

Singing fields

Why gamekeeping helps
birds in the countryside



Introduction

Gamekeepers make an often unappreciated contribution to the richness of bird life in the countryside.

Since the Second World War, farming and forestry have become intensive and a lot of wild birds struggle to find shelter and food in modern crops and uniform plantations. Many species of farm and woodland birds are in national decline.

However, gamekeepers manage this same countryside for pheasants, partridges and grouse, and in doing so create conditions that other birds benefit from too.

This report summarises the evidence and shows the winners and losers from game conservation.





Gamekeeping past and present

Although it is well known that intensive predator control, particularly during the Victorian era, reduced, and in some cases wiped out some predatory birds and carnivores^{1,2,3,4}, there is another side that is less often acknowledged and certainly less well documented. This is the extent to which predator control and other aspects of game preservation improve the fortunes of other birds which are not game species.

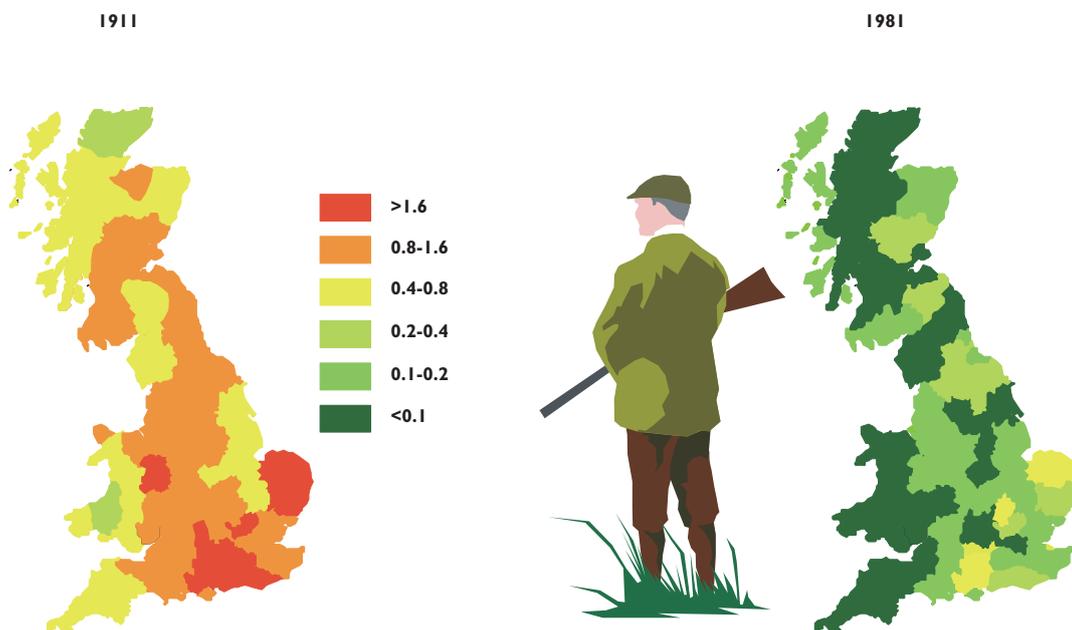
The first records of gamekeepers are from the 17th century⁵, but earlier the King and his nobility employed forest wardens to protect game (mostly deer) during the Middle Ages⁶. By Tudor times the rural population generally, was being encouraged to control pests and predators through comprehensive bounty schemes⁷. By the 19th century, after farm improvements and land enclosure, and as the popularity of stag hunting and falconry declined in favour of shooting, gamekeepers were increasingly employed by squires and lairds. Then much of the gamekeeper's work was to protect game from poaching - indeed in 1823 a third of all prisoners in English jails had been convicted under Game Laws⁵.

Later, predator control became more important with the pursuit of larger bags and driven shooting. This was often financed by the new wealth from industry and commerce across the globe. The 1911 population census shows that there were 25,000 full-time professional gamekeepers employed across Britain⁸. Virtually all of some counties, such as Norfolk and Hampshire, were patrolled by keepers. Today there are around 3-4,000 full-time gamekeepers as well as part-timers and amateurs^{7,9}.



Setting a tunnel trap. (Stephen Tapper)

Numbers of gamekeepers then and recently⁸: In 1911 (left) most of England was patrolled by gamekeepers with some counties having over 1.6 gamekeepers employed for every 1,000 hectares over the whole county. Today most counties have between half and one-tenth of that number.





Game management today

A hopper feeder for pheasants and partridges placed on a field corner. Hoppers are usually filled with wheat tailings which gamebirds peck out from the coil at the base. Such feeders are popular with finches which pick up the spilt grain. (Peter Thompson)

Most people have only a vague idea about what gamekeepers do. Many believe they simply rear pheasants, partridges and grouse for shooting. Actually the job is as varied as the British landscape. On upland moors they protect the wild red grouse by controlling the animals that prey on them, and maintaining the heather (which the grouse nest in and feed on) by patchwork burning. On farmland some wild bird shoots survive, but most rely on young pheasants and partridge chicks provided by game farms in mid-summer. Following a brief period of acclimatisation in large wooded pens, the birds are then released to live wild in the countryside before the start of the winter shooting season.

Feeding: Natural food is scarce on farmland so grain hoppers are used to feed game in the autumn and winter. Grouse are never fed and they rely solely on the heather and other native plants for food.

Habitat: Heather is the main natural cover for grouse. Small patches are burnt in rotation so there is short heather for feeding, and boot-high heather for nesting and cover. Gamekeepers manage the woodland on lowland farms. They open up skylights, create rides, improve the understory and maintain shrubs along the woodland edge. Where large-scale cropping dominates, keepers often plant special game crops such as kale or quinoa for winter food and cover.

A strip of kale planted as game-cover adjacent to plough in which kale will also be sown in spring. Kale lasts two years providing a bird-seed crop in the second year. (Peter Thompson)



Fox control: Foxes kill game whenever they get the chance but they do most damage in spring when they find and kill the nesting hens. Shooting at night with a rifle and spotlight is the main means of control these days, and most is done in the winter when there are few crops to obstruct visibility. In spring and summer, and on moorland, gamekeepers often also rely on snares to catch foxes. Grouse moor keepers try to keep the moor free of foxes all year round. Whereas most farm shoots control foxes only around the releasing areas in autumn.

Crow and magpie control: Crows and magpies are notorious egg thieves so gamekeepers control their numbers in late winter and spring, before and while gamebirds are nesting. Most are trapped in cage traps, like the Larsen trap, which uses a decoy bird to attract in others.



Crows and magpies are notorious egg thieves.
(Peter Thompson)



A multi-catch cage trap for crows which works on the lobster pot principle. Cages are baited with bread or carrion and often contain a decoy or call bird to attract in others. This trap is set in a conifer clearing at the edge of moorland.
(Stephen Tapper)

Small predator control: Small mammalian predators, especially stoats and mink, are significant game predators and are taken in traps placed in tunnels. Tunnel trapping is extensive on wild bird shoots, but less so on shoots with reared game.

A tunnel trap set to catch small predators like stoats (below). Inside is a spring trap designed to kill the animal outright. (Peter Thompson)



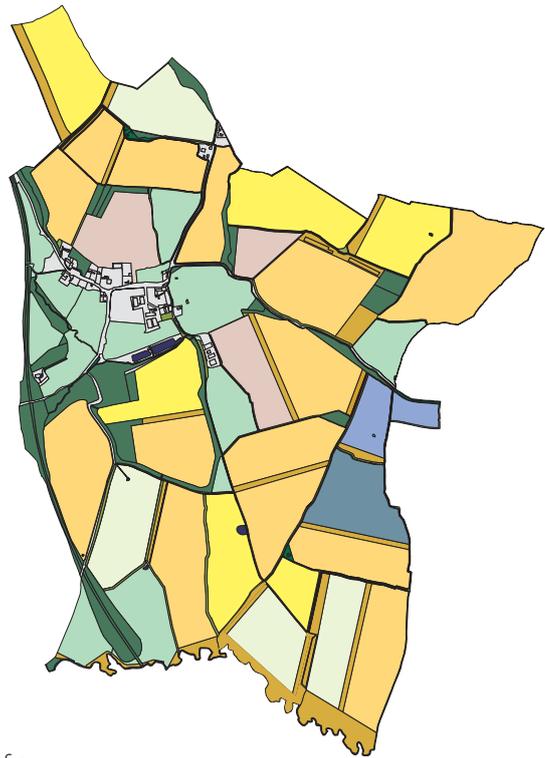
Evidence - The Allerton Project farm

The map of the Game & Wildlife Conservation Trust's Allerton Project shows the cropping on the farm (right).

-  Woodland
-  Permanent pasture
-  Winter wheat
-  Spring beans
-  Winter oilseed rape
-  Winter oats
-  Phacelia on set-aside
-  Hemp and flax
-  Set-aside
-  Hedgerow/verge

The Allerton Project farm is 800 acres (324 ha) of rolling Leicestershire countryside with mixed arable cropping dominated by winter cereals and oilseed rape. There are some small woods and permanent pasture, particularly along stream sides. The farm surrounds the small village of Loddington and was owned by Lord and Lady Allerton.

In 1992 it passed to a trust which managed it as a research and demonstration of farming with wild game conservation¹⁰. Work started in 1993 so that 1992 could be used as a comparison year against which changes could be measured. Perhaps the single most important change was the employment of a gamekeeper to look after the wild game. No gamebirds have been released.



Management of the Allerton Project			
	Up to 1992	1993 to 2001	2002 to 2006
Predator control	No	Yes	No
Habitat	No	Yes	Yes
Hopper food	No	Yes	Yes

Game management consisted of three strategies:

- **Predator control:** Foxes, stoats, rats, crows and magpies were killed mainly during the summer nesting season to protect breeding gamebirds.
- **Pest control:** Woodpigeons, rooks, rabbits and rats were controlled to reduce crop damage.
- **Habitat improvements:**
 - Much of the farm woodland had been planted in the 1920s and had remained un-thinned. Therefore, it was of poor quality and poor for wildlife too. Some was cleared and re-planted, some was thinned and some new areas were planted with native trees and shrubs.
 - The farm is well hedged, but field margins were widened by about an extra metre to provide more rough grass nesting cover and to protect the hedge better.
 - Set-aside. In 1992 several large fields were in set-aside under the five year scheme. These were brought back into cultivation, and instead most of the set-aside requirement was made up of 20-metre wide strips which were planted using different bird-seed mixtures under the wild bird cover option.
 - Some fields were split in half using set-aside strips and beetle banks.
- **Hopper feeding:** A network of feeders were placed around the farm and kept topped up with grain primarily for pheasants.



Yellowhammers were one of the bird species monitored.

In 2002 the predator control was stopped, but the habitat and hopper feeding programme continued. This was done to assess how much the predator control was contributing to the overall conservation programme. Bird censuses have been made at regular intervals¹¹. Here we only consider species that had at least five breeding pairs at Allerton.

Findings – The birds at the Allerton Project

Predator and pest control

On the Allerton farm until 2002, **magpie** and **crow** numbers were reduced from 10 and eight pairs to zero. **Rook** numbers were reduced from 55 nests to between 25 to 30, to reduce crop damage and pillaging the game feeders. Likewise **woodpigeons**, of which there had been some 30 pairs, were kept to near zero¹⁰.

Game and open-field birds

Unsurprisingly wild **pheasants** doubled, **red-legged partridges** increased from two to 16 pairs. **Skylarks** (36 to 37 pairs) were plentiful throughout.

Hedgerow and thicket residents

Many common garden birds fall into this group and although none were scarce at Allerton, the crow and magpie control seemed to boost their numbers considerably. **Wren** (47 to 141 pairs), **dunnock** (46 to 144 pairs), **robin** (54 to 110 pairs), **blackbird** (66 to 143 pairs), **song thrush** (14 to 56 pairs). All these species declined after predator control was stopped.

Tree-hole nesters

These garden favourites seem largely immune to magpie and crow predation and they don't venture far from the woods and gardens. None of the birds showed much improvement in number - **Marsh tit** (four to seven pairs), **blue tit** (46 to 51 pairs), **great tit** (21 to 30 pairs) and **long-tailed tit** (four to nine pairs), although the latter is not a hole nester.

Resident seed-eating finches

Most finches increased after 1992 at Allerton. **Chaffinch** (135 to 229 pairs), **greenfinch** (15 to 62 pairs), **goldfinch** (three to 14 pairs), **linnet** (10 to 25 pairs) and **bullfinch** (six to 12 pairs). All these birds took advantage of the pheasant feeders and set-aside cover crops, and all but the goldfinch dropped in number when predator control stopped. They are open nesters and easily spotted by magpies. Only the **yellowhammer** (57 to 55 pairs) seemed to be unaffected. Their habit of nesting in thick vegetation on or near the ground makes their nests difficult to find.

Migratory warblers and flycatchers

Four out of five species improved with game conservation and this was most clear-cut for **blackcap** (19 to 38 pairs), **chiffchaff** (two to 10 pairs), **willow warbler** (28 to 47 pairs) and **spotted flycatcher** (eight to 14 pairs). Both blackcap and chiffchaff continued to increase after the predator control stopped. **Whitethroat** (25 to 45 pairs) were on an upward trend anyway so it is difficult to credit game conservation for the improvement. **Garden warbler** (11 to nine pairs) numbers were unchanged.



Dunnock, a common garden bird, increased from 46 to 144 pairs on the Allerton Project farm.



Linnets increased from 10 to 25 pairs on the Allerton Project farm.

Winners

Pheasant
Red-legged partridge
Wren
Dunnock
Robin
Blackbird
Song thrush
Chaffinch
Greenfinch
Goldfinch
Linnet
Bullfinch
Blackcap
Chiffchaff
Willow warbler
Spotted flycatcher

Unaffected

Skylark
Marsh tit
Blue tit
Great tit
Long-tailed tit
Yellowhammer
Whitethroat
Garden warbler

Losers

Carrion crow
Magpie
Rook
Woodpigeon



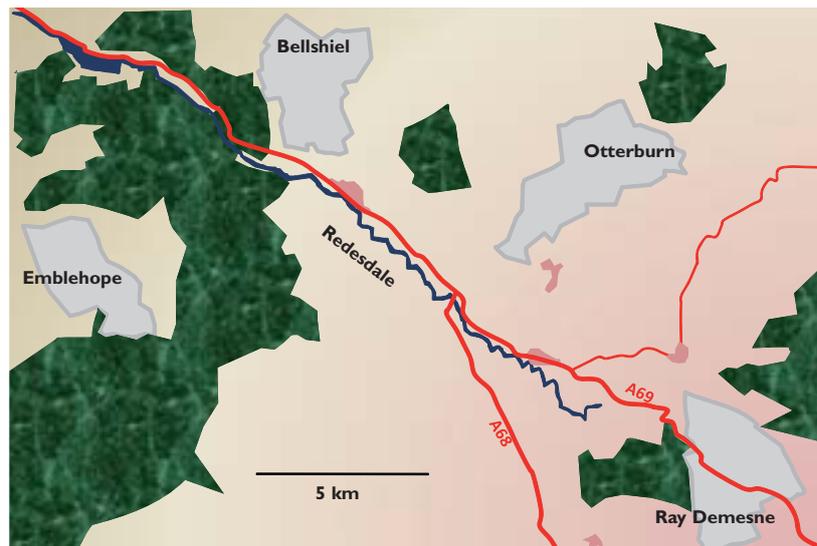
Evidence - RSPB's upland bird survey

In 1995 and 1996, in collaboration with ourselves and upland land owners, the RSPB undertook a survey of the breeding abundance of birds on British moorland managed for grouse¹². They surveyed 232 sites on grouse moors across the Pennines, North York Moors, Southern Uplands and Highlands, and compared the bird numbers on these with nearby sites of similar habitat that were not managed for grouse.

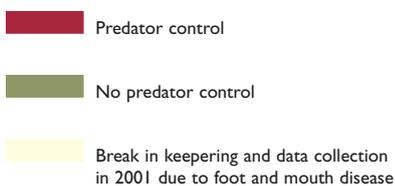
For some birds, like the waders, the survey was able to record good measures of breeding abundance, but for others, such as the birds of prey, it had to rely on transitory sightings. The survey also recorded habitat differences, although the aim was to compare similar sites.

Evidence - The Upland Predation Experiment

Layout of plots in the Upland Predation Experiment. All four are on moorland of heather and rough grass. Blocks of forestry, roads and a river run between the plots. Only two plots are subject to predator control in any year.



Surveys can reveal important associations but they cannot always categorically determine cause and effect. In 1999 we designed a large field experiment to test the effect of predator control for grouse on the breeding success and abundance of waders and other moorland birds. To discount inevitable differences between sites and years the experiment had two long-term sites, one with a gamekeeper and one without, and a further two sites, one which had a gamekeeper for the first four years and the second which had a keeper for the second four years. The plots were widely separated so that activity on one site did not affect the other. The study completes in 2008 and here we draw on interim results published in 2007¹³.



The experimental design of the Upland Predation Experiment									
Year	1	2	3	4	5	6	7	8	9
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Otterburn	No predator control	Predator control	No predator control	No predator control	No predator control	No predator control	No predator control	No predator control	No predator control
Bellshiel	No predator control	No predator control	No predator control	No predator control	No predator control	Predator control	Predator control	Predator control	No predator control
Ray Demesne	No predator control	Break in keeping and data collection	No predator control						
Emblehope	No predator control	No predator control	No predator control	No predator control	No predator control	No predator control	No predator control	No predator control	No predator control

Findings - Birds of the upland moor

Predators

Grouse management consists mostly of heather burning and predator control. **Crows** are consequently uncommon and probably entirely absent in summer, as are foxes and stoats. In the RSPB survey, raptors were not seen frequently enough either on or off grouse moors to test for differences in abundance, but **hen harrier** numbers are certainly limited by grouse moors. **Merlin** occur at high densities on the grouse moors of the North York Moors, where the species is listed in the Natura 2000 designation¹⁴, although the RSPB survey did not detect this.

Gamebirds

Typically the breeding stocks of **red grouse** increase by about 400% after three years of predator control¹³, and autumn numbers can be in the region of 2-300 birds per 100 hectares which is enough to sustain shooting and maintain breeding densities. Without predator control the status of the red grouse is problematic – it is now rare in Ireland where it was once widely managed. In Wales the disappearance of grouse shooting was followed by a 30% contraction in breeding range between 1970 and 1990. **Black grouse** benefit from gamekeeping even though they live on the moor fringe rather than heather tops¹⁵.

Waders

Areas of burnt and short heather, as well as an open landscape free of foxes and crows, provide ideal nesting areas for waders. As a consequence the North Pennines is a Natura 2000 site for 700 pairs of **golden plover** and 3,900 pairs of **curlew**. In addition **lapwings** are at least twice as common on grouse moors as other moors¹². All these waders breed much better where predators are controlled¹³. Only **snipe** seem to escape significant predation¹².

Heathland songbirds

Meadow pipit and **skylark** fare less well on grouse moors, probably because the vegetation is dominated by heather rather than grass¹². Similarly heather burning for grouse eliminates the taller shrubs like gorse, pioneer birch and pine, and therefore **whinchat** are less common on grouse moors¹², but **wheatear** are just as prevalent on either³.

Winners

Merlin
Red grouse
Black grouse
Golden plover
Curlew
Lapwing

Unaffected

Raven
Snipe
Wheatear

Losers

Carrion crow
Hen harrier
Meadow pipit
Skylark
Whinchat

*Curlew benefit from grouse moor management.
There are 3,900 pairs of curlew on the
North Pennines. (Laurie Campbell)*





Conclusion

How do we judge these winners and losers? Clearly, it is too simplistic to just tally them up. We need to judge them against a background of their abundance elsewhere and whether or not they are declining nationally. Fortunately we have good measures of both in the UK and these data are published regularly¹⁶. If we make this comparison, some birds stand out. For example, willow warbler, spotted flycatcher, linnets and bullfinch are declining nationally but increased at the Allerton Project farm. On grouse moors, red grouse, black grouse, lapwing and curlew, are faring better than elsewhere but are in national decline. Only the whinchat and the hen harrier are species of concern that do less well on grouse moors. We see no reason why, with carefully planned management, their numbers too should not be improved on areas managed for grouse.

Britain's wildlife reflects our rich history of land use as much as it does a natural response to climate and geology. Animals and plants also flourish or perish by interacting with one another and with man's activity. Our natural heritage is not a "balance of nature" in the commonly used sense, but an outcome that is part contrived and part luck. On a small crowded island conservation cannot only be about nature reserves. It must also be about economic land-use and how this can be made to support increased biodiversity. Grouse management does this on upland moors and the Allerton Project demonstrates too, what can be achieved on a typical lowland farm if managed with wild gamebirds in mind.

Gamebird feeder alongside a cereal and wild flower mixture. (Peter Thompson)



References

1. Moore, N W (1956). Rabbits, buzzards and hares. Two studies on the indirect effects of Myxomatosis. *La Terre et la vie* 103: 220-225.
2. Brown, L (1976). *British Birds of Prey*. New Naturalist, Collins, London.
3. Watson, D (1977). *The Hen Harrier*. T & AD Poyser, Berkhamsted.
4. Langley, P J W and Yalden, D W (1977). The decline of the rarer carnivores in Great Britain during the nineteenth century. *Mammal Review* 7: 95-116.
5. Longrigg, R (1977). *The English squire and his sport*. Michael Joseph, London.
6. Rackham, O (1986). *The History of the countryside*. J M Dent & Sons Ltd, London.
7. Lovegrove, R (2007). *Silent Fields: the long history of decline of a nations wildlife*. Oxford University Press, Oxford.
8. Tapper, S C (1992). *Game Heritage: An Ecological Review from Shooting and Gamekeeping Records*. Game Conservancy Ltd, Fordingbridge, Hampshire.
9. Anon (2007). National Gamekeepers Organisation.
www.nationalgamekeepers.org.uk
10. Stoate, C and Leake, A (2002). *Where the birds sing: The Allerton project: 10 years of conservation on farmland*. The Game Conservancy Trust, Fordingbridge.
11. Stoate, C (2007). Songbirds at Loddington. *Review of 2006 of The Game Conservancy Trust* 38: 54-55.
12. Tharme, A P, Green, R E, Baines, D, Bainbridge, I P, and O'Brien, M (2001). The effect of management for red grouse shooting on the population density of breeding birds on heather-dominated moorland. *Journal of Applied Ecology* 38: 439-457.
13. Fletcher, K (2007). Predator control and ground-nesting birds. *Review of 2006 of The Game Conservancy Trust* 38: 21-25.
14. Tapper, S (2005). *Nature's gain: How gamebird management has influenced wildlife conservation*. The Game Conservancy Trust, Fordingbridge, Hampshire.
15. Warren, P & Baines, D (2004). Black grouse in northern England: stemming the decline. *British Birds*, 97: 183-189.
16. Anon (2007). *The State of the UK's Birds 2006*. The RSPB, Sandy, Bedfordshire.



