

Matter number: SC7A.3

Respondent number: 25199

Confirmed representation number: 65138

Written statement from John Meed

This statement is a response to the paper *Matters and Issues for South Cambridgeshire Local Plan specific hearing sessions*. It deals with the field south of the Cambridge Biomedical Campus identified in matter SC7A.3: *New Policy E/1B: Cambridge Biomedical Campus Extension – Proposed Modifications PM/SC/8/A and PM/SC/8/B*.

I will respond to the first two questions raised by the inspector in *Matters and Issues for Examination*, namely:

- i) Could the exceptional circumstances necessary to release land from the green belt be demonstrated in relation to the campus extension development?
- ii) Would the development of the site have an adverse effect on biodiversity in this location?

I will respond to these in reverse order as the bulk of my evidence is relevant to Question (ii).

I shall also refer to papers submitted by South Cambridgeshire District Council ahead of the Council meeting on November 17th 2016, specifically in relation to Item 8d on the agenda, and in particular:

- Appendix A: *Further Proposed Modifications to the South Cambridgeshire Local Plan 2014*
- Appendix E: Evidence for Land South of CBC Part 1 (*Covering letter from Carter Jonas*) and Part 6 (*Phase 3 Cambridge Bio-Medical Campus: Ecological Appraisal*)
- Appendix F: *Land south of the Cambridge Biomedical Campus Council's Assessment of Evidence Policy E1/B*

I also refer to the 2012 *Inner Green Belt Boundary Study*, the 2015 *Inner Green Belt Review* and the 2015 *Development Strategy Update* from both councils.

I am also submitting two reports as appendices to this statement: Meed, J, *The value of the green belt south of Cambridge to populations of farmland birds: Interim report of a survey of grid square TL4654 (2016)* and Meed, J, *The Grey Partridges of Nine Wells: Interim report for 2016*

I am John Meed, an ecological surveyor whose work is extensively quoted in the *Phase 3 Cambridge Bio-Medical Campus: Ecological Appraisal* submitted by the Council as Appendix E Part 6. I have studied the field in question, and those around it, for the last five years, drawing on my expertise as a surveyor for the Royal Society for the Protection of Birds (RSPB) and the British Trust for Ornithology (BTO). The report of my study is being published in the Annual Cambridge Bird Report and has been described as 'extremely interesting' by Dick Potts, the UK's leading expert on grey partridge.

Question (ii): Would the development of the site have an adverse effect on biodiversity in this location? (Answer: Yes)

In my study of the field and its surrounding area I have drawn on the methodologies of the BTO Breeding Bird Survey and the RSPB Volunteer and Farmer Alliance, as well as the Game and Wildlife Conservation Trust (GWCT) stubble count methodology for assessing grey partridge numbers. I visit the area for the study around 30 times a year.

My research has shown that the field in question supports important breeding populations of ‘red list’ farmland birds of ‘high conservation concern’. The field:

- Regularly supports in winter over 30 red listed **grey partridge**, and provides an important breeding site for a species that declined by 92% between 1970 and 2013. The GWCT estimate that there are now just 43,000 breeding pairs in the UK – a dramatic decline from the 1 million pairs in 1911. Autumn stubbles and grassy margins partly explain the field’s value.
- Saw successful fledging in 2016 of **corn buntings**. This classic farmland bird is another red listed species that declined by 90% between 1970 and 2013 and whose range contracted by 56%. Its recent extinction in Ireland risks being repeated in large parts of Britain if its breeding sites are not protected.
- Provided nest sites in 2016 for five pairs of **yellowhammer**, at least four pairs of **skylark**, and several pairs of **linnet**, all red list species that declined by over 50% between 1970 and 2013. **Yellow wagtail**, another red list species, may also breed in the field.

The following table shows the numbers of these species recorded breeding in the field over the last four years:

Breeding pairs of red list species	2016	2015	2014	2013
Skylark	4+	2	2	1
Linnet	4+	4	1	2
Grey partridge	2	1	2	1
Yellowhammer	5	5	2	2
Corn bunting	2	1	–	–
Yellow wagtail	1?	–	1?	1?

These birds are also **indicator species** for the UK Government *Sustainable Development Strategy*. In total the *UK Farmland Bird Indicator* includes 18 species: 16 of these are present on the site and 14 breed – in addition to the six species above red listed starling, amber listed whitethroat, reed bunting and stock dove, and green listed greenfinch, goldfinch, jackdaw and wood pigeon breed in the adjoining hedgerows and trees and feed on the field. These birds are indicator species because of their place as consumers in the ecosystem; their presence in the field in question suggests that it, and the hedges, ditches and margins that surround it, provide food in the form of seed-bearing plants and invertebrates.

In 2016 the field also provided at least one host nesting site for the **cuckoo**, a once-common red list species that now has only 16,000 pairs in the UK. This summer visitor declined by 21% in just one year (2008–9) and its iconic call may not be heard by future generations unless measures are taken to protect it, including protection of known nesting sites.

In addition, in 2016 the field provided an autumn resting place for several migrating whinchat (red list), and several wintering meadow pipit (amber list).

My research demonstrates that the field forms part of a wider, well-functioning ecosystem that also includes the Nine Wells nature reserve. The one-kilometre square that I study supported in total the following breeding red list species in 2016:

- 33 pairs of skylarks
- 17 pairs of linnets
- 13 pairs of grey partridge
- 14 pairs of yellowhammers
- 6–7 pairs of corn buntings
- 2 pairs each of starling, song and mistle thrush
- 1–2 pairs yellow wagtails
- as well as the cuckoo previously mentioned

It also supported the following breeding amber list species of ‘medium conservation concern’:

- 18 pairs of whitethroats
- 14 pairs of dunnocks
- 4+ pairs of reed buntings, 4 pairs of swallows and 2 pairs of green woodpecker
- 1 pair each of bullfinch, stock dove and tawny owl

In total I recorded 74 species across the area in 2016, and 82 over the five years of the study, along with good populations of brown hare and other mammals, plants, butterflies and other invertebrates. Full details of my survey of the area are contained in Appendix 1: Meed, J (2016) *The value of the green belt south of Cambridge to populations of farmland birds: Interim report of a survey of grid square TL4654* (2016).

Over the last three years the wider area has supported winter populations of 80–90 grey partridge. Full details are in Appendix 2: Meed, J (2016) *The Grey Partridges of Nine Wells: Interim report for 2016*.

My detailed research raises some important issues with the *Phase 3 Cambridge Bio-Medical Campus: Ecological Appraisal* submitted by South Cambridgeshire District Council.

Firstly, the main methodology used was the Phase 1 Habitat Survey. This methodology, while useful for giving a picture of the surrounding vegetation and wildlife habitats, is not designed to give any significant data on bird species. The report itself states that only ‘Incidental records of bird species encountered during the Phase 1 habitat survey were recorded’ (3.1.2). This means that, while the appraisal provided data for the hedgerows adjoining the field which are not directly at risk from the proposed development, it provided extremely limited data for the field itself at the centre of the proposal.

Secondly, while the appraisal acknowledges that the field 'supports a farmland bird assemblage' (Paragraph 5.23) it gave a misleading description of the species concerned as 'common to fairly common but declining species'. This runs counter to the normally accepted definition of red list birds as being species 'of high conservation concern' which have suffered a 'severe decline' in the UK. (Eaton et al (2015) 'Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man'. *British Birds* 108, 708–746)

Thirdly, the references to my research are selective, and misleadingly so. Paragraph 5.23 makes no reference to the corn bunting and grey partridge, both ground-nesting species which as we have seen have declined by over 90% in recent decades. Yet this one field supports breeding pairs of both species.

Fourthly, the appraisal makes some unfounded assertions. In particular:

- The statement in 5.25 that 'the mosaic of new habitats proposed within the site are also considered to offer further nesting opportunities for cuckoo, linnet and yellowhammer' sounds highly optimistic and is not backed up by concrete evidence. And there is no mention of corn bunting, grey partridge or skylark for which such minor changes would be of no value whatsoever.
- Above all the statement in 5.24 that that 'the continued availability of further arable habitats within the wider landscape' will mitigate loss of the field provides no evidence of how this will happen. While it is true that the field forms part of an important web of habitats around Nine Wells, the other fields already hold good populations and significant research would be needed to gauge whether they would support a further increase. The fields the other side of Granhams Road provide rather less habitat diversity and again research would be needed to support the assertion that displaced birds could move there.

By the time all this is translated into the *Covering letter from Carter Jonas* (Part 1 of Appendix E), it has been boiled down to a quite remarkably bland and unfounded assertions that the site represents 'arable habitat of generally low ecological value'; that the development will have 'minor adverse impact ... on local farmland birds'; and that 'residual effects due to displacement are not considered to be significant'. These assertions are repeated in Appendix F: *Land south of the Cambridge Biomedical Campus Council's Assessment of Evidence Policy E1/B*.

These conclusions are highly questionable: my own research for the BTO and RSPB elsewhere in the county underlines that it is rare to find similarly valuable habitats. Populations compare favourably also with other larger studies. For example, with little or no specific management for grey partridge the arable farms typical of Cambridgeshire support between 0 and 5 pairs/km² and 0–20 birds/km² in the autumn. The Nine Wells population is several times greater than this. Only with high levels of management aimed at the species such as full-time game keeping do numbers approach those around Nine Wells.

Question (i): Could the exceptional circumstances necessary to release land from the green belt be demonstrated in relation to the campus extension development? (Answer: No)

The evidence I have set out in answer to Question (ii) demonstrates that the field in question forms a valuable part of the green belt, supporting the purpose of assisting 'in safeguarding the countryside from encroachment'. And, not surprisingly, the 2012 *Inner Green Belt Boundary Study* from both councils, which included the field in question in Sector 10, Area 2, rated the area as 'high' against all criteria, and overall as of 'very high' significance with 'very distinctive character and setting susceptible to relatively small change'; it also identified the view across the field as a 'minor view'.

Despite this the councils felt obliged to commission a further *Inner Green Belt Review* in 2015 at which they looked again at Area 10.2. Once again, however, Paragraph 0.6.1 states that:

South-east of the city, the rising land of the Gog Magog Hills is a distinctive element of the setting of Cambridge, and is visible in views from within and across the city. The foothills extend to the urban edge in places; elsewhere, *flatter land at the foot of the hills is also important as the foreground to the city in views from the elevated land.* (My italics)

There is an important internal contradiction as the *Review* (6.13.5) states that 'open rural land would be retained at the foot of the hills' but also that 'land released from Green Belt should be restricted to the relatively flat ground'. The field in question is precisely the 'open rural land ... at the foot of the hills' as White Hill rises immediately from the other side of the southern hedge as is clearly shown by the contour lines in the map provided by the *Review*.

There is a further inconsistency in the *Review*. Whereas in the 2012 *Boundary Study* Area 10.2 of the green belt extended right up to the railway line and the cycle track, this corner has been omitted in the *Review*, conveniently allowing the statement that 'land released along the northern edge of sub area 10.2 should extend no further from the existing Green Belt boundary than the northern corner of sub area 10.3'. However in the joint councils' *Development Strategy Update* (November 2015 – which refers to the *Review* and was presumably prepared after it) the corner is still marked as green belt in Figure 2: Key diagram for Cambridge and South Cambridgeshire.

So how does the council seek to justify 'the exceptional circumstances necessary to release land from the green belt'? When one reads *Appendix A: Further Proposed Modifications to the South Cambridgeshire Local Plan*, one simply finds 'employment allocations for the expansion of the Cambridge Biomedical Campus' (Para 2.44) which is barely extended by the equally non-specific wording 'for biomedical and biotechnology research and development' (new policy E/1B). *Appendix A* even acknowledges that 'there is no overall shortage of employment land within South Cambridgeshire' but contentiously suggests that it 'considers that the need for jobs can comprise exceptional circumstances' (new policy E/1B). Following the council meeting that approved the release (by a remarkably narrow margin) Robert Turner, the council's cabinet member for planning, said: 'It is good news that we have been able to support releasing land to help the Biomedical Campus expand in the future *if needed.*' Clearly, the 'exceptional circumstances' do not exist.

John Meed 22/11/2016

Appendix 1 (SC7A.3)

Respondent number: 25199

The value of the green belt south of Addenbrookes, Cambridge to populations of farmland birds (2016)

Interim report of a survey of grid square TL4654

John Meed, November 2016



Introduction

For the last five years I have surveyed breeding populations of farmland birds on a square kilometre of green belt south of Addenbrooke's Hospital in Cambridge (grid reference TL4654), to assess the levels of the biodiversity of an area close to the city.

The area studied is largely arable land, with 2.5km of mature hedgerows, 1km of streams / ditches, and 4+ha of scrub and woodland, including the Nine Wells nature reserve (right). It includes a cycle path and footpath, and sensitive land management has created several permissive footpaths, flower-rich field margins and additional woodland (see Appendix 1). It is widely used by walkers, cyclists, families and dog owners.



Why do farmland birds matter?

Farmland birds have suffered major declines in recent decades.

- Grey partridge declined by 92% between 1970 and 2013 and corn bunting (right) by 90% while yellow wagtail declined by 67%, skylark and linnet by 60%, and yellowhammer by 55% (1).
- Farmland birds are indicators for the UK Government Sustainable Development Strategy (2) and 9 of the 18 indicator species are 'red list' birds of 'high conservation concern' (3).
- The city council's local plan identifies skylark (and brown hare) as 'priority species'.



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 2016* report (4) states that 'the indicator of butterfly species of the wider countryside has declined by 41% since 1976'.

Methodology

I monitored the area throughout 2016, using a combination of methods. I adopted the British Trust for Ornithology (BTO) 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 19, June 14 and June 29

I carried out 27 further visits over the year. Between April and July I built up 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 focused on other areas in the square and on specific breeding signs such as singing males, territorial behaviour and calls, courtship displays, nest building and juvenile birds. I also visited the site regularly in the early spring, autumn and winter, monitoring winter flocks and in particular grey partridge populations.

Findings

Appendices 2 – 4 show the 74 species recorded on the three transect walks and other visits:

- On the first transect walk: 30 species and 212 individuals
- On the second transect walk: 34 species and 186 individuals
- On the third transect walk: 31 species and 190 individuals



The 74 species recorded included 16 of the 18 farmland bird indicator species for the Sustainable Development Strategy, of which 14 are breeding (Appendix 5). In total I recorded 16 red list species and 24 amber list species as follows:

Breeding red list species (10)	Breeding amber list species (8)
<ul style="list-style-type: none"> • 33 pairs of skylarks • 17 pairs of linnets • 15 pairs of grey partridge • 14 pairs of yellowhammers (above) • 6–7 pairs of corn buntings • 2 pairs of starlings • 2 pairs each of song and mistle thrush • 1–2 pairs yellow wagtails • 1 cuckoo <p>Red list visitors include lapwing, herring gull and in winter merlin, fieldfare, redwing and whinchat.</p>	<ul style="list-style-type: none"> • 18 pairs of whitethroats • 14 pairs of dunnocks • 4+ pairs of reed buntings, 4 pairs of swallows and 2 pairs green woodpecker • 1 pair each of bullfinch, stock dove and tawny owl • Kestrels, swifts and house martins nest nearby and visit regularly <p>Amber list visitors include common tern, mallard, marsh harrier, mute swan, red kite, redstart, black-headed, great and lesser black-backed gull and in winter little egret, kingfisher, golden plover and meadow pipit</p>

Grey partridge

Grey partridge numbers remain remarkably high.

- Autumn counts towards the end of 2015 had shown at least 85 birds present.
- Pairs began to form in late January and at least 14 or 15 pairs formed.
- Autumn counts in late 2016 showed around 88 birds present, in at least 10 coveys.



Despite the continued high numbers, the development of the Biomedical Campus is starting to have an impact. Two of the pairs were on land since developed (Field 0 in Appendix 4) and it is highly unlikely they were able to rear young successfully. In autumn there was significant disturbance of Field 1 and I recorded no partridge there after October 17th.

Nonetheless the counts remain exceptional compared to other studies which suggest that the arable farms typical of Cambridgeshire support between 0–5 pairs/km² in spring and 0–20 birds/km² in the autumn. Only with high levels of management aimed at the species do numbers approach those on the Nine Wells site. For example, on the GWCT's Grey Partridge Demonstration Project near Royston the density of grey partridge pairs rose from under 3 pairs/km² before management to around 15 pairs/km², while autumn densities increased from 8 birds/km² before management to around 80 birds/km² (7).

Several aspects of the habitat may help to explain the success of grey partridge around Nine Wells. The birds feed at dawn and dusk in open fields, but need suitable cover during the day and the Nine Wells nature reserve together with the hedge, margin and copses running north-west from the reserve appear ideal. Grassy margins such as that running north from the reserve also provide food for chicks while autumn stubbles provide foraging for the coveys. Recent mild winters have also helped.

Skylark

Skylark populations (right), with at least 33 breeding pairs, show an increase on last year (8) that may simply be due to better recording. Skylark are mainly seen in song flight and so numbers are estimated on singing males observed (greatest on June 7th). This population density is higher than the mean recorded for similar crops in the BTO's skylark survey (9). Winter flocks regularly numbered 15+ birds.



Yellowhammer

Yellowhammer populations, at around 14 breeding pairs, are slightly higher than last year. This represents over 4 pairs per km of hedgerow, which compares well with populations found by Bradbury et al (10). Densities were highest in the hedges close to Nine Wells and along Granhams Road. The most birds recorded on one occasion was 15, on March 10th. Winter flocks were also present.



Linnet

The **linnet** population increased to at least 17 pairs; linnets are less territorial and more communal than some other species (11) so this estimate is based on the number of regularly used song posts; from April onwards I regularly recorded 20 birds, with 35 on April 21st and 33 on June 29th. In the autumn there were flocks of up to 80 birds.

Corn bunting

6–7 pairs of corn bunting bred, twice the number of the previous year. It seems likely that young birds from 2015 survived the winter to breed. This is an important population – there are just 11,000 birds in the UK and its recent extinction in Ireland risks being repeated in large parts of Britain if its breeding sites are not protected. The RSPB's Hope Farm had 2 pairs in 2011 in almost 2km² (12). Corn bunting also joined winter mixed flocks.

Yellow wagtail

1–2 pairs of **yellow wagtail** (right) were also present, though I did not have definite evidence of successful breeding.



Other red list species

For the first time I recorded a pair of **cuckoo**, with the female laying eggs on one occasion.

At least two pairs of **starlings** bred; large flocks were present in the autumn with several hundred on November 14th. Two pairs of **song thrush** and **mistle thrush** also bred. **Lapwing** continued to feed and display in the area, but do not breed on the site. **Herring gull** visit regularly and **fieldfare** and **redwing** in the winter. I recorded migrating **common redstart** twice in the spring, **whinchat** on three occasions in the autumn, and one **merlin** in January.

Amber list species

For the amber list farmland bird indicator species present:

- **Whitethroat** populations, with 18 breeding pairs, are significantly higher than last year. Densities were highest along the hedges around Nine Wells and in the hedges along Granham's Road. The most birds on one occasion was 20, on May 9th.
- Around 14 pairs of **duncock** bred. The increase compared to last year in probably the result of better recording.
- **Reed bunting** (right) did well with at least 4 pairs, compared to 1 in recent years. A pair of **stock dove** also breed.
- **Kestrel** are present and breed nearby. A nest box has been erected on the edge of Nine Wells.



Other notable amber list breeding species include bullfinch, green woodpecker and swallow. In winter the site provides habitat for meadow pipit while the water courses are used by little egret, kingfisher and snipe. I recorded flocks of up to 80 golden plover. Mallard, mute swan, red kite, black-headed, great and lesser black-backed gull also visit.

Green list species

The remaining **green list indicator species** are all present as well as breeding lesser whitethroat, greater-spotted woodpecker, pied wagtail (with flocks of up to 15 in the autumn) and moorhen. Buzzards bred in the woods on White Hill. Wheatear stopped to feed during their autumn migration.

The habitat survey showed:

- 10 mature, species rich hedgerows with thick growth and good variety
- 2 important watercourses and extensive grassy and flower-rich margins
- 3 small areas of scrub and woodland, plus the Nine Wells nature reserve.

The area also supports:

- regular counts of 20+ brown hare, a city council 'priority species'; Hutchings and Harris (13) recorded 7.12 hares/km² on arable land
- muntjac and roe deer, badger, fox, stoat, rabbit, bank vole and wood mouse (right)
- good populations of butterflies including small tortoiseshell, speckled wood, red admiral, ringlet, peacock, small white, orange tip, holly blue, brimstone, common blue, comma and other invertebrates
- good populations of threatened arable flowers, including chamomile, cornflower, fumitory, mallow, poppy, speedwell and viper's bugloss.



Conclusions

- 1 The green belt arable land immediately south of the Addenbrooke's site (grid reference TL4654) continues to support important breeding populations of farmland birds. Populations compare favourably both with other larger studies, and with the other areas I survey further from the city. The area also includes important populations of mammals, plants, butterflies and other invertebrates.
- 2 In particular, the population of grey partridge (a species that has declined by 90% since 1970) is quite exceptional and the site may well be among the best in Cambridgeshire for this species.
- 3 Habitat variety and sympathetic land-management contribute to the richness of the area. The combination of arable crops with margins and areas of bare earth benefit grey partridge, skylark, corn bunting and yellow wagtail; the ditches benefit yellowhammer and reed bunting while hedges are well used by linnet, yellowhammer, whitethroat and dunnock, and by grey partridge for cover. In particular, the hedge, margin and copses running north-west from the Nine Wells nature reserve provide excellent habitat for grey partridge, linnet and yellowhammer and must be conserved.
- 4 Development of Addenbrooke's is now having a significant impact. Development of Field 0, probably preventing breeding of grey partridge and skylark there. Disturbance in Field 1 is already affecting these species and is likely to reduce breeding sites for yellowhammer (right), corn bunting and yellow wagtail. Proposed development of Field 2 would have a further detrimental effect on populations.
- 5 The area provides an important green space and area for walking, cycling and relaxation for local residents who are clearly able to co-exist with nature; the land also forms part of that covered by the Gog Magog Countryside Project proposed in the Cambridgeshire Green Infrastructure Strategy.



John Meed, November 2016

References

- 1 Hayhow D B, Bond A L, Eaton M A, Grice P V, Hall C, Hall J, Harris S J, Hearn R D, Holt C A, Noble D G, Stroud D A and Wotton S (2015) *The state of the UK's birds 2015*. RSPB, BTO, WWT, JNCC, NE, NIEA, NRW and SNH
- 2 HMSO (2005) *Securing the Future: Delivering UK Sustainable Development Strategy*, London, The Stationery Office
- 3 Eaton M A, Aebischer N J, Brown A F, Hearn R D, Lock, L, Musgrove A J, Noble D G, Stroud D A and Gregory R D (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. *British Birds* 108, 708–746
- 4 Hayhow DB, Burns F, Eaton MA, Al Fulaij N, August TA, Babey L, Bacon L, Bingham C, Boswell J, Boughey KL, Brereton T, Brookman E, Brooks DR, Bullock DJ, Burke O, Collis M, Corbet L, Cornish N, De Massimi S, Densham J, Dunn E, Elliott S, Gent T, Godber J, Hamilton S, Havery S, Hawkins S, Henney J, Holmes K, Hutchinson N, Isaac NJB, Johns D, Macadam CR, Mathews F, Nicolet P, Noble DG, Outhwaite CL, Powney GD, Richardson P, Roy DB, Sims D, Smart S, Stevenson K, Stroud RA, Walker KJ, Webb JR, Webb TJ, Wynde R and Gregory RD (2016) *State of Nature 2016*. The State of Nature partnership
- 5 BTO/JNCC/RSPB (2015) *Breeding Bird Survey Instructions*
- 6 RSPB (2012) *RSPB Volunteer and Farmer Alliance Training Manual*
- 7 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 RSPB's Hope Farm Project, also nearby, recorded no grey partridge prior to management. Following management changes the population rose to 3 pairs/km² in 2011. The largest UK partridge study, the Sussex Study, recorded under 2 pairs/km² with typically 5 birds/km² 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/km² by 2008 with around 20 breeding pairs/km² by 2014.)
- 8 Meed, John (2015) *The value of the green belt south of Cambridge to populations of farmland birds: Report of a survey of grid square TL4654 (2015)*, www.johnmeed.net
- 9 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 (Density for spring cereals: just over 12 per km²; for root crops was under 10. The RSPB's Hope Farm skylark density was 6 per km² before management and 23 per km² after management – see 12 below)
- 10 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 km² of hedgerow, and two thirds of hedges surveyed in 1997 held fewer than 2 pairs per km². The RSPB's Hope Farm density was 8 before and 18 per km² after management)
- 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 was 3 before and 14 per km² after management)
- 12 RSPB (2012) *Hope Farm: Farming for Food and Wildlife*, RSPB. (The Hope Farm before and after management figures provide useful comparisons but it is important to recognise that the Hope Farm bird-friendly management measures are much more extensive than those on the Nine Wells site.)
- 13 Hutchings, M.R. and Harris, S., (1996), *The current status of the brown hare (Lepus europaeus) in Britain* (out of print)

Appendix 1: The area covered



Looking towards White Hill



Nine wells from White Hill



Mature hedge and permissive path



Cycle path and flower-rich margin



Grey partridge on Field 2, autumn 2016



Yellowhammer on Field 2 ditch, spring 2016

Appendix 2: Species recorded on visits

This list shows the 74 species recorded during the year, organised in order of **red list** birds of high conservation concern, **amber list** birds of medium conservation concern, and **green list** species (overleaf) which are of less conservation concern.

Species	1 st transect	2 nd transect	3 rd transect	Other visits	Estimated pairs
Corn bunting	3	4	6	x	6-7
Cuckoo				x	1
Fieldfare				x	-
Grey partridge	12	2	2	x	15
Herring gull	1			x	-
Lapwing				x	-
Linnet	19	11	33	x	17
Merlin				x	-
Mistle thrush		1		x	2
Redwing				x	-
Skylark	26	25	14	x	33
Song thrush	1	1	2	x	2
Starling	1	1		x	2
Whinchat				x	-
Yellowhammer	12	6	13	x	14
Yellow wagtail		1		x	1-2
Black-headed gull				x	-
Bullfinch		1		x	1
Common redstart				x	-
Common tern			2	x	-
Duncock	6	2	5	x	14
Golden plover				x	-
Green woodpecker	1		1		2
Great b-b gull				x	-
House martin		8	4	x	-
Kestrel		1	1	x	-
Kingfisher				x	-
Lesser b-b gull				x	-
Little egret				x	-
Mallard	4	2		x	-
Marsh harrier				x	-
Meadow pipit				x	-
Mute swan				x	-
Red kite				x	-
Reed bunting	4	2	1	x	4+
Stock dove	6			x	1
Swallow		2	4	x	4
Swift		4	1	x	-
Tawny owl	6			x	1
Whitethroat		10	8	x	18

Species	1 st transect	2 nd transect	3 rd transect	Other visits	Estimated pairs
Blackbird	10	8	4	x	8
Blackcap	3	4	1	x	5
Blue tit	9	7	8	x	5
Buzzard		1	1	x	1
Canada goose				x	–
Carrion crow	6	3		x	Not counted
Chaffinch	2	2	1	x	3
Chiffchaff	3	2	3	x	3
Cormorant				x	–
Egyptian goose				x	–
Feral pigeon				x	–
Goldcrest				x	1
Goldfinch	1		8	x	2
Gt-sp woodpecker				x	1
Great tit	6		6	x	4
Greenfinch	4	7	6	x	4
Grey heron				x	–
Greylag goose	1			x	–
Jackdaw	4			x	Not counted
Jay		1	1	x	1
Lesser whitethroat	1	1		x	4
Long-tailed tit	4	1	2	x	4
Magpie	8	3	1	x	Not counted
Moorhen				x	1
Pheasant		1		x	1+
Pied wagtail				x	1+
R-L partridge				x	2+
Robin	11	5	7	x	10
Rook	10	4	3	x	Not counted
Sedge warbler				x	–
Sparrowhawk				x	–
Wheatear				x	–
Wood pigeon	26	46	33	x	Not counted
Wren	8	7	8	x	10

Species recorded in other years include **common gull**, **snipe**, **coal tit**, **collared dove**, **hobby**, **reed warbler**, **peregrine falcon** and **siskin**, to give a total of 82 species recorded on the site over the last five years.

Appendix 3: Evidence of breeding populations

This table shows breeding signs recorded for the red and amber list species on the site:

Species	Estimated pairs*	Breeding signs
Skylark	33 (22)	Singing males; pairs; fledged young
Yellowhammer	14 (11)	Singing males; pairs; nest sites; fledged young
Linnet	17 (15)	Singing males; pairs; nest sites; fledged young
Grey partridge	15 (13)	Courtship behaviour; pairs; fledged young
Corn bunting	6–7 (3)	Singing males; pairs; fledged young
Yellow wagtail	1–2 (1)	Singing males; probable nest sites
Cuckoo	1 (0)	Pair; egg laying
Mistle thrush	2 (2)	Singing males; pairs
Song thrush	2 (2)	Singing males; pairs; fledged young
Starling	2 (2)	Pairs; nest sites; fledged young
Whitethroat	18 (10)	Singing males; pairs; nest sites; fledged young
Dunnock	14 (8)	Singing males; pairs; nest sites; fledged young
Green woodpecker	2 (2)	Pairs
Reed bunting	4+ (1)	Singing males; pairs; nest sites; fledged young
Stock dove	1 (1)	Pair
Swallow	4 (3)	Singing males; pairs; nest sites; fledged young
Bullfinch	1 (1)	Pair
Tawny owl	1 (1)	Calling male

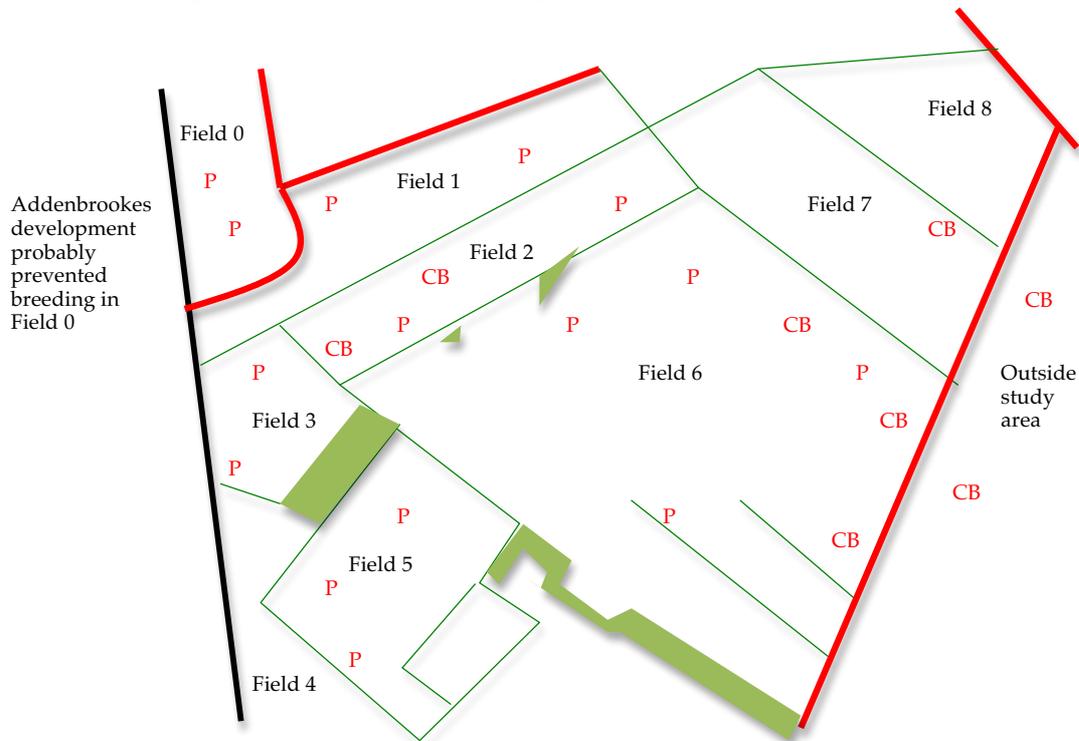
* Figures in brackets show estimates for 2015

For other red and amber species: no breeding signs were observed for **herring gull**, **lapwing**, **black-headed gull**, **kestrel**, **house martin**, **swift**, **mallard**, **marsh harrier** and **mute swan**: these species visit to feed. The **red kite**, **common tern** and **lesser-black-backed gull** were flying over. The **whinchat** and **merlin** and **redstart** were on passage. The **fieldfare**, **redwing**, **little egret**, **kingfisher**, **golden plover**, **great-black-backed gull** and **meadow pipit** were winter visitors, all using the site to feed.

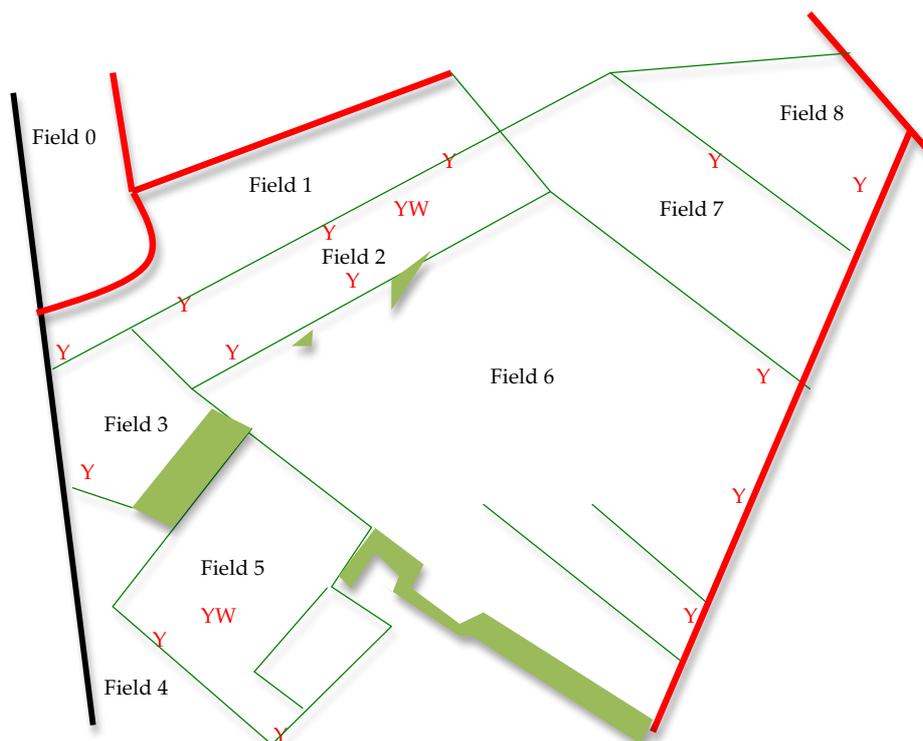
Appendix 4: Maps showing breeding pairs

These maps show estimated breeding pairs in 2016 of the 10 red- or amber-listed farmland bird indicator species breeding in the one kilometre square:

Grey partridge (P) and corn bunting (CB)



Yellowhammer (Y) and yellow wagtail (YW)



Appendix 5: Farmland bird indicator species

This table shows the 18 species on the UK Farmland Bird Indicator; the per cent change shows their population trends for the period 1970-2013:

Species	Present?	Breeding?	Per cent change*
Turtle dove	–	–	-97%
Grey partridge	☒	☒	-92%
Corn bunting	☒	☒	-90%
Tree sparrow	–	–	-90%
Starling	☒	☒	-81%
Yellow wagtail	☒	☒	-67%
Linnet	☒	☒	-60%
Skylark	☒	☒	-60%
Yellowhammer	☒	☒	-55%
Kestrel	☒	–	-52%
Reed bunting	☒	☒	-38%
Greenfinch	☒	☒	-33%
Whitethroat	☒	☒	+12%
Stock dove	☒	☒	+102%
Goldfinch	☒	☒	+146%
Woodpigeon	☒	☒	+126%
Jackdaw	☒	☒	+146%
Rook	☒	–	n/a

Skylark is also a priority species in Policy 70 of the Cambridge Local Plan

- Source: Hayhow D B, Bond A L, Eaton M A, Grice P V, Hall C, Hall J, Harris S J, Hearn R D, Holt C A, Noble D G, Stroud D A and Wotton S (2015) *The state of the UK's birds 2015*. RSPB, BTO, WWT, JNCC, NE, NIEA, NRW and SNH

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Appendix 2 (SC7A.3)

Respondent number: 25199

The grey partridges of Nine Wells

A five-year study of a square kilometre of arable land south of Addenbrooke's Hospital in Cambridge

Interim report for 2016

John Meed, November 2016



Introduction

Grey partridge populations are a cause of great concern. According to British Trust for Ornithology (BTO) records grey partridge numbers in the UK fell by 92% between 1967 and 2013. The Game and Wildlife Conservation Trust (GWCT) estimate that there are now just 43,000 breeding pairs in the UK – a dramatic decline from the 1 million pairs in 1911 (1). Should this trend continue the species may risk extinction in parts of the country.



This report describes a study of grey partridge populations in a square kilometre of green belt south of Addenbrooke's Hospital in Cambridge (grid reference TL4654). The area studied is bounded by the hospital to the north, the railway line to the west, Granham's Road to the west and the paddocks of White Hill Farm to the south (see Figure 1).

The area is largely arable land, with 2.5km of mature hedgerows, 1km of streams/ditches, and 4+ha of scrub and woodland, including the Nine Wells nature reserve. It includes a cycle path and footpath, and sensitive land management has created several permissive footpaths, flower-rich field margins and new woodland (2).

Methodology

I have studied the grey partridge of the area over the last five years, drawing on my experience of ecological surveying on behalf of both the British Trust for Ornithology (BTO) and the Royal Society for the Protection of Birds (RSPB). I use a combination of three methods:

- In the breeding season survey I use the BTO Breeding Bird Survey methodology, 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.
- I also carry out further visits between April and July to build up a more accurate picture of the number of breeding pairs, using the methodology of the RSPB Volunteer and Farmer Alliance. In these visits I focus on other areas in the square and on specific breeding signs such as singing males, territorial behaviour and calls, courtship displays, nest building and juvenile birds.
- Since 2014 I have also been conducting stubble counts during the autumn and winter, a methodology developed by the GWCT.

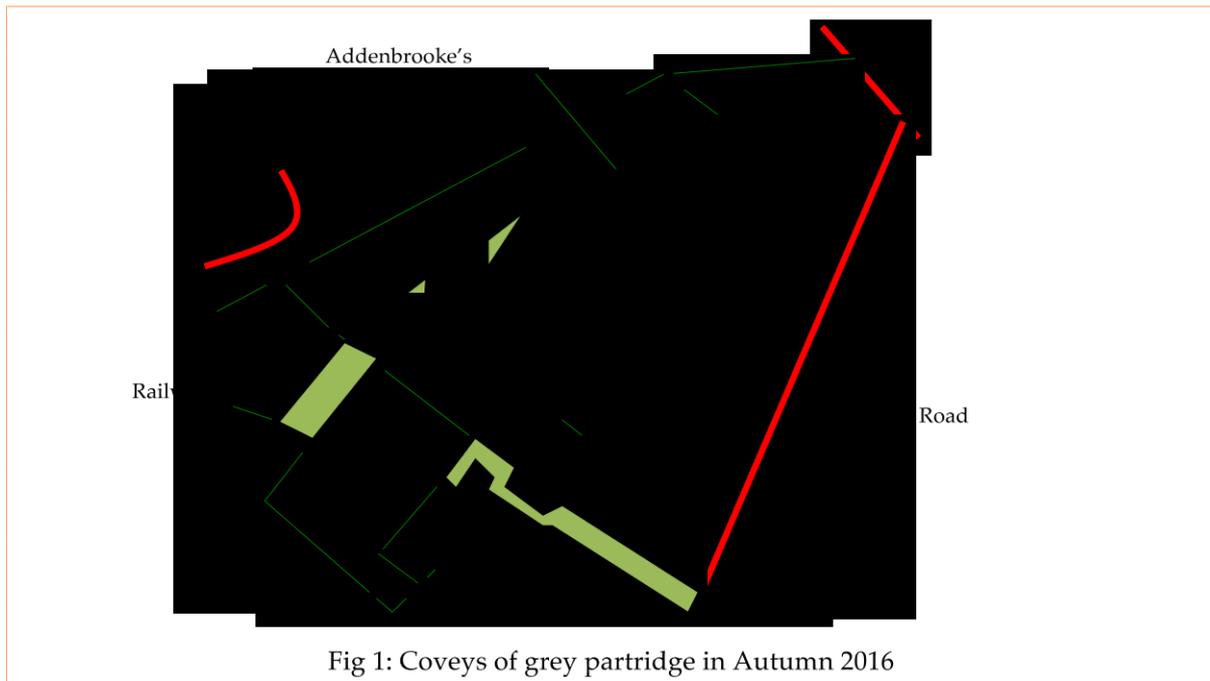
Typically I visit the area around 30 times a year.

Findings

Autumn and winter coveys

Grey partridge have large broods and in the autumn families form groups known as 'coveys'. My stubble counts have shown that:

- Towards the end of 2014 around 90 birds were present in at least 9 coveys. There were 4 coveys of 8, 11, 12 and 13 regularly present in Field 2, 2 coveys of 7 and 16 in Field 6, 1 covey of 9 in Field 5, 1 of 4 in Field 4 and 1 of 12 in Fields 7/8.
- In late 2015 at least 85 birds were present, and probably 93, with 11 coveys and 2 additional pairs. There were 4 coveys of 6, 8, 10 and 12 plus 1 pair in Field 2, 4 coveys of 5, 6, 8 and 10 in Field 6, 2 coveys in Field 0, 1 in Fields 7/8 and a pair in Field
- Towards the end of 2016 at least 88 birds were present in at least 10 coveys. 4 coveys of 4, 8, 10 and 14 used Field 2, 4 coveys of 2, 3, 8 and 14 used Field 4, and 2 coveys of 11 and 14 used Field 6. There was some movement of coveys between Fields 1, 2 and 6, indicated by the grey arrows in Figure 1:



This table shows the particular importance of Fields 2 and 6 for winter coveys.

	2014	2015	2016
Coveys using Field 2	8+11+12+13 = 44	2+6+8+10+12 = 38	4+8+10+14 = 36
Coveys using Field 6	7+16 = 23	5+6+8+10 = 29	11+14 = 25

This picture shows one of the Field 2 coveys:



Covey behaviour

Some coveys appear to be more mobile than others whether as a result of changes in land use, or as a result of disturbance:

- In 2015 the birds showed a distinct preference for stubbles, and when these were ploughed they tended to move to an adjoining field. For example, following ploughing in October, the covey of 11 from Field 8 moved to Field 7. By contrast Field 0 was in effect grass ley awaiting Addenbrookes development. The two coveys moved very little throughout the autumn. The covey of 7 is pictured below.
- In 2016 only Field 4 remained unploughed through the autumn, and the coveys here moved very little. There was rather more movement of coveys between Fields 1, 2 and 6, with September coveys in Field 1 moving to Field 2 after ploughing. However one Field 6 covey remained in much the same spot throughout the autumn (between winter wheat and sugar beet) and was joined by others which appeared to like the habitat.



Partridge generally feed in the early morning and in the time before dusk, probably to avoid predation. They roost during the day in areas of longer grass, hedge bottoms or areas of new tree planting, notably around the hedge between Fields 2 and 6, and that between Fields 4 and 5. They emerge in the hour or so before dark; some emerge later than others. When feeding one or two birds typically keep watch for predators while the rest of the covey eats.

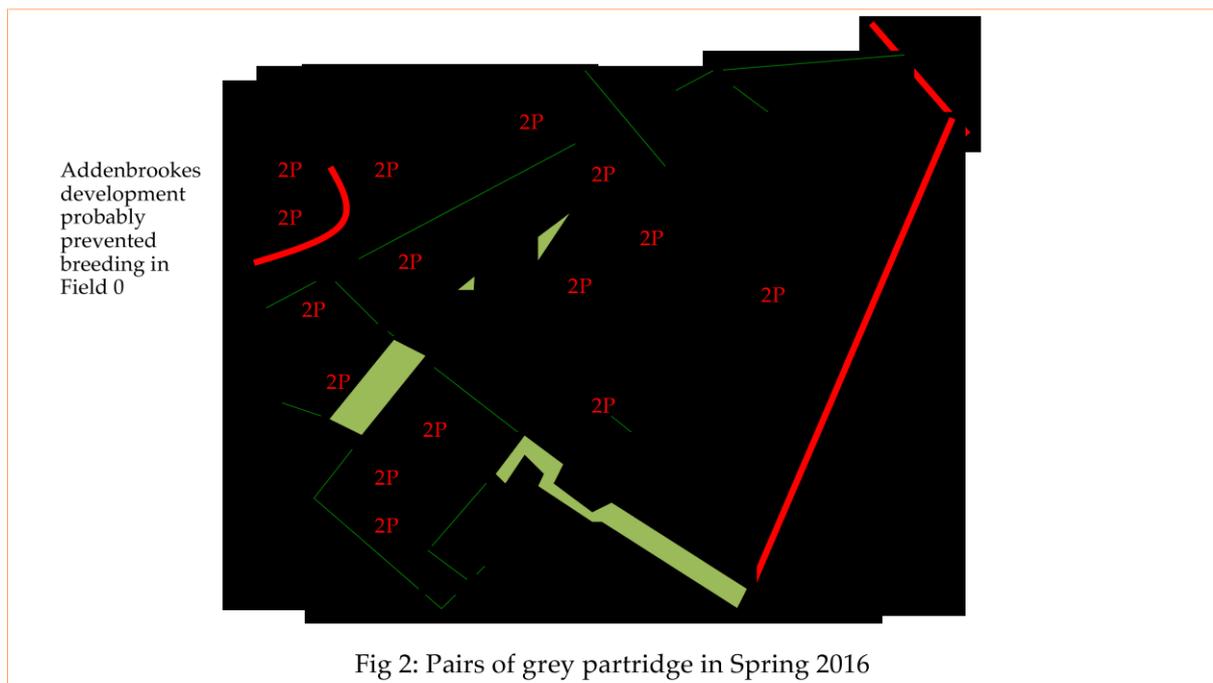
There was often interaction between coveys – normally calling, but sometimes two coveys would move closer together and may even intermingle. The weather appears to influence partridge behaviour, and I generally recorded fewer birds on windy or wet days.

Through the autumns there appeared to be little loss from predators. Although from mid November onwards I often record fewer birds, I have the impression that this is because some coveys change their habits or location, rather than a reduction in the size of coveys. Nonetheless I generally recorded fewer birds across the site after spring pairing than during the previous autumn – I am unclear as to whether this results from predation or dispersal.

Spring pairs

Pairs begin to form in late January or early February. This change leads to some territorial behaviour and a spreading out of the pairs.

- In spring 2014 at least 12 pairs were present; on February 10 I recorded 4 pairs each in Fields 1 and 6, and 2 pairs each in Fields 2 and 5.
- In spring 2015 at least 13 pairs were present; on March 20 I recorded 8 pairs in Field 6, with the 5 other pairs spread across Fields 1, 2, 5 and 7.
- In spring 2016 at least 15 pairs were present; on February 11 I recorded 9 pairs in Field 1, 3 pairs in Field 6, and 2 pairs in Field 0. However the development of this field for the Biomedical campus almost certainly means that they were unable to rear young successfully. Figure 2 shows the pairs in spring 2016:



As the spring develops and crop cover increases the pairs become more discrete. From late March to early September I usually record 2–3 birds on my visits.

Discussion

My records show that the square km south of Addenbrookes has regularly supported a partridge population of at least 12–15 spring pairs and 85–90 autumn individuals.

To put this in context it is possible to compare with other studies of the species, for example:

- The RSPB's Hope Farm Project, on the other side of Cambridge, recorded no grey partridge prior to management. Following management changes the Hope Farm population rose to around 3 pairs/km² in 2011 (there were 5 pairs across an area of 1.8km²). The management measures included winter stubbles and seed-bearing cover

crops for winter food; field margins to provide insect food for chicks in the summer; and reduced pesticide usage. (3)

- On the GWCT's Grey Partridge Demonstration Project near Royston the density of grey partridge pairs rose from under 3 pairs/km² before management to around 15 pairs/km², while autumn densities increased from 8 birds/km² before management to around 80 birds/km² (7). The management measures included game keeping, predator control, set-aside strips for brood rearing and overwinter cover. (4)
- The largest UK partridge study, the Sussex Study, provides valuable data on population densities. From 2003, major changes in management including game keeping, predator control, winter stubbles, beetle banks, wild bird cover and conservation headlands were introduced to one part of the study area and compared to the other parts of the area which remained conventionally farmed (5). The managed area saw an increase in autumn densities from 1.2 birds/km² in 2003 to 64 birds/km² in 2008 and around 200 birds/km² in 2015 while in other areas there were around 5 birds/km² throughout the period (6). Breeding density increased from 5.2 pairs/km² in 2004 to 20.1 in 2010 while on other areas the equivalent densities were 0.9 pairs/km² in 2004 and 2.4 in 2010 (7).
- The latest Partridge Count Scheme from GWCT suggests that in 2014 spring pair density was 3.4 pairs/km² and autumn densities were 19.9 birds/km². Figures were slightly higher in Eastern England at 5 pairs and 22.2 autumn birds. GWCT members would generally take some measures to support game bird populations including feeding (8).

To summarise these figures; with little or no specific management the arable farms typical of Cambridgeshire support between 0 and 5 pairs/km² and 0–20 birds/km² in the autumn. The Nine Wells population is several times greater than this. Only with high levels of management aimed at the species do numbers approach those around Nine Wells.

Factors affecting the success of grey partridge

The grey partridge has been researched extensively. The GWCT (9) suggest that the several measures can help with partridge survival:

- **A safe place to nest in tussocky grass** in hedge banks, beetle banks and set-aside strips. On the Nine Wells site there are good areas of tussocky grass in hedge banks, grassy strips and areas of new tree planting, notably around the hedge between Fields 2 and 6. Trumpington Farm Company entered higher level stewardship in 2009 and the agreement included woodland and hedge management.
- **Insect food for chicks** in set-aside strips, conservation headlands, reduced pesticide use. On the Nine Wells site the same areas are likely to provide insect food in the summer. There are also several margins and strips in Field 6 and along the cycle path.
- **Food and cover for winter and spring survival** in stubbles, seed-bearing crops and feeders. On the Nine Wells site areas of stubble remain into November and as we have seen these areas often see the greatest concentration of autumn coveys. The hedges, new woodland and margins provide cover, as do the scrubby areas of the Nine Wells nature reserve and patches of woodland south of Field 2.

Dick Potts (10) argues that in addition **game keeping and predator control** can help partridge numbers increase, a view shared by Aebischer and Ewald (11). The Nine Wells site is not managed for shooting and although there is occasional control of woodpigeons I am not aware of formal predator control. Potts points out that key nest predators include corvids and foxes, as well as stoat, rat and badger, and all are well represented on the site, with at least one fox and several pairs of magpie and carrion crow. Sparrow hawk and buzzard, and occasionally peregrine and red kite, also hunt the area. It is possible that the good areas of cover help reduce predation.

It is likely that three **mild winters** have also helped survival rates.



The area is widely used by walkers, cyclists, families and dog owners and this does not seem to disturb unduly the partridges which usually squat down to make themselves less visible or walk or run further away from pedestrians – even when dogs run across stubble fields it is quite unusual for the birds to fly off. The grey partridge appear to have adapted to the presence of people who may even on occasion discourage predators.

The area also supports pheasant and red-legged partridge, but these are much less numerous than the grey partridge. The maximum numbers recorded were 3 pheasant and 16 or so red-legged partridge. At least twice I have seen grey partridge mingle with red-legged coveys.

Conclusions

In conclusion:

- 1 The square kilometre of green belt arable land immediately south of the Addenbrooke's site (grid reference TL4654) supports an exceptional population of grey partridge. It also supports good populations of other farmland birds, notably the other red list species skylark, linnet, yellowhammer, corn bunting and yellow wagtail.
- 2 The success of the grey partridge is likely to result from appropriate habitat and sympathetic land-management, notably the combination of arable crops with grassy margins, hedges and areas of scrub and woodland – in particular, the hedges, margins and woodland running north-west and south-west from the Nine Wells nature reserve.
- 3 Although the main partridge predators are present on the site, and the site is extensively used by people, this does not seem to impact unduly on partridge survival rates.
- 4 Given the catastrophic decline in grey partridge numbers in the UK, it is important that the area continues to be conserved and managed sensitively. Any further loss of habitat is likely to reduce grey partridge populations on the site.

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