

The grey partridges of Nine Wells: 2012–2016

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

John Meed, January 2017



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 risks extinction in parts of the country.



This report describes a five-year 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.

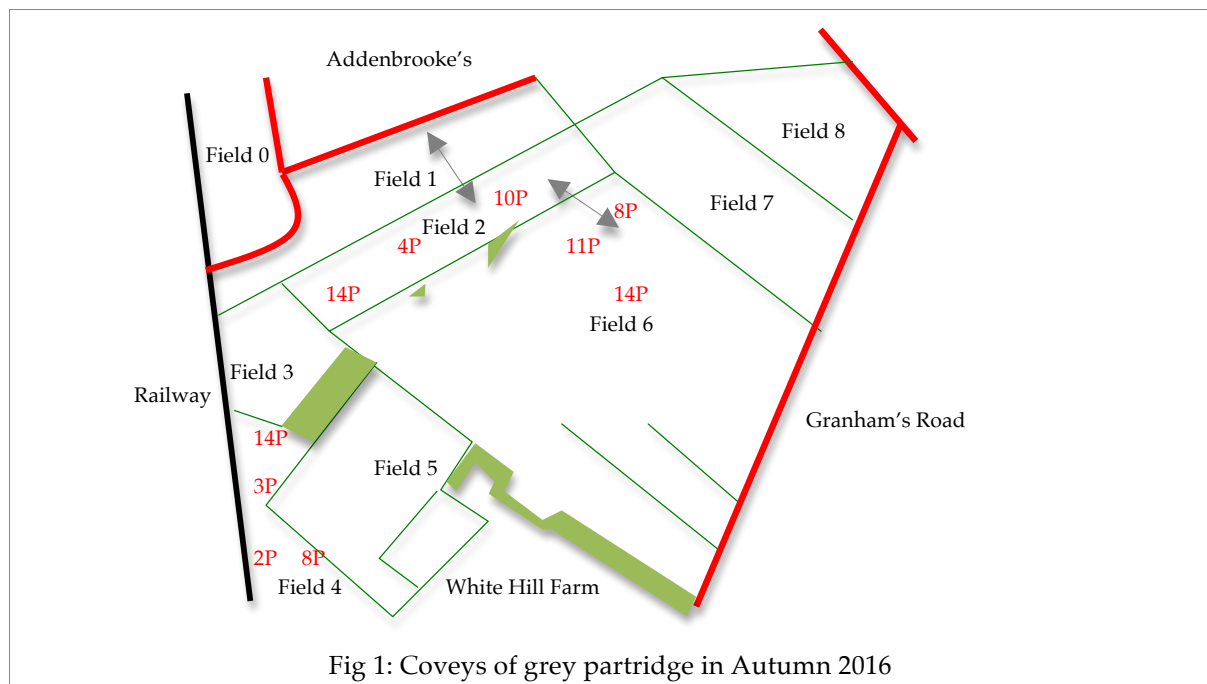
Typically I visit the area around 30 times a year.

Findings

Autumn and winter coveys

Grey partridge have large broods and in the autumn families form groups known as 'coveys'. My stubble counts over the last three years 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	$8+11+12+13 = 44$	$2+6+8+10+12 = 38$	$4+10+14 = 28$
Coveys using Field 6	$7+16 = 23$	$5+6+8+10 = 29$	$8+11+14 = 33$

However in November 2016 development work started in Field 1. I recorded no further partridge in either Fields 1 or 2 subsequent to this disturbance.

This picture shows one of the Field 2 coveys:



Influence of cropping on covey behaviour

Changes in cropping and land use, or disturbance, impact on coveys:

- 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 late 2016 only Field 4 remained unploughed, and the coveys here moved very little. There was more movement of coveys between Fields 1, 2 and 6, with September coveys in Field 1 moving to Field 2 after ploughing and later to Field 6 after disturbance from developers on the Biomedical campus. 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 scrub, notably around Nine Wells, and the hedges between Fields 2/6, and Fields 4/5. 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.

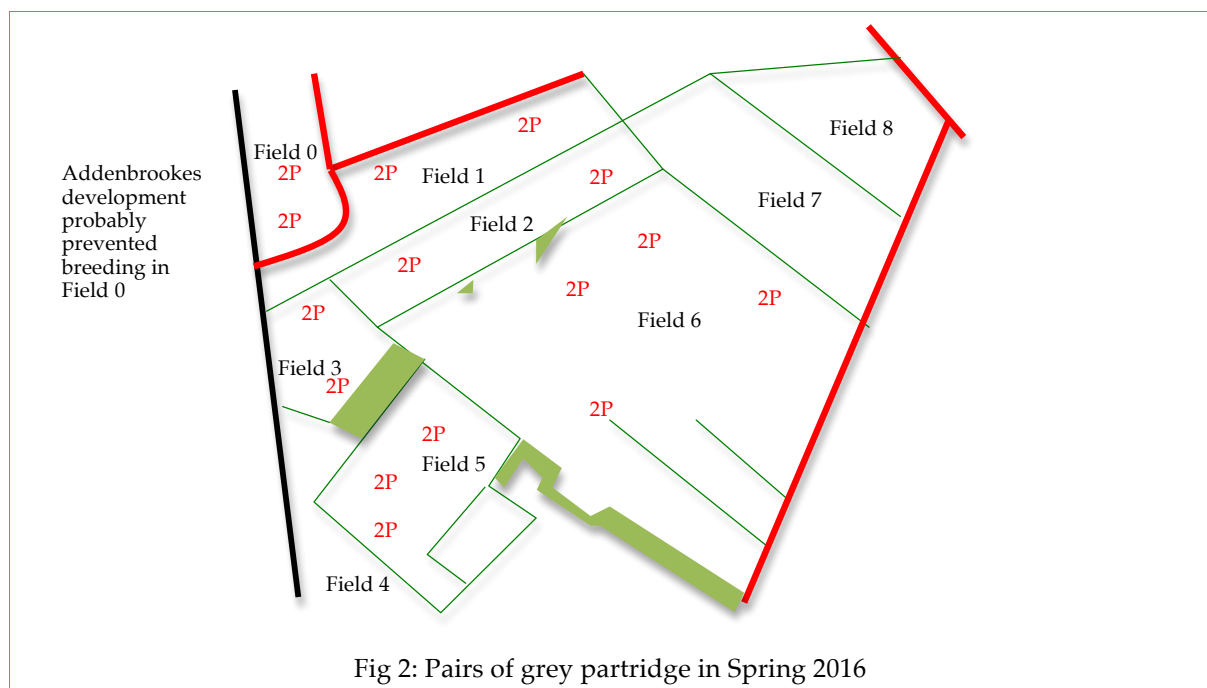
There can be interaction between coveys – normally calling, but sometimes two coveys move closer together and may even intermingle. The weather appears to influence partridge behaviour, and I generally recorded fewer birds on windy or wet days.

The autumn coveys appear to suffer little loss from predators. While I often record fewer birds from mid November onwards, I have the impression that this results from changing covey habits or location, rather than a reduction in the size of coveys. I generally record fewer birds after spring pairing than during the previous autumn – I am unclear as to whether this results from predation, greater crop cover or dispersal.

Spring pairs

Pairs begin to form in late January or early February. This change leads to some territorial behaviour and dispersal 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 Field 0 for the Biomedical campus almost certainly means that they were unable to rear young there 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 2–3 pairs/km² in 2016 (there were at least 3 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 hedges between Fields 2/3, 2/6 and 5/6. 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, marsh harrier 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 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 red-legged partridge. At least twice I have seen grey partridge mingle with red-legged coveys.

Conclusions

- 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 Habitat loss and disturbance from the Biomedical campus has started to have an impact on the grey partridge present. Given the catastrophic decline in UK grey partridge, it is important that the remaining 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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