

THE MISSING PARTRIDGE

What happened to the Grey Partridge, and can we bring it back?
By Ben Macdonald



↑ **VANISHING**
The once-abundant Grey Partridge is getting harder to find



GREY PARTRIDGE

A WARM EVENING IN North Norfolk, and a small, brown bundle starts to croak at the edge of a deep hedgerow. Closer inspection finds a bird rich in subtleties – greys, oranges and chocolate brown. I remember my surprise at the fine auburn barring on the flanks, the knitted grey breast and bright orange face. In the soft evening, my first Grey Partridge glowed in the fading light. In my Norfolk summers, these seemingly common birds became the backdrop to some of the county's more ostentatious acts. Glowing Golden Orioles. Languid Montagu's Harriers. It didn't occur to me quite how special Grey Partridges were until, one day, I realised that, when travelling home to Bristol, I didn't see them at all.

Long before the fields where I saw my first Grey Partridges were created – long before they were reclaimed from the vast marshes that once dominated East Anglia, the ancient realm of this species was the temperate steppe grassland of Eurasia. Our forested island, to the best of our knowledge, never contained large tracts of steppe grassland, but Grey Partridges did arrive naturally in Britain, after the last Ice Age. Early calcareous grasslands, like Salisbury Plain, may have provided the species with an early foothold on our islands. Over the subsequent eight millennia, however, the westwards spread of agricultural development in Europe created vast tracts of artificial grasslands, suitable for breeding.

By the 18th Century, the conversion of pasture and meadows to arable land may have threatened the Wryneck, Corn Crake and Red-backed Shrike, but such a march of cultivation perfectly suited the Grey Partridge. As cited in the Historical Atlas, Yarell (1843) observed that Grey Partridges expanded and flourished in the most intensively cultivated farmland. Macpherson (1892) found that the draining of marshes, cultivation of uplands and ploughing of mosslands all contributed to its range expansion and abundance.

Even 300 years ago, the shooting fraternity introduced birds into regions like the Isle of Man where, from the 1830s, they thrived. Bag records suggest birds were most numerous in Britain between 1870 and 1930, with up to 2 million wild birds killed annually. But, by the end of the 19th Century, Parslow (1973) and others found evidence of early declines across Wales, especially following wetter summers. By the end of World War Two, nationwide declines were underway. And between 1950 and 1990, Grey Partridges in Britain declined by 80%.

From 1974 to 1999 alone, Grey Partridge abundance in Britain has, according to the BTO's Common Bird Census, fallen by 84%. The New Atlas shows that since 1968-72, large range losses have occurred across the south-west, the Welsh Marches and a great deal of south-west Scotland. Relative abundance maps reveal that the highest remaining densities occur in the arable belt along our east coast: East Kent, North Norfolk, Lincolnshire, South and East Yorkshire, Durham, Northumberland, Fife, Borders, Lothian, Angus and Aberdeenshire. From Norfolk, relatively high densities occur south-westwards, into Cambridgeshire and inland Suffolk. There are, in addition, high densities across some of the calcareous downlands of southern England – from Berkshire to the Salisbury Plain. On the west coast, high densities remain only around the Fylde and Silverdale, in Lancashire. A species that once embraced intensive agriculture has, in a short period of time, been largely destroyed by it. Yet compared to other species, like the Red-backed Shrike, the Grey Partridge's agricultural decline has been relatively recent – but why?



Mike Wilkes / NPL

↑ PROBLEM

The decline of the Grey Partridge is a relatively recent phenomenon

A partridge in a...

Excluding, for a moment, the well-known preference for a Pear Tree, what else do Grey Partridges need to survive? Like many species that use modern farmland, Grey Partridges require a dual habitat – dense, sheltered sites for nesting, and open ground, rich in seeds and insects, for feeding. Nesting takes place in tall herbaceous cover, with prime sites often placed at the base of a hedgerow. Other nest sites include tall, marginal vegetation – like nettles and grasses – or rushes, fallows or heather, especially on moorland. RSPB studies reveal that dense clumps of grass, left from the previous season, are particularly attractive for nesting females. More rarely, nests can be situated within autumn-sown crops.

The feeding requirement of Grey Partridges, as with other farmland specialists like Tree Sparrows, is access to seeds and invertebrates at different periods of the year. In winter, the coveys we see in the fields of Norfolk are foraging for arable grains. Winter wheat stubble is strongly preferred by Grey Partridges because grass seeds and arthropods can be most readily retrieved here. Whereas Red-legged Partridges can forage in carrot and sugar beet crops, Grey Partridges are limited to foraging in cereals and other grass-seed resources like set-aside (Green 1984). During the breeding season, seeds remain an important part of the diet, but invertebrates become increasingly vital. When chicks hatch, field margins with broad-leafed weeds provide these food supplies. Grey Partridge broods, during the first weeks of their lives, feed in these margins, where protein synthesis necessitates a purely insectivorous diet for the first 14-21 days of life. Chick diet consists mainly of arthropods, especially beetles, caterpillars, bugs and hoppers. Stubble in winter, weeds in summer. This is the recipe for Partridge success.

For decades following the Agrarian Revolution, and the wholesale conversion of pastoral land to arable, from the 1860s onwards, the Grey Partridge's modest requirements would have been catered for on a massive

→ SLIM PICKINGS

Modern, intensive farming methods have led to a lack of food for Grey Partridges

scale. At this time, dense nesting cover and year-round food supplies were the natural by-products of crop growing. Grey Partridges did not need special measures to survive – they just needed us to farm.

The main cause

What has changed since 1945 is not the fundamental process of planting crops – which benefits Grey Partridge – but how we have gone about doing it. All studies now concur that since the 1950s, the primary driver of Grey Partridge decline has been chick starvation. Potts (1980), Green (1984) and many subsequent scientists have identified that June abundance of arthropods, in cereal crops, is the main factor affecting chick survival rates. And as early as 1967, Southwood and Cross found that herbicides and fungicides – used to reduce weed competition and grain contamination – were stifling the broad-leafed weeds that harboured the partridge chicks' arthropod prey. One study would go farther than this, proving these facts in enormous detail.

The 'Sussex Study', which the The Game & Wildlife Conservation Trust (GWCT) has run since 1968, is the longest running study of its kind in the world. It aims to determine, quantitatively, the relationship between farmland change, chemical application and species abundance. The study, occurring across 62 square kilometres of farmland, collects data from 100 individual cereal fields every year, in the third week of June. Invertebrates are sampled using vacuum traps. Special attention is given to spiders and harvestmen, ground and click beetles, leaf beetles and weevil larvae, plant bugs and hoppers. Pesticide data is collected for application of herbicides, fungicides and insecticides. Cropping information for each field is also entered into a geographical database. The results have been as clear as we might expect. The primary factor driving Grey

“Grey Partridges did not need special measures to survive – they just needed us to farm”

David Tipling / FLPA RM





Robert Camis/FLPA RM



David Tipling/FLPA

Partridge decline, since 1970, and probably before, has been the removal of broad-leaved arable weeds, largely as the result of herbicide application. This weed-removal has led to huge losses of arthropod food, and, consequently, the starvation of Grey Partridge chicks. The Sussex Study, when coupled with earlier bag records, found that chick survival rates fell from an average of 45% to 30% between 1952 and 1962. And by the 1980s, the number of chick-food insects in cereals had fallen by at least 75%.

Green (1984) surveyed chick survival rates, and food supplies, on different farms – finding that the survival of Grey Partridge chicks decreased with a decreasing density of arthropod prey. Rands (1985) found that mean brood size and insect abundance were significantly higher when even small portions of a field were left unsprayed. Borg (2000) found that, even when chicks attempted to feed on aphids, which have increased since herbicide introduction, this was no valid substitute for a varied insect diet. All findings are unanimous. Starvation – the disease destroying so many British birds – is driving partridge decline.

Winter woes

Three secondary factors, occurring across the same time period, have conspired to accelerate this downfall. The first has been a loss of winter food, compounding partridge mortality in the breeding season. Winter stubble fields were once widespread in the arable world. When a field had been cut in autumn, it was, most often, left over the winter, where the remaining biomass – especially the seeds spilled during harvesting – provided food for numerous species like Yellowhammers, Tree Sparrows and Grey Partridges. Today, the BTO estimate that just 3% of lowland farmland is given over to winter stubble. Spring-sown crops, harvested in late summer and left fallow over winter, have often been replaced by autumn-sown crops. These, unlike short stubble, reduce access to seed-food across the hard months of winter. After insect loss starves chicks in summer, seed deprivation then hits adult birds in winter. Modern agriculture has dealt a deadly double blow to the Grey Partridge.

Another factor has been loss of nesting sites – primarily hedgerows with fallow margins. In the 18th Century, as Grey Partridge feeding grounds were created by arable planting, nesting sites were simultaneously created by hedgerows. These hedgerows marked the start

→ TOP SITE

Covered areas under hedges are needed for nesting



Kim Taylor/NPL

of 'enclosures', and functioned as natural, visible boundaries between agricultural estates. As in the era of subsistence farming, we inadvertently created perfect pastures for the Wryneck and Red-backed Shrike, so, in the 19th Century, we accidentally created arable heaven for the Grey Partridge. But, since 1945, the British countryside has lost up to 50% of its hedgerows. Between 1984 and 1990 alone, an estimated 9,500km were removed every year. Deprived of the optimal nesting cover provided by hedgerows, Grey Partridges have been forced to nest in suboptimal sites, where predation rates may be higher because nests are more easily discovered.

And predation is the final factor in partridge decline. Numerous studies have proven recent increases in predation rates of females, and, especially, nests with eggs. The GWCT attribute this to the lack of keeping, resulting from initial declines in breeding Grey Partridge densities. Tapper, in the *Journal of Applied Ecology*, 1996, found that breeding season control of Foxes, Carrion Crows and Magpies led to a 75% increase in August counts of Grey Partridge broods. Breeding 'stocks', in following years, were 36% larger than in cases when predator control had not taken place. There is little doubt that predator control has a significant effect on any Grey Partridge population – reducing nest and brood predation. Do we want it? In an ideal world, with abundant food and nesting sites, we probably do not. But we are not living in avian paradise. Today, faced with starvation and degraded nest sites, predation is an unwelcome addition to the problems of the Grey Partridge. Predator management, especially for fragile populations, could buy valuable time as we seek to implement longer-term solutions.

The hunted

It is, lastly, impossible to talk about Grey Partridges without reference to shooting. During the 19th Century, Grey Partridges were the primary quarry of sports hunters across most of their range. Not only were up to 2 million bagged per season, but they proved far more popular to shoot than the Red-legged Partridges – poorer flyers – which established in Britain in around 1770. In recent decades, however, the situation has reversed. A recent shooting report (PACEC), estimated that 6.5 million Red-legged Partridges were released in 2004, of which 2.6 million were shot. Since 1961, Grey Partridge bag numbers have dropped by 91%. Shooting organisations now advocate avoidance if there are fewer than 20 wild Grey Partridges per 100 hectares. No conservation

organization, or study, has found modern, legal hunting to be a key factor limiting remaining populations.

So, in the face of a sudden intensification in arable farming, and the widespread deployment of chemical weaponry against weeds and insects, what hope is there for Grey Partridge survival? In this case, the prospects are, to some degree, encouraging. As always, where conservationists have acted decisively on factors operating in the UK, and based their actions on creating food supply and nest sites, there have been positive results. The combined work of GWCT, RSPB and others has led to the establishment of 'conservation headlands'

across significant areas of UK farmland. These 'headlands' are, in effect, deliberate reproductions of the arable scruffiness that once dominated the countryside. Headlands are the margins of crops, sprayed selectively with herbicides, rather than intensively. This allows small populations of broad-leaved weeds and insects to flourish in summer. When left for winter, these headlands form equally valuable margins of seed-rich stubble.

Such simple measures may sound superficial, but I have witnessed, first hand, how effective just a little scruffiness can be for the Grey Partridge. In 2011, I drove along my 'partridge lane' in late June. As Grey Partridges are not, yet, as rare as Red-backed Shrikes, I

↓ FROZEN OUT

A huge reduction in food and nest sites has been disastrous for Grey Partridges

Marin B Withers/FLPA RM





can tell you that it's the road running between Snettisham and Fring, in West Norfolk. I would challenge readers to find a better partridge paradise in the British Isles. Here, consecutive fields of dense hedgerows, weed-rich margins and spring-sown crops – yielding winter stubble – promote thriving densities of these arable specialists. This same habitat benefits numerous passerines as well – Corn Buntings, Yellowhammers, Tree Sparrows, Lesser Whitethroats, Bullfinches and even a few remaining Turtle Doves. When we recreate food at a landscape level, it's amazing how birds bounce back.

The great irony of Grey Partridge decline is that, unlike the Corn Crane, it has millions of acres of suitable breeding habitat in Britain. All farmers need to do is apply less and leave more – and partridges can flourish, even today. Easily reintroduced, restoring Grey Partridges to weed and stubble-rich land will not prove an insurmountable challenge for conservationists. Whereas recreating older agricultural systems and insect supplies will require long-term changes in conservation thinking, all we need for Grey Partridge recovery is to tweak an existing agricultural model. Reduce chemical warfare against weeds and arthropods. Recover hedgerows. Retain year-round seed food in the form of stubble.



“All farmers need to do is apply less and leave more – and partridges can flourish, even today”

Grey Partridges, however, teach us wider lessons about the importance of starvation in Britain today. As we search for migratory explanations for the decline of visitors like the Cuckoo, let us remember that starvation does not just cripple our residents – but our migrants, too. The vast majority of British breeding birds with specialised insect and seed-based diets are now in decline. Cuckoos, specialising in the hairy caterpillars of large moths, have seen a 90% reduction in their food supply in southern England since 1970. Spotted Flycatchers lack an abundance of large flying insects to feed their young. Others, like the Wryneck, dependent entirely on abundant ant-hills, have already vanished. And today, another broad-leaved weed specialist is dying out – the Turtle Dove. It could, according to RSPB studies, be extinct on our shores in just eight years time. Unlike the Grey Partridge, all the Turtle Dove needs to survive is weed seeds. Its entire life-cycle evolves around eating the grains of Fumitory, Knotgrass, Chickweed, oilseed rape and cereals – now sprayed and tidied across its breeding range.

And yet, whenever we have realised that starvation drives decline, our residents, like the Grey Partridge, and our migrants, like the Corn Crane, have come back from the brink. Let us learn from the Grey Partridge – and the likes of the Sussex Study. There is no mystical element to the decline of birds in the wider countryside. If we destroy food and nest sites on a massive scale, we can drive our most familiar species to extinction. But if we reverse these changes, in time, we can also bring birds back. When I drove from Snettisham to Fring last summer, watching brood after brood of Grey Partridge scuttle into hedgerow cover, I was reminded quite how forgiving our feathered friends can be. A patch of weeds, a line of hedge... In the long term we will need more than this. But for now, at least, small gestures – on a massive scale – are a great way to start. 🍂

↑ **HABITAT**
The Grey Partridge does not need specialist habitat, just traditional farming

← **FUTURE**
If we know the problem, we also know the solution