SLE Response to: Call for Evidence on Gamebird Release, Shooting and Welfare during Rearing in England

Executive Summary

The Scottish Land & Estates (SLE) response highlights the important environmental, economic and social contributions associated with gamebird management and the wider shooting sector. While this Call for Evidence relates to activities in England, many of the associated supply chains, businesses, employment opportunities and conservation services operate across Great Britain. Policy decisions affecting gamebird management in England therefore have the potential to generate significant cross-border impacts in Scotland and should be considered as part of Defra's assessment.

Gamebird management forms part of a broader land management system which delivers multiple public benefits through private investment. Income associated with shooting helps support habitat management, species conservation, woodland creation and management, predator control, supplementary feeding, wildlife monitoring, peatland restoration, deer management and wildfire preparedness. These activities contribute towards wider government objectives relating to biodiversity recovery, climate resilience and thriving rural communities.

Evidence from the Angus Glens provides a clear example of the scale and breadth of these benefits in practice. The report demonstrates how sporting estates support employment, local businesses, habitat management, peatland restoration, deer management, biodiversity enhancement and community resilience across a large upland landscape. Importantly, it illustrates that many environmental and social outcomes are not delivered in isolation, but are supported through the investment, staffing and land management infrastructure associated with sporting activity.

The sector also provides significant economic and social benefits. It supports employment in some of the most remote rural areas of the country, sustains local businesses and contractors, contributes to rural tourism, and helps retain the skills and expertise required for long-term stewardship of rural landscapes. The wider contribution of sporting management to community resilience and economic sustainability should form part of any assessment of future regulatory change.

In addition, game management infrastructure and staffing contribute to wildfire risk reduction and response capability. Trained estate personnel, access infrastructure, equipment and vegetation management activities provide an important element of landscape-scale resilience at a time when wildfire risk is increasing across the UK. Any

reduction in management activity should therefore be assessed against the potential loss of this existing prevention and response capacity.

The Angus Glens evidence also highlights the importance of assessing potential losses alongside potential impacts – demonstrating what would be lost, not just what currently exists. Should future policy changes reduce the viability of sporting activity, there may be consequential effects on the environmental management, conservation investment, rural employment and resilience measures that are currently supported through associated private expenditure. These wider implications should form a key part of Defra's evidence base and impact assessment.

SLE encourages Defra to adopt a balanced and evidence-led approach that considers both the potential impacts associated with gamebird release and the wider public benefits currently delivered through associated land management. Future policy assessments should therefore evaluate not only risks but also the potential loss of conservation capacity, private environmental investment, rural employment, biodiversity management and wildfire resilience that may arise if activity declines.

Key Messages for Defra

- Gamebird management supports significant private investment in environmental management and conservation.
- Evidence from the Angus Glens demonstrates how sporting activity underpins a wider system of biodiversity enhancement, habitat management, rural employment and community benefit.
- Policy changes may affect not only gamebird management itself, but also the wider public goods currently delivered through associated land management.
- Decisions taken in England may have significant cross-border impacts on Scottish businesses, rural communities and conservation activity.
- Defra's assessment should consider both the impacts of gamebird release and the potential loss of environmental, economic and social benefits if associated management activity declines.

Section A: Call for Evidence Questions – Biodiversity

Biodiversity

Question 8

What evidence is there of positive and/or negative impacts from:

a. grouse shooting;

A substantial body of peer-reviewed evidence indicates that the habitat management practices associated with driven grouse moors can deliver significant biodiversity and conservation benefits when undertaken to high standards. Predator control, in particular, has been identified as an effective conservation tool for improving the breeding success and abundance of ground-nesting birds. Experimental and landscape-scale studies have demonstrated that the control of generalist predators such as foxes and carrion crows can increase nesting success and productivity of species including lapwing, curlew, golden plover and black grouse (Fletcher et al., 2010; Roos et al., 2018). More recently, Sage et al. (2026) reported that integrated habitat management and predator control contributed to the recovery of lapwing populations in the Hampshire Avon Valley.

Management undertaken for grouse shooting also supports the maintenance and restoration of upland habitats. Research has shown that grouse moors often support internationally important populations of breeding waders, with managed heather moorland providing suitable nesting and feeding habitat for species such as curlew, golden plover and dunlin (Tharme et al., 2001; Robertson et al., 2017). The GWCT Game for Nature Report (2026) highlights evidence that game management practices can benefit a wide range of birds, invertebrates and other wildlife through habitat creation, supplementary feeding, predator management and the preservation of structurally diverse habitats.

There is also evidence that muirburn, when conducted in accordance with regulatory requirements and best-practice guidance, can contribute to ecosystem resilience by creating a mosaic of heather ages that supports biodiversity and reduces the accumulation of combustible vegetation (Davies et al., 2016). Strategic fuel-load management is increasingly recognised as an important tool for enhancing wildfire resilience in upland landscapes, helping to protect peatland habitats, carbon stores, livestock, wildlife and rural communities from severe wildfire events.

Evidence supports the view that well-managed grouse moors can provide positive outcomes for biodiversity conservation, habitat management and wildfire mitigation alongside sustainable sporting use.

The Angus Glens evidence demonstrates that biodiversity management is not delivered in isolation but forms part of an integrated land management system supported by sporting income. Habitat management, species monitoring, woodland management and predator control are delivered by personnel whose employment is directly linked to sporting activity. Sporting income and investment directly funds the environmental activity and biodiversity outcomes.

Further Scottish practice and evidence which should be considered is Wildlife Estates Scotland (WES). This scheme provides an objective, independently assessed accreditation framework that promotes high standards of wildlife and habitat management across a wide range of land uses, including grouse moor management, gamebird releasing, wetland management and conservation activities. At its core, WES requires land managers to demonstrate a commitment to best practice, maintain habitat and species records, undertake conservation work, monitor outcomes and integrate biodiversity objectives into day-to-day land management. The scheme is designed to provide evidence that biodiversity is being maintained and enhanced through structured, data-led management.

WES supports biodiversity by encouraging members to implement habitat management plans, monitoring programmes and ensure compliance with recognised best practice guidance and regulatory requirements. Accredited estates must demonstrate exemplary responsible management practices, including the maintenance of heather moorland, peatland restoration, species recording and landscape-scale conservation measures. This aligns closely with the principles of the Code of Practice for Grouse Moor Management, which recognises the importance of moorlands for biodiversity, carbon storage, flood mitigation and species such as waders and other ground-nesting birds. By requiring evidence-based decision-making and continual improvement, WES helps ensure that grouse moor management delivers wider environmental benefits alongside sporting objectives. Consideration should be given to the ongoing progress of Wildlife Farms and Estate in England, and the role it plays in supporting best practice.

References

Davies, G.M. et al. (2016). *The role of fire in UK peatland and moorland management: the need for informed, unbiased debate*. Philosophical Transactions of the Royal Society B. Published paper

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Robertson, P.A. et al. (2017). *Does moorland management for red grouse benefit biodiversity?* Journal of Applied Ecology. Published paper

Roos, S. et al. (2018). *Long-term trends in the conservation status of UK breeding birds associated with game management*. Wildlife Biology. Published paper

Tharme, A.P. et al. (2001). *The effect of management for red grouse shooting on the population density of breeding birds on heather-dominated moorland*. Journal of Applied Ecology. Published paper

Angus Glens Impact Report, Scottish Land & Estates & Angus Glens Moorland Group Published report

Scottish Land & Estates, The Response to the Glenmore-Strathnethy Wildfire by Land-Based and Rural Businesses (2026) Report

Scottish Land & Estates, The Response to the Carrbridge and Dava Wildfires by Land-Based and Rural Businesses Report

Wildlife Estates Scotland (WES) Website

b. pheasant/partridge release and shooting;

A substantial body of peer-reviewed research indicates that management associated with pheasant and partridge releasing can deliver wider biodiversity benefits. Woodland habitats managed for pheasants have been shown to support significantly higher levels of wildlife, with studies recording 22-32% more wild birds and approximately twice as many butterflies compared with comparable unmanaged woodlands. These benefits are linked to active woodland management that promotes a more diverse understorey structure, increased ground vegetation cover and improved habitat conditions for a range of bird species, particularly woodland passerines.

Similarly, farms and estates with gamebird interests have been found to maintain substantially more linear habitat features. Research across southern and eastern England found that properties managed for released gamebirds contained 10-65% more hedgerow per square kilometre, as well as wider hedge banks, than comparable

non-game-managed farms. These features provide nesting, foraging and refuge habitats for farmland birds, small mammals, bats, pollinating insects and other invertebrates, contributing to greater landscape connectivity and ecological resilience.

The establishment of game crops also provides important conservation benefits in otherwise simplified agricultural landscapes. These crops offer food, shelter and overwintering resources for a range of farmland wildlife while increasing habitat heterogeneity. Research has demonstrated that game crops can support substantially higher numbers of songbirds, butterflies, bumblebees and arable plants compared with neighbouring conventionally managed arable fields.

Evidence from Exmoor found that hedgerows located close to winter game crop plots supported between 1.5 and 2 times more breeding resident songbirds than similar hedges located further away. The study concluded that game crop provision helps retain breeding populations of farmland birds by supplying critical food and cover resources during the winter period and the "hungry gap" before spring.

Long-term ecological monitoring at the GWCT's Allerton Project, Loddington, further demonstrates the importance of integrated game management. Following the reintroduction of gamebird management practices, including habitat management, supplementary feeding and legal predator control, breeding songbird populations increased substantially, more than doubling over time and reversing previous declines observed when management interventions were withdrawn.

Supplementary feeding programmes implemented for gamebirds can also benefit non-target species. Studies have shown that species such as yellowhammer, tree sparrow, reed bunting and stock dove make extensive use of game feed hoppers, with winter feeding linked to increased breeding densities and improved local population performance where feeding is delivered and accompanied by appropriate pest management.

While habitat creation and food provision are critical components of farmland bird conservation, evidence suggests that these measures are most effective when combined with lawful predator management. A landmark eight-year experiment found that legal control of generalist predators led to a threefold increase in breeding success among vulnerable ground-nesting species, including lapwing, golden plover, curlew and red grouse, with resulting population increases where predator control was maintained. The authors concluded that predator management can be an important conservation tool when integrated with habitat-focused measures.

WES accreditation encourages operators to adopt recognised best practice through habitat planning, monitoring and integration with wider land uses. Accredited holdings are assessed on their conservation activities, habitat creation and management, collaborative working and record-keeping. This can help drive the provision and maintenance of habitats such as woodland edges, game crops, field margins, hedgerows and shelterbelts that support a wide range of farmland birds, pollinators and other wildlife. The requirement for ongoing monitoring and the independent assessment of this every 5 year which helps demonstrate that management interventions are delivering positive biodiversity outcomes. We encourage DEFRA to take into the scheme information into account.

References

Draycott, R.A.H., Hoodless, A.N. & Sage, R.B. (2008). *Effects of pheasant management on vegetation and birds in lowland woodlands*. Published paper

Sage, R.B., Woodburn, M.I.A., McCready, S. & Coomes, J.R. (2024). *Winter game crop plots for gamebirds retain hedgerow breeding songbirds in an improved grassland landscape*. Published paper

Fletcher, K.L., Aebischer, N.J., Baines, D., Foster, R. & Hoodless, A.N. (2010). *Changes in breeding success and abundance of ground-nesting moorland birds in relation to the experimental deployment of legal predator control*. Published paper

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Draycott, R.A.H. et al. (2011). *Hedgerow characteristics associated with released gamebird management*. Paper summary

Wildlife Estates Scotland (WES) Website

c. mallard release and shooting on biodiversity.

A growing body of evidence indicates that the management associated with wildfowl and mallard shooting can deliver wider biodiversity benefits. Although the direct release

of mallard has been less extensively studied than pheasant and partridge releasing, many of the associated management activities, including wetland creation and maintenance, supplementary feeding, predator management and wider investment in habitat management, are recognised as important drivers of biodiversity enhancement across lowland and wetland landscapes.

One of the principal biodiversity benefits associated with mallard shooting is the creation, restoration and long-term management of wetlands. Sporting interests frequently support the retention of ponds, scrapes, marshes and riparian habitats that provide breeding, feeding and overwintering opportunities for a wide range of wildlife, including amphibians, aquatic invertebrates, wading birds, waterfowl and pollinators. Across the UK, managed wetlands consistently support higher levels of biodiversity than comparable intensively farmed land and contribute to wider nature recovery objectives.

Supplementary feeding undertaken to support mallard and other gamebirds can also provide an important food resource for non-target wildlife during periods of natural food scarcity. Research on gamebird feeding programmes has demonstrated that feed hoppers and feeding areas are widely used by declining farmland and wetland bird species, including yellowhammer, tree sparrow, reed bunting and stock dove, resulting in improved survival and increased breeding densities when implemented alongside good habitat management.

Predator management associated with sporting interests can further enhance biodiversity outcomes, particularly for vulnerable ground-nesting and wetland bird species. Experimental research has shown that legal control of generalist predators can significantly improve nesting success and population growth in species such as lapwing, curlew, golden plover and red grouse. These findings have important implications for the conservation of breeding waders and wildfowl, many of which continue to experience substantial population declines due to nest predation.

Importantly, the economic value of sporting shooting often provides an incentive for sustained investment in habitat management that might not otherwise occur. Income generated through shooting can support the maintenance of wetlands, water control structures, nesting cover, predator management and habitat restoration projects that benefit a broad range of species beyond gamebirds. This "conservation through sustainable use" model has been widely recognised as an important mechanism for delivering biodiversity outcomes on privately managed land.

As with other forms of gamebird management, the greatest biodiversity benefits are typically achieved where habitat creation, supplementary feeding and predator management operate together as an integrated package. Evidence from long-term studies demonstrates that this combination of measures can contribute to increased abundance, breeding success and habitat availability for a wide range of farmland and wetland wildlife.

WES promotes a holistic approach that encourages good wetland management, habitat enhancement and species monitoring. The accreditation framework recognises that management for sporting purposes often sits alongside broader conservation objectives and requires applicants to demonstrate how wildlife and habitat management contribute to biodiversity gains. The emphasis on evidence gathering, adaptive management and long-term planning supports sustainable management of ponds, wetlands and associated habitats that can benefit a range of species beyond quarry species alone.

A key strength of WES is its emphasis on best practice and continuous improvement. Accreditation involves independent assessment by external auditors and site visits to verify that management meets the required standard. Land managers must provide evidence of wildlife and habitat management plans, species records, conservation projects and engagement with relevant guidance and legislation. This creates a framework for accountability, encourages learning and knowledge-sharing across holdings, and helps promote a culture of exemplary sustainable land stewardship.

References

Fletcher, K.L., Aebischer, N.J., Baines, D., Foster, R. & Hoodless, A.N. (2010). Changes in breeding success and abundance of ground-nesting moorland birds in relation to the experimental deployment of legal predator control. Published paper

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Wildlife Estates Scotland (WES) Website

***d. and related activities*.**

Creation and maintenance of hedgerows, woodland rides, game crops and field margins increases habitat availability across farmed landscapes.
Supplementary feeding supports farmland birds during the "hungry gap" in late winter and early spring.
Predator control is associated with improved nesting success and recovery of vulnerable ground-nesting birds.
Game management delivers substantial privately funded conservation effort across large areas of the countryside.

WES Level 2 accreditation is recognised as a route to Trusted Operator status, providing confidence that a business is operating in accordance with relevant codes and recognised good practice. Scottish Land & Estates notes that Level 2 accreditation is recognised as a means of monitoring compliance with both the Code of Practice for Grouse Moor Management and the Muirburn Code. As a result, WES can help provide regulators, policymakers and the public with assurance that accredited operators have robust management systems in place, are committed to biodiversity enhancement and are operating to independently verified standards.

Overall, WES provides a practical mechanism for demonstrating that grouse shooting, pheasant and partridge management, mallard management and associated sporting activities are being undertaken within a framework of responsible land management, evidence-based conservation and continual biodiversity improvement. The combination of independent assessment, best-practice requirements and Trusted Operator recognition helps ensure that environmental, social and economic outcomes are delivered in a transparent and accountable manner.

When managed according to best practice, pheasant and partridge releasing can deliver landscape-scale biodiversity benefits through habitat creation, winter feeding and predator management. Overall, privately funded sporting estates contribute significantly to conservation including; predator control, feeding game and songbirds

through the hunger gap, manage woodlands, control invasive species, manage hedgerows for game and wildlife, establish wild bird seed mixes, manage ponds and plant trees.

The shooting sector also plays a vital role in supporting the work of The Country Food Trust, helping to turn a sustainable, locally sourced resource into nutritious meals for people experiencing food insecurity across the UK. Through donations of game meat, venison and financial support from estates, sporting businesses, game dealers and individual shooters, the sector provides a practical example of how countryside management can deliver tangible social benefits alongside environmental and economic outcomes.

Since its establishment in 2015, The Country Food Trust has provided nearly 3 million meals to people facing food poverty, working with food banks, charities and community kitchens throughout the country. The charity's mission is to provide high-protein, nutritious meals free of charge to those who need them most, recognising that access to quality protein is often one of the greatest challenges for families struggling with food insecurity.

Game shooting makes an important contribution to this work by supplying healthy, sustainable wild meat which might otherwise go underutilised. Game is naturally lean, high in protein and has a low environmental footprint compared with many alternative protein sources. Estates and shooting interests have become key partners in the charity's supply chain, enabling significant quantities of game meat to be processed into ready-to-eat meals and distributed to vulnerable communities.

The scale of the charity's impact is considerable. In 2022 alone, The Country Food Trust donated more than 1.4 million meal pouches and distributed an additional 148 tonnes of meat to charities, food banks and community kitchens across the UK. In the 2022-23 reporting year, the charity delivered over 500,000 meals through a network of more than 100 charities nationwide.

Beyond simply providing food, the charity demonstrates how the shooting and deer sectors can contribute positively to wider society. By connecting sustainable countryside management with communities facing hardship, it creates a direct link between rural land use and public benefit. The continued support of estates, game managers and the wider shooting community is therefore fundamental to the charity's ability to meet growing demand and ensure that high-quality, protein-rich food reaches thousands of people who would otherwise struggle to access it.

Concluding remarks

These outcomes are not delivered in isolation. They are supported by sustained private investment in land management associated with sporting activity. Assessment of environmental impacts should therefore consider both direct effects and the potential consequences of reduced management activity, including any loss of habitat management, species monitoring, supplementary feeding and predator control currently undertaken on a landscape scale.

It is important that Defra's assessment considers the counterfactual scenario. A reduction in the scale or economic viability of gamebird management may also lead to reductions in habitat management, supplementary feeding, predator control, wildlife monitoring and other conservation activities currently supported through private investment. The environmental implications of losing these activities should form part of any assessment of future policy options.

References

Game & Wildlife Conservation Trust (2026). *Game for Nature: Why released gamebird management is a lifeline for declining farmland biodiversity*. Published

Sage, R.B., Woodburn, M.I.A., McCready, S. & Coomes, J.R. (2024) Published paper

Wildlife Estates Scotland (WES) Website

Country Food Trust Website

Question 9

What evidence is there of impacts on species included in national species indicators or Red List species? For Red List, please see Appendix 4, Outcome Indicator Framework for current species statuses. For National Species Indicators.

Several Red List farmland bird species have been shown to benefit from habitat provision associated with shooting estates. For example, yellowhammer, tree sparrow, lapwing and song thrush are repeatedly identified within the evidence base as species responding positively to the management measures commonly associated with pheasant and partridge shoots.

Recent research by Sage et al. (2024) found that hedgerows located near winter game crops supported 1.5 to 2 times more breeding resident songbirds than comparable hedges further away. These findings suggest that game crops provide important winter food and shelter resources that can improve subsequent breeding densities of farmland birds, many of which contribute to national farmland bird indicators.

Supplementary feeding has also been shown to benefit species of conservation concern. Long-term GWCT studies found that winter feeding programmes increased breeding densities of species including yellowhammer, tree sparrow, reed bunting and stock dove, particularly during the late-winter "hungry gap" when natural seed availability is limited. Given that food availability is recognised as a key driver of farmland bird declines, these measures can contribute to improved local population performance.

Strong evidence also exists for the contribution of predator management to the conservation of vulnerable ground-nesting birds. An eight-year field experiment by Fletcher et al. (2010) found that legal predator control produced a threefold increase in breeding success among species including lapwing, golden plover and curlew, with breeding populations increasing where predator management was maintained but declining where it was absent. Both lapwing and curlew are species of significant conservation concern and are included within measures used to assess the health of farmland and upland bird communities.

Long-term monitoring at the GWCT Allerton Project provides further evidence of population-level benefits. Following the implementation of integrated game management, including habitat enhancement, supplementary feeding and predator control, breeding songbird populations more than doubled over time. Notably, song thrush, a Red List species, increased substantially despite broader national declines.

Evidence also suggests benefits for woodland bird assemblages. A large-scale study of 159 broadleaved woods found that pheasant-managed woodlands supported 22-32% more birds than unmanaged woods and provided favourable habitat conditions for a range of woodland species through increased vegetation structure and understorey development.

Overall, the available evidence indicates that gamebird management can contribute positively to several species included within national species indicators and to a number of UK Red List species. The clearest benefits are associated with habitat creation and management, winter feeding and predator control, which improve breeding success, winter survival and habitat availability. The documented benefits frequently occur at farm and landscape scales and are associated with improved outcomes for several species of conservation concern.

References

Draycott, R.A.H., Hoodless, A.N. & Sage, R.B. (2008). *Effects of pheasant management on vegetation and birds in lowland woodlands*. Published paper

Sage, R.B., Woodburn, M.I.A., McCready, S. & Coomes, J.R. (2024). *Winter game crop plots for gamebirds retain hedgerow breeding songbirds in an improved grassland landscape*. Published paper

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Game for Nature: Why Released Gamebird Management is a Lifeline for Declining Farmland Biodiversity (2026). Game & Wildlife Conservation Trust. Report.

GWCT Allerton Project Long-term Songbird Monitoring. Project summary.

Question 10

What evidence is there that practices aligned with recognised regulatory requirements, industry codes or guidance increase the likelihood of positive outcomes and reduce the risk of negative outcomes for biodiversity?

The available evidence indicates that biodiversity benefits are most consistently delivered where gamebird management is undertaken in accordance with recognised regulatory requirements, industry codes and best-practice guidance. In particular, the principles contained within the Guidelines for Sustainable Gamebird Releasing focus on appropriate stocking densities, habitat protection, woodland management, biosecurity, supplementary feeding, predator management and the careful siting and management of release pens. These measures are designed to maximise biodiversity gains while minimising potential environmental impacts.

Evidence also supports the role of best-practice supplementary feeding. Winter feeding programmes, delivered according to established guidance, help address food shortages during the late-winter "hungry gap" and have been associated with increased breeding densities of declining farmland birds such as yellowhammer, tree sparrow, reed bunting and stock dove. Research underpinning current guidance found that feeding methods, feeder design and placement influence both target-species uptake and the likelihood of attracting pest species, demonstrating the importance of following recognised standards.

There is also strong evidence that lawful predator management, when undertaken within the framework of wildlife legislation and recognised codes of practice, can improve conservation outcomes. An eight-year experimental study by Fletcher et al. (2010) found that legal predator control increased breeding success threefold in species including lapwing, golden plover and curlew. Populations increased where integrated predator management was maintained but declined where it was absent.

The evidence further suggests that adherence to best-practice guidance reduces many of the environmental risks that have been identified within the literature. Reviews of gamebird releasing consistently note that any adverse effects are generally concentrated around release pens, feeders and areas of exceptionally high stocking density. Measures recommended through industry guidance, including appropriate release densities, careful pen siting, rotational use of pens, protection of sensitive habitats, prudent feeding practices and biosecurity measures, are specifically intended to reduce these localised impacts. The Game for Nature report concludes that while some negative effects can occur at a local scale, positive outcomes from habitat creation, winter feeding and predator management are typically realised at the farm and landscape scale when best practice is followed.

Long-term monitoring at the GWCT Allerton Project provides a practical example of these principles in action. Integrated management involving habitat creation, supplementary feeding and predator control resulted in substantial increases in breeding songbirds, including species of conservation concern. The project demonstrates that when interventions are implemented in a coordinated and evidence-led manner, biodiversity benefits can be sustained over time.

Overall, the evidence suggests that compliance with recognised regulatory requirements and industry guidance increases the likelihood of achieving positive biodiversity outcomes while reducing the risk of negative environmental impacts. The clearest benefits arise where habitat management, supplementary feeding and predator management are delivered as part of an integrated management approach, while adherence to best-practice standards.

References

Draycott, R.A.H., Hoodless, A.N. & Sage, R.B. (2008). *Effects of pheasant management on vegetation and birds in lowland woodlands*. Published paper

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Game for Nature: Why released gamebird management is a lifeline for declining farmland biodiversity (2026). Dimbleby, J., Hopgood, A. & Connelly, J.. Game & Wildlife Conservation Trust. Report

Guidelines for Successful Gamebird and Songbird Feeding, Game & Wildlife Conservation Trust. Report

Question 11

What evidence exists on the factors that influence whether practices aligned with recognised regulatory requirements, industry codes or guidance are adopted and maintained?

The available evidence suggests that the adoption and long-term maintenance of practices aligned with recognised regulatory requirements, industry codes and best-practice guidance are influenced by a combination of economic incentives, practical considerations, regulatory frameworks, access to advice, and confidence that management interventions deliver measurable outcomes for wildlife.

A consistent finding across the literature is that the private investment generated by shooting interests provides a significant driver for the implementation of conservation measures. Habitat management activities such as hedgerow restoration, woodland management, game crop establishment, supplementary feeding and predator management often require sustained financial and labour inputs. Where shooting provides an economic return, land managers are more likely to invest in and maintain these activities over the long term, creating conditions that support wider biodiversity objectives. The Game for Nature: Why released gamebird management is a lifeline for declining farmland biodiversity report highlights how gamebird management can provide the financial incentive for large-scale conservation activity that might otherwise not occur within commercial farming systems.

Evidence also suggests that uptake is influenced by the availability of clear, practical guidance and demonstrable evidence of success. Management interventions are more likely to be adopted where land managers can see clear ecological benefits and where guidance provides straightforward, evidence-based recommendations. For example, research demonstrating increased breeding densities of songbirds near game crops, improved breeding success through supplementary feeding, and population recovery following integrated habitat and predator management provides a strong evidence base supporting the continued implementation of these measures.

Long-term monitoring from the GWCT Allerton Project illustrates the importance of evidence-led management. Habitat creation, winter feeding and predator management were introduced as part of an integrated programme and resulted in substantial increases in breeding songbirds and other farmland wildlife. Where managers can observe tangible biodiversity outcomes, there is a greater incentive to maintain these practices over time.

The availability of advisory support and knowledge transfer is another important factor influencing compliance with recognised guidance. The success of management interventions often depends on how they are implemented in practice. Guidance documents such as the Guidelines for Successful Gamebird and Songbird Feeding provide practical recommendations on feeder design, placement, timing, biosecurity and pest management, helping managers maximise benefits while avoiding unintended consequences. Access to such guidance can increase confidence in implementation and improve long-term adherence to best-practice standards.

Regulatory and licensing frameworks can also drive adoption. Requirements relating to wildlife legislation, environmental protection, disease control and, increasingly, gamebird release licensing create incentives for land managers to follow recognised standards. Clear and proportionate regulation can reinforce best practice, while providing assurance that management activities are consistent with wider environmental objectives. Conversely, uncertainty around future regulation or licensing requirements may discourage long-term investment in habitat management and conservation infrastructure. This issue has been identified repeatedly by practitioners as a potential barrier to continued conservation investment.

Many of the most successful examples of conservation delivery involve integrated approaches where habitat management, supplementary feeding and predator management are implemented together. The evidence suggests that coordinated management across larger landscapes is more likely to deliver measurable biodiversity gains and therefore encourage continued participation.

Conversely, several factors can reduce adoption or long-term maintenance. The literature highlights that habitat creation, feeding programmes and predator management can require significant ongoing investment of time and resources. Financial costs, labour availability, competing land-use pressures and administrative burdens may all constrain implementation. Concerns about environmental risks, negative public perceptions, or uncertainty regarding future policy and regulatory requirements may also reduce willingness to invest in long-term management programmes.

The experience of gamebird management demonstrates that habitat creation, supplementary feeding, woodland management and predator management are most successfully maintained where these factors operate together, supported by recognised standards such as the Guidelines for Sustainable Gamebird Releasing.

References

Sage, R.B., Woodburn, M.I.A., McCready, S. & Coomes, J.R. (2024). *Winter game crop plots for gamebirds retain hedgerow breeding songbirds in an improved grassland landscape*. Published paper

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GWCT Allerton Project – Songbirds and Game Management. Report

Guidelines for Successful Gamebird and Songbird Feeding. Game & Wildlife Conservation Trust. Guidelines

Protected sites and habitats

Question 12

What evidence exists of links between gamebird activities and damage to protected sites or habitats, or positive impacts on biodiversity within protected sites?

SLE considers that the biodiversity effects of gamebird activities should be assessed by reference to the management undertaken, its scale and the sensitivity of the habitats and species concerned, rather than designation alone. Habitat management and lawful predator control associated with game management can operate both within and outside designated sites. However, designation brings site-specific conservation objectives and regulatory requirements, and similar practices cannot be assumed to have identical effects in every location. Defra should therefore distinguish the effects of released birds themselves from the effects of the wider management that accompanies shooting.

For released pheasants, Draycott, Hoodless and Sage (2008) compared 159 lowland broadleaved woods in southern and eastern England, including 81 with pheasant releases and associated management and 78 without pheasant management for at least 25 years. They recorded 22–32% more birds in pheasant-managed woods, alongside a more open canopy and greater ground-vegetation cover. The study supports benefits for some woodland birds from the associated woodland management, but was not a protected-site-specific assessment and does not establish that releasing itself produces a net biodiversity benefit.

Sage et al. (2020) reviewed the ecological effects of pheasant and red-legged partridge releasing and associated management. They identified positive, neutral and negative effects: positive effects were generally associated with management activities, while most negative effects arose from the released birds themselves. Some local adverse effects could be mitigated through careful management, including avoiding especially sensitive sites when locating release pens. SLE draws attention to this evidence both for its recognition of management benefits and for its emphasis on site sensitivity and good practice.

A more directly relevant protected-site example is the Langholm Moor Demonstration Project, whose study area included land within the Langholm–Newcastleton Hills SSSI and SPA. The project was a partnership between Scottish Natural Heritage, Natural England, the RSPB, the Game & Wildlife Conservation Trust and Buccleuch Estates. Its Seven Year Review should therefore be understood as a multi-partner project report, rather than evidence produced by the shooting sector alone.

Grouse-moor management was restored from 2008, combining heather restoration and management, reduced grazing, lawful control of generalist predators and monitoring.

The Seven Year Review reported that targets for expanding heather habitat and improving its condition had been met, and that nesting hen harriers exceeded the 2014 project target, contributing to the SPA's conservation objectives.

Peer-reviewed analysis of monitoring during 2008–2017 provides further evidence. Ludwig, Roos and Baines (2019) found average annual increases of approximately 10% in curlew, 16% in golden plover and 21% in snipe, while lapwing numbers did not change. These trends contrasted with regional and national declines. The authors concluded that restoration of predator control as part of grouse-moor management could reverse declines in some breeding waders.

Taken together, this evidence shows that management associated with shooting can benefit particular species and habitats, including within a protected-site setting. The Langholm evidence concerns management for wild red grouse, not pheasant or partridge releases, and should not be used as direct evidence of benefits from releasing birds. SLE therefore asks Defra to recognise demonstrated conservation benefits alongside potential adverse effects, and to assess activities against each site's designated features, conservation objectives and monitored outcomes. Proportionate policy should retain effective management while addressing evidenced risks through site-appropriate safeguards.

References

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Sage, R. B., Hoodless, A. N., Woodburn, M. I. A., Draycott, R. A. H., Madden, J. R. and Sotherton, N. W. (2020). *Summary review and synthesis: effects on habitats and wildlife of the release and management of pheasants and red-legged partridges on UK lowland shoots*. Published paper

Langholm Moor Demonstration Project (2014). *The Langholm Moor Demonstration Project: Seven Year Review – December 2014*. Langholm Moor Demonstration Project Ltd. Project review

Ludwig, S. C., Roos, S. and Baines, D. (2019). *Responses of breeding waders to restoration of grouse management on a moor in South-West Scotland*. Published paper

Question 13

What evidence exists on whether, and how, high standards of practice reduce risks to protected sites and habitats?

SLE questions the framing of this question. Although the words "whether, and how" allow respondents to question the effectiveness of particular practices, the emphasis

on reducing risks may imply that adverse effects attributable to gamebird activities have already been established. An evidence-gathering exercise should first identify whether a risk exists, its scale and causal pathway, and then assess whether particular practices mitigate it. A more balanced formulation would ask how standards of practice influence the condition and resilience of protected sites and habitats.

Subject to that reservation, SLE considers that high standards of land management can contribute positively to the protection of designated sites. In upland settings, appropriately planned vegetation management, including lawful muirburn where suitable, can reduce or interrupt combustible surface vegetation and form part of a wider approach to wildfire resilience.

Game management infrastructure and staffing provide a significant wildfire mitigation and response capability which extends well beyond sporting interests. Any reduction in management activity should be assessed against the potential loss of existing wildfire prevention and response capacity.

For released game, SLE draws Defra's attention to *Game for Nature: Why released gamebird management is a lifeline for declining farmland biodiversity* (Dimbleby, Hopgood and Connelly, 2026), published by the Game & Wildlife Conservation Trust. Drawing on scientific and practitioner evidence, the report describes how gamebird management supports private investment in woodland and hedgerow management, winter feeding and lawful predator management. These activities can benefit wildlife beyond the quarry species and provide conservation capacity that would otherwise require replacement resources.

SLE asks Defra to assess standards against demonstrable outcomes: protection of designated features, improved habitat condition, appropriate release densities and siting, reduced wildfire vulnerability and sustained restoration. The evidence should distinguish management for wild grouse from released-game management, identify the contribution of individual interventions where possible, and compare outcomes with credible alternative management scenarios. Policy should support effective, lawful and site-appropriate practice, preserve the private investment and skills that contribute to conservation, and address substantiated risks proportionately.

References

Holland, J. P., Pollock, M., Buckingham, S., Glendinning, J. and McCracken, D. (2022). *Reviewing, assessing and critiquing the evidence base on the impacts of muirburn on wildfire prevention, carbon storage and biodiversity*. NatureScot Research Report 1302. Evidence review

Ramage, T. (2019). *Climate change effort by Badenoch, Strathspey estates.* Strathspey & Badenoch Herald, 13 December; reporting restoration at The Hopes Estate. Estate case study

Dimbleby, J., Hopgood, A. and Connelly, J. (2026). *Game for Nature: Why released gamebird management is a lifeline for declining farmland biodiversity. A report based on scientific and practitioner evidence.* Game & Wildlife Conservation Trust, Fordingbridge. Full report

Question 14

What evidence is there that gamebird release or shooting affects the condition of Sites of Special Scientific Interest (SSSIs), or the wildlife, habitats or geological features for which they are protected?

SLE considers that gamebird activities can have a positive effect on the wildlife and habitats for which SSSIs are notified, through both the birds themselves and the management associated with shooting. Peer-reviewed research demonstrates that particular interventions, especially lawful generalist-predator control, can improve breeding outcomes for species relevant to protected upland sites. However, improved productivity of selected species is not equivalent to an improvement in the assessed condition of an entire SSSI. Defra should distinguish evidence of species responses from changes in notified-feature condition, and distinguish management for wild grouse from pheasant and partridge releasing.

Fletcher et al. (2010) provide strong experimental evidence. In an eight-year experiment on four moorland sites in northern England, habitat conditions were kept consistent while lawful predator control was applied or withheld. Fox abundance indices fell by 43% and crow indices by 78%, with an average threefold increase in breeding success across lapwing, golden plover, curlew, red grouse and meadow pipit. Breeding numbers of lapwing, golden plover, curlew and red grouse subsequently increased under predator control but declined without it.

Baines et al. (2023) provide complementary evidence from 18 paired moorland–farmland blocks across UK regions. Each block compared a grouse moor with predator control against similar habitat without predator control. Curlew productivity averaged 1.05 fledglings per pair on grouse moors, compared with 0.27 on non-grouse moors—approximately four times higher. Fox and corvid indices were three- to fourfold lower on grouse moors, and hatching and fledging success were negatively associated with these predator indices. The paired design strengthens the comparison, but this was observational research and does not isolate every difference between management systems or establish favourable condition for all protected features.

For a Scottish protected-site application, the Langholm research discussed in Question 12 is particularly relevant: the study area included the Langholm–Newcastleton Hills SSSI and SPA. Ludwig, Roos and Baines (2019) reported average annual increases of approximately 10% in curlew, 16% in golden plover and 21% in snipe during restoration of grouse management. This supports the potential contribution of the management package to particular wildlife features in a designated landscape.

For released-game management, SLE draws attention to the chapter "How gamebird management contributes to national nature recovery" in *Game for Nature* (Dimbleby, Hopgood and Connelly, 2026), published by the Game & Wildlife Conservation Trust. The report synthesises scientific and practitioner evidence on habitat management, supplementary feeding and lawful predator management. Grain supplied through hoppers and seed-bearing game crops can provide additional food during autumn and winter, including the late-winter "hungry gap" where provision is sustained. The report is a useful synthesis, rather than a peer-reviewed experiment or a direct assessment of SSSI condition.

Primary research supports a qualified feeding argument. Siriwardena et al. (2007) examined two large-scale, three-year controlled experiments in supplementary winter seed provision. Simple comparisons between fed and control areas provided little evidence of a general increase in breeding abundance, but analyses accounting for actual use of feeding sites found positive relationships for yellowhammer and some other species. The implication is that effective delivery, adequate quantities, suitable seed and timing matter: food provision can support selected farmland birds, but the presence of game feeders alone does not demonstrate a population increase or a benefit to a protected site.

In addition to biodiversity outcomes, active land management contributes to wildfire resilience. Estates frequently maintain trained staff, specialist equipment, access routes and water access points that support wildfire prevention and emergency response capabilities. These functions are becoming increasingly important as wildfire risk increases.

References

Fletcher, K., Aebischer, N. J., Baines, D., Foster, R. and Hoodless, A. N. (2010). *Changes in breeding success and abundance of ground-nesting moorland birds in relation to the experimental deployment of legal predator control*. Published paper.

Baines, D., Fletcher, K., Hesford, N., Newborn, D. and Richardson, M. (2023; published online December 2022). *Lethal predator control on UK moorland is associated with high breeding success of curlew, a globally near-threatened wader*. Published paper.

Ludwig, S. C., Roos, S. and Baines, D. (2019). *Responses of breeding waders to restoration of grouse management on a moor in South-West Scotland.* Published paper.

Siriwardena, G. M., Stevens, D. K., Anderson, G. Q. A., Vickery, J. A., Calbrade, N. A. and Dodd, S. (2007). *The effect of supplementary winter seed food on breeding populations of farmland birds: evidence from two large-scale experiments.* Publication record.

Dimbleby, J., Hopgood, A. and Connelly, J. (2026). *Game for Nature: Why released gamebird management is a lifeline for declining farmland biodiversity. A report based on scientific and practitioner evidence.* Game & Wildlife Conservation Trust, Fordingbridge; particularly "How gamebird management contributes to national nature recovery". Full report.

Scottish Land & Estates, The Response to the Glenmore-Strathnethy Wildfire by Land-Based and Rural Businesses (2026) Report

Scottish Land & Estates, The Response to the Carrbridge and Dava Wildfires by Land-Based and Rural Businesses Report

Question 15

What evidence is there that particular factors influence compliance with high standards of practice in relation to protected sites and habitats?

SLE considers that compliance with high standards of practice on protected sites depends not simply on whether a requirement is mandatory, but also on whether it is understood, practically deliverable, proportionate to the identified risk and coherent with other requirements. Managers should be able to connect prescribed actions to the environmental outcomes sought. Wider environmental-compliance and agri-environment research supports the importance of awareness, capability, motivation and practical advice.

Clarity, awareness and credible enforcement. Winter and May (2001), using survey data from 1,562 Danish farmers subject to agri-environmental regulation, found that awareness of rules played a critical role in compliance. Normative motivations, such as a sense of duty, and social motivations were as influential as calculated motivations associated with costs and enforcement. Their findings also showed that enforcement style mattered: formal requirements could help, while coercive approaches could be counterproductive. This supports a combination of clear obligations, consistent communication and credible enforcement, rather than assuming that either advice or penalties alone will secure compliance.

Skills, advice and practical capacity. Lobley et al. (2013) examined training in agri-environmental management through interviews with 24 farmers in eastern and south-

west England. Tailored group training helped fill knowledge gaps, develop management skills and improve confidence. The study supports practical demonstrations and accessible advice explaining both how to implement a prescription and why it matters. It was a small qualitative study, not a controlled estimate of compliance improvement, but is relevant to training for site-sensitive activities such as release-pen siting, feeding arrangements and habitat management.

Motivation and a visible link to conservation outcomes. De Snoo et al. (2013), in a peer-reviewed review, argued that sustained farmland conservation requires attention to managers' motivations and behaviour, rather than reliance on short-term payments for prescribed actions alone. This supports involving practitioners in explaining and demonstrating conservation objectives, including feedback from habitat and species monitoring. It is a supporting synthesis, not experimental proof that outcome-based requirements always outperform prescriptions. SLE considers that standards should explain the protected feature, the relevant pressure and the purpose of each management condition, while retaining enforceable safeguards.

SLE therefore recommends clear, site-specific written requirements; coordinated advice identifying which permissions are needed; realistic application timetables and communication of changes; accessible training; and proportionate record-keeping and monitoring linked to notified features and conservation objectives. Adequate staff time, skills and resources are necessary to implement these requirements. Simplification should remove avoidable duplication, not weaken statutory protection. Advice and support should complement inspections and effective action against serious or deliberate breaches. DEFRA should commission direct research with protected-site managers and regulators to identify the relative importance of these factors, distinguishing lack of awareness or capacity from intentional non-compliance and measuring actual practice rather than stated intentions alone.

References

Winter, S. C. and May, P. J. (2001). *Motivation for Compliance with Environmental Regulations*. Journal of Policy Analysis and Management, 20(4), 675–698. Full paper.

Lobley, M., Saratsi, E., Winter, M. and Bullock, J. (2013). *Training farmers in agri-environmental management: the case of Environmental Stewardship in lowland England*. International Journal of Agricultural Management, 3(1), 12–20. Research record and paper.

De Snoo, G. R. et al. (2013). *Toward effective nature conservation on farmland: making farmers matter*. Conservation Letters, 6(1), 66–72. DOI: 10.1111/j.1755-263X.2012.00296.x. Full paper.

Biosecurity and disease

Question 16

What evidence exists of links between grouse shooting, pheasant/partridge release and shooting, and mallard shooting and the spread of disease, including Highly Pathogenic Avian Influenza (HPAI) and other infectious diseases?

There is limited direct evidence demonstrating that grouse shooting, pheasant/partridge release and shooting and mallard shooting are a significant driver of HPAI or other infectious diseases. Direct empirical evidence linking shooting activities to disease outbreaks remains limited. The primary reservoirs of avian influenza are wild waterfowl and migratory birds, with disease spread largely driven by natural movements and environmental transmission pathways.

The main disease-related concern relates to the release of large numbers of captive-reared gamebirds and mallards, which may increase opportunities for transmission if pathogens are already present. However, much of this is based on risk assessment and modelling rather than observed outbreak attribution and the literature indicates that robust biosecurity, surveillance and compliance with animal health regulations can substantially mitigate these risks.

References

Risk Assessment on the spread of High Pathogenicity Avian Influenza (HPAI) H5N1 to wild birds from released, formerly captive gamebirds in Great Britain: Pheasants, produced by Defra and APHA (2022)

UK Chief Veterinary Officer advice: risk assessment work on gamebirds and high pathogenicity avian influenza (2025) Published

Pepin et al. (2023), "Environmental transmission of influenza A virus in mallards. Published paper

Michels et al. (2025), "The Release of Non-Native Gamebirds Is Associated With Amplified Zoonotic Disease Risk Published paper

Question 17

How do risks of occurrence, severity and impact vary by species, scale or management approach?

The available evidence suggests that disease and environmental risks associated with gamebird management are not uniform, but vary considerably according to species,

release scale, stocking density, habitat, and management practices. Importantly, the literature indicates that many potential risks can be substantially reduced through adherence to recognised codes of practice, biosecurity measures and proportionate management.

Risks differ significantly between species due to their ecology, behaviour and susceptibility to disease:

Wild waterfowl and mallards are recognised as the principal natural reservoirs of avian influenza viruses. Research demonstrates that influenza transmission is particularly efficient in aquatic environments, with contaminated water acting as a major transmission pathway between birds. Consequently, disease occurrence is inherently higher in waterfowl than in terrestrial gamebird species.

Pheasants and red-legged partridges appear to play a more limited role in the natural maintenance of avian influenza. UK risk assessments identify them as potential bridge hosts when infection is already present, but there is limited evidence that they act as primary drivers of disease outbreaks in wild bird populations.

Red grouse differ fundamentally from released gamebirds because they are a native, wild species managed in situ rather than reared and released. As a result, risks associated with disease introduction through movements of captive birds are largely absent from grouse moors.

The evidence indicates that risks vary far more by species biology, stocking density and management quality than by shooting activity itself. Waterfowl generally present greater avian influenza risks than terrestrial gamebirds, while wild red grouse avoid many of the disease pathways associated with captive-reared releases. Across all sectors, robust biosecurity, surveillance, proportionate stocking levels and adherence to best-practice guidance are consistently identified as the key factors that reduce the likelihood, severity and impact of disease events.

References

Sage, R.B., Ludolf, C. & Robertson, P.A. (2005). The ground flora of ancient semi-natural woodland and pheasant release pens in England. Biological Conservation. Published paper

Hudson, P.J., Dobson, A.P. & Newborn, D. (1998). Prevention of population cycles by parasite removal. Published paper

Newborn et al., (2004) Published paper

Pepin et al. (2023), "Environmental transmission of influenza A virus in mallards. Published paper

Question 18

What evidence exists on whether, and how, high standards of practice reduce disease risks?

Evidence consistently indicates that high standards of management, biosecurity, surveillance and husbandry reduce the likelihood of disease occurrence, limit transmission and minimise the impacts of outbreaks where they do occur. Across poultry, gamebird and wildlife management systems, disease risk is influenced less by the presence of game management itself and more by the quality of management practices applied.

The strongest evidence comes from avian influenza research and disease-control programmes. The UK Chief Veterinary Officer and the Animal and Plant Health Agency (APHA) have repeatedly identified robust biosecurity, movement controls, surveillance and rapid detection as the primary mechanisms for reducing disease risks associated with gamebirds and other kept birds. UK Chief Veterinary Officer advice: risk assessment work on gamebirds and high pathogenicity avian influenza concluded that disease risks can be significantly mitigated through appropriate management and biosecurity measures.

Peer-reviewed evidence shows that active surveillance and monitoring programmes are critical in reducing the severity and consequences of disease outbreaks.

Research by Machalaba et al. (2015) demonstrated that enhanced surveillance allows earlier detection of avian influenza incursions, reducing both disease spread and economic impacts. Early reporting, testing and rapid implementation of control measures are consistently associated with improved disease outcomes.

This principle is reflected in UK animal health policy, where monitoring of gamebird breeding, rearing and release operations forms a key component of disease prevention and control.

There is also evidence that adherence to recognised standards and codes of practice supports lower disease risk by ensuring a consistent approach to management, record-keeping, biosecurity and welfare.

The gamebird sector operates within a framework of statutory animal health requirements alongside industry guidance. Compliance with these measures increases the likelihood that disease threats are identified early and managed effectively, reducing risks to both managed and wild bird populations.

The available evidence strongly suggests that high standards of practice reduce disease risks, regardless of the species being managed. The most effective measures are:

- Robust biosecurity
- Active surveillance and disease monitoring
- Prompt reporting and response procedures
- Good husbandry and welfare standards
- Compliance with regulatory requirements and industry guidance

Rather than disease risks being an inevitable consequence of gamebird or grouse management, the evidence indicates that outcomes are heavily influenced by the quality of management. Well-managed systems that apply recognised best practice are consistently associated with lower risks of disease occurrence, reduced transmission potential and less severe impacts when disease is detected.

Evidence:

Machalaba, C.C., Elwood, S.E., Forcella, S., Smith, K.M., Hamilton, K., Jebara, K.B., Swayne, D.E., Webby, R.J., Mumford, E., Mazet, J.A.K., Gaidet, N., Daszak, P. & Karesh, W.B. (2015).Global Avian Influenza Surveillance in Wild Birds: A Strategy to Capture Viral Diversity. *Emerging Infectious Diseases* Published paper

UK Chief Veterinary Officer advice: risk assessment work on gamebirds and high pathogenicity avian influenza (2025) Report

Question 19

What factors influence compliance with high standards of practice?

Available evidence suggests that compliance with high standards of practice is most strongly influenced by a combination of regulation, education, industry culture, economic incentives, practical support and confidence that standards deliver tangible benefits. Across animal health, wildlife management and agricultural sectors, compliance is generally highest when practitioners understand the rationale behind requirements, have access to clear guidance, and can see demonstrable benefits in terms of disease prevention, animal welfare and operational outcomes.

A review by Racicot et al. (2012) found that compliance with biosecurity protocols is strongly influenced by awareness, understanding and perceived effectiveness of disease prevention measures. When managers and practitioners understand how diseases spread and how controls reduce risk, adoption rates tend to be higher. Evidence suggests that compliance is highest where standards are considered practical, proportionate and achievable.

Research on biosecurity adoption highlights that measures perceived as excessively complex, costly or disproportionate can reduce compliance, whereas guidance that is clear, risk-based and tailored to operational circumstances achieves greater uptake. This is particularly relevant in extensive land management systems where flexibility is often needed to reflect local conditions.

The risk-based approach adopted by the UK Chief Veterinary Officer and the Animal and Plant Health Agency reflects this principle, focusing on proportionate mitigation measures aligned with assessed risk.

Evidence from animal health programmes consistently shows that adoption increases when disease prevention measures are associated with improved productivity, reduced losses, higher animal welfare standards, and lower outbreak risks.

For example, disease control programmes in both livestock and wildlife management demonstrate that surveillance, health monitoring and preventative interventions can improve population health outcomes while reducing long-term costs associated with disease outbreaks.

Peer-reviewed studies show that social and professional networks play an important role in encouraging adoption of best practice.

Nöremark et al. (2010) found that compliance with biosecurity measures is influenced not only by regulation but also by industry norms, peer expectations and trusted sources of advice. Where best practice becomes the accepted standard within a sector, uptake and maintenance of those practices tends to increase.

This is particularly relevant in game management, where professional organisations, training programmes and sector guidance help reinforce expectations around disease prevention, biosecurity and responsible management.

The evidence suggests that high levels of compliance are most likely when standards are:

- Evidence-based
- Practical and proportionate to risk
- Accompanied by clear regulatory guidance
- Linked to demonstrable benefits for animal health, welfare and business performance

Overall, peer-reviewed research indicates that compliance is rarely driven by regulation alone. Instead, the highest levels of adoption and long-term maintenance occur where practitioners understand the benefits of best practice, have confidence in the evidence underpinning it and are supported by strong industry leadership and accessible guidance.

References

Racicot et al. (2012) Published report

Tompkins, D.M., Dunn, A.M., Smith, M.J. & Telfer, S. (2011) Published report

Risk Assessment on the spread of High Pathogenicity Avian Influenza (HPAI) H5N1 to wild birds from released, formerly captive gamebirds in Great Britain: Pheasants. Department for Environment Food and Rural Affairs/Animal and Plant Health Agency (2022) Report

UK Chief Veterinary Officer advice: risk assessment work on gamebirds and high pathogenicity avian influenza (2025) Report

Bird of Prey Crime

Question 20

What evidence exists of links between gamebird activities and bird of prey crime?

SLE is concerned that presenting bird-of-prey crime principally through its possible links with gamebird activities risks encouraging an unduly narrow view of offending and collective attribution to lawful practitioners.

SLE unequivocally condemns the illegal killing, poisoning, trapping and disturbance of birds of prey. Wildlife crime has no place in responsible game management. Responsibility for individual offences must be established through evidence, rather

than inferred solely from occupation, land ownership or proximity to a shooting enterprise.

Bird-of-prey offending also has other contexts. Kettel et al. (2021) documented conflict between raptors and racing-pigeon keepers, including differences between perceived and previously measured losses. Their study establishes a conflict context, not that its respondents committed offences. Separately, official prosecution reporting records guilty pleas to acquiring, keeping for sale and selling wild peregrine falcon chicks in a commercial wildlife-trade case in Scotland (COPFS, 2024). This demonstrates that bird-of-prey crime is not confined to persecution intended to protect gamebirds.

There is also evidence that lawful grouse-moor management can support raptor breeding. Ludwig et al. (2020) examined 27 years of monitoring at Langholm Moor in south-west Scotland. Hen harriers and merlins increased during grouse-managed periods and had a higher proportion of successful nesting attempts; no management effect was detected for peregrines, buzzards or ravens. Ludwig et al. (2017), using overlapping monitoring from the same site, found abundance and breeding success of grouse and hen harriers to be two- to threefold higher under grouse management, alongside lower fox and crow indices. The studies concern management for wild grouse rather than gamebird release.

References

Kettel, E. F., Yarnell, R. W., Quinn, J. L. and Gentle, L. K. (2021). *Raptors, racing pigeons and perceptions of attacks.* European Journal of Wildlife Research, 67, 73. DOI: 10.1007/s10344-021-01513-2. Research record.

Crown Office and Procurator Fiscal Service (2024). *Father and son receive bans for illegally selling peregrine falcon chicks.* 12 February. Official prosecution account.

Ludwig, S. C., Roos, S., Rollie, C. J. and Baines, D. (2020). *Long-term changes in the abundance and breeding success of raptors and ravens in periods of varying management of a Scottish grouse moor.* Avian Conservation and Ecology, 15(1), 21. DOI: 10.5751/ACE-01568-150121. Full paper.

Ludwig, S. C., Roos, S., Bubb, D. and Baines, D. (2017). *Long-term trends in abundance and breeding success of red grouse and hen harriers in relation to changing management of a Scottish grouse moor.* Wildlife Biology, wlb.00246. DOI: 10.2981/wlb.00246. Full paper.

Question 21

What evidence exists on whether, and how, high standards of practice reduce these risks?

SLE remains concerned that the question's emphasis on reducing "these risks", immediately following a question about bird-of-prey crime, may encourage respondents to view gamebird management primarily through a lens of misconduct. A call for evidence should distinguish lawful management from criminal conduct and avoid collective attribution. Nevertheless, the wording "whether, and how" leaves the effectiveness of particular measures open to examination. SLE unequivocally condemns raptor persecution.

Scotland provides relevant regulatory context, although its legislation does not apply in England. The Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020 increased maximum penalties for certain serious wildlife offences, including specified offences against wild birds and possession of prescribed pesticides, to five years' imprisonment, an unlimited fine, or both, on conviction on indictment. The 2024 Wildlife Management and Muirburn (Scotland) Act introduced a separate framework for grouse licensing and associated standards.

No regulatory system can guarantee the elimination of offending. A comparison with road-safety is useful as an illustration of the need for clear rules, practical compliance and credible enforcement. Wider peer-reviewed criminological research offers firmer support: Nagin (2013) found more consistent evidence for the deterrent effect of the likelihood of apprehension than for increased punishment severity. This is not wildlife-crime-specific research, but supports adequately resourced investigation and enforcement rather than assuming that progressively harsher maximum sentences alone will prevent persecution.

SLE and the Angus Glens Moorland Group's *Moorland Management in the Angus Glens: Economic, Environmental and Social Impacts from 2025* provides complementary practitioner evidence from seven estates. The report presents a baseline based on data supplied by participating landholdings, describing investment, employment and wildlife associated with actively managed moorland and details the success of raptors on these managed shooting estates.

SLE therefore recommends a combined approach: unambiguous legal requirements; training and practical advice; management accountability and cooperation with investigators; adequately resourced, intelligence-led enforcement; and sanctions proportionate to proven conduct and applicable legal tests. Any additional requirements should have a clear evidential rationale and be evaluated for effectiveness and unintended consequences, rather than imposed on the assumption that all lawful operators pose the same risk.

References

Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020, section 7. Wildlife-offence penalty provisions.

Scottish Government (2025). *Animals and Wildlife (Penalties, Protections and Powers) (Scotland) Act 2020: provisions and requirements for additional animal welfare, animal health and wildlife offences – review*. Section 6. Conclusions and proposed action.

NatureScot. *Grouse and related licences: Frequently Asked Questions*. Licensing and Code requirements.

Nagin, D. S. (2013). *Deterrence in the Twenty-First Century*. Crime and Justice, 42(1), 199–263. DOI: 10.1086/670398. Peer-reviewed review.

Scottish Land & Estates and Angus Glens Moorland Group (2026). *Moorland Management in the Angus Glens: Economic, Environmental and Social Impacts from 2025*. Practitioner report based on participating-estate data. Full report.

Animal welfare post-release

Question 22

What evidence exists regarding the nature, frequency and causes of welfare concerns during and following release?

SLE considers that welfare during and following release should be assessed through bird-health and management records, rather than inferred from releasing alone or from the existence of welfare guidance.

As noted in our answer to Question 21, Scotland provides relevant regulatory and practical context, although its legislation does not apply in England. The Scottish Government's *Code of Practice for the Welfare of Gamebirds Reared for Sporting Purposes* (2011) provides guidance under the Animal Health and Welfare (Scotland) Act 2006, including duties concerning unnecessary suffering and meeting animals' needs. It requires attention to a suitable environment, food and water, space and normal behaviour, appropriate companionship and protection from suffering, injury and disease. The Code applies up to and including confinement in release pens. Once birds can leave and re-enter voluntarily they fall outside its scope, although it recognises continuing keeper responsibility immediately after release until birds adjust to free-living conditions. The Code's scope should not be confused with the statutory tests determining whether an animal remains protected under the Act.

GWCT's sustainable gamebird-releasing guidance offers complementary management advice, particularly on release density and habitat sensitivity; ecological density recommendations should not be presented as a standalone welfare guarantee. Keepers of captive gamebirds in Scotland must also register the required keeper, location and flock information on the Scottish Kept Bird Register and keep it updated. Registration supports disease communication and control.

SLE would also highlight the economic incentive for good husbandry. Shoots invest in birds, feed, infrastructure and staff, and avoidable losses impose direct costs. This reinforces the case for prevention and prompt action. Responsible practice should include timely investigation, veterinary assessment where appropriate, remedial action and review of preventable causes.

References

Scottish Government (2011). *Welfare of gamebirds reared for sporting purposes: code of practice*. Particularly the Preface, Introduction and Recommendations for best practice. Code; scope and post-release responsibilities.

Animal Health and Welfare (Scotland) Act 2006, particularly sections 17–19 and 24. Legislation.

Scottish Government. *Scottish Kept Bird Register*. Registration requirements and purpose. Official register guidance.

Game & Wildlife Conservation Trust. *Guidelines for sustainable gamebird releasing*. Guidance.

Question 23

What evidence exists on whether, and how, compliance with relevant regulatory requirements, statutory or industry codes of practice, guidance, assurance schemes, or other recognised good practice improves welfare outcomes during and following release?

SLE considers that compliance with relevant requirements and recognised good practice provides a practical framework for protecting gamebird welfare during and following release. As outlined in Question 22, this includes meeting birds' needs, maintaining appropriate release conditions and identifying health concerns promptly. SLE draws Defra's attention specifically to BASC's biosecurity guidance, the Game & Wildlife Conservation Trust's sustainable releasing guidelines and veterinary release-pen scoring systems.

As noted in Question 22, shoots invest in birds, feed, staff and infrastructure. Avoidable illness, injury and losses impose direct costs, providing a strong commercial incentive for preventive husbandry and compliance. SLE considers that this aligns business interests with investment in bird health.

Taken together, these resources explain how recognised good practice is intended to improve welfare: preventing disease, providing suitable release conditions, detecting problems and prompting corrective action. SLE supports practical, evidence-led standards and proportionate assessment focused on welfare outcomes.

Supporting references

BASC. *Biosecurity guidance for gamekeepers and shoot managers*. Guidance.

Game & Wildlife Conservation Trust. *Guidelines for sustainable gamebird releasing*. Full guidance.

BASC. *Pheasant release pen scoring system checklist*. Assessment criteria. See also the veterinary pen-scoring document.

St David's Game Bird Services (2021). *New Pen Scoring Initiative Launched for Game Bird sector*. 7 July. Development and intended application of the matrix.

Question 24

What factors influence compliance with relevant regulatory requirements, statutory or industry codes of practice, guidance, assurance schemes, or other recognised good practice during and following release?

SLE recommends that Defra gather evidence directly from a representative range of individual shoots, supported where appropriate by veterinary and assurance records, to understand what influences compliance during and following release. SLE considers that investment and a responsible shooting culture are two important drivers. Their relative influence should be tested through evidence of actual practice, rather than assumed from expenditure or participation in shooting alone.

As noted previously, shoots invest in birds, feed, release infrastructure, staff and veterinary care. Avoidable illness, injury and losses impose costs and can undermine the quality and reputation of the shooting day. For commercial shoots, healthy birds and a well-run operation are integral to the business model; for other shoots, pride in responsible management can provide a similar motivation. These interests create incentives to follow recognised husbandry and welfare standards and to maintain the resources needed to deliver them.

A positive shooting culture should reinforce those incentives through clear expectations from owners and managers, competent husbandry, access to training and veterinary advice, and prompt reporting and correction of concerns. As discussed in Question 23, biosecurity guidance, sustainable releasing advice and veterinary pen scoring provide practical tools. Clear requirements, sufficient staff time and resources, and confidence that recommended measures are effective can help translate willingness into consistent practice. SLE considers these important factors to investigate, rather than presenting them as quantified findings about compliance across all shoots.

SLE recommends that Defra examine how investment, management culture, training, veterinary access and the clarity and practicality of requirements interact across

shoots of different sizes and operating models. The aim should be to support the resources and culture that enable good practice, while retaining proportionate scrutiny and enforcement where standards are not met.

Use of natural resources

Question 25

What evidence exists on the number of birds shot and how many enter the food chain?

Evidence on the use of shot game should be gathered directly by Defra from individual shoots to establish a more accurate picture of how game meat is processed, distributed and consumed. Individual shoots should be given the opportunity to provide evidence of their own circumstances, including the quantities of game retained for personal consumption, used to feed shoot-day participants, distributed within local communities, donated to charitable causes or supplied to game dealers. It is likely that current government estimates underestimate the volume of game meat consumed by guns, beaters, shoot helpers and others involved in the running of shoots.

Practices vary between shoots. Many process their quarry in-house and use the meat to provide meals for guns and shoot-day staff. Others process game for wider distribution, including supporting charitable initiatives and community projects. Some shoots supply game to dealers, who collect and process it before it enters the food chain. However, the relatively low financial return offered by game dealers can make this a less attractive option, meaning that many shoots prefer to process and utilise their game themselves. It is also established good practice for guns attending a shoot to take home a proportion of the quarry for their own personal consumption.

Any assessment of the contribution of game shooting to the food chain must therefore account for these different routes of use and distribution, rather than focusing solely on commercially traded game meat. A significant proportion may be consumed directly by those involved in shooting or distributed locally without passing through conventional commercial channels.

The benefits extend beyond the shoots themselves. Game provides a source of lean, wild-reared meat to households across rural communities, including beaters, shoot helpers and local people who contribute to the organisation and operation of shoot days. This supports local food networks, makes productive use of harvested quarry and provides access to a locally sourced food that might otherwise be overlooked in official estimates of game meat consumption.

The *Guns on Pegs 2026 Shoot Owner Consensus* provides useful evidence of how game meat is distributed and consumed. According to the consensus, on average, around 83% of a shoot's game goes directly to people for consumption without passing through a game dealer. This demonstrates that a substantial proportion of game enters the food chain through direct distribution, personal consumption and local networks, rather than conventional commercial channels. Consequently, assessments based solely on dealer sales are likely to underestimate the true contribution of gamebirds to the food supply.

Defra should therefore gather direct evidence from individual shoots, using a representative approach that captures differences in shoot size, location and operating practices. This would provide a more reliable evidence base on the quantity of game processed and consumed, the proportion entering commercial markets, and the wider contribution of game shooting to rural food provision and charitable activity.

Question 26

What evidence exists on the impact of birds that enter the food chain?

Evidence on the impact of gamebirds entering the food chain demonstrates that game shooting can make a valuable contribution to the supply of locally sourced, sustainable protein, while supporting rural communities and charitable food initiatives. The nutritional and environmental benefits of game meat should not be overlooked or underestimated. Gamebirds provide lean, wild-reared meat that generally involves less intensive production and intervention than intensively farmed poultry, offering an alternative source of protein with potential environmental benefits.

The benefits extend beyond the commercial food chain. Game meat reaches households across rural communities, including guns, beaters, shoot helpers and local people who contribute to the running of shoot days. This provides access to a lean, locally sourced food and helps ensure that harvested game is put to productive use. Game meat is also versatile and can be incorporated into a wide range of meals, supporting its use by households and community organisations.

Charities also play an important role in ensuring that British game meat reaches people who can benefit from it. The Country Food Trust, for example, has undertaken valuable work in distributing game-based food to people experiencing food insecurity. This demonstrates the potential for game meat to contribute to charitable food provision, reduce barriers to accessing nutritious protein and ensure that more of the available resource is used for public benefit. Further evidence of the charity's work and its impact is provided in the supporting material below.

Overall, the available evidence indicates that gamebirds entering the food chain deliver benefits through direct consumption, commercial distribution, local food networks and charitable provision. However, a fuller assessment of their impact requires data that captures all these routes, including game retained by individuals, shared within rural communities, used in shoot-day meals and donated to charities. Defra should take these pathways into account when evaluating the contribution of gamebirds to food provision, rural communities and the wider food system.

References

https://www.thecountryfoodtrust.org/26836-raised-in-winter-appeal/

https://www.thecountryfoodtrust.org/scotlands-regional-moorland-groups-and-the-country-food-trust-join-forces-to-tackle-food-insecurity-in-the-scottish-borders/

https://www.thecountryfoodtrust.org/can-you-help-the-country-food-trust-reach-3-million-meals-donated/

https://www.thecountryfoodtrust.org/local-venison-supports-those-in-food-poverty-across-sutherland/

Question 27

What evidence exists on waste or disposal issues associated with shot birds?

SLE is not aware of specific evidence indicating significant waste or disposal issues associated with shot birds. This is an important consideration, as game is generally treated as a food resource rather than simply a by-product of shooting. Shoots and shooters have developed the skills, equipment and local networks necessary to ensure that harvested game is processed and consumed wherever possible, including through personal consumption, local distribution and charitable initiatives.

However, further evidence would be beneficial to establish a comprehensive picture of how shot birds are utilised and how any waste materials arising from processing are managed. Defra should therefore undertake a data-gathering exercise directly with individual shoots to understand their game-handling and processing practices, the proportion of birds used for human consumption, and the nature and quantity of any residual waste requiring disposal.

SLE understands that, in Scotland, a number of shoots that process game meat in-house use incinerators to manage residual waste materials. These facilities are subject to regulatory requirements and compliance monitoring. This provides an example of

how shoots may manage processing waste through established disposal arrangements operating within a regulated framework.

It is important that any assessment distinguishes between game meat intended for consumption and residual materials arising from processing. Without reliable data on the quantities involved, the disposal methods used and the regulatory controls in place, it would be inappropriate to draw broad conclusions about the scale or significance of any waste-related issues.

SLE therefore recommends that Defra gather evidence directly from shoots before determining the extent of any waste or disposal concerns. This would support a proportionate, evidence-based assessment that recognises the established use of game as a food resource while identifying any areas where further guidance or improvements in waste management may be appropriate.

Other impacts

Question 28

What evidence exists of links between gamebird activities and:

use of lead shot;

Available evidence from the GunsonPegs Game Shooting Census demonstrates that the sector is actively transitioning towards non-lead alternatives, with increasing uptake of steel, bismuth and tungsten ammunition.

The proportion of shooters who have tried non-lead or eco-wad steel cartridges has increased steadily from 27% in 2021 to 48% in 2026, indicating growing familiarity and confidence with alternative ammunition. At the same time, acceptance of these products remains high, with 77-80% of respondents consistently reporting that eco-friendly cartridges performed as well as, or better than, traditional alternatives.

The data also suggest that non-lead requirements are unlikely to significantly affect participation in shooting. Throughout the period 2021-2026, around three-quarters of shooters (73-76%) stated they would still book a day at a shoot that prohibited lead ammunition, demonstrating broad willingness to adapt to changing standards.

Attitudinal data from 2026 further illustrate this trend. Almost one-third (29%) of shooters reported they already support and use non-lead ammunition, while a further 37% understand the rationale and intend to transition when legislation requires. Although 27% remain opposed in principle, they nevertheless indicated they would

comply if regulations change. Collectively, this suggests a high degree of readiness for transition across the sector.

Evidence from the Shoot Owner Census 2026 indicates similar preparedness among shoot operators. Seventy-one percent of shoots believe they could insist on lead-free ammunition if they wished, an increase from 62% in 2024, demonstrating growing confidence in implementing non-lead policies. Furthermore, 99% of shoot owners stated they would continue operating even if game dealers required lead-free game, indicating that the sector sees adaptation as achievable rather than existential.

The remaining challenges identified by respondents relate primarily to supply-chain readiness rather than shooter acceptance. Free-text responses highlighted practical issues such as limited processing capacity among some game dealers for game harvested using steel shot. This suggests that future progress may depend less on willingness within the shooting sector and more on ensuring supporting infrastructure can accommodate the transition.

Overall, the evidence points to a sector that is already well advanced in moving towards non-lead ammunition, with increasing uptake, high levels of awareness, broad acceptance of cartridge performance and strong indications that both shooters and shoot operators are willing and able to adapt to future regulatory requirements.

References

GunsOnPegs Game Shooting Census Census details
Gunson Pegs Shoot Owner Census 2026 Census details

misuse of medicated products;

The available evidence suggests that misuse of medicated products is not an inherent feature of gamebird management and, in recent years, the sector has demonstrated substantial progress in reducing reliance on antibiotics through improved husbandry, habitat management and veterinary oversight. Evidence increasingly points to management quality, rather than gamebird releasing itself, as the key factor influencing medicine use.

Data collected by the Veterinary Medicines Directorate show that the gamebird sector has reduced antibiotic usage by 48% since the VMD baseline year of 2016. This

reduction has been achieved through a combination of better management practices, disease prevention measures and greater focus on bird health and welfare.

The Game & Wildlife Conservation Trust highlights that improvements in release pen management can significantly reduce disease risk and, therefore, the need for medicinal interventions. Their 2026 review notes that disease problems are often linked to stress caused by overcrowding, poor habitat quality, disturbance, predation pressure, or competition around food and water resources. By addressing these underlying factors, shoots can improve bird resilience and reduce treatment requirements.

For example, practical case studies reported by GWCT found that adherence to recommended stocking densities, habitat enhancement, improved woodland structure, additional feeders and drinkers, and better nutrition all contributed to improved bird health and lower antibiotic reliance.

The broader veterinary literature also supports the principle that reducing stress, improving welfare and maintaining good environmental conditions lowers susceptibility to infectious disease and reduces reliance on medicines.

The gamebird sector has increasingly adopted structured approaches to promote responsible medicine use.

The Trusted Game Scheme, launched in 2022, provides an audit-based framework focused on gamebird health, welfare and best practice. Developed by specialist gamebird veterinarians and industry practitioners, the scheme is designed to encourage evidence-based management and responsible use of veterinary medicines.

Likewise, the Pen Scoring Matrix, developed collaboratively by veterinary practices and industry bodies, provides shoot managers with a structured assessment tool to identify disease risks and improve management before medication becomes necessary.

The evidence suggests that any risks associated with medicated products are best understood through the lens of management quality rather than gamebird activities themselves. The gamebird sector has already achieved a 48% reduction in antibiotic use since 2016, while initiatives such as recommended stocking densities, improved habitat management, the Pen Scoring Matrix and the Trusted Game Scheme are helping to further reduce reliance on medicines.

References

GWCT - Release pen management and antibiotic reduction Guidance

Trusted Game Scheme Scheme

Pen Scoring Matrix Guidance

antimicrobial resistance;

Research across poultry and gamebird systems consistently shows that good husbandry and environmental management reduce disease incidence and the need for antimicrobials. Jones, T.A., Donnelly, C.A. & Dawkins, M.S. (2005) found that improved biosecurity and management practices were among the most effective mechanisms for reducing antimicrobial use in livestock systems. Similarly, Tompkins, D.M., Dunn, A.M., Smith, M.J. & Telfer, S. (2011) concluded that disease outcomes in managed wildlife populations are strongly influenced by husbandry, stocking density and environmental conditions, reinforcing the importance of preventative management rather than reactive treatment.

While concerns about antimicrobial resistance have driven scrutiny across all animal production sectors, there is little published evidence suggesting widespread or systematic misuse of medicated products within the UK gamebird sector.

Instead, recent evidence points towards:

- Reduced antibiotic usage over time
- Greater veterinary oversight
- Increased application of assurance and audit schemes
- Improved husbandry and stocking-density management
- A stronger emphasis on disease prevention rather than treatment

The available evidence points towards a sector that is increasingly adopting preventative health approaches, aligning with best practice seen elsewhere in modern animal management.

References

Jones, T.A., Donnelly, C.A. & Dawkins, M.S. (2005).
Environmental and management factors affecting the welfare of chickens on commercial farms in the United Kingdom and Denmark stocked at five densities.
Published paper

Tompkins, D.M., Dunn, A.M., Smith, M.J. & Telfer, S. (2011).
Wildlife diseases: from individuals to ecosystems. Published paper

Game & Wildlife Conservation Trust (2026).
Stocking densities, habitat and infrastructure: how release pen management is driving antibiotic reduction in gamebirds. Report

misuse of pesticides;

Available evidence suggests that there is limited evidence of widespread pesticide misuse associated with modern gamebird management in the UK and that the sector increasingly operates within a framework of regulatory controls, stewardship schemes, and best-practice guidance designed to minimise risks. Most contemporary evidence focuses on isolated incidents of illegal pesticide use rather than routine or systemic misuse within gamebird management.

A growing body of evidence suggests that habitat creation associated with gamebird management can contribute positively to biodiversity, potentially reducing pest pressures naturally through increased ecosystem resilience.

Research by Stoate et al. (2003) and Bicknell et al. (2010) found that game management activities often create habitats that benefit a range of farmland birds, pollinators and invertebrates. Enhanced habitat quality can support natural predator-prey relationships and reduce dependence on chemical interventions.

Similarly, the Game & Wildlife Conservation Trust's sustainable gamebird releasing guidance promotes habitat management, woodland structure improvement and biodiversity enhancement as key components of best practice.

Evidence

Stoate, C. et al. (2003) Published paper
Bicknell, J.E. et al. (2010) Published paper
Game & Wildlife Conservation Trust (2026). *Stocking densities, habitat and infrastructure: how release pen management is driving antibiotic reduction in gamebirds*. Report
Wildlife Incident Investigation Scheme reports from SASA and related UK monitoring programmes Information

other environmental or social impacts.

A substantial body of peer-reviewed research identifies a range of positive biodiversity, conservation and socio-economic benefits associated with well-managed shooting activities.

One of the most consistently reported findings is that gamebird management often results in significant habitat creation and maintenance. Activities such as woodland management, hedgerow maintenance, cover crop establishment, pond creation and predator management can provide benefits for a wide range of wildlife beyond game species.

Research by Stoate et al. (2003) found that management associated with game shooting can contribute positively to farmland biodiversity by increasing habitat availability and food resources for a variety of bird species.

Similarly, Baines et al. (2018) found that moorland management associated with grouse shooting supported higher abundances of several ground-nesting bird species, including curlew, golden plover and lapwing, compared with unmanaged sites.

The Game & Wildlife Conservation Trust's sustainable releasing guidance is specifically designed to balance gamebird management with biodiversity outcomes. Their recommended release densities and habitat management approaches are based on peer-reviewed research and aim to achieve net environmental benefits while reducing negative impacts.

The latest GWCT guidance highlights how improved pen design, woodland thinning, habitat diversification and lower stocking densities can simultaneously improve biodiversity outcomes, bird welfare and disease resilience.

As a result, current evidence increasingly points towards management quality rather than gamebird releasing itself as the key determinant of environmental outcomes.

The social and economic contribution of shooting is well documented.

The shooting sector supports employment for gamekeepers, wildlife managers, contractors, accommodation providers, catering businesses, gunmakers, game dealers and rural suppliers. Numerous economic assessments have found that shooting contributes hundreds of millions of pounds annually to rural economies while supporting jobs in areas where alternative employment opportunities may be limited.

These economic benefits can also indirectly support conservation through investment in habitat management and landscape-scale stewardship.

Gamebird management also contributes to the social fabric of many rural communities.

Research examining countryside management has highlighted the role of shooting in:

- Maintaining traditional countryside skills
- Supporting volunteering and community engagement
- Encouraging participation in wildlife management
- Preserving cultural heritage associated with rural land use
- Maintaining access and investment in the countryside

These benefits are frequently cited as important social outcomes within rural areas.

Overall, the evidence indicates that, while some localised environmental pressures can occur if gamebird releases are poorly managed, well-managed gamebird activities can deliver substantial environmental and social benefits. These include habitat creation, biodiversity enhancement, conservation funding, rural employment, support for local businesses, cultural heritage preservation and investment in countryside management.

Importantly, recent evidence suggests that the sector is increasingly adopting best-practice approaches, with improved habitat management, lower antibiotic use, assurance schemes and science-based guidance helping to maximise positive outcomes.

References

Stoate, C. et al. (2003) Published paper
Baines, D. et al. (2018) Published
Sage, R.B., Hoodless, A.N. & Draycott, R.A.H. (2005) Published paper
Robertson, P.A., Woodburn, M.I.A. & Hill, D.A. (2001) Published paper
Game & Wildlife Conservation Trust (2026). *Stocking densities, habitat and infrastructure: how release pen management is driving antibiotic reduction in gamebirds*. Report

Question 29

Are there any additional positive or negative impacts, not covered above, for example recreational benefits?

SLE notes the independent assessment commissioned by DEFRA. While this call for

evidence relates to English practice, it is clear that there is a significant cross-border supply chain, meaning that changes in one jurisdiction could have material economic consequences for the other. SLE considers that those consequences must form part of and be taken into account in DEFRA's assessment of future regulation of the sector [and would welcome assurances to this effect.

Turning to other impacts, while much of the evidence surrounding shooting focuses on environmental and regulatory considerations, there is a substantial range of wider recreational, social, economic and community benefits associated with game shooting and wider game management, particularly in rural areas. The shooting sector currently delivers multiple public goods funded through private expenditure.

For many participants, shooting provides a valuable opportunity to spend time outdoors, stay physically active and engage with nature. Research consistently shows that access to green space, participation in outdoor recreation and social engagement can improve mental wellbeing, reduce stress and support overall health.

Game shooting offers a structured reason to spend time outdoors throughout the autumn and winter, particularly during the darker months when opportunities for outdoor recreation can be more limited. For many individuals, regular participation contributes positively to mental health, wellbeing and quality of life.

Shooting is often a multi-generational activity, bringing together parents, grandparents, children and grandchildren. Shoot days can provide opportunities to pass on practical countryside skills, knowledge of wildlife management, fieldcraft, conservation and responsible firearm use.

This transfer of knowledge helps maintain rural traditions and strengthens family and community connections, few other rural activities bring together multiple generations in the same way.

Rural isolation is a recognised challenge across many areas and shoot days, keepering activities and associated rural events provide regular social interaction and support networks.

For many people, particularly older residents, seasonal workers and those living in more remote communities, participation in shooting and associated activities creates opportunities to engage with like-minded individuals, maintain friendships and access informal support networks. These social connections can be particularly valuable in fragile rural communities.

Shooting is deeply embedded within many rural economies and communities. The sector supports:

- Gamekeepers and estate staff
- Accommodation providers
- Hotels, restaurants and pubs
- Rural retailers
- Vehicle and machinery suppliers
- Veterinary services
- Feed merchants
- Dog breeders and trainers
- Fencing contractors
- Habitat management contractors
- Firearms and sporting goods businesses

Importantly, much of this economic activity occurs during autumn and winter when other sources of tourism income are often lower.

The benefits of shooting extend far beyond the shooting season itself. Habitat creation, predator management, woodland management, muirburn, keepering, dog training, game rearing and estate maintenance support employment and business activity throughout the year.

Many small rural businesses rely on this spending, particularly in remote areas where economic opportunities can be limited.

The sustainability of many rural communities depends on maintaining employment opportunities and attracting working-age families.

Game management helps support year-round jobs in some of the most remote areas, helping to sustain local populations. In turn, this can contribute to:

- Demand for rural housing
- Continued viability of local schools
- Retention of young families
- Maintenance of local services
- Community resilience

Without viable rural employment opportunities, many communities face continued challenges associated with depopulation and loss of local services.

Game management supports a wide range of specialist countryside skills that might otherwise be lost, including:

- Moorland management
- Habitat restoration
- Wildlife surveying
- Predator management
- Deer management
- Gamekeeping
- Gundog breeding and training
- Muirburn planning and delivery
- Vermin control
- Woodland management

These skills contribute not only to shooting but to broader conservation and land management objectives.

Managed moorlands provide a range of public benefits beyond shooting interests. These can include:

- Habitat management for internationally important bird species
- Peatland protection and restoration
- Carbon storage
- Water management
- Public access opportunities
- Landscape maintenance

Evidence from a number of studies has shown that management associated with grouse moors can support higher densities of some ground-nesting bird species, including curlew, lapwing and golden plover compared with some unmanaged landscapes.

One of the most significant public-interest benefits is wildfire management.

A growing body of evidence suggests that fuel load management is an important component of wildfire prevention and suppression. Where undertaken appropriately and in accordance with regulation and best-practice guidance, managed muirburn can:

- Reduce heavy fuel loads
- Create vegetation breaks

- Slow wildfire spread
- Improve access for firefighting operations
- Increase landscape heterogeneity

Following severe wildfires across the UK and Europe in recent years, interest has increased in the role of fuel management as part of wider wildfire resilience strategies.

Many land managers argue that managed muirburn should be viewed alongside other recognised fuel-management tools used internationally to reduce wildfire risk and protect vulnerable habitats, communities and infrastructure.

Beyond the direct environmental and economic impacts typically considered in policy discussions, shooting and game management can deliver broader recreational and social benefits. These include improved wellbeing and mental health, opportunities for family participation, reduced rural isolation, support for local businesses, retention of countryside skills, assistance in sustaining fragile rural communities and contributions to landscape management and wildfire resilience.

These wider social and community benefits are often highly valued by those living and working within rural areas and form an important part of the overall contribution of the sector.

The wider contribution of sporting management should not be assessed solely through the lens of gamebird release. Evidence from the Angus Glens demonstrates how sporting activity underpins a broader system of environmental management, rural employment and community resilience. Across seven estates managing more than 54,000 hectares, moorland management supported 86 full-time jobs, 768 seasonal jobs, provided 68 rural homes and generated £6.6 million of annual economic activity, with more than 82% of expenditure retained within the local economy. The same estates also support habitat management, biodiversity enhancement, peatland restoration, wildlife monitoring and wildfire resilience.

WES plays a part in driving high standards of biodiversity management, animal welfare and responsible release practices. WES accreditation requires estates and shoots to demonstrate adherence to recognised best practice, maintain detailed species and habitat records, implement management plans, and show evidence of continual improvement through independent assessment and site inspections. This creates a strong incentive for operators involved in pheasant, partridge and mallard releasing to adopt robust welfare, biosecurity and habitat management measures that extend beyond minimum regulatory requirements.

The scheme promotes an evidence-led approach to wildlife management, requiring participants to monitor habitats, assess biodiversity outcomes and integrate sporting activities with wider conservation objectives. This encourages responsible release strategies, appropriate stocking densities, habitat enhancement and ongoing welfare monitoring, helping ensure that gamebird management is undertaken in a sustainable manner that benefits both released birds and the wider environment. WES also supports knowledge-sharing and continuous professional development, enabling operators to learn from emerging research and best practice guidance.

Importantly, WES Level 2 accreditation provides independent assurance of responsible management and is recognised as a means of monitoring compliance with the Code of Practice for Grouse Moor Management and the Muirburn Code, supporting Trusted Operator status. This independent verification provides confidence to regulators, stakeholders and the public that accredited shoots are committed to high standards of environmental stewardship, gamebird welfare and sustainable land management. As a result, WES should be viewed as a significant additional positive outcome associated with gamebird shooting and releasing, helping to embed transparency, accountability and continual biodiversity improvement across the sector.

These benefits are not incidental. They are sustained through ongoing private investment associated with sporting activity. If future policy changes reduce the viability of that activity, Defra should recognise that there is currently no identified alternative mechanism capable of replacing this combination of environmental management, rural employment, conservation capacity and community support at a comparable scale without significant additional public or charitable funding. The key policy question is therefore not only what impacts gamebird management may have, but what would be lost if the investment that supports these wider public benefits were diminished.

References

Angus Glens Impact Report, Scottish Land & Estates & Angus Glens Moorland Group Published report

BiGGAR Economic's Report on The Contribution of Rural Estates to Scotland's Wellbeing Economy (2023) Report

PACEC (2014) The Value of Shooting: The Economic, Environmental and Social Benefits of Shooting Sports to the UK. Published

Scottish Land & Estates, The Response to the Glenmore-Strathnethy Wildfire by Land-Based and Rural Businesses (2026) Report

Scottish Land & Estates, The Response to the Carrbridge and Dava Wildfires by Land-Based and Rural Businesses Report

Game & Wildlife Conservation Trust (2026). *Game for Nature: Why released gamebird management is a lifeline for declining farmland biodiversity*. Published

Wildlife Estates Scotland (WES) Website

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