

# The value of green belt south of Cambridge to populations of farmland birds (2024)

Report of a 13-year study



John Meed, January 2025



## Introduction

For the last thirteen years I have conducted ecological surveys – focusing in particular on farmland birds – in a square kilometre of green belt south of the Cambridge Biomedical Campus to assess the levels of the biodiversity of an area close to the city.

The area studied is largely arable land, with mature hedgerows, watercourses, ponds, scrub and woodland, including the Nine Wells local nature reserve (LNR – right). It includes a cycle path and footpath, and land management has created several permissive footpaths, flower-rich field margins and additional woodland (see Appendix 1). It is widely used by walkers, cyclists and families.



## Why do farmland birds matter?

Farmland birds have suffered major declines in recent decades.

- Grey partridge declined by 93% between 1970 and 2018 and corn bunting (right) by 89% while yellow wagtail declined by 68%, yellowhammer by 60% and skylark and linnet by 56% (1).
- Farmland birds are indicators for the UK Government Sustainable Development Strategy (2) and 11 of the 19 indicator species are 'red list' birds of 'high conservation concern' (3).
- Grey partridge are now classified as 'vulnerable' to extinction in the UK while corn bunting and yellow wagtail are classified as 'near threatened' (3).



Birds are indicator species because of their place as consumers in the ecosystem, and declines in bird populations indicate wider problems. The *State of Nature 2023* report (4) states that the 'indicator for common breeding birds declined by 14%; within this group, farmland birds have suffered particularly strong declines of on average 58%.'

## Methodology

I monitor the area using a combination of methods. As a British Trust for Ornithology (BTO) surveyor I adopt their Breeding Bird Survey methodology (5), which involves a habitat survey and walking two parallel transects, each of 1 km, on 2–3 occasions early and later in the breeding season; this approach gives a good snapshot of the species present in an area. I did my transect walks on April 8, May 6 and June 3.

In summer I build a more accurate picture of the number of breeding pairs, drawing on my experience as a surveyor for the Royal Society for the Protection of Birds (RSPB) Volunteer and Farmer Alliance (6). In these visits I observe breeding signs such as singing males, territorial behaviour, courtship displays, nest building and juvenile birds. In summer I also survey butterflies and dragonflies for the UK Butterfly Monitoring Scheme.

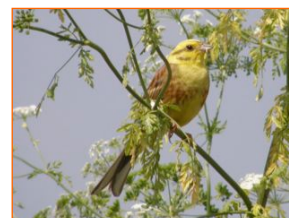
I also visit the site regularly in the autumn and winter, monitoring passage migrants and winter visitors, and in particular grey partridge populations. In 2024 I made 35 visits.

## Findings

Over the thirteen years I have recorded 107 bird species on the site including 25 red list species and 34 amber list species. See Appendices 2 and 3.

In 2024 I recorded 83 species on the three transect walks and other visits:

- On the first transect walk: 35 species and 263 individuals
- On the second transect walk: 38 species and 268 individuals
- On the third transect walk: 34 species and 254 individuals



The 83 species recorded included 16 of the 19 farmland bird indicator species for the Sustainable Development Strategy, of which 15 bred (Appendix 4). In total I recorded 18 red list species and 24 amber list species in 2024. This table shows the indicator species recorded.

| Breeding red list indicator species                                                                                                                                                                                                                                                                                                      | Other indicator species                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 60 pairs of skylarks</li> <li>• 14 pairs of grey partridge</li> <li>• c8 pairs of linnets</li> <li>• 11 pairs of corn buntings</li> <li>• 10 pairs of yellowhammers (above)</li> <li>• 8 pairs of greenfinches</li> <li>• 1 pair of yellow wagtails</li> <li>• c6 pairs of starlings</li> </ul> | <p>All the other amber and green-listed indicator species were present, and most bred:</p> <ul style="list-style-type: none"> <li>• 20 pairs of whitethroats</li> <li>• 3 pairs of reed buntings</li> <li>• 3 pairs of stock dove</li> <li>• Goldfinch, wood pigeons and jackdaws all bred in good numbers, and probably a first pair of kestrels</li> <li>• Rooks nest nearby and visit regularly</li> </ul> |

In total 46 species bred in 2024, including red listed house sparrows and probably a pair of house martins, as well as several other amber-listed species including song thrush and dunnoek. The area continues to attract migrating birds, including this year willow warblers and wheatear.

I will discuss in more detail my findings about the populations of two key red list species that do unusually well in the fields around Nine Wells:

- Grey partridge (right)
- Corn bunting.

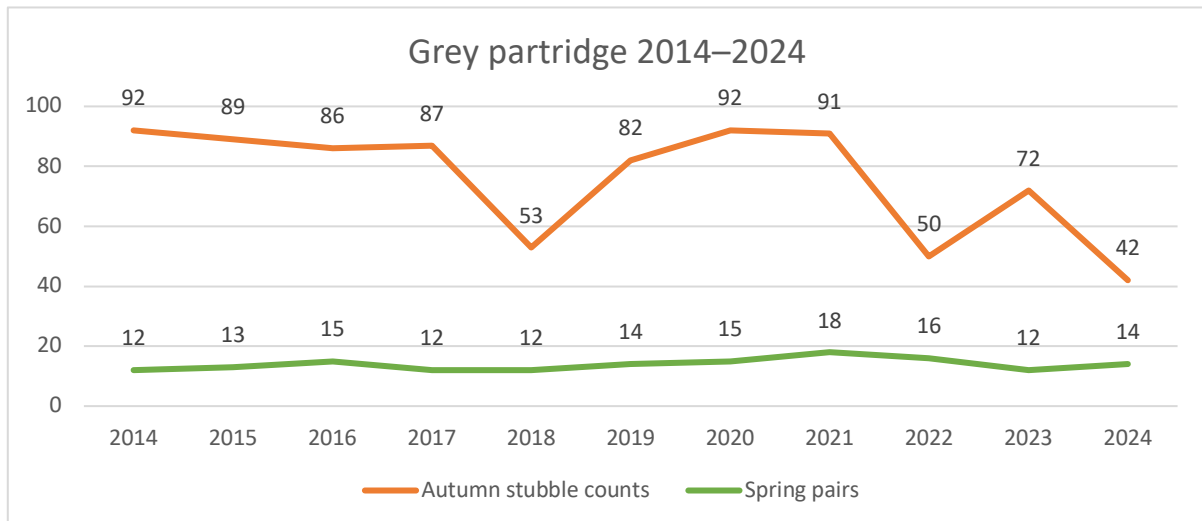


Populations *continue to give cause for concern*, especially yellow wagtail and linnet, and I will discuss possible reasons for this, of which habitat loss is clearly one. I will then go on to examine my findings for other species.

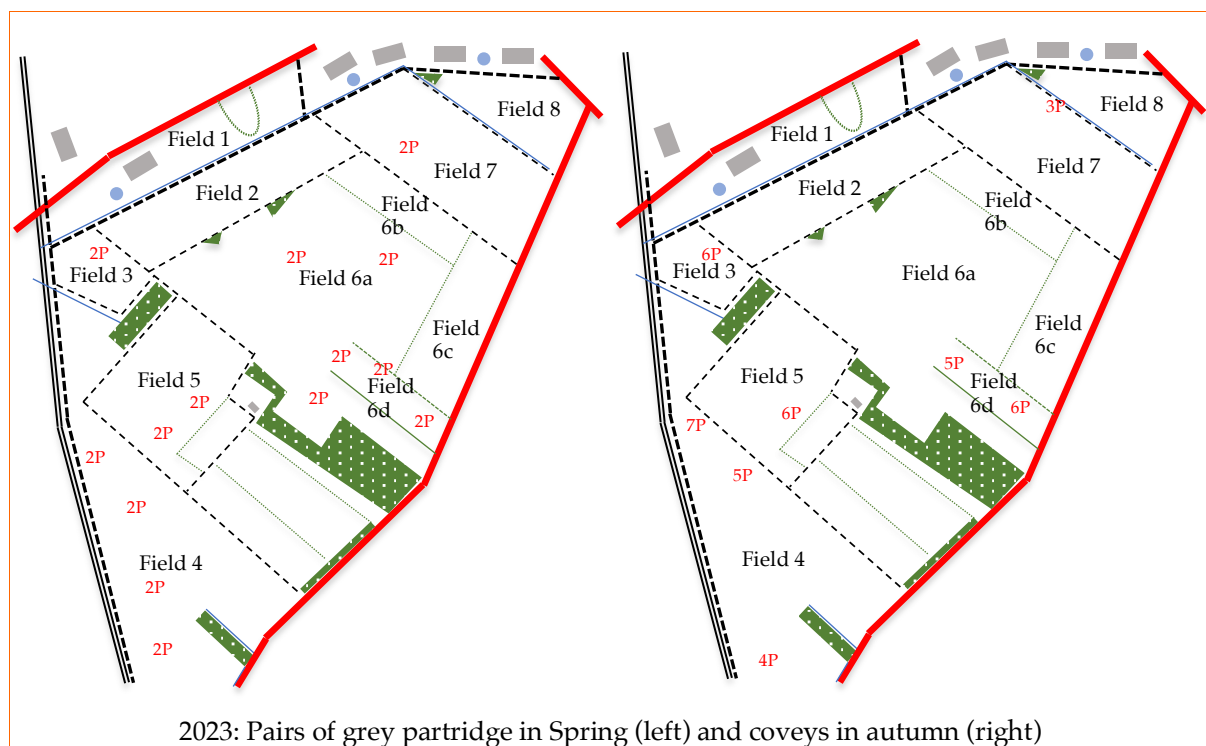
I have written up my observations of the fascinating behaviour of these species, and especially grey partridge and corn bunting, in much greater detail in my book *A haven for farmland birds* (7). For more information see [johnmeed.net/ecology](http://johnmeed.net/ecology).

## Grey partridge 2014–24

**Grey partridge** do remarkably well in the square kilometre I study – typically arable farms support between 0–5 pairs/km<sup>2</sup> in spring and 0–20 birds/km<sup>2</sup> in the autumn. Only with high levels of management aimed at the species do numbers approach those around Nine Wells, as in the Grey Partridge Demonstration Project near Royston (8). Spring pairs (14) were slightly up on 2023. My autumn counts of just over 40 birds are much less reliable than usual and may represent a significant under-estimate – the crop of oilseed rape in three of the fields made observation difficult. However it is possible that the wet weather in early summer reduced breeding success.

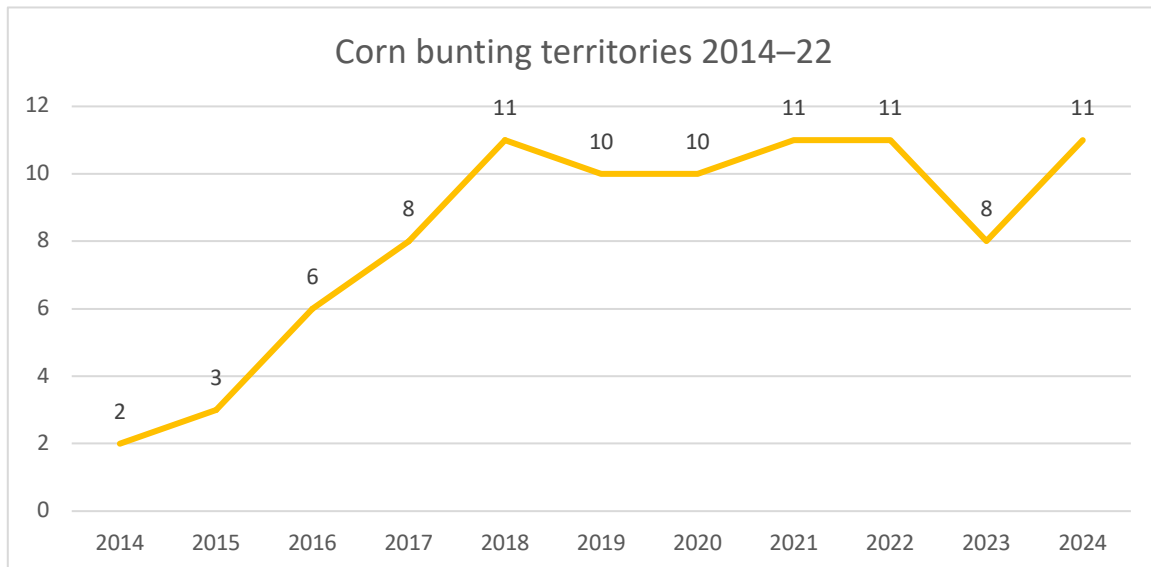


Perhaps more crucially, habitat loss is of increasing concern; expansion of the Biomedical Campus has now removed Field 1 and I barely recorded grey partridge in Field 2. The species is now confined to a smaller remaining area, principally in Fields 4, 5 and 6.



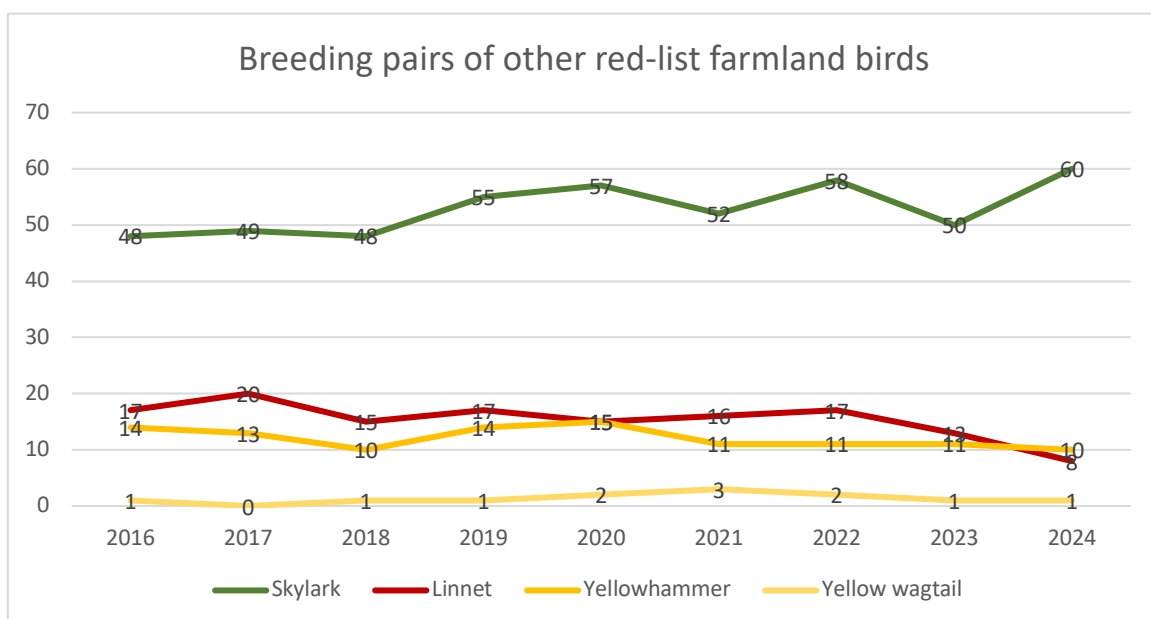
## Corn bunting 2014–24

In 2024 I recorded 11 singing **corn buntings**, three more than last year – interestingly the birds appears to have adjusted to the work on the railway line by moving most territories there to the hedge between Fields 4 and 5 – see Appendix 3. The number recorded in this study is important; there are now only 11,000 corn bunting territories in the UK and despite the fact that East Anglia is now one of their main remaining areas, a recent survey of populations found a very patchy distribution of singing males across Cambridgeshire (9). The species' recent extinction in Ireland risks being repeated in large parts of Britain if breeding sites are not protected.



## Other red-list farmland indicator species

Four other red-listed species have also been a key focus of my study, and this graph shows their breeding populations over recent years:



- **Skylark** populations (right), with around 60 breeding pairs, had a good year. I base estimates of skylark numbers on singing males observed (greatest on May 21st). This population density is higher than the mean recorded for similar crops in the BTO's skylark survey (10). Winter counts numbered up to 55 birds.
- I estimated the **linnet** population (right) at just 8 pairs – in the years up to 2022 I estimated 15-20 pairs, but 2023 was lower and this year lower still. Linnets tend to nest more communally than other species (11) so populations are harder to estimate than species with distinct territories. Winter flocks were also much smaller than in earlier years.
- **Yellowhammer** populations (right), at around 10 breeding pairs, were similar to last year, and compare well with populations found by Bradbury et al (12). Densities were highest in the hedge along Granhams Road and the ditch along the cycle path. Winter flocks were frequent, with up to 20 birds.
- One pair of **yellow wagtail** (below right) probably bred, in Field 4. This is lower than the 2–3 pairs which have bred in recent years. This species is now classified as 'near threatened' in the UK, with just 20,000 breeding pairs.
- **Greenfinch** were moved to the red list this year, following a decline of 68% in the years 2008-2018, largely as a result of the trichomonas parasite. However, they have recovered well in my study area. In 2012, I recorded a single pair. By 2016 I recorded 4 pairs, and this year at least 8 pairs bred.
- At least 6 pairs of **starlings** bred, continuing the recent increase; flocks of over 200 were present in the winter.
- Worryingly, this year is the first when I recorded no **lapwing**.



All the other farmland bird indicator species were present:

- Whitethroat (right) with 20 breeding pairs, maintained a high population. Densities were highest along the hedges around Nine Wells and in the hedges along Granham's Road. The most birds on one occasion was 14, on May 5th.
- Two–three pairs of stock dove bred.
- Reed bunting (right) populations (3 pairs) were one up on 2023.
- It is likely that kestrels bred for the first time – recently fledged juveniles were present regularly in early August.
- Rooks breed nearby and visit regularly.



Goldfinch, jackdaws and wood pigeon all bred.



## Changes in populations

After studying these fields for 13 years, I have observed several changes. As well as the reduced numbers of **linnet** and **yellow wagtail** and lack of **lapwing** observations, several species that used to breed here have not done so recently:

- I recorded very few **chaffinch** – and none in the breeding season. In the early years of my study there was an estimated 6 breeding pairs. However numbers declined sharply after 2018, probably as a result of a parasite, and none have bred since 2021.
- A pair of **bullfinches** bred in the early years of my study and in 2015 I had once recorded 5 birds. However I have not recorded any since 2021.
- This year was the first when I recorded no **mistle thrush** at all. Two pairs had bred in 2021 and one in 2022 and possibly 2023.

In addition to the recovery of **greenfinch** on the site and probable first breeding of **kestrel** some other species have started breeding:

- **House sparrows**, once scarce visitors to the site, have bred in the last two years in the bushes along the railway line. Autumn flocks of 40–60 were present, including recently fledged youngsters.
- In recent years **reed warblers** have bred in the bushes along Hobson's Brook. A second (and possibly third) pair have also attempted to breed around the balancing ponds.
- A pair of **red kites** have attempted to nest in the woodland on White Hill in the last two years and I observed courtship and display. I do not know whether they were successful as I was away during the time when young would have fledged.

I also recorded five new species this year: a **water rail** in Hobson's Brook – probably one of the family that bred in Hobson's Park. An **oystercatcher** flew over calling on 22/2 and was present on a flood across railway line on later days. Other new records include a **black redstart**, winter **waxwings** and migrating **whimbrel**.

## Habitat and other species surveys

My habitat surveys show that, in summary:

- The total cropped area is 88 hectares. The total uncropped area is 12.5 hectares including woodland (4ha), set-aside (4ha), margins (c3ha) and hedges (c1.5ha).
- There are now 5.5km of hedgerows (of which almost half a km has been planted recently); 5km of margins; and 1.5km of streams and ditches.
- There are also 4 new ponds adjoining new development.

It is important that over 10% of the site is uncropped, as this allows a good range of arable weeds to grow, which provide food for the birds in the form of leaves, shoots and seeds. They are host plants for the invertebrates that grey partridge chicks and other young birds depend on in their early days. In addition, weeds are sometimes present in cropped areas.

Furthermore, cultivation techniques have changed over the course of my study. Whereas ten years ago fields were frequently ploughed, this is now rarely the case. Field 4 (owned by St John's College and farmed by the Webster family) has in recent years been left as stubble into the autumn, with the next crop drilled directly into the soil without ploughing. Several coveys of grey partridge spend the winter in the field, along with skylarks, finches and hares.

I continue to record other, non-bird, species:

- **Mammals:** I continue to record water vole in Hobson's Brook – important as water vole numbers in Britain have fallen disastrously. Up to 20 brown hare, principally in Fields 4 and 6, represent a good population of another declining species (13). I have recorded a total of 20 mammal species over the study.
- **Amphibians and reptiles:** A grass snake crossed the cycle path on August 2nd. I have also recorded common lizard and frog.
- **Invertebrates:** Butterfly populations were considerably reduced this year, with just 19 species and lower numbers of brown argus, common blue, holly blue and orange tip in particular. This reflects findings across the country as a whole, probably as a result of the very wet spring. While large and small whites were also low throughout the summer, numbers were higher in September than I have ever recorded before. I recorded 11 species of dragonfly and damselfly, 3 fewer than 2023. The site supports good populations of other invertebrates including moths, grasshoppers, crickets, beetles, flies, ants, bees and wasps.
- **Flora:** I have recorded over 40 trees and shrubs including the rare black poplar (right), and well over 100 species of flowering plants – which now include pyramidal and bee orchids. The area has mature hedgerows with thick growth and good variety and extensive grassy and flower-rich margins.



## Discussion

In *A haven for farmland birds* I argue that 'three key factors contribute to the success of the farmland birds and other wildlife in the fields around Nine Wells':

- 'Firstly, the geology of the site – the combination of the low chalk hill of White Hill with the flatter surrounding fields – provides an important foundation. Above all, this produces the springs that are a vital source of water and essential for the populations of water voles, dragonflies and other aquatic plants and animals.
- 'Secondly, the variety of habitats – copses, hedgerows, ditches, ponds and grassy and flower-rich margins – provide an important complement to the arable fields. They offer food, shelter and nesting habitat for the endangered farmland birds and brown hares, and they also help to explain the richness of the overall flora and fauna across the site.
- 'Thirdly, the management of the land – the restrained use of pesticides, the approaches to cultivation, the attention to spring chick food and winter bird food – all help to create space for nature.'



For grey partridge, the mosaic of habitats helps provide their three key requirements. Grassy, raised hedge bottoms, notably between Fields 4 and 5 and on the slope of Field 6, provide good nesting sites. Food for chicks in the form of invertebrates live in the field margins and on arable weeds. Autumn stubbles provide winter food for the coveys, while the winter bird food crop in Field 6d have helped contribute to high survival rates (as well as feeding meadow pipits, larks and finches).

## The growing impact of development

Since I began my study, there has been considerable development, particularly of the Biomedical Campus. This year all of Field 1 was lost to development – probably destroying two–three skylark nesting attempts – and this has had a significant impact on grey partridge. In 2017 I recorded 11 pairs in and around Fields 1 and 2, but none in either field this year – loss of habitat and high noise levels may both explain this. The partridges have become concentrated in the other fields, and it is likely that the loss of habitat has contributed to a reduced population.



*Field 1 on May 28 (left) and August 5 (right)*

Field 2 is scheduled for future development, while Fields 7 and 8 have been recommended for development by the local councils in the next local plan. Such development would remove the last breeding sites of yellow wagtail, risk halving the number of corn bunting and drastically reduce breeding sites for grey partridge and other red list birds.

The problem is where wildlife can go as good existing habitat is lost. The square kilometre of land on the other side of Granham's Road comprises just four fields, far less margin habitat and three hedges, one of which is a poor remnant with large gaps. The land does support skylark, but is less welcoming to the other red list species, and while partridge occasionally feed there they are unlikely to breed. As further fields are lost, it will be essential to improve habitat here to provide a refuge for displaced wildlife. Whether the local authorities and developers will recognise the importance of this remains to be seen.

In addition, work in connection with the Cambridge South station may have disrupted the breeding of house martins under the bridge the work along the railway and displaced some corn bunting territories. The planned guided busway across Fields 3 and 4 will cause disruption during construction and some longer-term impacts, though this is at least one example of where some genuine on-site mitigation is planned in the form of a 30 metre wide strip of margin and meadow between the busway and the hedge between Fields 4 and 5.

## Conclusions

The data I have gathered over the last eleven years provide a picture of an area of green belt arable land on the outskirts of the city of Cambridge that supports important breeding populations of threatened farmland birds and other wildlife.

- 1 Over the period of my study the site has supported exceptional populations of grey partridge and corn bunting (species that have declined by around 90% since 1970) and the site is among the best in Cambridgeshire for both species.
- 2 Other red list farmland species also live in the area, notably linnet, yellow wagtail, skylark and yellowhammer. The area also supports good populations of water vole and brown hare, as well as plants and invertebrates.
- 3 Habitat variety and land management contribute to the richness of the area. The combination of arable crops with grassy hedgerow bottoms and margins benefit grey partridge, skylark, corn bunting and yellow wagtail; the ditches benefit yellowhammer and reed bunting, as well as water vole.
- 4 Development and infrastructure work has resulted in disruption and lost farmland habitat. This has led to a concentration of birds in the relatively undisturbed areas, and is a likely cause of 2024's lower grey partridge populations.
- 5 Proposed further construction would place real pressure on populations. If this were to go ahead, considerable, and urgent, new habitat creation will be essential in adjoining fields to provide a refuge for displaced wildlife.

**John Meed, January 2025**

John Meed is a researcher, writer and musician who lives in south Cambridge. His book *A haven for farmland birds* provides much more detail about the ecology, behaviour and social lives of the birds he has studied in this area. See: <https://johnmeed.net/ecology/>

## References

- 1 Burns F, Eaton MA, Balmer DE, Banks A, Caldow R, Donelan JL, Douse A, Duigan C, Foster S, Frost T, Grice PV, Hall C, Hanmer HJ, Harris SJ, Johnstone I, Lindley P, McCulloch N, Noble DG, Risely K, Robinson RA, Wotton S (2020) *The state of the UK's birds 2020*. The RSPB, BTO, WWT, DAERA, JNCC, NatureScot, NE and NRW, Sandy, Bedfordshire
- 2 HMSO (2005) *Securing the Future: Delivering UK Sustainable Development Strategy*, London, The Stationery Office
- 3 Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.
- 4 Burns, F, Mordue, S, al Fulaij, N, Boersch-Supan, PH, Boswell, J, Boyd, RJ, Bradfer-Lawrence, T, de Ornellas, P, de Palma, A, de Zylva, P, Dennis, EB, Foster, S, Gilbert, G, Halliwell, L, Hawkins, K, Haysom, KA, Holland, MM, Hughes, J, Jackson, AC, Mancini, F, Mathews, F, McQuatters-Gollop, A, Noble, DG, O'Brien, D, Pescott, OL, Purvis, A, Simkin, J, Smith, A, Stanbury, AJ, Villemot, J, Walker, KJ, Walton, P, Webb, TJ, Williams, J, Wilson, R, Gregory, RD, 2023. State of Nature 2023, the State of Nature partnership, Available at: [www.stateofnature.org.uk](http://www.stateofnature.org.uk).
- 5 BTO/JNCC/RSPB (2018) *Breeding Bird Survey Instructions*
- 6 RSPB (2012) *RSPB Volunteer and Farmer Alliance Training Manual*
- 7 Meed, J (2022) *A haven for farmland birds*. See [johnmeed.net/ecology](http://johnmeed.net/ecology)
- 8 Aebischer, N J and Ewald, J A (2012) The grey partridge in the UK: population status, research, policy and prospects. *Animal Biodiversity and Conservation*, 35.2: 353–362. (Other comparisons: the largest UK partridge study, the Sussex Study, recorded under 2 pairs/km<sup>2</sup> with typically 5 birds/km<sup>2</sup> in the autumn. Major changes in management – including game keeping and predator control – on one area of the Sussex Study led to autumn densities of 64 birds/km<sup>2</sup> by 2008 with around 20 breeding pairs/km<sup>2</sup> by 2014. The RSPB's *Hope Farm Annual Review 2019*, describes how on their farm also near Cambridge, there were no grey partridge prior to management. Following management changes the population rose to 3 pairs in 2019.)
- 9 Bedfordshire Bird Club, Cambridgeshire Bird Club and Herts Bird Club (2014) *Three counties breeding corn bunting survey*, [cornbunting.birdsurvey.org.uk](http://cornbunting.birdsurvey.org.uk)
- 10 Browne, S, Vickery, J and Chamberlain, D (2000) Densities and population estimates of breeding skylarks *Alauda arvensis* in Britain in 1997, *Bird Study* 47, 52-56
- 11 Moorcroft, D and Wilson, J (2000) The ecology of linnets *Carduelis cannabina* on lowland farmland, in Aebischer, N J et al, *Ecology and conservation of lowland farmland birds*, British Ornithologists' Union, pp 173–181. The RSPB's Hope Farm density rose from 3 pairs to 19 pairs after management.
- 12 Bradbury, R et al (2000) Habitat associations and breeding success of yellowhammers in lowland farmland, *Journal of Applied Ecology*, 37, 789-805 (The density of breeding yellowhammers varied between 0.5 and 3 pairs per km of hedgerow, and two thirds of hedges surveyed in 1997 held fewer than 2 pairs per km. The RSPB's Hope Farm density rose from 14 pairs to 27 pairs after management).
- 13 Hutchings, M.R. and Harris, S., (1996), *The current status of the brown hare (Lepus europaeus) in Britain* recorded a mean density of 7.12 hares/km<sup>2</sup> on arable land



## Appendix 1: The area covered



Looking towards White Hill



The Nine Wells LNR from White Hill



Mature hedge and copse



Cycle path and flower-rich margin



Grey partridge in frost on Field 6, winter 2023



Yellowhammer on Field 4/5 hedge, 2020

## Appendix 2: Species recorded (2012–24)

This list shows the 107 bird species recorded over the last 13 years: **25 red list** birds, **34 amber list** birds, and **48 green list** species. The numbers show the number of breeding pairs/territories (except n/c where not counted); (S) denotes summer visitor, (W) winter visitor, (P) passage migrant and *italic* = not recorded in 2024.

| Species               |        | Species                |        | Species                     |     | Species                |     |
|-----------------------|--------|------------------------|--------|-----------------------------|-----|------------------------|-----|
| Barn owl              |        | Garden warbler         | 1 (S)  | Little egret                | W   | <i>Short-eared owl</i> | W   |
| <i>Barnacle goose</i> | W      | Goldcrest              | 2      | <i>Little ringed plover</i> | P   | Siskin                 | W   |
| Black redstart        | P      | Golden plover          | W      | Long-tailed tit             | c5  | Skylark                | 60  |
| Black-headed gull     |        | Goldfinch              | c6     | Magpie                      | c8  | Snipe                  | W   |
| Blackbird             | 7      | Great black-back gull  | W      | Mallard                     | 3   | Song thrush            | 5   |
| Blackcap              | 8 (S)  | Gt spot woodpecker     | 2      | <i>Marsh harrier</i>        |     | Sparrowhawk            |     |
| Blue tit              | c12    | Great tit              | c12    | Meadow pipit                | W   | Starling               | c6  |
| Brambling             | W      | Green woodpecker       | 2      | Merlin                      | W   | Stock dove             | 3   |
| <i>Bullfinch</i>      |        | Greenfinch             | 8      | <i>Mistle thrush</i>        | –   | Stonechat              | W   |
| Buzzard               | 1      | <i>Green sandpiper</i> | P      | Moorhen                     | 3   | Swallow                | 2   |
| Canada goose          | W      | Grey heron             |        | Mute swan                   |     | Swift                  | S   |
| Carrion crow          | c8     | Greylag goose          |        | Oystercatcher               | W   | <i>Tawny owl</i>       | ?   |
| Chaffinch             | W      | Grey partridge         | 14     | Peregrine                   |     | Teal                   | W   |
| Chiffchaff            | 11 (S) | Herring gull           | W      | Pheasant                    | 3   | <i>Tree pipit</i>      | P   |
| Coal tit              | 1      | <i>Hobby</i>           | P      | Pied wagtail                | 3   | <i>Turtle dove</i>     | P   |
| <i>Collared dove</i>  |        | House martin           | 1? (S) | Raven                       |     | Water rail             | W   |
| Common gull           | W      | House sparrow          | 2      | Red kite                    | 1   | Waxwing                | W   |
| Common tern           | S      | <i>Jack snipe</i>      |        | Red-legged partridge        | n/c | Wheatear               | P   |
| Coot                  |        | Jackdaw                | n/c    | <i>Redstart</i>             | P   | Whimbrel               | P   |
| Cormorant             |        | Jay                    | 2      | Redwing                     | W   | <i>Whinchat</i>        | P   |
| Corn bunting          | 11     | Kestrel                | 1      | Reed bunting                | 3   | Whitethroat            | 20  |
| <i>Crane</i>          |        | Kingfisher             | W      | Reed warbler                | 2   | Willow warbler         | P   |
| Cuckoo                | S      | <i>Lapwing</i>         | -      | <i>Ring ouzel</i>           | P   | Wood pigeon            | n/c |
| Duncock               | 24     | Lesser black-back gull | W      | Robin                       | 33  | Wren                   | c15 |
| <i>Egyptian goose</i> |        | <i>Lesser redpoll</i>  | W      | Rook                        |     | Yellow wagtail         | 1   |
| Feral pigeon          | n/c    | Lesser whitethroat     | 4      | <i>Sand martin</i>          | P   | Yellowhammer           | 10  |
| Fieldfare             | W      | Linnet                 | c8     | <i>Sedge warbler</i>        | P   |                        |     |

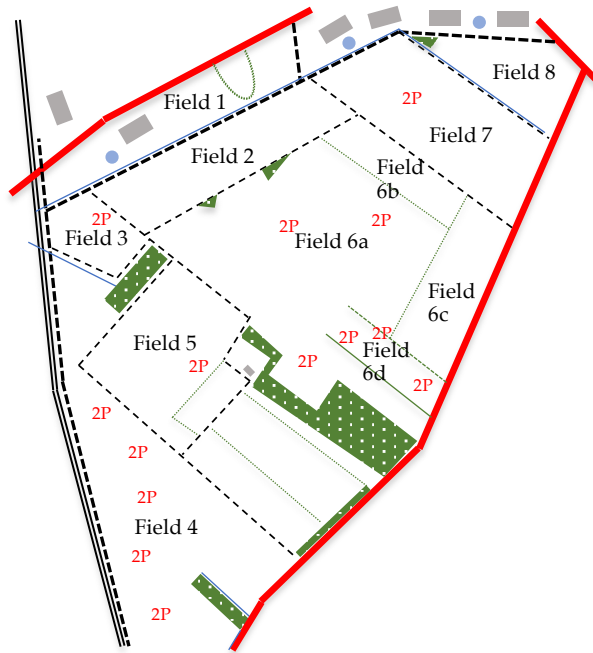
This table shows the 25 butterfly species and 16 dragonfly / damselfly species recorded:

| Butterflies              |                              |                     |                                 |
|--------------------------|------------------------------|---------------------|---------------------------------|
| Brimstone                | Green-veined white           | Orange tip          | Small skipper                   |
| Brown argus              | <i>Grizzled skipper</i>      | <i>Painted lady</i> | Small tortoiseshell             |
| <i>Clouded yellow</i>    | Holly blue                   | Peacock             | Small white                     |
| Comma                    | <i>Large skipper</i>         | Red admiral         | Speckled wood                   |
| Common blue              | Large white                  | <i>Ringlet</i>      |                                 |
| Essex skipper            | <i>Marbled white</i>         | Small copper        |                                 |
| Gatekeeper               | Meadow brown                 | Small heath         |                                 |
| Dragonflies              |                              |                     |                                 |
| Azure damselfly          | <i>Broad-bodied chaser</i>   | Emperor             | Ruddy darter                    |
| <i>Banded demoiselle</i> | Brown hawker                 | Four-spotted chaser | <i>Small red-eyed damselfly</i> |
| Black-tailed skimmer     | <i>Common blue damselfly</i> | Large red damselfly | Southern hawker                 |
| Blue-tailed damselfly    | Common darter                | Migrant hawker      | <i>Willow emerald</i>           |

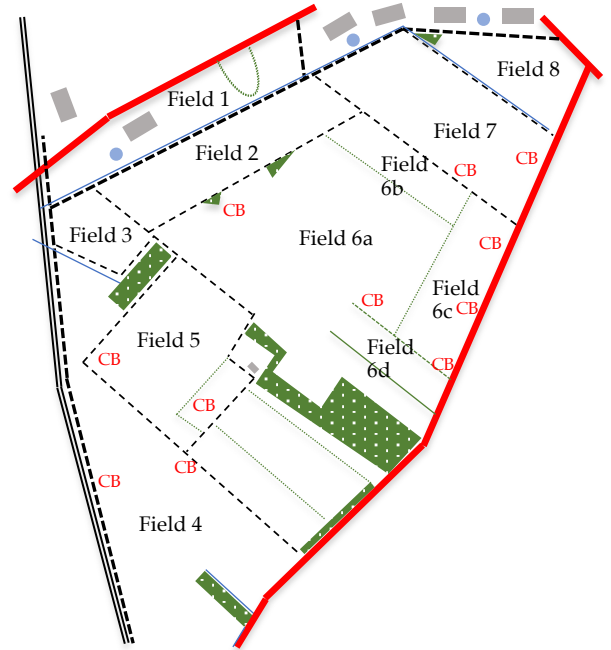
## Appendix 3: Maps showing breeding pairs

These maps show estimated breeding pairs/territories in 2024 of six red-listed farmland bird indicator species breeding in the study area:

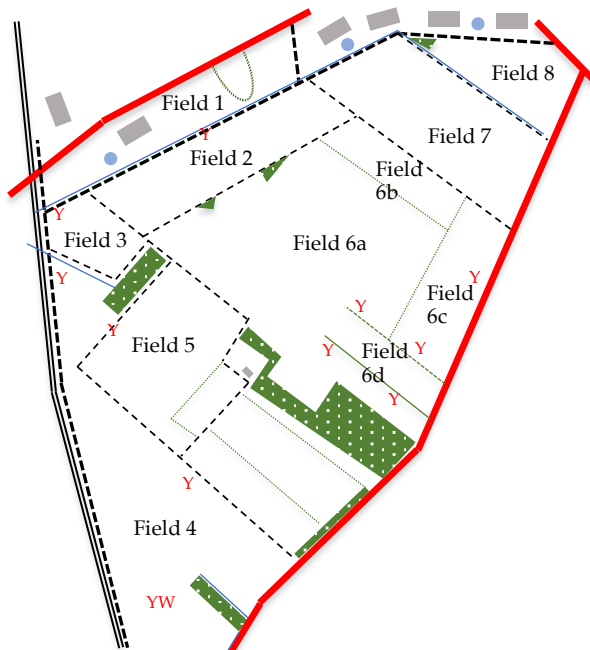
### Grey partridge (P)



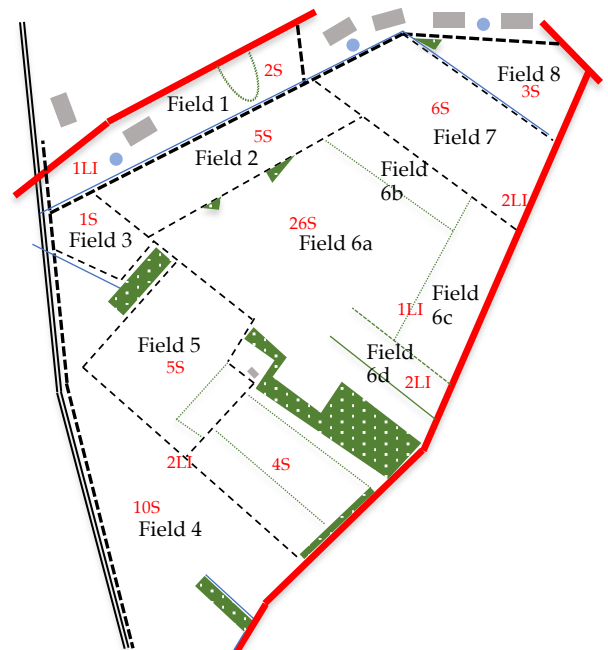
### Corn bunting (CB)



### Yellowhammer (Y), yellow wagtail (YW)



### Linnet (LI) and skylark (S)



## Appendix 4: Farmland bird indicator species

This table shows the 19 species on the UK Farmland Bird Indicator; the second column shows species which I recorded on the site in 2024; the third column shows species which bred on the site; and the final column shows the percentage change in their national populations for the period 1970-2018:

| Species        | Present? | Breeding? | Per cent change** |
|----------------|----------|-----------|-------------------|
| Turtle dove    | —*       | —         | -98%              |
| Grey partridge | ☒        | ☒         | -93%              |
| Tree sparrow   | —        | —         | -90%              |
| Corn bunting   | ☒        | ☒         | -89%              |
| Starling       | ☒        | ☒         | -82%              |
| Yellow wagtail | ☒        | ☒         | -68%              |
| Lapwing        | —*       | —         | -64%              |
| Greenfinch     | ☒        | ☒         | -64%              |
| Yellowhammer   | ☒        | ☒         | -60%              |
| Skylark        | ☒        | ☒         | -56%              |
| Linnet         | ☒        | ☒         | -56%              |
| Kestrel        | ☒        | ☒         | -48%              |
| Reed bunting   | ☒        | ☒         | -28%              |
| Whitethroat    | ☒        | ☒         | -13%              |
| Rook           | ☒        | —         | +5%               |
| Woodpigeon     | ☒        | ☒         | +121%             |
| Stock dove     | ☒        | ☒         | +127%             |
| Jackdaw        | ☒        | ☒         | +157%             |
| Goldfinch      | ☒        | ☒         | +197%             |

\* A juvenile turtle dove passed through on migration in 2019. Lapwing were present in all earlier years.

\*\* Source: Burns F, Eaton MA, Balmer DE, Banks A, Caldow R, Donelan JL, Douse A, Duigan C, Foster S, Frost T, Grice PV, Hall C, Hanmer HJ, Harris SJ, Johnstone I, Lindley P, McCulloch N, Noble DG, Risely K, Robinson RA, Wotton S (2020) *The state of the UK's birds 2020*. The RSPB, BTO, WWT, DAERA, JNCC, NatureScot, NE and NRW, Sandy, Bedfordshire