

10 Management for lowland gamebirds

Context

- 10.1 It has been estimated that approximately 500,000 people shoot live quarry in the UK, the majority of which involves gamebirds (including grouse in the uplands) or other bird quarry species.¹ Many in the game industry consider that management for sport shooting provides a substantial contribution to conservation management, although this may depend on the activity in question.
- 10.2 In lowland England gamebird shooting involves mainly three species (grey partridge, red-legged partridge and pheasant). Red-legged partridge and pheasant are non-native species, and are typically reared and released in large numbers. This is often associated with specific management activities aimed at supporting the resulting high populations.
- 10.3 It is estimated that shooting influences land management activity over approximately 9 million hectares in England (upland and lowland).² Active management of habitats and wildlife, primarily to provide gamebird shooting is carried out over around 1.2 million hectares.³ Wildfowling clubs manage approximately 105,000 ha of foreshore, marsh and wetland for shooting in the UK, of which 90% coincides with SSSIs.⁴

Current practice

- 10.4 Various estimates suggest that between 20 and 30 million gamebirds are reared and released in the UK each year (the majority in England), some 60% of which are imported as eggs or chicks. Birds shot in the lowlands comprise approximately 80% pheasants and approximately 14% red-legged partridges.⁵
- 10.5 Non-gamebird quarry species (mainly ducks, waders and geese), are also shot for sport, and some species are shot as agricultural pests, notably the woodpigeon.
- 10.6 Wildfowling often involves the shooting of birds from wild populations rather than being based on rear and release. However, the ranges of certain species, including the non-native Canada goose and the native greylag goose have been deliberately extended for the purpose of providing stock for shooting, and large numbers of mallard are reared and released for shooting each year.⁶
- 10.7 Much land management undertaken for gamebirds is associated with driven shooting where high densities of birds are required in order to provide adequate sport. In contrast, rough shooting involves the 'walked-up' shooting of small numbers of a range of different game species. It can still require habitat management to maintain viable numbers of quarry species. Wood pigeon can only be shot under the terms of the relevant Natural England general licence - it isn't legal quarry. Shooting wood pigeons therefore has to be associated with land management measures, such as preventing serious damage to crops, for it to be legal, and only once other satisfactory (non-lethal) solutions have been shown to be ineffective.
- 10.8 The specialised land management practices carried out to enhance red grouse populations for shooting on upland moorland, including burning, are covered in a separate chapter 'Drainage and burning management on moorlands'.

Industry trends and pressures

- 10.9 Game shooting and wildfowling are traditional activities and have influenced the nature of the English landscape for hundreds of years. Game shooting has increased markedly in popularity from the Victorian era, with an associated increase in the intensity of management and hence greater potential for influencing landscape and biodiversity.⁷
- 10.10 Historically, gamebirds and waterfowl were shot primarily to provide food for the table, particularly in poor rural areas. Now, this activity is undertaken mainly as a sport or hobby, although most of the edible birds shot are retained or sold for human consumption. To ensure that sufficient birds are available for shooting, the wild stock is often supplemented by birds reared on the shoot and then released into the wild. This is especially the case for driven game shooting where large numbers of birds are flushed over lines of guns. Wildfowling and rough shooting generally involve the shooting of only small numbers of birds, and the attraction of the pastime is often as much about spending time in the countryside as it is about hunting birds.
- 10.11 The leasing of shooting rights is considered a viable source of income for many landowners. It has been calculated that the full-time equivalent of 49,000 people work on activities directly related to shooting (620,000 individuals are estimated to be involved).⁸ In 2004, approximately £850 million was spent providing sporting shooting,⁹ although these figures include pest control, deer stalking, target shooting and clay pigeon shooting, in addition to the shooting of birds for sport. It is estimated by the industry that £250 million per year is spent on management activities that provide benefits for conservation - equivalent to 2.6 million work days.¹⁰
- 10.12 Lower intensity shooting, including wildfowling and rough shooting, has little commercial value except potentially where pest control is involved.
- 10.13 For current incentives, advice and regulation for lowland gamebird management, see Annex I to this chapter.

Key impacts

- 10.14 In general terms, sport shooting in the lowlands has had a positive effect on the landscape. Many hedgerows, field margins¹¹ and small woodlands¹² are maintained more for their sporting value than for their biodiversity interest, although the practice can be beneficial in both aspects. Many land managers with shooting interests plant small areas of game cover to provide food and shelter for partridges and pheasant. These crops provide a useful food source for farmland birds such as sparrows, finches and buntings when winter cropping regimes may have reduced other feeding opportunities.¹³
- 10.15 In many cases woodlands are beneficially managed and maintained to support the shooting interest. This can have influence the structure of the woodland habitat. Woodlands used for gamebird rearing tend to have a more open aspect,¹⁴ which can benefit other woodland species such as ground flora, birds and invertebrates. Where excessive ground feeding is practised, the natural ground flora can be adversely affected through increased nutrification, disturbance and the introduction of non-woodland species.¹⁵
- 10.16 The maintenance of hedgerows and field margins for gamebird provides buffer zones to mitigate surface water, sediment and nutrient flow,¹⁶ but also benefits birds and other wildlife through the provision of food, shelter and nesting sites.¹⁷
- 10.17 There is little published evidence that quantifies the effect on native species of releasing such large numbers of non-native gamebirds into the wild on an annual basis. Whilst artificial food sources provided for gamebirds may benefit some native farmland birds, competition for natural food is thought likely to be detrimental to many species. There is a lack of published research on this topic.

- 10.18 Control of common predators, such as foxes, mustelids and corvids, and of rats has been shown to be beneficial to some other ground nesting birds.¹⁸ The control of rats with highly toxic modern rodenticides can lead to accidental secondary poisoning of birds of prey and predatory/scavenging mammals.¹⁹
- 10.19 Raptors can benefit from shoots, in that there is generally a source of birds which have died after being winged, and a high mortality of reared game chicks, which can provide a food source, particularly for scavengers like the red kite and buzzard. This can have a harmful side-effect in that a number of dead kites have been found with high lead levels, due to the ingestion of lead shot.²⁰ Instances have also been recorded of wading birds, and game birds being adversely affected by lead shot ingestion.²¹
- 10.20 Shooting on, or adjacent to, wetland sites supporting concentrations of waterbirds can result in disturbance which causes birds to expend extra energy in making escape flights and reduces the time available for feeding. This can reduce survival rates, particularly if disturbance events are frequent and birds are in poor condition, for example during a period of severe winter weather.²²
²³
- 10.21 For further factual background to this section, see Annex II to this chapter.

Summary of impacts

Biodiversity

- 10.22 A number of lowland habitats have been preserved and enhanced in order to provide suitable conditions for gamebirds and quarry species. This can also provide valuable habitats for species of conservation concern, a wide range of wildlife, including species of conservation concern such as farmland birds.
- 10.23 Some semi-natural habitats can be damaged by operations associated with game rearing such as the inappropriate siting of release pens.
- 10.24 Whilst many raptor populations have increased in recent decades, the illegal persecution of birds of prey is still a problem in some areas. Birds of prey may also be adversely affected by secondary poisoning from the lead used in shotgun cartridges and from highly toxic modern rodenticides.
- 10.25 Disturbance to waterbird concentrations by shooting and other recreational activities is a concern on some designated sites.

Landscape

- 10.26 Many areas of wildlife habitat on farmland have been preserved by land managers because of their value for sporting activities. This is likely to have had a considerable effect in maintaining landscapes and non-game species.
- 10.27 Shooting is a legitimate reason for limiting access on some land.

Annex I Current incentives, advice and regulation

- The firearms required for shooting are subject to controls overseen by the police and have become tighter in recent years. A shotgun certificate is required in order to own and use a shotgun for shooting gamebirds and other quarry. The use of firearms for shooting is controlled by the Firearms Act 1968²⁴
- The requirement to hold a game licence to kill or take game and the requirement for a local authority licence and an excise licence in order to deal in game were removed by the Regulatory Reform (Game) Order on 1 August 2007²⁵.
- The shooting of gamebirds and other quarry species is restricted to open seasons as set out by the *1831 Game Act*²⁶ (and related legislation) and the *Wildlife and Countryside Act (1981)*.²⁷
- *The Wildlife and Countryside Act (Part 1)* prohibits the intentional killing of wild birds and the use of certain methods of control. The shooting of some 'pest species', such as woodpigeon and magpie, is authorised year-round through a system of general licences issued by Natural England.
- It is illegal to use lead shot when shooting over SSSI land (the Environmental Protection (Restriction on the use of lead shot) (England) Regulations 1999).
- Regulations have recently been introduced to allow the imposition of movement restrictions on birds should this prove necessary to prevent the spread of diseases such as avian influenza. It is possible that this could impact on the importing of gamebird chicks for rearing and release in future.
- Natural England consent is required in order to carry out shooting and many of the associated management activities on designated sites. It may be refused where it could result in adverse impacts on the interest features of the site. For example, through excessive disturbance to waterbird concentrations or damage to woodland vegetation.
- A number of organisations provide a considerable quantity of advice for shooting interests. For example, the British Association for Shooting and Conservation; the Game & Wildlife Conservation Trust; and the Countryside Alliance. The Code of Good Shooting Practice²⁸ is a voluntary code overseen by a steering committee comprising representatives of all the major shooting organisations. The code sets out a framework for sustainable shooting.

Annex II Impacts on environmental sustainability of management for lowland game birds

Table 12 Impacts on environmental sustainability of managing for lowland game birds

Habitat quality and diversity	<ul style="list-style-type: none">• Typical habitats actively provided or managed by lowland shooting interests:²⁹<ul style="list-style-type: none">• Conservation headlands• Hedgerows• Stubbles/cover crops• Beetle banks• Woodlands• Flight ponds• River banks.• Lowland farmland is often managed to encourage gamebirds, including the maintenance of hedgerows, unsprayed field margins and headlands, game cover-crops and seed-bearing crop mixtures.³⁰• There is some evidence that woodland structure in woods managed for pheasant shooting in England is more open, with a denser field layer and is able to support higher breeding densities of some bird groups, for example, certain warblers.³¹• The siting of pheasant release pens in ancient/semi-natural woodland of high conservation value, including woodland SSSIs, can result in damage to ground flora.³²
-------------------------------	---

Table continued...

Species abundance and diversity	<ul style="list-style-type: none"> • The control of generalist predators such as corvids, foxes and stoats by gamekeepers can result in increased breeding success for some species of ground nesting birds of conservation value.³³ • The maintenance of semi-natural habitats for gamebirds and other quarry species, and the provision of artificial food for gamebirds either directly as grain, or indirectly through game-cover crops and the retention of cereal stubbles, can benefit other birds of conservation importance. This includes a suite of declining farmland birds such as sparrows, finches and buntings.³⁴ These habitats are also favoured by grey partridge,³⁵ for which shooting interests are putting considerable effort o reverse its decline. • The mortality through shooting of the native Grey Partridge (a Red-listed species) has been reported to be six times higher through shooting than through predation.³⁶ • Wounded gamebirds, which subsequently die, can provide a food source for some native mammals and birds of prey, for example buzzard and red kite, although this has on occasion given rise to secondary lead poisoning in birds of prey.³⁷ There are some recorded instances of the ingestion of lead shot by waders, and gamebirds.³⁸ • Shooting on or adjacent to wetlands with important waterbird concentrations has, in a small number of cases, reduced site populations through direct mortality and, more often, through disturbance.^{39 40} Other leisure activities may have a similar or additive effect, for example walking, boating and bait digging.⁴¹ • Some species that predate gamebirds can be controlled legally. Illegal control of protected species can result in population declines. The illegal killing of hen harriers and goshawks to protect gamebirds is preventing population recovery of these rare species.^{42,43} • Introduced, non-native gamebirds may compete for food with native farmland birds. There is limited evidence suggesting that intensively-reared birds could spread disease to native species, although this has not been well studied.⁴⁴
Water level control	<ul style="list-style-type: none"> • The raising of water levels to create lowland wetlands and wet grasslands is beneficial to some wildfowl and wading birds.⁴⁵ This is not generally undertaken primarily for game shooting purposes.
Sediment loads in water	<ul style="list-style-type: none"> • Field margins maintained as nesting/feeding habitat for gamebirds can help to prevent sediment from arable fields entering adjacent watercourses by acting as buffers.⁴⁶
Nutrient loads in water	<ul style="list-style-type: none"> • Field margins maintained as nesting/feeding habitat for gamebirds can reduce nutrient run-off from arable farmland when situated adjacent to watercourses by acting as buffers.⁴⁷

Table continued...

Pesticide control in water

- Management prescriptions to reduce pesticide use on arable crops, for example conservation headlands under Environmental Stewardship, may be taken up to provide habitat for gamebirds, with a resulting reduction in pesticide run-off into watercourses.⁴⁸

Other pollutants

- Medication is widely used to prevent disease in intensively-reared gamebirds. Concerns have been raised that this could contribute to the development of immunity to antibiotics and even have implications for human health when birds enter the food chain, but this is a little-studied area, with scant evidence. The Veterinary Medicines Directorate monitor chemical residue in game meat for human consumption to ensure the safety of human health.
- Modern rodenticides are often used to control rats in areas where supplementary food is provided for gamebirds. This can result in secondary poisoning of birds of prey and mammal predators/scavengers; when they feed on poisoned rodents.^{49,50}
- Lead is still used in shotgun cartridges. This is legal for shooting terrestrial birds though it is illegal for shooting waterbirds.⁵¹ Waterbirds can be poisoned through direct ingestion of lead and birds of prey are subject to secondary poisoning when feeding on shot prey.⁵²

Landscape character, and access

- The varied, 'patchwork' landscape of lowland England has been heavily influenced by the maintenance of woodland and hedgerows to encourage gamebirds. Continued management of field margins, hedgerows and woodlands is undertaken in some areas for game shooting, enhancing the landscape character.⁵³
- The perceived threat to gamebirds from disturbance by people and their dogs means that public access is often strictly controlled on estates where game rearing is important. CRoW 'open access' land may be closed to the public for up to 28 days each year to allow shoots to take place.

¹ BASC (2005), *Aim of the Game. Driven Game Shooting in Britain Today*. URL: www.basc.org.uk/media/aim_of_game.pdf. Accessed January 2009

² BASC op cit.

³ PACEC (2006), *The economic and environmental effects of sporting shooting*, URL: www.shootingfacts.co.uk/. Accessed January 2009

⁴ Countryside Alliance (2008), *Wildfowling and shooting*. Appendix to Political Media and Campaigns teams Update, URL: www.countryside-alliance.org.uk/political/general/appendix-1-%11-wildfowling-and-shooting. Accessed January 2009

⁵ PACEC. op.cit

⁶ Brown, A. and Grice, P., *Birds in England* (London, Poyser, 2005)

⁷ Tapper, S.C., *Game heritage: An ecological review from shooting and gamekeeping records* (Fordingbridge, Game Conservancy Trust, 1992)

⁸ PACEC, op.cit.

⁹ PACEC, op.cit.

¹⁰ PACEC, op.cit.

¹¹ Vickery, J., Carter, N. and Fuller, R.J., 'The potential value of managed cereal field margins as foraging habitats for farmland birds in the UK', *Agriculture, Ecosystems and Environment*, 89 (2002), 41-52

¹² Draycott, R.A.H., Hoodless, A.N. and Sage, R.B., 'Effects of pheasant management on vegetation and birds in lowland woodlands', *J. Applied Ecology* (OnlineEarly Articles) doi:10.1111/j.1365-2664.2007.01379.x

-
- ¹³ Stodate, C., Szczur, J. and Aebischer, N.J., 'Winter use of wild bird cover crops by passerines on farmland in northeast England', *Bird Study*, 50 (2003), 15-21
- ¹⁴ Draycott, *op.cit.*
- ¹⁵ Sage, R.B., Ludorf, C. and Robertson, P.A., 'The ground flora of ancient semi-natural woodlands in pheasant release pens in England', *Biological Conservation*, 122 (2005), 243-52
- ¹⁶ SEPA, *Agricultural best management practices (BMP 80): Riparian buffer strip (wet)*, URL: www.sepa.org.uk/bmp/ShowPractice.aspx?bmpNumber=80. Accessed January 2009
- ¹⁷ Vickery, *op.cit.*
- ¹⁸ Tapper, S.C., Potts, G.R. and Brockless, M.H., 'The effect of an experimental reduction in predation pressure on the breeding success and population density of grey partridges *Perdix perdix*', *J. Applied Ecology*, 33 (1996), 965-78
- ¹⁹ Burn, A.J., Carter, I. and Shore, R.F., 'The threat to birds of prey in the UK from second-generation rodenticides' in *Aspects of Applied Biology 67, Birds and Agriculture* (Wellesbourne, Association of Applied Biologists, 2002), pp. 203-12
- ²⁰ Pain, D.J., Carter, I., Sainsbury, A.W., Shore, R.F., Eden, P., Taggart, M.A., Konstantinos, S., Walker, L.A., Meharg, A.A. and Raab, A., 'Lead contamination and associated disease in captive and reintroduced red kites *Milvus milvus* in England', *Science of the Total Environment*, 376 (2007), 116-27
- ²¹ Fisher, I.J., Pain, D.J., Thomas, V.G., 'A review of lead poisoning from ammunition sources in terrestrial birds', *Biological Conservation*, 131 (2006), 421-432
- ²² Owen, M., 'The UK shooting disturbance project', *Wader Study Group Bulletin*, 68 (1993), 35-46
- ²³ Madsen, J. and Fox, A.D., 'Impacts of hunting disturbance on waterbirds - a review', *Wildlife Biology*, 1 (1995), 193-207
- ²⁴ Ministry of Justice (1968), UK Stature Law Database, Firearms Act 1968, URL: www.statutelaw.gov.uk/. Accessed January 2009
- ²⁵ Ministry of Justice (1999), UK Stature Law Database, 'Environmental Protection (Restriction on the use of lead shot) (England) Regulations 1999', URL: www.statutelaw.gov.uk/. Accessed January 2009
- ²⁶ Ministry of Justice (1831), UK Stature Law Database, 'Game Act 1831 (c.32)', URL: www.statutelaw.gov.uk/. Accessed January 2009
- ²⁷ Ministry of Justice (1981), *UK Statute Law database*, 'Wildlife and Countryside Act 1981 (c. 69)', URL: www.statutelaw.gov.uk/. Accessed January 2009
- ²⁸ BASC, 2008. Code of Good Shooting Practice. URL: www.basc.org.uk/content/codeofgoodshootingpractic. Accessed January 2009
- ²⁹ PACEC, *op.cit.*
- ³⁰ Vickery, *op.cit.*
- ³¹ Draycott, *op.cit.*
- ³² Sage, *op.cit.*
- ³³ Tapper, *op.cit.*
- ³⁴ Sage, R.B., Parish, D.M.B., Woodburn, M.I.A. and Thompson, P.G.L., 'Songbirds using crops planted on farmland as cover for game birds', *European J. Wildlife Research*, 51:4 (2005), 248-53
- ³⁵ UK Biodiversity Action Plan (2005), *Species Action Plan: Grey Partridge*, URL: www.ukbap.org.uk/. Accessed January 2009
- ³⁶ Watson, M., Aebischer, N. J., Potts, G. R; Ewald, J. A. The relative effects of raptor predation and shooting on overwinter mortality of grey partridges in the United Kingdom . 2007, *Journal of Applied Ecology*, 44, 5, 972-982
- ³⁷ Pain, *op.cit.*
- ³⁸ Fisher, *op.cit.*
- ³⁹ Owen, M., *op cit*
- ⁴⁰ Madsen, J. and Fox, A.D., *op cit*
- ⁴¹ Townshend, D.J. and O'Connor, D.A., 'Some effects of disturbance to waterfowl from bait-digging and wildfowling at Lindisfarne National Nature Reserve, north-east England', *Wader Study Group Bulletin*, 68 (1993), 47-52
- ⁴² Howat, M. and Townshend, D.J., *Hen Harrier Project: Progress Report*. Paper to Committee of Council (English Nature, 2003)
- ⁴³ Brown, *op.cit.*
- ⁴⁴ Tompkins, D.M., Draycott, R.A.H. and Hudson, P.J., 'Field evidence for apparent competition mediated via the shared parasites of two gamebird species', *Ecology Letters*, 3:1 (2000), 10-14

⁴⁵ Treweek, J., Drake, M., Mountford, O., Newbold, C., Hawke, C., Jose, P., Self, M. and Benstead, P., *The wet grassland guide* (Sandy, RSPB, 1997)

⁴⁶ SEPA, *op.cit.*

⁴⁷ SEPA, *op.cit.*

⁴⁸ SEPA, *op.cit.*

⁴⁹ Birks, *op.cit.*

⁵⁰ Burn, *op.cit.*

⁵¹ ADAS, *Assessment of techniques for monitoring compliance with Lead Shot Regulations (England) 1999* (Defra, 2007)

⁵² Pain, *op.cit.*

⁵³ PACEC, *op.cit.*

Case Study: Predator Control

Predator control is practiced by land managers principally to try to avoid losses of livestock on farms, and game animals and birds where there is a shooting interest. Predatory species controlled in this way range from foxes and mustelids (such as mink and stoats), to corvids (such as crows and magpies). Control of raptors is illegal unless carried out under license. To date no such licenses have been issued. The subject is still highly contentious where there is the belief that raptors are reducing numbers of potentially valuable gamebirds, or affecting the breeding success of other scarce native species.

Moorland managed for red grouse supports higher numbers of certain species of bird than moorland not managed for grouse.¹ Specific research which clearly demonstrates the impact of predator control on upland birds is limited. This is likely to be a reflection of differences in habitat quality, type of management and predator control. It is not possible from research to date to determine the precise contribution that predator control may play. Conversely there are a number of species which are less abundant on grouse moors, particularly certain raptors. A report assessing hen harrier nesting success between 2002 and 2008 shows that very few nesting attempts on grouse moors are successful and this is likely to have limited their distribution and expansion in England.²

In order to test whether predator removal by moorland gamekeepers improves the numbers or breeding success of moorland birds other than red grouse, the Game and Wildlife Conservation Trust have recently concluded an 8 year Upland Predation Experiment based at Otterburn, Northumberland. The project adopted an experimental approach using four plots each of 12 square kilometres. Two plots retained the same regime for the whole period, one where fox and crow populations were managed (keepered) and one where they were not (unkeepered), whilst the other two switched half way through the experiment from keepered to unkeepered and unkeepered to keepered, allowing an assessment of breeding success on the same plot with and without predator control. A final analysis of the experiment is currently being completed. Provisional findings outlined by the Game and Wildlife Conservation Trust³ suggested waders and meadow pipits show a tendency for greater breeding success on sites with predator removal, though the trend in numbers of breeding pairs is not yet clear. Black grouse and grey partridges also show a tendency for better breeding success in the presence of predator removal, but the low numbers of these species means that the analysis may not be conclusive.

Reviews of a large number of studies into predator control have concluded that whilst killing predators frequently increases breeding productivity (and hence, for game species, the surplus of birds available for shooting in autumn), this does not necessarily translate into an increase in the size of the breeding population in subsequent years.⁴

¹ Tharme, A.P., Green, R.E., Baines, D., Bainbridge, I.P. and O'Brien, M. The effect of management for red grouse shooting on the population density of breeding birds on heather dominated moorland. *Journal of Applied Ecology* 38 (2001), 439-45

² Natural England, A future for the Hen Harrier in England (Natural England, 2008).

³ Game and Wildlife Conservation Trust. *Predator control and waders*. *Game and Wildlife Review* (2007) 42-45.

⁴ Cote, I.M., Sutherland, W.J., The effectiveness of removing predators to protect bird populations. *Conservation Biology* 11, 2 (1997) 395-405