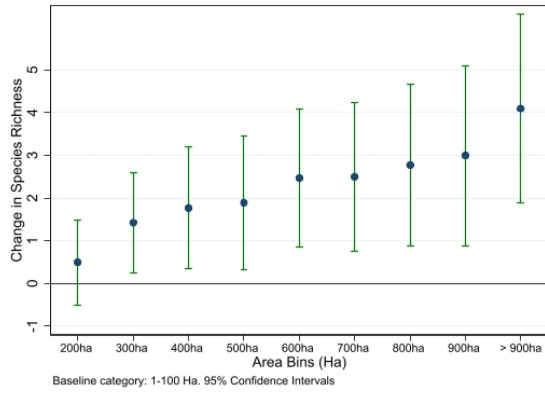


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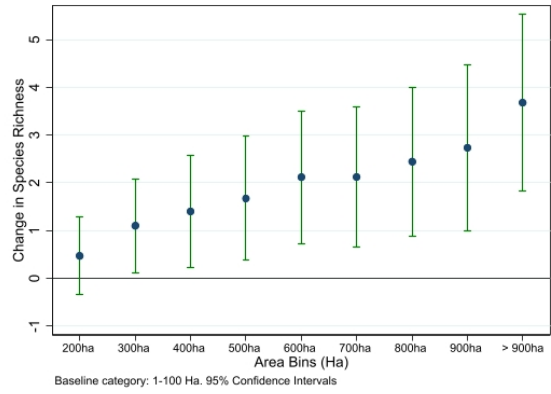


(e) Farmland Specialists

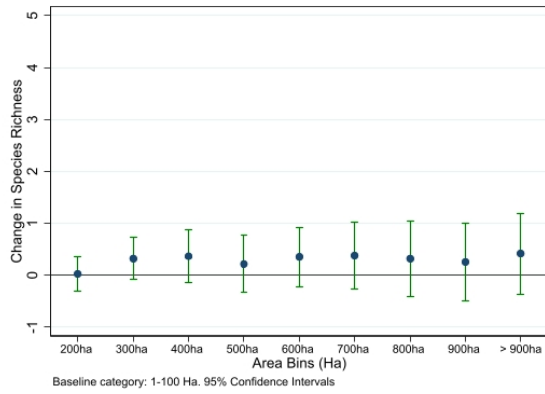
Figure A8: Species abundance: Non-parametric estimation results. *Note:* 200ha area bin denotes set-aside range of 101ha to 200ha; 300ha denotes 201-300ha; 400ha denotes 301-400ha; 500ha denotes 401-500ha; 600ha denotes 501-600ha; 700ha denotes 601-700ha; 800ha denotes 701-800ha; and, 900ha denotes 801-900ha. These non-parametric results have a baseline category of 1-100ha rather than 1-200ha. The 101-200ha bin is routinely not statistically significant and has a reasonably well-defined zero effect. Our main results (Fig. 4-5, Fig. A7) combine the 101-200ha bin with the 1-100ha bin. The results are qualitatively identical. Standard errors are two-way clustered at the region-by-year level (309 clusters in total).



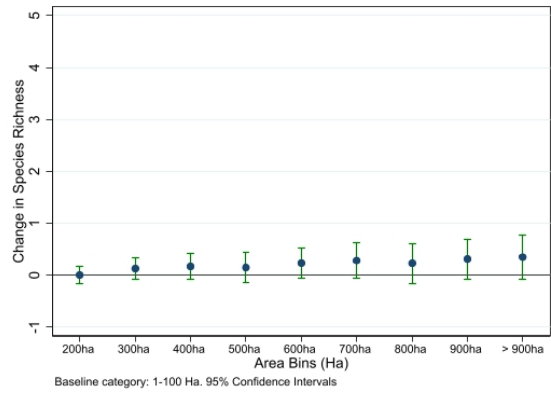
(a) All Species



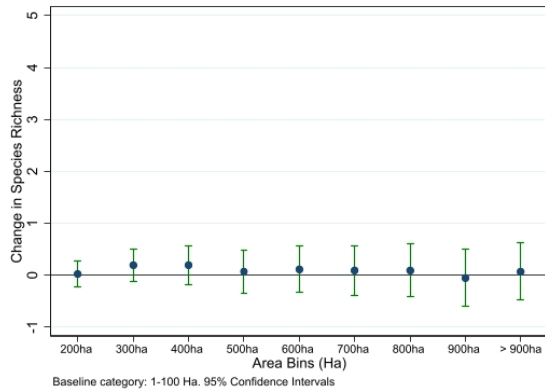
(b) Non-farmland



(c) Farmland

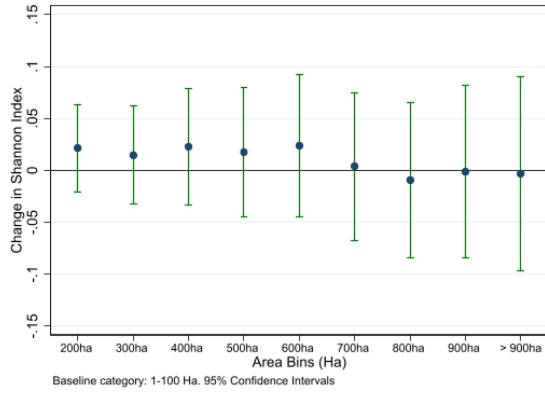


(d) Farmland Generalists

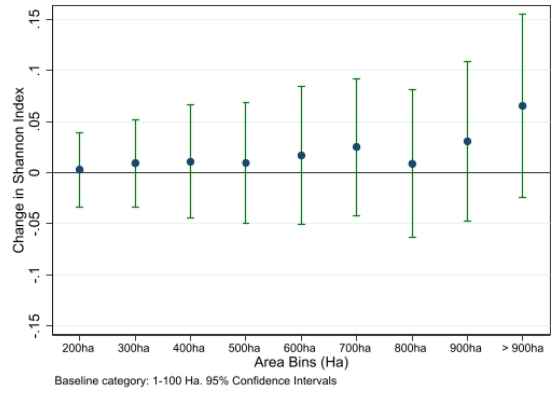


(e) Farmland Specialists

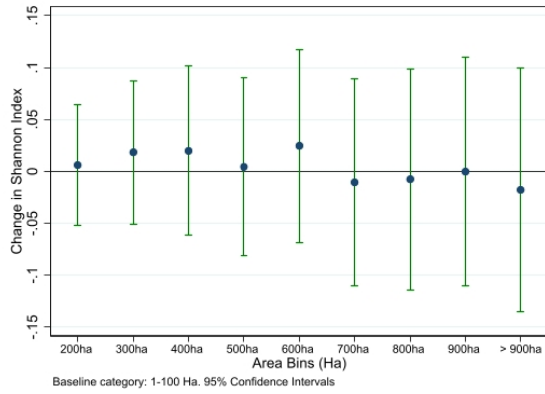
Figure A9: Species Richness: Non-parametric estimation results. *Note:* 200ha area bin denotes set-aside range of 101ha to 200ha; 300ha denotes 201-300ha; 400ha denotes 301-400ha; 500ha denotes 401-500ha; 600ha denotes 501-600ha; 700ha denotes 601-700ha; 800ha denotes 701-800ha; and, 900ha denotes 801-900ha. These non-parametric results have a baseline category of 1-100ha rather than 1-200ha. The 101-200ha bin is routinely not statistically significant and has a reasonably well-defined zero effect. Our main results (Fig. 4-5, Fig. A7) combine the 101-200ha bin with the 1-100ha bin. The results are qualitatively identical. Standard errors are two-way clustered at the region-by-year level (309 clusters in total).



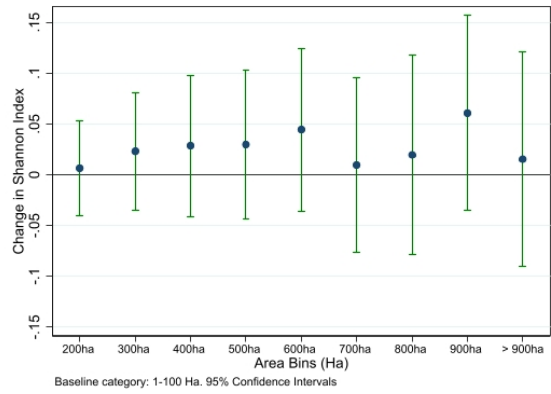
(a) All Species



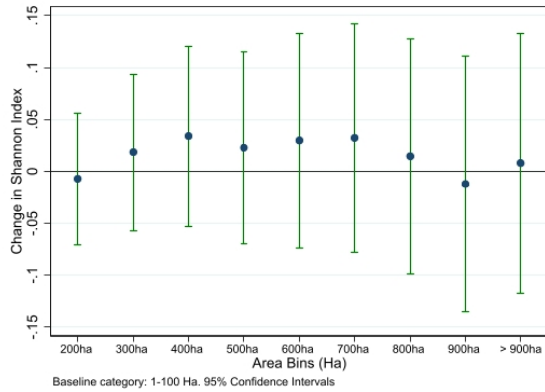
(b) Non-farmland



(c) Farmland



(d) Farmland Generalists



(e) Farmland Specialists

Figure A10: Diversity (Shannon-Wiener Index): Non-parametric estimation results. *Note:* 200ha area bin denotes set-aside range of 101ha to 200ha; 300ha denotes 201-300ha; 400ha denotes 301-400ha; 500ha denotes 401-500ha; 600ha denotes 501-600ha; 700ha denotes 601-700ha; 800ha denotes 701-800ha; and, 900ha denotes 801-900ha. These non-parametric results have a baseline category of 1-100ha rather than 1-200ha. The 101-200ha bin is routinely not statistically significant at conventional levels and has a reasonably well-defined zero effect. Our main results (Fig. 4-5, Fig. A7) combine the 101-200ha bin with the 1-100ha bin. The results are qualitatively identical. Standard errors are two-way clustered at the region-by-year level (309 clusters in total).

Additional Tables

Table A1: Non-farmland abundance by species (Arctic Tern to Cirl Bunting)

	Mean	Std.Dev.	Max	Min	Obs
Arctic Tern (<i>Sterna paradisaea</i>)	0.00	0.08	4.00	0.00	4294
Little Tern (<i>Sternula albifrons</i>)	0.00	0.02	1.00	0.00	4294
Crane (<i>Grus grus</i>)	0.00	0.00	0.00	0.00	4294
Black Swan (<i>Cygnus atratus</i>)	0.01	0.13	4.00	0.00	4294
Avocet (<i>Recurvirostra avosetta</i>)	0.03	0.78	27.00	0.00	4294
Alexandrine Parakeet (<i>Psittacula eupatria</i>)	0.00	0.02	1.00	0.00	4294
Lesser Scaup (<i>Aythya affinis</i>)	0.00	0.00	0.00	0.00	4294
Blackbird (<i>Turdus merula</i>)	11.60	7.00	71.00	0.00	4294
Bar-tailed Godwit (<i>Limosa lapponica</i>)	0.01	0.52	30.00	0.00	4294
Brent Goose (Black Brant) (<i>Branta bernicla nigricans</i>)	0.00	0.00	0.00	0.00	4294
Blackcap (<i>Sylvia atricapilla</i>)	2.23	2.09	44.00	0.00	4294
Bullfinch (<i>Pyrrhula pyrrhula</i>)	0.55	0.90	10.00	0.00	4294
Brent Goose (<i>Branta bernicla</i>)	0.01	0.24	15.00	0.00	4294
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	2.08	8.42	146.50	0.00	4294
Bittern (<i>Botaurus stellaris</i>)	0.00	0.00	0.00	0.00	4294
Black Tern (<i>Chlidonias niger</i>)	0.00	0.06	3.00	0.00	4294
Black Grouse (<i>Tetrao tetrix</i>)	0.00	0.05	3.00	0.00	4294
Brambling (<i>Fringilla montifringilla</i>)	0.01	0.34	17.00	0.00	4294
Black-necked Grebe (<i>Podiceps nigricollis</i>)	0.01	0.31	12.00	0.00	4294
Barn Owl (<i>Tyto alba</i>)	0.03	0.18	2.00	0.00	4294
Bearded Tit (<i>Panurus biarmicus</i>)	0.00	0.09	4.50	0.00	4294
Bewick's Swan (<i>Cygnus columbianus</i>)	0.00	0.00	0.00	0.00	4294
Blue Tit (<i>Cyanistes caeruleus</i>)	8.38	5.75	60.00	0.00	4294
Bluethroat (<i>Luscinia svecica</i>)	0.00	0.00	0.00	0.00	4294
Black-throated Diver (<i>Gavia arctica</i>)	0.00	0.00	0.00	0.00	4294
Black-tailed Godwit (<i>Limosa limosa</i>)	0.02	0.43	18.00	0.00	4294
Black Redstart (<i>Phoenicurus ochruros</i>)	0.00	0.04	1.00	0.00	4294
Barnacle Goose (<i>Branta leucopsis</i>)	0.02	0.28	11.00	0.00	4294
Buzzard (<i>Buteo buteo</i>)	0.45	0.90	13.00	0.00	4294
Carrion Crow (<i>Corvus corone</i>)	9.41	10.15	277.00	0.00	4294
Cormorant (<i>Phalacrocorax carbo</i>)	0.25	0.79	12.00	0.00	4294
Chiffchaff (<i>Phylloscopus collybita</i>)	2.19	2.33	30.00	0.00	4294
Collared Dove (<i>Streptopelia decaocto</i>)	2.74	3.67	64.00	0.00	4294
Corncrake (<i>Crex crex</i>)	0.00	0.02	1.00	0.00	4294
Chough (<i>Pyrrhocorax pyrrhocorax</i>)	0.00	0.00	0.00	0.00	4294
Canada Goose (<i>Branta canadensis</i>)	2.21	12.68	575.00	0.00	4294
Chaffinch (<i>Fringilla coelebs</i>)	11.41	5.93	48.00	0.00	4294
Cuckoo (<i>Cuculus canorus</i>)	0.68	0.86	12.00	0.00	4294
Cirl Bunting (<i>Emberiza cirrus</i>)	0.00	0.09	3.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A2: Non-farmland abundance by species (Common Gull to Goshawk)

	Mean	Std.Dev.	Max	Min	Obs
Common Gull (<i>Larus canus</i>)	0.29	2.76	107.00	0.00	4294
Common Tern (<i>Sterna hirundo</i>)	0.16	1.71	60.00	0.00	4294
Coot (<i>Fulica atra</i>)	0.97	3.62	60.00	0.00	4294
Capercaillie (<i>Tetrao urogallus</i>)	0.00	0.00	0.00	0.00	4294
Common Crossbill (<i>Loxia curvirostra</i>)	0.13	1.44	40.50	0.00	4294
Common Sandpiper (<i>Actitis hypoleucos</i>)	0.03	0.21	6.00	0.00	4294
Coal Tit (<i>Parus ater</i>)	0.82	1.71	25.00	0.00	4294
Curlew (<i>Numenius arquata</i>)	0.46	1.45	20.00	0.00	4294
Cetti's Warbler (<i>Cettia cetti</i>)	0.03	0.28	6.00	0.00	4294
Common Scoter (<i>Melanitta nigra</i>)	0.00	0.02	1.00	0.00	4294
Dunnoch (<i>Prunella modularis</i>)	3.51	2.64	30.00	0.00	4294
Wood Duck (<i>Aix sponsa</i>)	0.00	0.04	2.00	0.00	4294
Dipper (<i>Cinclus cinclus</i>)	0.01	0.13	4.00	0.00	4294
Dunlin (<i>Calidris alpina</i>)	0.03	0.93	55.00	0.00	4294
Dotterel (<i>Charadrius morinellus</i>)	0.00	0.05	3.00	0.00	4294
Spotted Redshank (<i>Tringa erythropus</i>)	0.00	0.01	0.50	0.00	4294
Rock Dove (<i>Columba livia</i>)	0.00	0.09	6.00	0.00	4294
Dartford Warbler (<i>Sylvia undata</i>)	0.04	0.46	11.00	0.00	4294
Eider (<i>Somateria mollissima</i>)	0.00	0.03	2.00	0.00	4294
Red-breasted Goose (<i>Branta ruficollis</i>)	0.00	0.02	1.00	0.00	4294
Cattle Egret (<i>Bubulcus ibis</i>)	0.00	0.00	0.00	0.00	4294
Red-backed Shrike (<i>Lanius collurio</i>)	0.00	0.00	0.00	0.00	4294
Egyptian Goose (<i>Alopochen aegyptiaca</i>)	0.02	0.28	12.00	0.00	4294
Little Egret (<i>Egretta garzetta</i>)	0.03	0.35	8.00	0.00	4294
Fulmar (<i>Fulmarus glacialis</i>)	0.00	0.14	6.00	0.00	4294
Firecrest (<i>Regulus ignicapilla</i>)	0.00	0.08	3.00	0.00	4294
Fieldfare (<i>Turdus pilaris</i>)	0.80	8.36	301.00	0.00	4294
Feral Pigeon (<i>Columba livia</i>)	2.59	6.97	230.00	0.00	4294
Helmeted Guineafowl (<i>Numida meleagris</i>)	0.02	0.59	30.00	0.00	4294
Green Woodpecker (<i>Picus viridis</i>)	0.77	0.97	8.00	0.00	4294
Gadwall (<i>Anas strepera</i>)	0.10	0.70	14.00	0.00	4294
Great Black-backed Gull (<i>Larus marinus</i>)	0.12	1.68	74.00	0.00	4294
Goldcrest (<i>Regulus regulus</i>)	0.85	1.53	16.00	0.00	4294
Goosander (<i>Mergus merganser</i>)	0.05	0.47	13.00	0.00	4294
Green Sandpiper (<i>Tringa ochropus</i>)	0.00	0.08	2.00	0.00	4294
Golden Pheasant (<i>Chrysolophus pictus</i>)	0.00	0.04	2.00	0.00	4294
Great Crested Grebe (<i>Podiceps cristatus</i>)	0.26	1.30	24.00	0.00	4294
Grasshopper Warbler (<i>Locustella naevia</i>)	0.03	0.19	4.50	0.00	4294
Goshawk (<i>Accipiter gentilis</i>)	0.00	0.05	1.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A3: Non-farmland abundance by species (Greylag Goose to Long-eared Owl)

	Mean	Std.Dev.	Max	Min	Obs
Greylag Goose (<i>Anser anser</i>)	0.85	7.56	188.00	0.00	4294
Greenshank (<i>Tringa nebularia</i>)	0.00	0.08	2.00	0.00	4294
Grey Wagtail (<i>Motacilla cinerea</i>)	0.16	0.51	14.00	0.00	4294
Goldeneye (<i>Bucephala clangula</i>)	0.00	0.07	3.00	0.00	4294
Golden Plover (<i>Pluvialis apricaria</i>)	0.00	0.05	2.00	0.00	4294
Greenfinch (<i>Chloris chloris</i>)	4.82	4.83	72.00	0.00	4294
Great Spotted Woodpecker (<i>Dendrocopos major</i>)	0.85	0.98	7.00	0.00	4294
Great Tit (<i>Parus major</i>)	4.79	3.43	28.00	0.00	4294
Guillemot (<i>Uria aalge</i>)	0.00	0.00	0.00	0.00	4294
Grey Plover (<i>Pluvialis squatarola</i>)	0.00	0.07	3.00	0.00	4294
Garden Warbler (<i>Sylvia borin</i>)	0.40	0.75	10.00	0.00	4294
Gannet (<i>Morus bassanus</i>)	0.00	0.05	3.00	0.00	4294
Garganey (<i>Anas querquedula</i>)	0.00	0.05	2.00	0.00	4294
Grey Heron (<i>Ardea cinerea</i>)	0.52	0.98	15.00	0.00	4294
Harris's Hawk (<i>Parabuteo unicinctus</i>)	0.00	0.03	1.00	0.00	4294
hybrid Carrion x Hooded Crow (<i>Corvus corone x cornix</i>)	0.00	0.00	0.00	0.00	4294
Hooded Crow (<i>Corvus cornix</i>)	0.00	0.06	3.00	0.00	4294
Bar-headed Goose (<i>Anser indicus</i>)	0.00	0.05	2.00	0.00	4294
Hawfinch (<i>Coccothraustes coccothraustes</i>)	0.00	0.04	1.00	0.00	4294
Herring Gull (<i>Larus argentatus</i>)	1.81	8.67	220.00	0.00	4294
Hen Harrier (<i>Circus cyaneus</i>)	0.00	0.04	1.00	0.00	4294
House Martin (<i>Delichon urbicum</i>)	3.07	4.93	58.50	0.00	4294
Swan Goose (Chinese Goose) (<i>Anser cygnoides</i>)	0.00	0.00	0.00	0.00	4294
Hoopoe (<i>Upupa epops</i>)	0.00	0.02	1.00	0.00	4294
House Sparrow (<i>Passer domesticus</i>)	8.71	11.09	148.00	0.00	4294
Hobby (<i>Falco subbuteo</i>)	0.05	0.21	2.00	0.00	4294
Honey-buzzard (<i>Pernis apivorus</i>)	0.00	0.03	1.00	0.00	4294
Glossy Ibis (<i>Plegadis falcinellus</i>)	0.00	0.02	1.00	0.00	4294
Black-winged Stilt (<i>Himantopus himantopus</i>)	0.00	0.00	0.00	0.00	4294
Jay (<i>Garrulus glandarius</i>)	0.65	0.99	12.00	0.00	4294
Jack Snipe (<i>Limnocryptes minimus</i>)	0.00	0.02	1.00	0.00	4294
Red-tailed Hawk (<i>Buteo jamaicensis</i>)	0.00	0.00	0.00	0.00	4294
Kingfisher (<i>Alcedo atthis</i>)	0.07	0.29	3.00	0.00	4294
Kittiwake (<i>Rissa tridactyla</i>)	0.00	0.00	0.00	0.00	4294
Knot (<i>Calidris canutus</i>)	0.00	0.00	0.00	0.00	4294
Red Kite (<i>Milvus milvus</i>)	0.03	0.22	4.00	0.00	4294
Lesser Black-backed Gull (<i>Larus fuscus</i>)	1.64	7.59	213.00	0.00	4294
Long-eared Owl (<i>Asio otus</i>)	0.00	0.03	1.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A4: Non-farmland abundance by species (Little Grebe to White Stork)

	Mean	Std.Dev.	Max	Min	Obs
Little Grebe (<i>Tachybaptus ruficollis</i>)	0.12	0.60	8.00	0.00	4294
Lady Amherst's Pheasant (<i>Chrysolophus amherstiae</i>)	0.00	0.00	0.00	0.00	4294
Long-tailed Duck (<i>Clangula hyemalis</i>)	0.00	0.02	1.00	0.00	4294
Little Owl (<i>Athene noctua</i>)	0.11	0.32	3.00	0.00	4294
Little Ringed Plover (<i>Charadrius dubius</i>)	0.02	0.19	5.00	0.00	4294
Lesser Redpoll (<i>Carduelis cabaret</i>)	0.17	1.62	69.00	0.00	4294
Lesser Spotted Woodpecker (<i>Dendrocopos minor</i>)	0.03	0.20	3.00	0.00	4294
Long-tailed Tit (<i>Aegithalos caudatus</i>)	1.34	1.98	45.00	0.00	4294
Little Gull (<i>Hydrocoloeus minutus</i>)	0.00	0.10	6.00	0.00	4294
Lesser Whitethroat (<i>Sylvia curruca</i>)	0.29	0.72	28.00	0.00	4294
Little Stint (<i>Calidris minuta</i>)	0.00	0.00	0.00	0.00	4294
Mistle Thrush (<i>Turdus viscivorus</i>)	1.21	1.34	19.00	0.00	4294
Mallard (<i>Anas platyrhynchos</i>)	3.39	5.01	89.00	0.00	4294
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	0.00	0.00	0.00	0.00	4294
Magpie (<i>Pica pica</i>)	3.37	3.04	32.00	0.00	4294
Moorhen (<i>Gallinula chloropus</i>)	0.88	1.35	25.00	0.00	4294
Merlin (<i>Falco columbarius</i>)	0.00	0.06	2.00	0.00	4294
Mandarin Duck (<i>Aix galericulata</i>)	0.06	0.53	16.00	0.00	4294
Montagu's Harrier (<i>Circus pygargus</i>)	0.00	0.05	1.00	0.00	4294
Meadow Pipit (<i>Anthus pratensis</i>)	0.94	3.42	115.00	0.00	4294
Marsh Harrier (<i>Circus aeruginosus</i>)	0.01	0.14	4.00	0.00	4294
Mute Swan (<i>Cygnus olor</i>)	0.63	2.66	64.00	0.00	4294
Marsh Tit (<i>Poecile palustris</i>)	0.20	0.60	10.00	0.00	4294
Mediterranean Gull (<i>Larus melanocephalus</i>)	0.00	0.06	2.33	0.00	4294
Marsh Warbler (<i>Acrocephalus palustris</i>)	0.00	0.05	2.00	0.00	4294
Manx Shearwater (<i>Puffinus puffinus</i>)	0.00	0.00	0.00	0.00	4294
Muscovy Duck (<i>Cairina moschata</i>)	0.00	0.06	2.00	0.00	4294
Spoonbill (<i>Platalea leucorodia</i>)	0.00	0.00	0.00	0.00	4294
Great Northern Diver (<i>Gavia immer</i>)	0.00	0.00	0.00	0.00	4294
Ring-necked Duck (<i>Aythya collaris</i>)	0.00	0.02	1.00	0.00	4294
Nuthatch (<i>Sitta europaea</i>)	0.49	0.99	12.00	0.00	4294
Nightjar (<i>Caprimulgus europaeus</i>)	0.00	0.09	4.00	0.00	4294
Serin (<i>Serinus serinus</i>)	0.00	0.00	0.00	0.00	4294
Oystercatcher (<i>Haematopus ostralegus</i>)	0.24	0.94	14.00	0.00	4294
Wood Sandpiper (<i>Tringa glareola</i>)	0.00	0.02	1.00	0.00	4294
Golden Oriole (<i>Oriolus oriolus</i>)	0.00	0.03	1.00	0.00	4294
Osprey (<i>Pandion haliaetus</i>)	0.00	0.05	1.00	0.00	4294
White Stork (<i>Ciconia ciconia</i>)	0.00	0.00	0.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A5: Non-farmland abundance by species (Peregrine to Swallow)

	Mean	Std.Dev.	Max	Min	Obs
Peregrine (<i>Falco peregrinus</i>)	0.01	0.11	2.00	0.00	4294
Pied Flycatcher (<i>Ficedula hypoleuca</i>)	0.02	0.21	7.50	0.00	4294
Pink-footed Goose (<i>Anser brachyrhynchus</i>)	0.00	0.18	11.00	0.00	4294
Pheasant (<i>Phasianus colchicus</i>)	4.39	4.28	55.25	0.00	4294
Pochard (<i>Aythya ferina</i>)	0.05	0.51	16.00	0.00	4294
Pintail (<i>Anas acuta</i>)	0.00	0.03	1.00	0.00	4294
Pied/White Wagtail (<i>Motacilla alba</i>)	0.99	1.07	16.00	0.00	4294
Indian Peafowl (<i>Pavo cristatus</i>)	0.03	0.41	20.00	0.00	4294
Quail (<i>Coturnix coturnix</i>)	0.03	0.26	6.00	0.00	4294
Cockatiel (<i>Nymphicus hollandicus</i>)	0.00	0.00	0.00	0.00	4294
Robin (<i>Erithacus rubecula</i>)	6.90	4.58	35.00	0.00	4294
Razorbill (<i>Alca torda</i>)	0.00	0.00	0.00	0.00	4294
Rock Pipit (<i>Anthus petrosus</i>)	0.00	0.04	2.00	0.00	4294
Redwing (<i>Turdus iliacus</i>)	0.10	1.98	84.00	0.00	4294
Red Grouse (<i>Lagopus lagopus</i>)	0.02	0.25	9.00	0.00	4294
Red-throated Diver (<i>Gavia stellata</i>)	0.00	0.06	4.00	0.00	4294
Ring-necked Parakeet (<i>Psittacula krameri</i>)	0.04	0.57	31.00	0.00	4294
Redshank (<i>Tringa totanus</i>)	0.14	0.97	18.00	0.00	4294
Red-legged Partridge (<i>Alectoris rufa</i>)	1.05	1.72	18.00	0.00	4294
Red-breasted Merganser (<i>Mergus serrator</i>)	0.00	0.13	8.00	0.00	4294
Raven (<i>Corvus corax</i>)	0.08	0.42	13.00	0.00	4294
Ringed Plover (<i>Charadrius hiaticula</i>)	0.02	0.47	22.00	0.00	4294
Red-crested Pochard (<i>Netta rufina</i>)	0.00	0.03	2.00	0.00	4294
Redstart (<i>Phoenicurus phoenicurus</i>)	0.08	0.41	7.00	0.00	4294
Ruff (<i>Philomachus pugnax</i>)	0.00	0.12	8.00	0.00	4294
Reeves's Pheasant (<i>Syrnaticus reevesii</i>)	0.00	0.00	0.00	0.00	4294
Reed Warbler (<i>Acrocephalus scirpaceus</i>)	0.46	1.85	27.00	0.00	4294
Ruddy Duck (<i>Oxyura jamaicensis</i>)	0.03	0.34	10.00	0.00	4294
Ring Ouzel (<i>Turdus torquatus</i>)	0.01	0.44	28.00	0.00	4294
Shag (<i>Phalacrocorax aristotelis</i>)	0.00	0.02	1.00	0.00	4294
Snow Bunting (<i>Plectrophenax nivalis</i>)	0.00	0.00	0.00	0.00	4294
Stonechat (<i>Saxicola rubicola</i>)	0.08	0.47	11.00	0.00	4294
Short-eared Owl (<i>Asio flammeus</i>)	0.00	0.05	1.50	0.00	4294
Spotted Flycatcher (<i>Muscicapa striata</i>)	0.16	0.46	5.00	0.00	4294
Sparrowhawk (<i>Accipiter nisus</i>)	0.19	0.36	4.00	0.00	4294
Swift (<i>Apus apus</i>)	3.90	11.32	301.00	0.00	4294
Snow Goose (<i>Anser caerulescens</i>)	0.00	0.00	0.00	0.00	4294
Siskin (<i>Carduelis spinus</i>)	0.12	1.46	75.00	0.00	4294
Swallow (<i>Hirundo rustica</i>)	4.86	5.57	148.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A6: Non-farmland abundance by species (Sand Martin to Whooper Swan)

	Mean	Std.Dev.	Max	Min	Obs
Sand Martin (<i>Riparia riparia</i>)	0.73	5.29	150.00	0.00	4294
Snipe (<i>Gallinago gallinago</i>)	0.06	0.38	11.00	0.00	4294
Snowy Owl (<i>Bubo scandiacus</i>)	0.00	0.00	0.00	0.00	4294
Scaup (<i>Aythya marila</i>)	0.00	0.03	2.00	0.00	4294
Common Rosefinch (<i>Carpodacus erythrinus</i>)	0.00	0.00	0.00	0.00	4294
Great Grey Shrike (<i>Lanius excubitor</i>)	0.00	0.02	1.00	0.00	4294
Sanderling (<i>Calidris alba</i>)	0.00	0.00	0.00	0.00	4294
Song Thrush (<i>Turdus philomelos</i>)	2.75	2.42	25.00	0.00	4294
Shelduck (<i>Tadorna tadorna</i>)	0.56	3.47	119.00	0.00	4294
Shoveler (<i>Anas clypeata</i>)	0.03	0.31	8.00	0.00	4294
Sedge Warbler (<i>Acrocephalus schoenobaenus</i>)	0.53	1.95	34.00	0.00	4294
Slavonian Grebe (<i>Podiceps auritus</i>)	0.00	0.00	0.00	0.00	4294
Teal (<i>Anas crecca</i>)	0.06	0.83	40.00	0.00	4294
Treecreeper (<i>Certhia familiaris</i>)	0.29	0.68	10.00	0.00	4294
Sandwich Tern (<i>Sterna sandvicensis</i>)	0.00	0.11	6.00	0.00	4294
Stone-curlew (<i>Burhinus oedicephalus</i>)	0.00	0.02	1.00	0.00	4294
Tawny Owl (<i>Strix aluco</i>)	0.09	0.30	7.00	0.00	4294
Tree Pipit (<i>Anthus trivialis</i>)	0.12	0.62	14.00	0.00	4294
Turnstone (<i>Arenaria interpres</i>)	0.00	0.08	5.00	0.00	4294
Tufted Duck (<i>Aythya fuligula</i>)	0.73	2.83	60.00	0.00	4294
Twite (<i>Carduelis flavirostris</i>)	0.01	0.22	12.00	0.00	4294
Australian Shelduck (<i>Tadorna tadornoides</i>)	0.00	0.03	2.00	0.00	4294
Ruddy Shelduck (<i>Tadorna ferruginea</i>)	0.00	0.12	7.00	0.00	4294
Purple Heron (<i>Ardea purpurea</i>)	0.00	0.00	0.00	0.00	4294
Great Bustard (<i>Otis tarda</i>)	0.00	0.00	0.00	0.00	4294
Savi's Warbler (<i>Locustella luscinioides</i>)	0.00	0.00	0.00	0.00	4294
Wheatear (<i>Oenanthe oenanthe</i>)	0.17	0.74	16.00	0.00	4294
Water Rail (<i>Rallus aquaticus</i>)	0.01	0.15	6.00	0.00	4294
Whinchat (<i>Saxicola rubetra</i>)	0.03	0.22	5.00	0.00	4294
White-tailed Eagle (<i>Haliaeetus albicilla</i>)	0.00	0.00	0.00	0.00	4294
White-fronted Goose (<i>Anser albifrons</i>)	0.00	0.06	3.00	0.00	4294
Water Pipit (<i>Anthus spinoletta</i>)	0.00	0.02	1.00	0.00	4294
Woodcock (<i>Scolopax rusticola</i>)	0.01	0.10	3.00	0.00	4294
Woodlark (<i>Lullula arborea</i>)	0.03	0.30	7.00	0.00	4294
Whimbrel (<i>Numenius phaeopus</i>)	0.08	0.88	24.00	0.00	4294
Wigeon (<i>Anas penelope</i>)	0.01	0.33	15.00	0.00	4294
Wood Warbler (<i>Phylloscopus sibilatrix</i>)	0.04	0.30	9.00	0.00	4294
Wren (<i>Troglodytes troglodytes</i>)	8.62	5.53	69.00	0.00	4294
Whooper Swan (<i>Cygnus cygnus</i>)	0.00	0.16	10.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A7: Non-farmland abundance by species (Willow Tit to Greyland Goose *domestic*)

	Mean	Std.Dev.	Max	Min	Obs
Willow Tit (<i>Poecile montana</i>)	0.09	0.43	7.00	0.00	4294
Willow Warbler (<i>Phylloscopus trochilus</i>)	1.92	2.72	33.67	0.00	4294
Waxwing (<i>Bombycilla garrulus</i>)	0.00	0.00	0.00	0.00	4294
Wryneck (<i>Jynx torquilla</i>)	0.00	0.02	1.00	0.00	4294
Other cage bird species ()	0.00	0.02	1.00	0.00	4294
unidentified crossbill (<i>Loxia sp</i>)	0.00	0.00	0.00	0.00	4294
Yellow-legged Gull (<i>Larus michahellis</i>)	0.00	0.02	1.00	0.00	4294
Mallard (<i>domestic</i>) (<i>Anas platyrhynchos</i>)	0.06	0.69	23.00	0.00	4294
Greylag Goose (<i>domestic</i>) (<i>Anser anser</i>)	0.02	0.25	8.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A8: Farmland abundance by species

	Mean	Std.Dev.	Max	Min	Obs
<i>Farmland Gen.</i>					
Greenfinch (<i>Chloris chloris</i>)	4.82	4.83	72.00	0.00	4294
Jackdaw (<i>Corvus monedula</i>)	7.43	10.13	128.00	0.00	4294
Kestrel (<i>Falco tinnunculus</i>)	0.38	0.50	6.00	0.00	4294
Reed Bunting (<i>Emberiza schoeniclus</i>)	0.59	1.37	15.50	0.00	4294
Rook (<i>Corvus frugilegus</i>)	13.72	26.79	717.00	0.00	4294
Woodpigeon (<i>Columba palumbus</i>)	26.39	20.74	327.00	0.00	4294
Yellow Wagtail (<i>Motacilla flava</i>)	0.41	1.42	25.00	0.00	4294
<i>Farmland Spec.</i>					
Corn Bunting (<i>Emberiza calandra</i>)	0.44	1.45	21.00	0.00	4294
Goldfinch (<i>Carduelis carduelis</i>)	2.44	2.59	29.00	0.00	4294
Grey Partridge (<i>Perdix perdix</i>)	0.39	0.95	10.80	0.00	4294
Lapwing (<i>Vanellus vanellus</i>)	1.53	2.99	34.50	0.00	4294
Linnet (<i>Carduelis cannabina</i>)	3.57	5.23	93.00	0.00	4294
Skylark (<i>Alauda arvensis</i>)	5.87	5.61	54.00	0.00	4294
Starling (<i>Sturnus vulgaris</i>)	14.87	20.72	326.00	0.00	4294
Stock Dove (<i>Columba oenas</i>)	1.53	2.60	53.50	0.00	4294
Tree Sparrow (<i>Passer montanus</i>)	0.40	1.44	23.00	0.00	4294
Turtle Dove (<i>Streptopelia turtur</i>)	0.36	1.05	27.00	0.00	4294
Whitethroat (<i>Sylvia communis</i>)	2.48	2.55	24.00	0.00	4294
Yellowhammer (<i>Emberiza citrinella</i>)	3.09	3.06	21.00	0.00	4294

Note: The summary statistics are for the balanced panel dataset used in the empirical analysis. Data are described at the 10km-by-10km grid cell scale. Species with a maximum abundance of zero in the balanced dataset are recorded as having non-zero abundance in the unbalanced dataset. Both the balanced and unbalanced datasets contain agricultural grid cells only.

Table A9: Harris-Tzavalis unit root tests for bird species groups (abundance) and set-aside

	ρ	p-value	No. groups
All	0.0921	0.000	351
Non-Farmland	0.0667	0.000	351
Farmland	0.0241	0.000	351
Farmland Gen.	-0.0167	0.000	349
Farmland Spec.	-0.0107	0.000	341
Set-aside	0.427	0.0131	351

Note: The table presents the results of the Harris-Tzavalis panel unit-root test to ensure that the data are stationary, which would jeopardise reliable estimation and inference. A variety of unit-root tests are available but the Harris-Tzavalis test is suitable for panel data sets with large N and fixed T. The null hypothesis in the Harris-Tzavalis test is that the data are non-stationary, and the alternative is that the data in the panels are stationary. For each variable, the null hypothesis is rejected at the 5% significance level. We use STATA's xtunitroot command to undertake these tests, and deploy the 'demean' and 'trend' options, and a correction for the time periods used, the 'altt' option, in order to correct for the size of the test in samples with fewer than 15 time periods.

Table A10: Correlation between biodiversity outcomes and over- and under-provision of setaside

	Δ <i>Set-aside</i>				
	All	Non-farm	Farm	Farm Gen.	Farm Spec.
Abundance	0.0368	0.0247	0.0436	0.0368	0.0369
Species richness	0.0359	0.0300	0.0407	0.0336	0.0374
Diversity (Shannon-Wiener)	0.0219	0.0424	0.0072	-0.0062	0.0261

Note: Pearson correlation coefficients between the difference in actual and mandated set-aside (Δ Set-aside) and biodiversity outcomes (for all classes of birds), across all three indices (abundance, species richness and Shannon-Wiener diversity).

Table A11: Three specifications for species abundance by bird group

	(1) All	(2) Non-farm	(3) Farm	(4) Farm Gen.	(5) Farm Spec.	(6) All	(7) Non-farm	(8) Farm	(9) Farm Gen.	(10) Farm Spec.	(11) All	(12) Non-farm.	(13) Farm	(14) Farm Gen.	(15) Farm Spec.
Set-aside	0.0109*** (0.00398)	0.00801* (0.00416)	0.0111** (0.00546)	0.00780 (0.00695)	0.00914 (0.00648)	0.0144*** (0.00427)	0.0111** (0.00443)	0.0148** (0.00575)	0.0110 (0.00710)	0.0124* (0.00690)	0.0174*** (0.00540)	0.0124** (0.00575)	0.0192*** (0.00730)	0.0205** (0.00845)	0.00921 (0.00846)
Fractionalisation	0.173** (0.0758)	0.105 (0.0789)	0.267** (0.107)	0.310** (0.121)	0.319** (0.141)	0.212*** (0.0762)	0.147* (0.0793)	0.304*** (0.109)	0.344*** (0.124)	0.375** (0.146)	0.142* (0.0788)	0.0715 (0.0821)	0.260** (0.113)	0.310** (0.132)	0.256* (0.151)
Wheat						-0.00141 (0.00193)	-0.000613 (0.00200)	-0.000868 (0.00287)	0.00359 (0.00408)	-0.00351 (0.00370)	-0.00242 (0.00223)	-0.00142 (0.00224)	-0.00102 (0.00333)	0.000991 (0.00464)	-0.00188 (0.00410)
Maize						-0.0344*** (0.0103)	-0.0308*** (0.0112)	-0.0552*** (0.0154)	-0.0511*** (0.0189)	-0.0711*** (0.0227)	-0.0356*** (0.0107)	-0.0324*** (0.0114)	-0.0554*** (0.0161)	-0.0404** (0.0194)	-0.0843*** (0.0235)
Winter barley						-0.0125*** (0.00375)	-0.0103*** (0.00396)	-0.0200*** (0.00514)	-0.0131** (0.00661)	-0.0192*** (0.00633)	-0.0169*** (0.00426)	-0.0148*** (0.00436)	-0.0236*** (0.00606)	-0.0214*** (0.00754)	-0.0200*** (0.00704)
Spring barley						-0.00607 (0.00590)	-0.0101 (0.00673)	0.00247 (0.00751)	-0.00464 (0.0103)	0.00871 (0.00967)	0.00192 (0.00625)	-0.00270 (0.00723)	0.00980 (0.00793)	0.00847 (0.0115)	0.0127 (0.00985)
Oats						0.00677 (0.0102)	0.00677 (0.0106)	0.00903 (0.0155)	0.00998 (0.0204)	0.00360 (0.0184)	0.00480 (0.0110)	0.00784 (0.0114)	0.0109 (0.0166)	0.0109 (0.0209)	0.0145 (0.0194)
Other cereal						-0.0407 (0.0300)	-0.0404 (0.0306)	-0.0520 (0.0416)	-0.106** (0.0511)	0.0229 (0.0552)	-0.0290 (0.0334)	-0.0280 (0.0334)	-0.0275 (0.0430)	-0.0871* (0.0514)	0.0584 (0.0581)
Temporary grass						0.00102 (0.00442)	-0.00196 (0.00421)	0.00845 (0.00595)	0.0176** (0.00774)	-0.00334 (0.00896)	0.000465 (0.00465)	-0.00267 (0.00443)	0.00783 (0.00618)	0.0127 (0.00789)	-0.00272 (0.00958)
Other grass						-0.00291** (0.00138)	-0.00430*** (0.00149)	-0.0000580 (0.00203)	-0.00106 (0.00270)	-0.000986 (0.00264)	-0.00189 (0.00147)	-0.00344** (0.00161)	0.00124 (0.00216)	-0.000561 (0.00277)	0.00156 (0.00301)
Woodland						0.0106* (0.00637)	0.0107 (0.00660)	0.0107 (0.00841)	0.00333 (0.0112)	0.0317*** (0.0115)	0.0130* (0.00702)	0.0149** (0.00744)	0.0101 (0.00895)	0.00348 (0.0117)	0.0368*** (0.0123)
Other land						0.0216*** (0.00777)	0.0257*** (0.00849)	0.0185 (0.0113)	0.0186 (0.0124)	0.0136 (0.0167)	0.0196** (0.00792)	0.0253*** (0.00887)	0.0152 (0.0118)	0.0138 (0.0128)	0.0114 (0.0168)
Oilseed rape (Osr)						-0.00290 (0.00410)	-0.000420 (0.00409)	-0.00496 (0.00559)	-0.0130 (0.00850)	0.00465 (0.00601)	0.0000499 (0.00440)	0.00135 (0.00454)	-0.00282 (0.00594)	-0.0122 (0.00894)	0.00801 (0.00691)
Osr set-aside						0.0210** (0.00913)	0.0271*** (0.0100)	0.0209 (0.0130)	0.0155 (0.0174)	0.00907 (0.0153)	0.00706 (0.0118)	0.0133 (0.0131)	0.00410 (0.0170)	-0.00599 (0.0223)	-0.000865 (0.0196)
Peas and beans						-0.00662 (0.00553)	-0.00676 (0.00555)	-0.00744 (0.00754)	-0.0133 (0.00997)	-0.0135 (0.00828)	-0.0144** (0.00558)	-0.0128** (0.00549)	-0.0184** (0.00815)	-0.0254** (0.0110)	-0.0209** (0.00920)
Stockfeed						0.0727*** (0.0163)	0.0667*** (0.0153)	0.0845*** (0.0244)	0.1000*** (0.0332)	0.0571** (0.0263)	0.0598*** (0.0169)	0.0506*** (0.0156)	0.0742*** (0.0256)	0.0768*** (0.0349)	0.0481* (0.0265)
Sugarbeet						0.0137* (0.00818)	0.0172* (0.00942)	0.00662 (0.0115)	-0.00228 (0.0157)	0.00555 (0.0140)	0.0161* (0.00957)	0.0134 (0.0104)	0.0181 (0.0134)	0.0177 (0.0167)	0.00861 (0.0164)
Fallow						-0.000561 (0.00952)	-0.000627 (0.00988)	-0.00190 (0.0130)	-0.0327* (0.0196)	0.0232 (0.0142)	-0.00495 (0.00977)	-0.00886 (0.0111)	-0.00543 (0.0124)	-0.0375* (0.0200)	0.00351 (0.0153)
Linseed set-aside						0.0807 (0.0813)	-0.100 (0.0945)	0.225* (0.116)	0.295* (0.152)	0.112 (0.138)	0.0829 (0.0864)	-0.117 (0.0960)	0.243* (0.126)	0.320* (0.165)	0.129 (0.146)
Linseed						-0.0169* (0.00926)	-0.0281*** (0.00894)	-0.00493 (0.0116)	-0.000696 (0.0171)	-0.0189 (0.0124)	-0.0115 (0.0102)	-0.0247** (0.0103)	0.00112 (0.0129)	0.00593 (0.0190)	-0.0178 (0.0143)
n						0.0491*** (0.0106)	0.0640*** (0.0114)	0.0558*** (0.0150)	0.0849*** (0.0189)	0.0663*** (0.0186)	0.0490*** (0.0104)	0.0637*** (0.0110)	0.0585*** (0.0152)	0.0856*** (0.0187)	0.0687*** (0.0193)
n2						-0.00348*** (0.000884)	-0.00471*** (0.000979)	-0.00387*** (0.00127)	-0.00597*** (0.00166)	-0.00425** (0.00175)	-0.00299*** (0.000823)	-0.00402*** (0.000867)	-0.00365*** (0.00127)	-0.00580*** (0.00165)	-0.00367** (0.00178)
Constant	9.415*** (0.0543)	8.964*** (0.0574)	8.328*** (0.0767)	7.716*** (0.0886)	7.328*** (0.105)	9.391*** (0.0745)	8.932*** (0.0768)	8.224*** (0.108)	7.534*** (0.136)	7.261*** (0.145)	9.429*** (0.0739)	8.987*** (0.0736)	8.215*** (0.111)	7.576*** (0.141)	7.271*** (0.150)
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region-Year FE	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
R ²	0.75	0.74	0.75	0.70	0.71	0.76	0.75	0.75	0.71	0.71	0.78	0.77	0.77	0.73	0.73
Obs.	4291	4291	4291	4290	4275	4291	4291	4291	4290	4275	4255	4255	4255	4254	4239
No. clusters	309	309	309	309	309	309	309	309	309	309	309	309	309	309	309
Cluster level	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y

p-values in parentheses

Fixed effects regressions undertaken using the Stata routine reghdfe. Standard errors are two-way clustered at the region and year level.

* p < 0.10, ** p < 0.05, *** p < 0.01

Table A12: Three specifications for species richness by bird group

	(1) All	(2) Non-farm	(3) Farm	(4) Farm Gen.	(5) Farm Spec.	(6) All	(7) Non-farm	(8) Farm	(9) Farm Gen.	(10) Farm Spec.	(11) All	(12) Non-farm.	(13) Farm	(14) Farm Gen.	(15) Farm Spec.
Set-aside	0.0109*** (0.00398)	0.219** (0.0869)	0.0168 (0.0289)	0.0194 (0.0152)	-0.00261 (0.0198)	0.226*** (0.0820)	0.220*** (0.0732)	0.00627 (0.0267)	0.0186 (0.0158)	-0.0123 (0.0176)	0.302*** (0.110)	0.295*** (0.0973)	0.00693 (0.0333)	0.0287 (0.0188)	-0.0217 (0.0233)
Fractionalisation	0.173** (0.0758)	0.213 (1.577)	0.925* (0.516)	0.247 (0.232)	0.678* (0.374)	2.933* (1.532)	1.892 (1.254)	1.041** (0.452)	0.252 (0.223)	0.789** (0.330)	1.310 (1.513)	0.677 (1.261)	0.634 (0.449)	0.0470 (0.221)	0.587* (0.333)
Wheat						0.0456 (0.0401)	0.0161 (0.0326)	0.0295** (0.0143)	0.0179** (0.00704)	0.0116 (0.0103)	0.0247 (0.0439)	0.000724 (0.0365)	0.0240* (0.0143)	0.0121* (0.00732)	0.0119 (0.0102)
Maize						-0.463** (0.214)	-0.392** (0.182)	-0.0704 (0.0732)	-0.0148 (0.0333)	-0.0555 (0.0537)	-0.625*** (0.222)	-0.516*** (0.189)	-0.109 (0.0758)	-0.0317 (0.0350)	-0.0773 (0.0547)
Winter barley						-0.133* (0.0763)	-0.0812 (0.0662)	-0.0520** (0.0235)	-0.0184 (0.0117)	-0.0336* (0.0174)	-0.271*** (0.0844)	-0.188** (0.0743)	-0.0826*** (0.0255)	-0.0366*** (0.0124)	-0.0460** (0.0194)
Spring barley						-0.0414 (0.106)	-0.0718 (0.0884)	0.0304 (0.0342)	-0.00484 (0.0175)	0.0352 (0.0279)	0.0216 (0.112)	-0.00690 (0.0944)	0.0285 (0.0361)	-0.00473 (0.0184)	0.0332 (0.0297)
Oats						-0.261 (0.215)	-0.201 (0.184)	-0.0598 (0.0712)	-0.0327 (0.0376)	-0.0271 (0.0515)	-0.380 (0.232)	-0.295 (0.199)	-0.0859 (0.0759)	-0.0538 (0.0386)	-0.0321 (0.0555)
Other cereal						-0.641 (0.651)	-0.434 (0.542)	-0.207 (0.195)	-0.0710 (0.0958)	-0.136 (0.151)	-0.162 (0.687)	-0.0665 (0.576)	-0.0957 (0.204)	-0.0549 (0.0970)	-0.0408 (0.162)
Temporary grass						0.0992 (0.0722)	0.0961 (0.0599)	0.00307 (0.0234)	0.0237** (0.0115)	-0.0207 (0.0191)	0.103 (0.0747)	0.0905 (0.0620)	0.0129 (0.0250)	0.0262** (0.0122)	-0.0133 (0.0204)
Other grass						-0.00197 (0.0305)	0.00422 (0.0245)	-0.00618 (0.00965)	-0.00879** (0.00422)	0.00261 (0.00749)	0.0236 (0.0287)	0.0208 (0.0234)	0.00279 (0.00974)	-0.00410 (0.00440)	0.00690 (0.00790)
Woodland						0.154 (0.120)	0.0694 (0.105)	0.0842** (0.0350)	0.0236 (0.0184)	0.0605** (0.0253)	0.281** (0.127)	0.169 (0.111)	0.111*** (0.0379)	0.0322* (0.0192)	0.0789*** (0.0277)
Other land						0.258* (0.154)	0.151 (0.129)	0.108** (0.0498)	0.0792** (0.0316)	0.0284 (0.0332)	0.244 (0.154)	0.143 (0.132)	0.101** (0.0498)	0.0724** (0.0330)	0.0284 (0.0332)
Oilseed rape (Osr)						-0.0533 (0.0752)	-0.0408 (0.0645)	-0.0125 (0.0236)	-0.0191 (0.0130)	0.00661 (0.0157)	0.0483 (0.0877)	0.0349 (0.0771)	0.0134 (0.0237)	-0.0104 (0.0143)	0.0238 (0.0166)
Osr set-aside						0.386** (0.171)	0.405*** (0.150)	-0.0192 (0.0596)	0.000229 (0.0291)	-0.0194 (0.0473)	0.458** (0.210)	0.522*** (0.184)	-0.0640 (0.0725)	0.00537 (0.0339)	-0.0694 (0.0601)
Peas and beans						-0.440*** (0.114)	-0.325*** (0.0913)	-0.116*** (0.0391)	-0.0738*** (0.0204)	-0.0421 (0.0256)	-0.486*** (0.118)	-0.347*** (0.0978)	-0.140*** (0.0429)	-0.0835*** (0.0214)	-0.0560* (0.0296)
Stockfeed						0.658** (0.302)	0.591** (0.254)	0.0673 (0.100)	0.0916* (0.0550)	-0.0244 (0.0680)	0.552* (0.318)	0.468* (0.263)	0.0842 (0.108)	0.0999* (0.0567)	-0.0157 (0.0726)
Sugar beet						-0.0403 (0.151)	-0.0278 (0.138)	-0.0125 (0.0423)	-0.0255 (0.0271)	0.0130 (0.0395)	-0.0716 (0.191)	-0.0852 (0.169)	0.0137 (0.0523)	0.0272 (0.0307)	-0.0135 (0.0442)
Fallow						0.103 (0.174)	0.0700 (0.158)	0.0331 (0.0530)	-0.0259 (0.0314)	0.0590 (0.0411)	-0.0869 (0.224)	-0.0948 (0.198)	0.00789 (0.0585)	-0.0607* (0.0335)	0.0686 (0.0457)
Linseed set-aside						-0.689 (1.784)	-1.063 (1.526)	0.375 (0.514)	0.274 (0.227)	0.101 (0.383)	-1.121 (1.864)	-1.374 (1.590)	0.253 (0.536)	0.308 (0.239)	-0.0540 (0.407)
Linseed						-0.424*** (0.138)	-0.314*** (0.115)	-0.110** (0.0434)	-0.0455* (0.0251)	-0.0642** (0.0313)	-0.536*** (0.154)	-0.391*** (0.128)	-0.144*** (0.0476)	-0.0524* (0.0282)	-0.0920*** (0.0348)
n						9.384*** (0.278)	7.208*** (0.214)	2.176*** (0.0894)	0.800*** (0.0448)	1.376*** (0.0567)	9.306*** (0.264)	7.143*** (0.205)	2.163*** (0.0864)	0.796*** (0.0439)	1.367*** (0.0563)
n2						-0.535*** (0.0345)	-0.392*** (0.0265)	-0.143*** (0.0105)	-0.0536*** (0.00540)	-0.0898*** (0.00582)	-0.517*** (0.0329)	-0.379*** (0.0255)	-0.139*** (0.0102)	-0.0518*** (0.00548)	-0.0870*** (0.00559)
Constant	9.415*** (0.0543)	32.24*** (1.143)	10.80*** (0.375)	4.289*** (0.172)	6.508*** (0.273)	23.84*** (1.551)	17.29*** (1.250)	6.549*** (0.488)	2.793*** (0.241)	3.756*** (0.350)	24.80*** (1.511)	18.05*** (1.220)	6.743*** (0.493)	2.890*** (0.253)	3.853*** (0.359)
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region-Year FE	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
R ²	0.75	0.68	0.65	0.53	0.64	0.83	0.83	0.76	0.61	0.73	0.84	0.84	0.77	0.64	0.74
Obs.	4291	4291	4291	4291	4291	4291	4291	4291	4291	4291	4255	4255	4255	4255	4255
No. clusters	309	309	309	309	309	309	309	309	309	309	309	309	309	309	309
Cluster level	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y

p-values in parentheses

Fixed effects regressions undertaken using the Stata routine reghdfe. Standard errors are two-way clustered at the region and year level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A13: Three specifications for species diversity by bird group

	(1) All	(2) Non-farm	(3) Farm	(4) Farm Gen.	(5) Farm Spec.	(6) All	(7) Non-farm	(8) Farm	(9) Farm Gen.	(10) Farm Spec.	(11) All	(12) Non-farm.	(13) Farm	(14) Farm Gen.	(15) Farm Spec.
Set-aside	-0.000385 (0.00386)	0.00601* (0.00352)	-0.00106 (0.00400)	0.000205 (0.00359)	-0.00351 (0.00443)	-0.00183 (0.00390)	0.00701** (0.00347)	-0.00298 (0.00406)	-0.0000650 (0.00400)	-0.00575 (0.00443)	-0.00540 (0.00473)	0.00654 (0.00433)	-0.00810* (0.00480)	-0.00224 (0.00465)	-0.00455 (0.00518)
Fractionalisation	-0.00491 (0.0655)	0.0591 (0.0647)	0.0342 (0.0670)	0.0715 (0.0676)	0.0843 (0.0753)	0.0378 (0.0619)	0.0923 (0.0651)	0.0806 (0.0655)	0.0864 (0.0656)	0.131* (0.0742)	0.0133 (0.0585)	0.0702 (0.0645)	0.0352 (0.0638)	0.0651 (0.0656)	0.105 (0.0754)
Wheat						0.00252 (0.00192)	0.000764 (0.00179)	0.00138 (0.00219)	0.00166 (0.00210)	0.00276 (0.00231)	0.00336* (0.00197)	0.000964 (0.00178)	0.00214 (0.00231)	0.00212 (0.00227)	0.00256 (0.00235)
Maize						-0.0195** (0.00859)	-0.0254*** (0.00717)	-0.0107 (0.0112)	-0.0170 (0.0103)	0.00906 (0.0126)	-0.0257*** (0.00876)	-0.0287*** (0.00746)	-0.0202* (0.0116)	-0.0232** (0.0111)	0.00549 (0.0131)
Winter barley						0.00193 (0.00329)	-0.00162 (0.00295)	0.00472 (0.00383)	-0.00224 (0.00325)	-0.00214 (0.00402)	-0.00145 (0.00369)	-0.00628** (0.00314)	0.00259 (0.00436)	-0.00629* (0.00356)	-0.00305 (0.00455)
Spring barley						-0.000584 (0.00443)	-0.00141 (0.00403)	-0.000659 (0.00522)	-0.00644 (0.00469)	0.000235 (0.00603)	-0.00380 (0.00473)	-0.000951 (0.00424)	-0.00677 (0.00582)	-0.0135** (0.00523)	-0.00188 (0.00654)
Oats						-0.00646 (0.00945)	-0.00322 (0.00863)	-0.0146 (0.0104)	-0.00709 (0.00997)	0.00178 (0.00995)	-0.00797 (0.00988)	-0.00651 (0.00942)	-0.0155 (0.0112)	-0.00832 (0.0106)	0.0108 (0.0103)
Other cereal						-0.00817 (0.0225)	-0.00605 (0.0208)	-0.0347 (0.0285)	-0.0355 (0.0254)	-0.0615* (0.0314)	0.00481 (0.0237)	0.0152 (0.0214)	-0.0350 (0.0305)	-0.0472* (0.0267)	-0.0526 (0.0352)
Temporary grass						0.00110 (0.00300)	0.00365 (0.00271)	0.000327 (0.00398)	0.00731** (0.00339)	-0.00682 (0.00500)	0.00207 (0.00316)	0.00313 (0.00278)	0.00324 (0.00426)	0.00934** (0.00364)	-0.00629 (0.00545)
Other grass						0.0000314 (0.00102)	0.0000409 (0.00112)	0.00103 (0.00138)	-0.00200 (0.00130)	0.00234 (0.00183)	0.000309 (0.000920)	0.000827 (0.000951)	0.00132 (0.00148)	-0.00183 (0.00139)	0.00223 (0.00198)
Woodland						0.00152 (0.00431)	-0.00403 (0.00420)	0.00582 (0.00652)	0.00262 (0.00570)	0.00397 (0.00612)	0.00644 (0.00436)	0.00184 (0.00428)	0.00869 (0.00709)	0.001000 (0.00616)	0.00710 (0.00615)
Other land						0.00448 (0.00618)	0.00270 (0.00645)	0.0142 (0.00930)	0.0145 (0.00916)	0.0195** (0.00795)	0.00390 (0.00594)	-0.000540 (0.00637)	0.0155* (0.00936)	0.0144 (0.00990)	0.0215*** (0.00811)
Oilseed rape (Osr)						0.000898 (0.00286)	0.00148 (0.00295)	-0.00228 (0.00336)	0.000854 (0.00294)	-0.00459 (0.00369)	0.00276 (0.00310)	0.00431 (0.00316)	0.000695 (0.00369)	0.00366 (0.00326)	-0.00322 (0.00415)
Osr set-aside						-0.00771 (0.00710)	0.00190 (0.00759)	-0.0202** (0.00881)	-0.00932 (0.00828)	-0.00793 (0.00820)	-0.00495 (0.00855)	0.00970 (0.0102)	-0.0246** (0.0107)	-0.0138 (0.00945)	-0.0116 (0.0100)
Peas and beans						-0.0160*** (0.00441)	-0.0166*** (0.00375)	-0.0144*** (0.00514)	-0.0127** (0.00520)	-0.00918* (0.00509)	-0.0118** (0.00486)	-0.0140*** (0.00416)	-0.0120*** (0.00539)	-0.0121** (0.00543)	-0.00881 (0.00575)
Stockfeed						0.00275 (0.0127)	0.0120 (0.0112)	0.00701 (0.0167)	0.0173 (0.0157)	0.00720 (0.0161)	0.00501 (0.0129)	0.0120 (0.0113)	0.0134 (0.0171)	0.0260 (0.0165)	0.0105 (0.0165)
Sugar beet						0.00302 (0.00747)	-0.000209 (0.00564)	0.00472 (0.00840)	-0.00276 (0.00782)	0.00933 (0.00762)	-0.00508 (0.00952)	-0.00307 (0.00688)	-0.000881 (0.00986)	0.00269 (0.00914)	-0.00351 (0.00883)
Fallow						-0.00205 (0.00790)	0.00308 (0.00718)	-0.00326 (0.00970)	-0.0162* (0.00979)	-0.00117 (0.00930)	-0.00728 (0.00905)	0.000218 (0.00883)	-0.00730 (0.0102)	-0.0216** (0.0100)	0.00496 (0.0109)
Linseed set-aside						-0.132 (0.0853)	0.00801 (0.0635)	-0.0266 (0.0788)	-0.0138 (0.0683)	-0.0111 (0.0907)	-0.168* (0.0885)	-0.0122 (0.0693)	-0.0507 (0.0814)	-0.00464 (0.0730)	-0.0488 (0.0954)
Linseed						-0.0141** (0.00550)	-0.00993* (0.00521)	-0.00699 (0.00729)	-0.0127* (0.00769)	-0.00116 (0.00690)	-0.0231*** (0.00585)	-0.0158** (0.00613)	-0.0157** (0.00727)	-0.0118 (0.00818)	-0.00845 (0.00738)
n						0.190*** (0.00900)	0.196*** (0.00962)	0.159*** (0.0101)	0.131*** (0.0105)	0.179*** (0.0106)	0.186*** (0.00887)	0.189*** (0.00931)	0.158*** (0.0103)	0.133*** (0.0104)	0.175*** (0.0108)
n2						-0.0122*** (0.00101)	-0.0123*** (0.00113)	-0.0103*** (0.00100)	-0.00914*** (0.00102)	-0.0108*** (0.00108)	-0.0116*** (0.000967)	-0.0118*** (0.00111)	-0.00993*** (0.000986)	-0.00892*** (0.00100)	-0.0106*** (0.00106)
Constant	3.157*** (0.0479)	2.934*** (0.0486)	1.771*** (0.0498)	0.928*** (0.0504)	1.425*** (0.0542)	2.768*** (0.0607)	2.571*** (0.0625)	1.406*** (0.0686)	0.714*** (0.0683)	0.980*** (0.0761)	2.800*** (0.0579)	2.588*** (0.0597)	1.445*** (0.0689)	0.733*** (0.0696)	1.012*** (0.0782)
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region-Year FE	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
R ²	0.52	0.56	0.52	0.51	0.59	0.61	0.65	0.57	0.55	0.63	0.64	0.67	0.60	0.58	0.66
Obs.	4291	4291	4291	4291	4291	4291	4291	4291	4291	4291	4255	4255	4255	4255	4255
No. clusters	309	309	309	309	309	309	309	309	309	309	309	309	309	309	309
Cluster level	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y

p-values in parentheses

Fixed effects regressions undertaken using the Stata routine reghdfe. Standard errors are two-way clustered at the region and year level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A14: P-values of Wald tests of non-parametric parameters for set-aside bins

	All	Non-farm	Farm	Farm Gen.	Farm Spec.
Abundance					
0 = 300ha	0.0193**	0.3195	0.0006***	0.0160**	0.0017***
300 = 400ha	0.1878	0.0311**	0.7804	0.4024	0.4747
400 = 500ha	0.5143	0.5031	0.7876	0.7231	0.7013
500 = 600ha	0.1174	0.1775	0.1836	0.5754	0.1200
600 = 700ha	0.4901	0.3027	0.6235	0.7590	0.2904
700 = 800ha	0.3307	0.4238	0.6203	0.8003	0.2250
900 = 900ha	0.6405	0.7503	0.4939	0.7766	0.1297
900 = 900+ha	0.0237**	0.1223	0.0265**	0.1122	0.0341**
300 = 900+ha	0.0013***	0.0081***	0.0445**	0.0403**	0.5642
Species Richness					
0 = 300ha	0.0069***	0.0247**	0.0182**	0.0518*	0.0750*
300 = 400ha	0.3808	0.3677	0.7040	0.4790	0.9952
400 = 500ha	0.7438	0.3602	0.1312	0.7239	0.0797
500 = 600ha	0.1222	0.1644	0.2495	0.1866	0.6299
600 = 700ha	0.9518	0.9990	0.8438	0.4829	0.8523
700 = 800ha	0.6041	0.4484	0.7496	0.5440	0.9850
900 = 900ha	0.7731	0.6556	0.7661	0.4875	0.3441
900 = 900+ha	0.1458	0.1454	0.4246	0.6975	0.4431
300 = 900+ha	0.0031***	0.0011***	0.7471	0.1637	0.4927
Diversity (Shannon-Wiener Index)					
0 = 300ha	0.6280	0.6075	0.5077	0.3293	0.2219
300 = 400ha	0.6813	0.9222	0.9438	0.7610	0.3349
400 = 500ha	0.6742	0.9217	0.3325	0.9559	0.5425
500 = 600ha	0.7211	0.6525	0.2553	0.4086	0.7345
600 = 700ha	0.2322	0.6160	0.0803*	0.0793	0.8913
700 = 800ha	0.4819	0.3799	0.9114	0.6868	0.4912
900 = 900ha	0.7635	0.3639	0.8046	0.1894	0.3275
900 = 900+ha	0.9506	0.2370	0.5806	0.1590	0.5430
300 = 900+ha	0.5738	0.1432	0.3542	0.8263	0.8228

Note: Each row provides the p-value of the Wald test of the parameter values estimated for the pairwise comparisons of set-aside bins shown in column 1, for each biodiversity measure and for each bird group. For example, row 1 shows the p-value for the test of the parameter on 201-300ha of set-aside compared to the baseline (1-200ha). Row 2 shows the p-value of the Wald test of the hypothesis that the parameter on the 201-300ha bin is identical to the 301-400ha bin, and so on. The last row of each panel shows the p-value of the test of the hypothesis that the 900+ha bin is identical to the 201-300ha bin. Evidence for a threshold can be found in the rejection of the hypothesis that the impact of 201-300ha (the 0 = 300ha rows) of set-aside is equal to zero, for species abundance and richness for different bird groups, at the 5% significance level. Evidence for a threshold effect at a larger scale can be seen in the rejection of the hypothesis that the parameter on the 801-900ha bin is equal to the 900+ha bin (the 900 = 900+ rows) for abundance. The comparison of the 201-300ha bin to the 900+ha bin (the 300 = 900+ha rows) also suggests that the marginal effects increase with scale for abundance (Fig. 4) and richness (Fig. 5). For diversity (Fig. A7), as measured by the Shannon-Wiener index, there are no effects that are significantly different at the 5% level, and only one at the 10% level. Disentangling the linear effect does not reveal heterogeneous impacts at different scales in this case.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A15: Three dynamic fixed effects specifications for species abundance by bird group

	(1) All	(2) Non-farm	(3) Farm	(4) Farm Gen.	(5) Farm Spec.	(6) All	(7) Non-farm	(8) Farm	(9) Farm Gen.	(10) Farm Spec.	(11) All	(12) Non-farm.	(13) Farm	(14) Farm Gen.	(15) Farm Spec.
Set-aside	0.006 (0.177)	0.005 (0.274)	0.009 (0.163)	0.007 (0.363)	0.006 (0.415)	0.009** (0.032)	0.009* (0.056)	0.012* (0.071)	0.012 (0.160)	0.006 (0.411)	0.009 (0.103)	0.007 (0.212)	0.012 (0.173)	0.014 (0.155)	0.002 (0.806)
Fract.	0.124* (0.092)	0.023 (0.742)	0.267** (0.016)	0.294** (0.019)	0.302** (0.038)	0.149** (0.049)	0.054 (0.463)	0.302*** (0.009)	0.321** (0.013)	0.371** (0.016)	0.091 (0.274)	-0.002 (0.978)	0.243* (0.052)	0.276* (0.055)	0.249 (0.128)
Lagged ln(All)	0.358*** (0.000)					0.346*** (0.000)					0.335*** (0.000)				
Lagged ln(Non-farm)		0.330*** (0.000)					0.317*** (0.000)					0.307*** (0.000)			
Lagged ln(Farm)			0.256*** (0.000)					0.245*** (0.000)					0.242*** (0.000)		
Lagged ln(Farm Gen.)				0.230*** (0.000)					0.222*** (0.000)					0.216*** (0.000)	
Lagged ln(Farm Spec.)					0.205*** (0.000)					0.194*** (0.000)					0.192*** (0.000)
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region- Year FE	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
R^2	0.788	0.779	0.769	0.719	0.724	0.792	0.784	0.772	0.723	0.728	0.808	0.799	0.792	0.748	0.750
Obs.	3630	3630	3630	3628	3608	3630	3630	3630	3628	3608	3630	3630	3630	3628	3608
Number of clusters	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262
Cluster level	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y

Note: p -values in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Fixed effects regressions undertaken using the Stata routine `reghdfe`. Standard errors are two-way clustered at the region and year level.

Table A16: Three dynamic fixed effects specifications for species richness by bird group

	(1) All	(2) Non-farm	(3) Farm	(4) Farm Gen.	(5) Farm Spec.	(6) All	(7) Non-farm	(8) Farm	(9) Farm Gen.	(10) Farm Spec.	(11) All	(12) Non-farm.	(13) Farm	(14) Farm Gen.	(15) Farm Spec.
Set-aside	0.247** (0.038)	0.203** (0.040)	0.044 (0.187)	0.031* (0.089)	0.012 (0.602)	0.266*** (0.003)	0.233*** (0.004)	0.030 (0.317)	0.029 (0.116)	0.001 (0.967)	0.295*** (0.009)	0.286*** (0.005)	0.006 (0.877)	0.025 (0.280)	-0.019 (0.454)
Fract.	1.083 (0.581)	0.575 (0.723)	0.634 (0.213)	0.284 (0.237)	0.404 (0.292)	3.310** (0.041)	2.395* (0.074)	0.949** (0.046)	0.369 (0.115)	0.591* (0.096)	2.057 (0.217)	1.512 (0.278)	0.551 (0.259)	0.208 (0.390)	0.340 (0.355)
L.All	0.371*** (0.000)					0.160*** (0.000)					0.153*** (0.000)				
L.Non-farm		0.361*** (0.000)					0.168*** (0.000)					0.167*** (0.000)			
L.Farm			0.247*** (0.000)					0.115*** (0.000)					0.103*** (0.000)		
L.Farm Gen.				0.152*** (0.000)					0.071*** (0.000)					0.054*** (0.004)	
L.Farm Spec.					0.227*** (0.000)					0.127*** (0.000)					0.122*** (0.000)
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region- Year FE	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
R^2	0.723	0.735	0.684	0.552	0.675	0.846	0.843	0.769	0.623	0.743	0.859	0.855	0.789	0.655	0.764
Obs.	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630
Number of clusters	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262
Cluster level	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y

Note: p -values in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Fixed effects regressions undertaken using the Stata routine `reghdfe`. Standard errors are two-way clustered at the region and year level.

Table A17: Three dynamic fixed effects specifications for species diversity by bird group

	(1) All	(2) Non-farm	(3) Farm	(4) Farm Gen.	(5) Farm Spec.	(6) All	(7) Non-farm	(8) Farm	(9) Farm Gen.	(10) Farm Spec.	(11) All	(12) Non-farm.	(13) Farm	(14) Farm Gen.	(15) Farm Spec.
Set-aside	-0.000 (0.971)	0.004 (0.260)	-0.001 (0.777)	0.001 (0.757)	-0.001 (0.868)	-0.002 (0.678)	0.005 (0.152)	-0.003 (0.534)	0.001 (0.915)	-0.001 (0.822)	-0.004 (0.435)	0.006 (0.169)	-0.008 (0.170)	-0.004 (0.454)	0.000 (0.948)
Fract.	-0.007 (0.917)	0.082 (0.225)	0.025 (0.716)	0.090 (0.178)	0.060 (0.469)	0.043 (0.516)	0.121* (0.086)	0.072 (0.298)	0.119* (0.070)	0.095 (0.241)	0.039 (0.555)	0.116 (0.113)	0.046 (0.513)	0.115* (0.094)	0.068 (0.428)
L.Shannon Index (All)	0.192*** (0.000)					0.116*** (0.000)					0.104*** (0.000)				
L.Shannon Index (Non-farm)		0.255*** (0.000)					0.164*** (0.000)					0.155*** (0.000)			
L.Shannon Index (Farm)			0.191*** (0.000)					0.148*** (0.000)					0.140*** (0.000)		
L.Shannon Index (Farm gen.)				0.160*** (0.000)					0.130*** (0.000)					0.128*** (0.000)	
L.Shannon Index (Farm spec.)					0.178*** (0.000)					0.134*** (0.000)					0.125*** (0.000)
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region- Year FE	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
R^2	0.546	0.597	0.542	0.531	0.614	0.619	0.668	0.583	0.563	0.647	0.651	0.698	0.619	0.599	0.673
Obs.	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630	3630
Number of clusters	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262
Cluster level	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y	R-Y

Note: p -values in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Fixed effects regressions undertaken using the Stata routine `reghdfe`. Standard errors are two-way clustered at the region and year level.