

Baseline monitoring of breeding bird abundance in the Brit Catchment



Yellowhammer Tom Brereton

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¹West Dorset Wilding

1.0 Introduction

The English government uses a number of indicators to assess the state of biodiversity and overall health of the environment. The first of these to be developed in the UK was populations of wild birds. Birds are high in the food chain and therefore are considered good indicators for the overall state of biodiversity (Chambers 2008). The bird indicator is updated annually and chiefly uses Breeding Bird Survey (BBS) data, from a network of randomly selected 1-km squares, stratified by recorder density. The BTO/JNCC/RSPB BBS is a partnership jointly funded by the BTO, RSPB and JNCC, with fieldwork conducted by volunteers.

West Dorset Wilding (WDW) is a new Landowner-led charity focused on promoting and delivering nature recovery and sustainable land management in the Brit Catchment through species reintroductions, rewilding and regenerative farming.

The Brit Catchment extends over 113.5 square km and chiefly comprises mixed farmland, with smaller quantities of woodland, urban development and pockets of semi-natural grassland, Bracken and scrub. Wetlands are few and far between, though there are several small river systems, some of the less intensively managed field support areas of Rush Pasture and there are a number of small artificial ponds. The farmland is mostly intensive, with the main mix being silage fields, improved pastures grazed by cattle and sheep, and cereal crops, especially wheat and maize.

An objective of West Dorset Wilding, is to establish a baseline of the state of biodiversity in the Brit Catchment, from which to monitor future changes and the effectiveness of conservation interventions at a catchment scale.

In 2023 a project was undertaken to establish a baseline of breeding bird populations in the Brit Catchment, adopting the BBS sampling approach and survey method. The aim was to establish 10 1-km squares (~10% of the catchment area) to be monitored annually in the future.



The Brit catchment looking north from Eggardon Hill *Tom Brereton*

2.0 Methods

2.1 Sampling framework

2.1.1. Stratified random squares

The 10 randomly selected 1-km squares were stratified by presence/absence of a substantial length of a named river water body. There are 109 1-km squares wholly or largely within the Brit catchment (criteria: 66-100% of the square is within the catchment boundary), whilst 63 of the 109 1-km squares (~60%) do not contain WFD river water bodies or only contain very small segments (<100 m). 46 of the 109 squares (~40%) contain WFD river water bodies (ie named stream/river sections >100m in length, with the majority of squares containing sections >300m in length)

Based on the ratio of river water body to non-river water body squares across the catchment, the allocation of random squares was as follows

Non river water bodies = 6 squares

River water bodies = 4 squares

2.1.2 Supplementary 'free choice squares'

Random square coverage at 10% is always going to look like uneven coverage, with some substantial gaps that may include important habitats and areas for birds.

A solution to getting more even geographical coverage was to offer a series of cherry-picked 'free choice' (non-random) squares to volunteers - 5 squares in the first instance. For example, SY4798 was one of the squares, as it was practically easy (mostly footpath which sample the land of interest well) and covers two land holding with positive land management underway. These squares were offered to volunteer surveyors from Bridport Bird Club.

This approach is loosely analogous to the UK Butterfly Monitoring Scheme where free choice butterfly transects are combined with randomly selected Wider Countryside Butterfly Squares to derive overall trends for species (Brereton et al. 2011).

2.2 Survey routes and access permission

Though a recce visit is advised, proposed survey routes were drawn up for each of the squares using satellite imagery, crop data and Ordnance survey maps showing public access points.

The ideal survey route comprises two parallel lines, each 1km in length, about 500m apart, and about 250m from the edge of the square. For practical reasons there is often substantial deviation from the ideal route. In particular, route through crops were avoided, whilst hedges often meant that transect lines (or access to them) were convoluted.

The two 1-km transects were divided into 200m sections, making a total of ten 200m sections per square.

Resource limitation precluded the collection of habitat data. In the BBS, habitat information is recorded using codes from an established hierarchical system common to a range of BTO schemes

(Crick 1992). Observers record the two primary habitat types for each transect section, in up to four levels of detail.

2.3 Field method

The [BBS survey method](#) involved two early-morning spring visits to each 1-km square, to count all the birds seen or hear while walking two 1-km lines across the square and record any nest counts for colonial nesting birds in the square.

Two visits were made to each square - Visits were timed so that the first was in the early part of the breeding season (April to mid-May) and the second at least four weeks later (mid-May to the end of June).

Survey were made early morning, to coincide with maximum bird activity, but avoiding concentrated song activity at dawn. All bird seen or heard were recorded as surveyors walked at a slow, steady pace along each transect line.

Birds were noted in four distance categories, three measured at right angles to the transect line (within 25m, between 25-100m, or over 100m from the transect line), and those seen in flight only. Recording birds in distance bands gives the potential to measure bird detectability and allows relative population density to be estimated.

The recommended visit time to a square was 90 minutes. Observers record the start and end times for each of the two halves of the transect, and weather conditions, using a three-level weather code system to describe cloud cover, rain, wind and visibility. Observers were discouraged from conducting bird counts in heavy rain, poor visibility, or strong winds when bird activity is significantly dampened.

Standard BTO bird activity (Crick 1992) and species name codes were used.

Bird sightings were annotated onto standardised field sheets <https://www.bto.org/volunteer-surveys/bbs/taking-part/download-forms-instructions>

A photographic record was made of a number of the WDW randomly selected transect sections.

2.4 Data collation – established BBS squares

The [BTO were contacted to obtain data](#) from any BBS squares falling within or near to the catchment that could be combined with the WDW survey data.

3.0 Results

The 10 random squares were surveyed by Tom Brereton along with five free choice squares by four volunteers and an additional four BT squares were collected (two of which were just outside the catchment) (Table 1, Figure 1).

Table 1: Description of sampled squares

Square type	1 -km square	Location	Type	Catchment
WDW random	ST4400	Brimley Farm, Stoke Abbot	Non-riverine	Within
WDW random	ST4700	Parnham House	Riverine	Within
WDW random	ST4902	White Sheet Hill, Beaminster	Non-riverine	Within
WDW random	SY4394	Symondsburry	Non-riverine	Within
WDW random	SY4498	South Bowood	Non-riverine	Within
WDW random	SY4894	Bradpole	Riverine	Within
WDW random	SY5096	West Milton	Riverine	Within
WDW random	SY5199	Coltleigh, Mapperton	Riverine	Within
WDW random	SY5298	North Poorton/Hooke	Non-riverine	Within
WDW random	SY5493	Haydon Down	Non-riverine	Within
WDW random	SY5194	Mappercombe	Non-riverine	Within
Free choice	SY4691	West Bay	Riverine	Within
Free choice	SY4795	Pyemore	Riverine	Within
Free choice	SY4798	Slope & Melplash	Riverine	Within
BTO random	ST4601	Beaminster	Non-riverine	Within
BTO random	ST5103	Toller Down	Non-riverine	Edge
BTO random	SY4690	West Bay 2	Riverine	Within
BTO random	SY4694	Pyemore 2	Riverine	Within
BTO random	SY5091	Shipton Gorge	Non-riverine	Edge

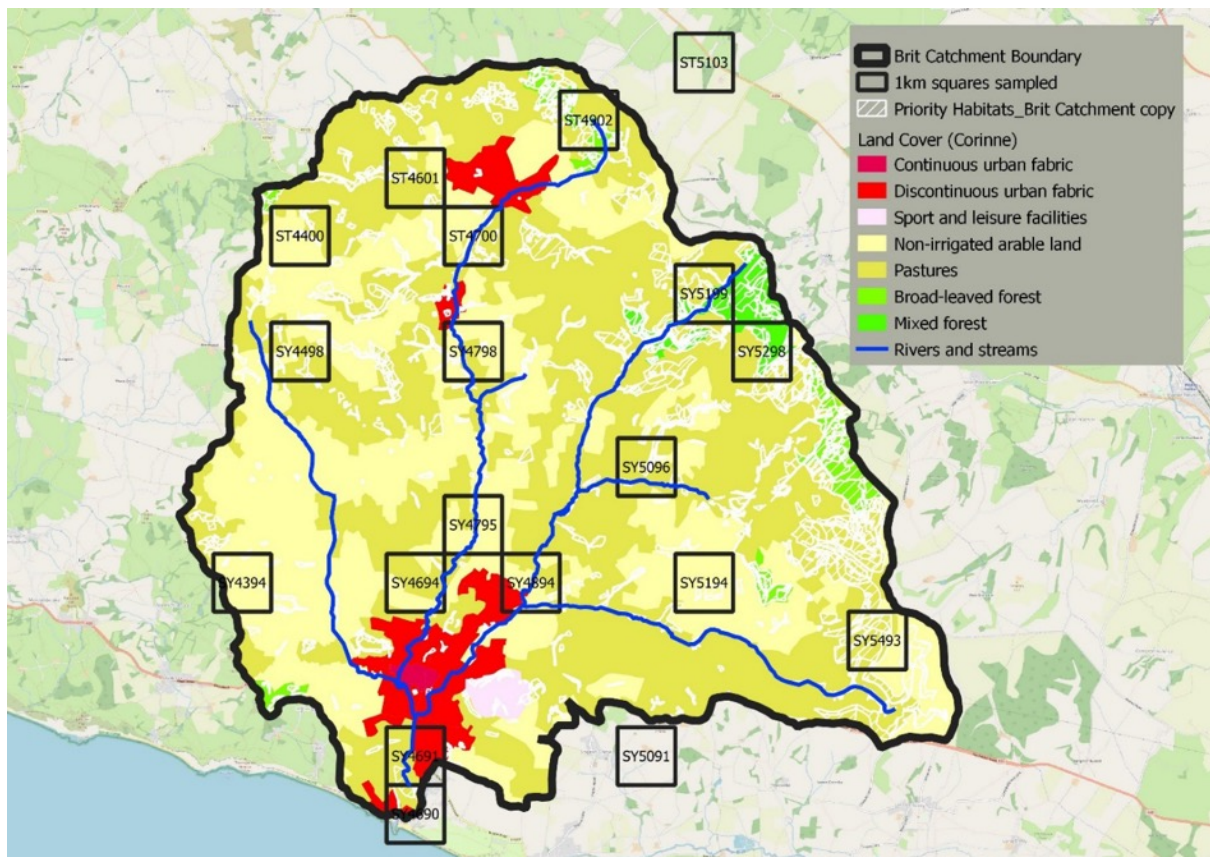


Figure 1: Location of surveyed squares

Species present and counts for each square are given in Table 2. There were 5967 birds counted across 38 visits to 19 squares, with 79 species recorded generating 7713 bird records. Based on our extensive local knowledge of species distributions, 70 of the species were likely to be breeding within the catchment, eight were passage migrants/foraging visitors, whilst Helmeted Guinefowl was a free-ranging non-native species and likely domesticated.

Breeding species included 13 Red Listed (highest conservation concern¹) and 19 Amber List (medium priority¹) species, respectively representing 23% and 22% of the UK total for each list. Nationally scarce Firecrest was also detected. Important breeding species present in steep national/regional decline included: Corn Bunting and Yellowhammer (both farmland specialists), Marsh Tit, Spotted Flycatcher and Willow Warbler, (woodland/woodland edge). Dipper, which is at its eastern range margin in southern England, was another noteworthy find. Raven, which has less than 8000 pairs breeding in the UK, was found in over half of the squares, qualifying the area as a stronghold.

The most widespread species were Woodpigeon, Blackbird and Robin, being recorded in every square (Table 3). The most abundant species were Herring Gull (a widespread foraging species on farmland, with nearly 300 pairs breeding in the Bridport area, [Brereton et al. 2021](#)), Woodpigeon, Jackdaw and Rook (Table 3).

The most species-rich sites were at West Milton and Slape Manor/Melplash, with both squares having good habitat diversity. Wetland birds were thin on the ground, chiefly being seen at West Bay where Cetti's Warbler, Reed Warbler and Mallard were detected. The pond at Mappercombe held Mute Swan and Tufted Duck.

Table 3: The most widely seen and abundant species. Red shading = Red Listed, Orange = Amber Listed.

Species	Frequency	Rank frequency	Abundance	Rank abundance
Woodpigeon	100	1	502	2
Blackbird	100	1	314	8
Robin	100	1	293	9
Jackdaw	95	4	377	3
Wren	95	4	344	6
Chiffchaff	95	4	236	10
Chaffinch	95	4	156	14
Duncock	95	4	111	16
Great Tit	95	4	98	17
Carrion Crow	89	12	320	7
Blackcap	89	10	181	11
Goldfinch	89	13	163	12
Blue Tit	89	10	151	13
Herring Gull	84	14	626	1
Song Thrush	84	15	104	15
Pheasant	84	15	74	
House Sparrow	74	17	354	5
Swallow	74	17	99	20
Great Spotted Woodpecker	74	17	36	
Maggie	68	20	61	
Linnet	63		101	19
Rook	58		376	4
House Martin	53		102	18



Woodpigeons at West Bay Tom Brereton

¹ Red list: Have declined by more than 50% in the last 25 years, or longer. Are globally threatened or are not recovering from historical decline. Have had their breeding range in the UK reduced drastically by at least 50% in the last 25 years or longer. Species of birds on the amber list: Have moderately declined by 25 – 50% in the last 25 years or longer. Are recovering / recovered from historical decline. Are a rare breeder in the UK or of either European or International importance.

Table 2: Species total for each square. Red shading = Red Listed, Orange = Amber Listed. Blue shaded = Passage/foraging visitor. Yellow = Non-native, feral

Species	ST4400 Brimley Farm, Stoke Abbot	ST4601 Beaminster	ST4700 Parmham House	ST4902 White Sheet Hill, Beaminster	ST5103 Toller Down	SY4394 Symondsburry	SY4498 South Bowood	SY4690 West Bay 2	SY4691 West Bay	SY4694 Pyemore 2	SY4795 Pyemore	SY4798 Slope & Welplash	SY4894 Bradpole	SY5091 Shipton Gorge	SY5096 West Milton	SY5194 Mappercombe	SY5199 Colleigh, Mapperton	SY5298 North Poorton/Hooke	SY5493 Haydon Down	% squares recorded in	Total no. counted	
Blackbird	11	14	18	25	25	12	23	20	19	24	12	21	15	7	24	12	20	8	4	100	314	
Blackcap	7	6	5	18	24	16	14	1	4		4	12	4		17	11	15	17	6	89	181	
Blue Tit	12		8	16	9	11	18	3	2	3	1	15	3		23	2	11	11	3	89	151	
Bullfinch	2		1			2						2			1	3	3	4		42	18	
Buzzard		3		3	2		2			1		5	8		1	1	2	1	2	63	31	
Canada Goose										1										5	1	
Carrion Crow	4	10	30	12	27	3	15	42		25	10	22	22	71	9		1	2	15	89	320	
Cetti's Warbler									4											5	4	
Chaffinch	4	6	10	3	12	18	11		1	4	2	6	7	7	23	11	8	10	13	95	156	
Chiffchaff	13	2	5	24	16	23	22	1	6	3		23	6	12	20	11	24	18	7	95	236	
Coal Tit	2	1	3	7		6	10					5			3		4	5	1	58	47	
Collared Dove			3			1	1	2	6	1			1		2			3		47	20	
Coot																1				5	1	
Cormorant								3												5	3	
Corn Bunting																			9	5	9	
Crossbill	2																			5	2	
Crow									7							10				11	17	
Dipper												1								5	1	
Dunmoock	3	4	6	7	2	14	13	13	8	1		8	2	7	5	3	6	4	5	95	111	
Feral Pigeon								35												5	35	
Firecrest															1					5	1	
Fulmar								12												5	12	
Goldcrest	2		4	3		10	5					3			3		5	10		47	45	
Goldfinch	8		7	8	6	6	7	37	13	6	1	6	9		24	3	8	5	9	89	163	
Grasshopper Warbler							1													5	1	
Great Spotted Woodpecker	1	1	1	3	1	5	3			1		3	2		5	3	4	3		74	36	
Great Tit	3	1	4	10	6	5	15	1	2	2	1	10	4	1	18	4	7	4		95	98	
Green Woodpecker			2			1				1						2	2			32	9	
Greenfinch	4	3	7		1	2	4	1	5			4			5			1		58	37	
Grey Heron			1																	5	1	
Grey Wagtail															1					5	1	
Helmeted Guineafowl				4																5	4	
Herring Gull	30		48	2	8	1	6	429	22	8	2	26	7		16	4		12	5	84	626	
House Martin	8		2	21					20			2	3	7	33	5	1			53	102	
House Sparrow	24	19	4		23		41	47	24	123	1	2	3	25	16			2		74	354	
Jack Snipe																	1			5	1	
Jackdaw	18	6	70	14	8	3	10	84	24	12		39	3	1	34	18	13	5	15	95	377	
Jay				1			1		1			1	2	1				1		37	8	
Kestrel	1																			5	1	
Lesser Whitethroat															1					5	1	
Linnet			3	7		4	4	4				1		2	51	1	4	13	7	63	101	
Long-tailed Tit	1		1		2	2	2					5			7		8	3		42	29	
Maggie				1	2		1	18	13	8		2	7	3	2	2	1		1	68	61	
Mallard								2								5				11	7	
Marsh Tit							2					1			1		2	1		26	7	
Meadow Pipit							1												1	11	2	
Mediterranean Gull													1							5	1	
Mistle Thrush	2		3	1	2	1	1					2	2		3		2		1	58	20	
Moorhen								3				2				2				16	7	
Mute Swan																1				5	1	
Nuthatch	2		3	1		1	4					2	1		2	1	4	1		58	22	
Pheasant	4	6	1	7	3		11	1		1		8	5	2	5	3	5	9	3	84	74	
Pied Wagtail			4		1	1	2	6		1		1			2					42	18	
Raven						7	1	2		1		1	2		2	1		1	4	53	22	
Red Kite																1			1	11	2	
Red-legged Partridge															1				1	11	2	
Reed Warbler								3	1											11	4	
Robin	13	7	15	18	6	19	22	5	16	2	15	19	17	13	45	9	29	11	12	100	293	
Rook	5		239				4	4	20	21	12	8	23		24	16				58	376	
Siskin			1			2											1	10		21	14	
Skylark	4			2				1	2			8		1	1	12	5	2	30	58	68	
Song Thrush	6	3	13	11	4	5	10		1	2		7	2		9	4	15	9	3	84	104	
Sparrowhawk									1				1							11	2	
Spotted Flycatcher			1				1													11	2	
Starling				1				62					3	1						21	67	
Stock Dove	4	1	3	8			5			1		10	2		3	1	3	1		63	42	
Stonechat	1															2			1	16	4	
Swallow	3	1	5	2	3	3	8	5		17	15	1	11		17		8			74	99	
Swift	2					2						1	1		2				2	32	10	
Tawny Owl				1																5	1	
Treecreeper	3		4	1		2	1					1			3		3	3		47	21	
Tufted Duck				1												2				11	3	
Turnstone								1												5	1	
Whitethroat	3					6	3	2	3				6		3	13	2	7	2	58	50	
Wigeon								1												5	1	
Willow Warbler					8							1							9	21	19	
Woodpigeon	19	24	11	40	30	16	38	60	35	24	20	28	42	21	22	15	22	30	5	100	502	
Wren	17	10	16	40	14	21	27	6	21	3	4	29	14		43	9	36	26	8	95	344	
Yellowhammer						4						1			3	4	2	4	2	8	42	28
No. species recorded	36	20	36	33	27	33	41	34	27	28	14	44	34	18	45	37	37	36	30		5967	

4.0 Discussion

Birds in the Brit Catchment

A good variety of species were recorded in most squares (mean 32 species per square, range 14-45), reflecting the prevalence of mixed farming, copses, thick hedgerows and good quality town and village gardens. Species per square is shown in Figure 2.

Records of Marsh Tit from five squares, Yellowhammer from eight squares and a population of Corn Buntings at Haydon Down/Eggardon were particularly encouraging.

Likely breeding species recorded in 2023 within the catchment, but not seen on survey squares included Barn Owl, Garden Warbler, Goshawk (Mapperton/Hooke), Kingfisher, Little Grebe, Reed Bunting (West Bay), Redstart (Mapperton) and Tree Pipit (Powerstock).

However, the complete absence of once common species from squares and the wider catchment such as Cuckoo, Lapwing, Grey Partridge, Lesser Spotted Woodpecker, Turtle Dove (bar singleton at Mappertcombe briefly) and Tree Sparrow highlights the scale of the challenge for nature recovery in the future.

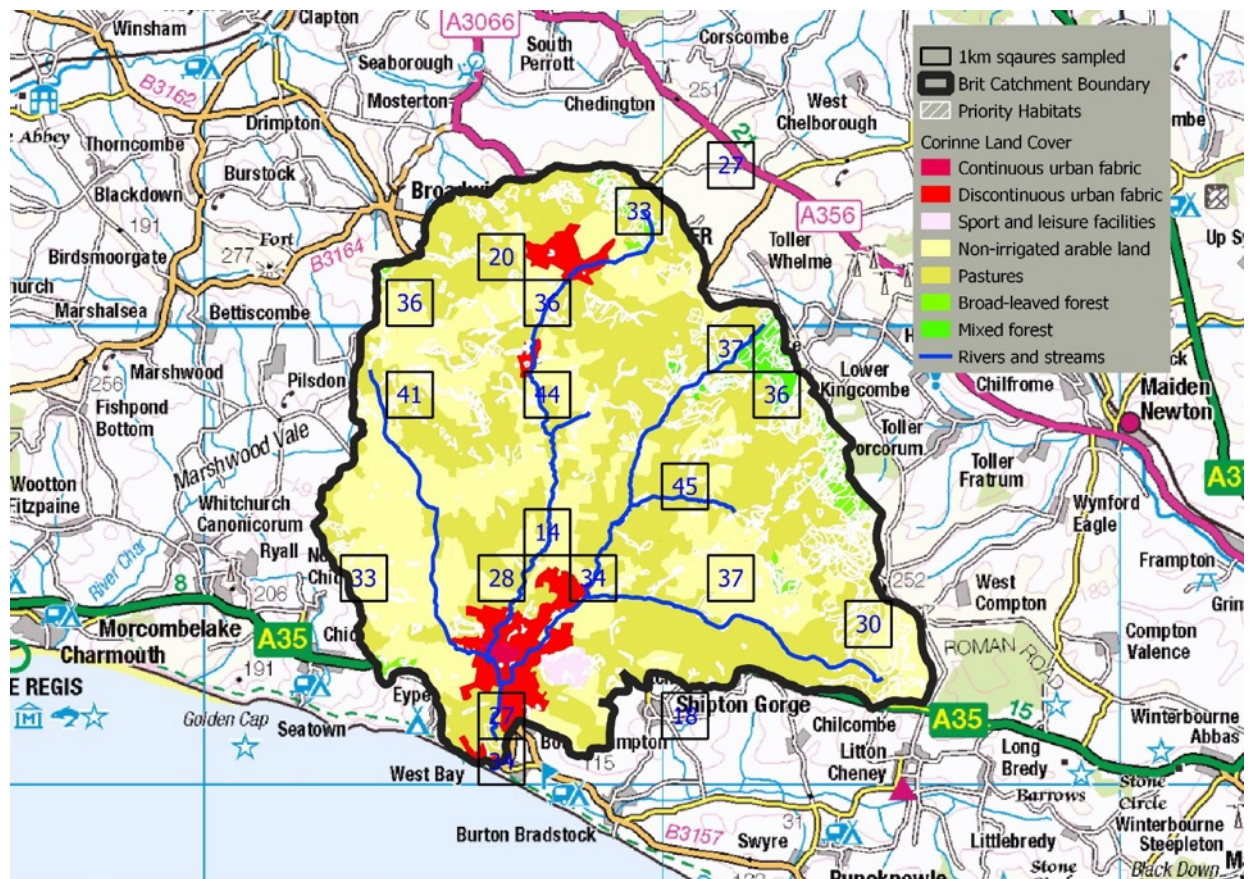


Figure 2: Number of species recorded in each 1km square

Coverage

A sound baseline has been established of bird abundance from which to monitor future changes for individual species and multi-species groupings with

- Almost a fifth of 20% of the catchment area sampled
- Sufficient data (present in four or more of squares) for 46 species to potentially contribute to a multi-species bird indicator.

Targeted surveys (e.g. for scarce species) or collation of other data sources (e.g. Wetland Birds Survey Counts) could further increase the number of species monitored.

Training and recruitment of volunteers through Bridport Bird Club could play a further role in increasing survey coverage.

Future compiling of indicators

With similar levels of data collected/collated in 2024, annual changes in occupancy and abundance could be assessed. Short-term trends will be calculable after five year of annual data collection and long-term trends after 10 years.

The building block for the trend analysis is a measure of abundance for each species at each site in each year - the maximum count from the 2 visits to each site. Hence the need for annual data.

Trends can be generated from the count data using Generalized linear models (GLMs) and additional smoothing techniques as has already been developed for UK birds (Gregory et al. 2003) and butterflies (Brereton et al. 2011).

Note there would be a lot of zeros in the data (species absences from individual squares), so there would be low statistical power to detect small changes over short time periods. Changes of less than 25% in 5 or 10 years would be unlikely

Multi-species trends could be disaggregated in different ways e.g. from 'All species' (n=46) to various sub-groupings e.g. 'farmland' species' (n=13 of 19 FBI species), 'woodland' (n=22 of 34 FBI species) , 'priority', 'rewilding positive' (eg species predicted to benefit from rewilding such as Yellowhammer, Linnet, Bullfinch, Willow Warbler and Long-tailed Tit) and rewilding 'negative' species (Skylark, Meadow Pipit, Pied Wagtail).

A review of survey coverage in 2023 suggest that a Brit Catchment farmland bird indicator would have sufficient data (assuming coverage was at similar levels in future years) for 13 of the 19 species that make up the UK indicator, whilst for woodland birds sufficient data is available to include 22 of the 34 UK species (Table 4).

Table 4: Brit catchment sample coverage in 2023 of UK farmland and woodland bird indicator species. Red shading indicates the species was recorded in too few squares to be included in any future trend analysis

Indicator	Species	Species type	No. squares present	Indicator	Species	Species type	No. squares present
Farmland	greenfinch	Generalist	11	Woodland	blackbird	Generalist	19
Farmland	jackdaw	Generalist	18	Woodland	blue tit	Generalist	17
Farmland	kestrel	Generalist	1	Woodland	bullfinch	Generalist	8
Farmland	reed bunting	Generalist	0	Woodland	chaffinch	Generalist	18
Farmland	rook	Generalist	11	Woodland	dunnock	Generalist	18
Farmland	woodpigeon	Generalist	19	Woodland	great tit	Generalist	18
Farmland	yellow wagtail	Generalist	0	Woodland	lesser whitethroat	Generalist	1
Farmland	corn bunting	Specialist	1	Woodland	long-tailed tit	Generalist	8
Farmland	goldfinch	Specialist	17	Woodland	robin	Generalist	19
Farmland	grey partridge	Specialist	0	Woodland	song thrush	Generalist	16
Farmland	lapwing	Specialist	0	Woodland	tawny owl	Generalist	1
Farmland	linnet	Specialist	12	Woodland	wren	Generalist	18
Farmland	starling	Specialist	4	Woodland	blackcap	Specialist	17
Farmland	stock dove	Specialist	12	Woodland	chiffchaff	Specialist	18
Farmland	skylark	Specialist	11	Woodland	coal tit	Specialist	11
Farmland	tree sparrow	Specialist	0	Woodland	garden warbler	Specialist	0
Farmland	turtle dove	Specialist	0	Woodland	goldcrest	Specialist	9
Farmland	whitethroat	Specialist	11	Woodland	great spotted woodpecker	Specialist	14
Farmland	yellowhammer	Specialist	8	Woodland	green woodpecker	Specialist	6
				Woodland	jay	Specialist	7
				Woodland	lesser redpoll	Specialist	0
				Woodland	lesser spotted woodpecker	Specialist	0
				Woodland	marsh tit	Specialist	5
				Woodland	nightingale	Specialist	0
				Woodland	nuthatch	Specialist	11
				Woodland	redstart	Specialist	0
				Woodland	siskin	Specialist	4
				Woodland	sparrowhawk	Specialist	2
				Woodland	spotted flycatcher	Specialist	2
				Woodland	treecreeper	Specialist	9
				Woodland	tree pipit	Specialist	0
				Woodland	willow tit	Specialist	0
				Woodland	willow warbler	Specialist	4
				Woodland	wood warbler	Specialist	0

5. References

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6.0 Acknowledgements

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Finally, we would like to thank all the landowners who kindly allow access to walk transects on their land.



Raven Tom Brereton