Briefing on grouse shooting & moorland management

This is a briefing by the British Association for Shooting and Conservation. It is updated annually with new scientific literature. BASC is the UK's largest shooting organisation with a membership of over 150,000.

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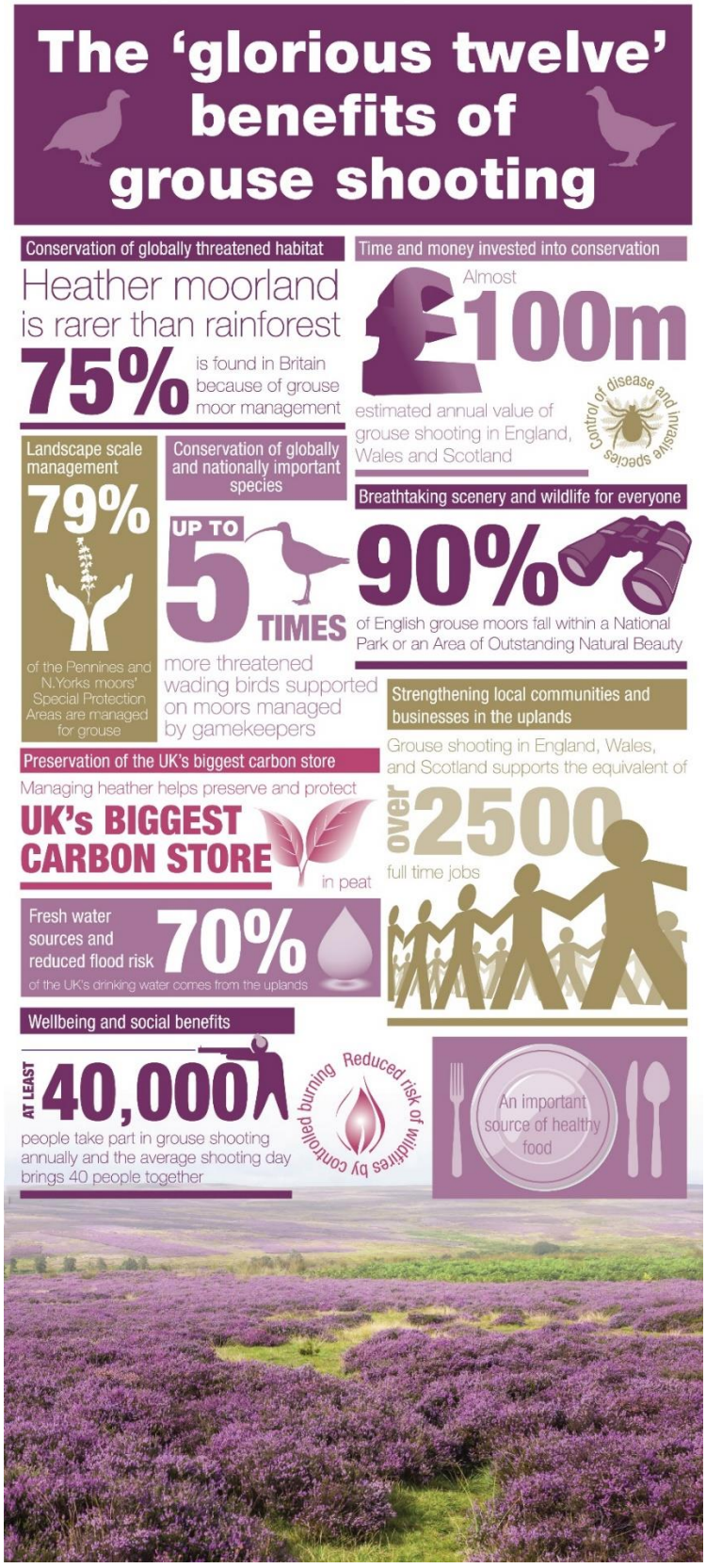
BASC
The British Association for Shooting & Conservation


The 'glorious twelve' benefits of grouse shooting
Conservation of globally threatened habitat
Heather moorland is rarer than rainforest
75% is found in Britain because of grouse moor management
Time and money invested into conservation
Almost £100m
estimated annual value of grouse shooting in England, Wales and Scotland
Control of disease and invasive species
Landscape scale management
79%
of the Pennines and N.Yorks moors' Special Protection Areas are managed for grouse
Conservation of globally and nationally important species
UP TO 5 TIMES
more threatened wading birds supported on moors managed by gamekeepers
Breathtaking scenery and wildlife for everyone
90%
of English grouse moors fall within a National Park or an Area of Outstanding Natural Beauty
Strengthening local communities and businesses in the uplands
Grouse shooting in England, Wales, and Scotland supports the equivalent of
over 2500
full time jobs
Preservation of the UK's biggest carbon store
Managing heather helps preserve and protect
UK's BIGGEST CARBON STORE
in peat
Fresh water sources and reduced flood risk
70%
of the UK's drinking water comes from the uplands
Wellbeing and social benefits
AT LEAST 40,000
people take part in grouse shooting annually and the average shooting day brings 40 people together
Reduced risk of wildfires by controlled burning
An important source of healthy food

About grouse moor management

The objective of grouse moor management is to provide a **sustainable harvest** of grouse from a specific area of heather moorland, within a balanced package of multi-purpose land uses including sheep grazing, deer stalking, conservation and public enjoyment of the upland environment.[1]

Grouse moor managers keep predator numbers low through seasonal and targeted legal avian (such as corvid) and mammalian (such as fox) predator control. Within a year, grouse moor managers undertake a **carefully planned programme of work designed to ensure the moorland is in good health** to support grouse – including heather burning, cutting or mowing heather, monitoring and controlling heather grazing, addressing pests such as heather beetle, controlling disease and ticks, managing invasive species such as bracken, and restoring historically damaged peatland.

This careful **upland custodianship** takes place throughout the year on grouse moors, whereas the number of days on which grouse shooting takes place on the moor make up only a small proportion of the grouse moor managers' annual time.

Grouse shooting delivers time, effort and millions of pounds of private investment into moorland management. The benefits of this effort are far-reaching and crucial to maintaining many aspects of upland ecology and biodiversity, while supporting rural economies and communities.

Red grouse

Red grouse (*Lagopus lagopus scotica*) are truly wild birds, which cannot be reared. They are only found in the British Isles and are closely associated with heather moorland, as heather (*Calluna vulgaris*) is their primary food source. It is estimated that 230,000 breeding pairs are present in the UK and red grouse is an amber listed species in the UK's *Birds of Conservation Concern*[2] and is on the list of UK Biodiversity Action Plan priority bird species.[3] The Game and Wildlife Conservation Trust (GWCT) estimated that numbers of red grouse shot annually fell by 82% between 1911 and 1980. This decline was attributed to reduced heather quality via sheep and deer grazing, an increase in grouse predators, a decline in the area of land covered by gamekeepers, and a 30% loss of heather between 1950 and 1980 largely due to sheep grazing and conversion to forestry.[4] More recently, the latest *State of the UK's Birds* report shows that red grouse populations increased by 13% in the UK between 1995 and 2015.[5]

Habitat

Red grouse live on heather moorland, specifically on areas of blanket bog and upland shrub heath.[4] Upland heathland and blanket bog are both priority habitats in the UK Biodiversity Action Plan, with a combined coverage of around 3.3 million hectares.[6] Both habitat types are home to an important and wide ranging assemblage of plant and animal species.[7–9] UK peatlands in general support a unique array of biodiversity and provide important ecosystem services such as carbon capture and water supply.[10–12]

Blanket bogs occur on 'deep peat' (more than half a metre deep); upland heath occurs on 'thin peat' (less than half a metre deep).[9] Blanket bog is one of the most extensive semi-natural habitats in the UK. It includes the EC Habitats Directive priority habitat 'active' (peat forming) blanket bog.[9] Blanket bog is a globally rare peatland habitat, and the British and Irish Isles have some of the best in the world.[10] Dwarf shrub heaths are internationally important; they are largely confined within Europe to the British Isles and the western coastline of mainland Europe. Upland heathland and blanket bog encompass a range of National Vegetation Classification (NVC) plant communities. High quality heaths are structurally diverse, containing stands of vegetation with heather at different stages of growth. Upland heath in 'favourable condition' also usually includes areas of mature heather.[9]

Prescribed burning

Rotational burning, or 'prescribed burning' targets pre-selected areas of older heather. The intention of burning is to enable the areas of burnt heather to regenerate, producing new growth which is a food source for red grouse. This prevents heather from degenerating, halting the successional process.[13–15] **Burning is regulated by law, guidance and codes of practice**, as well as being covered by cross-compliance regulations. The intention of burning for grouse moor management is to conduct **'quick, cool burns'** as per Defra's Heather and Grass Burning Code.[16] Such burns aim to remove only the canopy layer of vegetation, leaving the 'stick' behind with underlying soil and peat intact. In this way, vegetation quickly regenerates. Cutting and mowing of vegetation are also used to produce this vegetation mosaic effect. An **estimated 0.68% of heather moorland in Britain is burned each year**.[17]

Key facts

Prescribed burning conserves heather moorland

- Heather moorland is a **globally threatened, internationally important** habitat. Worldwide, it is rarer than rainforest.[18–20]

- The fact that heather burning occurs in the UK for grouse moor management is by and large the reason that **75% of heather moorland worldwide** is found in the UK.[14,19,21–23]

- The selective nature of rotational burning produces a high quality heath, via a **mosaic of structurally diverse vegetation** at different stages of growth.[9]

Appropriate burning can help to reduce wildfire risk

- Large stands of old heather which are not rotationally burnt pose a major fire hazard due to a significant build-up of fuel loads, and **wildfires in such areas are more likely to be more intense or severe**, igniting peat, releasing large amounts of carbon, affecting water quality and destroying species and habitats.[12,17,23,24]

- Regular burning **reduces fuel loads - thus to some extent mitigating the risks of large and damaging wildfires**.[12,23–25] However, more research is needed to better understand the interactions between wildfire and managed fire regimes.[12,17,26]

- A Natural England evidence review on managed burning cited evidence that **fuel load and structure are critical factors in fire behavior** and noted moorland managed by rotational burning appeared less prone to wildfire, although stated no studies were found to date that specifically provided evidence on the direct relationship between managed burning occurrence and wildfire severity in the UK.[27]

- In a letter to the chairman of Natural England in July 2014, the Chief Fire Officers' Association (CFOA) Lead Officer on Wildfire set out the CFOA Wildfire Group position on prescribed burning. The letter said the consensus of the Wildfire Group was that: "Prescribed burning is a vital tool for the management of fuel loading and is considered by the Fire and Rescue Services (FRS) to be a critical component of their wildfire prevention plans." The letter also stated that **alternatives to prescribed burning for managing fuel loads were not considered as effective** in delivering the outcomes required by the FRS.

- A case study of an upland estate managed for grouse shooting in the Peak District found that burning was undertaken in keeping with **best practice guidelines**, and that the risk of large or escaped fires was very low.[28] If not undertaken in line with best practice guidelines however, burning can have detrimental impacts.

- Grouse moor managers helped firefighters tackle the **Saddleworth Moor** wildfire, ignited during the heatwave of July 2018. Michael Gove, in a letter to BASC about the fire, said he very much appreciated the work that gamekeepers and grouse moor managers were undertaking to help fire crews in dealing with wildfires and restoring peatland that has been historically damaged.

Helen Wilkinson / Heatherburning / CC BY-SA 2.0

The head gamekeeper at Dunmaglass Estate, Iain Hepburn, engaging with Wildfire Tactical Adviser Alex McKinley, to share best practice on tackling moorland wildfires.

Well-managed burning can be ecologically beneficial

- Research has demonstrated that more frequent prescribed burning on blanket bog can actually **increase the abundance of peat forming species** such as *Sphagnum* mosses and *Eriophorum* sedges.[29] The removal of dense canopies of heather via burning creates hydrological and light **conditions that favour *Sphagnum* species**, which are relatively resilient to fire and recover quickly following prescribed burning.[12,17,29–31]

- Moorland burning can create and maintain **high conservation value** in plant, invertebrate and bird communities.[32] Research in Scotland recommended timely prescribed burning to **maintain floral diversity**.[33]

> "To **maintain floral diversity** in heathlands there needs to be regular burning."
>
> – Welch (2016)

- A Natural England evidence review on the effects of managed burning[27] concluded there was **strong evidence that burning typically benefits open-ground invertebrates**. Many of the scientific studies reviewed documented increases in the number of

different species present ('species richness'), which may be a product of burning increasing the structural diversity of vegetation.

- The same review[27] found **strong evidence of correlations between burning and/or predator control intensity and densities of moorland breeding birds** – this is discussed in more detail on page 18.

- Prescribed burning occurs in small areas of moorland, typically leaving over 85% unburnt per year and 65% unburnt for more than three years; many scientific studies suggest an **overall increase in biodiversity** at the whole moor-scale.[34]

Well-managed prescribed burns can be used as a conservation tool

- Burning is **widely used as a conservation tool**. Natural England and Scottish Natural Heritage use and approve burning on SSSIs, the RSPB burn on a number of their upland reserves, and national parks, the National Trust and the Wildlife Trusts also use burning for conservation purposes.[34]

- Although there is pressure in some areas to reduce the use of fire, and a trend toward presenting burning only as a damaging practice, **prescribed burning can be used to protect biodiversity and achieve a variety of management objectives**.[17,24] Prescribed burning can occur within Special Areas of Conservation, Special Protection Areas[35] and Sites of Special Scientific Interest (SSSI);[36] burning has usually taken place on a site long before its designation for conservation importance, highlighting the role burning has played in **creating features of conservation importance** in the UK uplands.[17]

- Post-fire regrowth speed and species-level benefits may depend on the conditions influencing individual fires, such as weather, habitat type and burn dynamics – for example, **under certain conditions, species such as heather can return faster** than normal.[12]

- Evidence shows that poorly-managed burning can have negative impacts. For example, wildfires could develop from poorly-managed prescribed burns.[23] Or, burning too frequently may dramatically reduce heather cover, leading to bracken invasion or conversion to grassland; burning too infrequently may lead to heather dominating at the expense of other species.[23] By following **burning regulations and codes of practice,** these issues can be avoided.

- Records show that **fire has been a common part of the UK uplands throughout history**, with records showing that burning was a common practice as far back as the 1300s. The use of prescribed burning for grouse moor habitat management was common by the middle of the 19th century.[37]

> “Fire has been a **common part of the uplands** of the UK for many hundreds, even thousands, of years.”
>
> - Worrall *et al.* (2010)

More research is needed into the impacts of burning on water quality and chemistry

- The impacts of burning on soils and hydrology are complex and **vary according to a number of interrelated factors**. Fire characteristics such as frequency, temperature, intensity, residency time and size, depend on a range of factors including fuel type, wind and moisture levels. The impacts of burning are therefore influenced by a variety of factors including soil and habitat conditions, season, weather conditions and interactions with grazing and other management practices.[12,17,23]

- Studies on the impact of burning on water quality and chemistry are varied and inconclusive.[12,17,23,34] **Research is ongoing** in this area, to better understand the processes involved.

More research is needed into burning effects on the water table and water flows

- Natural England[27] found **no evidence in relation to the impact of burning on the risk of downstream flood events**. More research in this area is needed.

- The water table is the depth underground below which the ground is saturated with water. The **lower (further from the surface)** the water table, the dryer the surface layer of peat, meaning that carbon may be released into the atmosphere that would have otherwise been sequestered if the water table was higher (closer to the surface).[22]

- However, the **higher (closer to the surface)** the water table, the more saturated the peat layer becomes, meaning that in heavy rain, water flows overland rather than being absorbed into the peat layer.[34]

- Studies into the impacts of prescribed burning on the water table have shown **differing results**: some show lower water tables in burned areas; others higher water tables.[38–40]

- Some researchers have found that lower water tables in burned areas reduce runoff rates, thereby decreasing the likelihood of downstream flooding.[38] **More research is needed** in this area, especially in order to better understand the effects that surface vegetation has on water flows.[41,42] See page 16 for more information.

More research is needed into the impacts of burning on carbon storage, but heathlands provide an important carbon sink

- National carbon sequestration by heathlands alone is more than double that of peatlands. **Heather-dominated plant communities sequester double the carbon** of grass-dominated upland heath communities. The potential carbon sequestration rate by upland heath is comparable to that of woodland.[43]

- The increase in carbon sequestration that could be gained from national heathland restoration could be **equivalent to around 60% of the annual (2012) UK CO_2 sink** attributed to forest land management. Upland management promoting **heather restoration** has therefore been recommended to provide a carbon sequestration benefit in addition to biodiversity benefits.[43]

- There is **evidence to suggest burning releases less carbon than that captured during the regrowth phase** (in part because new vegetation is more efficient at sequestering carbon), meaning burnt plots of moorland can be better at capturing carbon than unburnt plots.[44]

> "It is also important to consider the relatively small loss of carbon from prescribed fires as a necessary and beneficial reduction in fuel load, **reducing the probability of a wildfire which would have a more detrimental effect** on the carbon budget."
>
> - Harper *et al.* (2018)

- Keeping fire severity low is likely to minimise soil carbon losses by **preserving the moss and leaf litter layer**, thus protecting the soil from overheating.[45]

- Studies into the impacts of burning on dissolved organic carbon in water are varied and inconclusive, with some showing elevated levels, some showing decreased levels, and some showing no effect. In addition, effects can differ at the plot and catchment scale, or change over time. **More research is needed** in these areas.[12,17,34,40,46–49]

- Prescribed fires reduce the fuel load, lessening the likelihood of **wildfires** that would have a **catastrophic effect on carbon storage**.[12,23,25] Climate change may increase wildfire occurrence and severity, especially in heathlands.[25,50] Evidence suggests that if wildfires increase, more frequent prescribed burning may minimise overall carbon loss.[25]

Peatland restoration

Damaged peatlands can become carbon sources, rather than carbon sinks. Bare, eroding peat is a worst-case scenario both for carbon loss and downstream flood risk.[41,42,51,52] **Peatland restoration aims to restore an ecosystem that sequesters carbon** and retains nutrients from through-flowing waters, by raising the water table, blocking drainage ditches and speeding up plant colonisation.[22,53,54]

Key facts

Grouse moor managers are restoring historically damaged peatland

- Peatland in good condition provides a **range of valuable ecosystem services** – from providing drinking water to performing a climate regulation role through carbon capture.[10]

- Historically, **peatlands around the world were drained for agriculture** (responsible for around 50% of European peatland alteration), forestry (30%) and peat extraction (10%), leading to negative impacts on biodiversity.[10,53] Historic drainage has lowered the water table and had negative impacts on the populations of many upland bird species, such as waders, and also invertebrate communities (which are an important food source for upland breeding birds).[7,10,55]

- Britain is one of the most extensively drained lands in Europe: historically, land drainage occurred before Roman times, taking off in the 17th century and peaking during the 20th century when extensive **government-incentivised drainage ditch networks were dug into UK peatlands**, mainly for the purposes of improving agricultural productivity.[10,56]

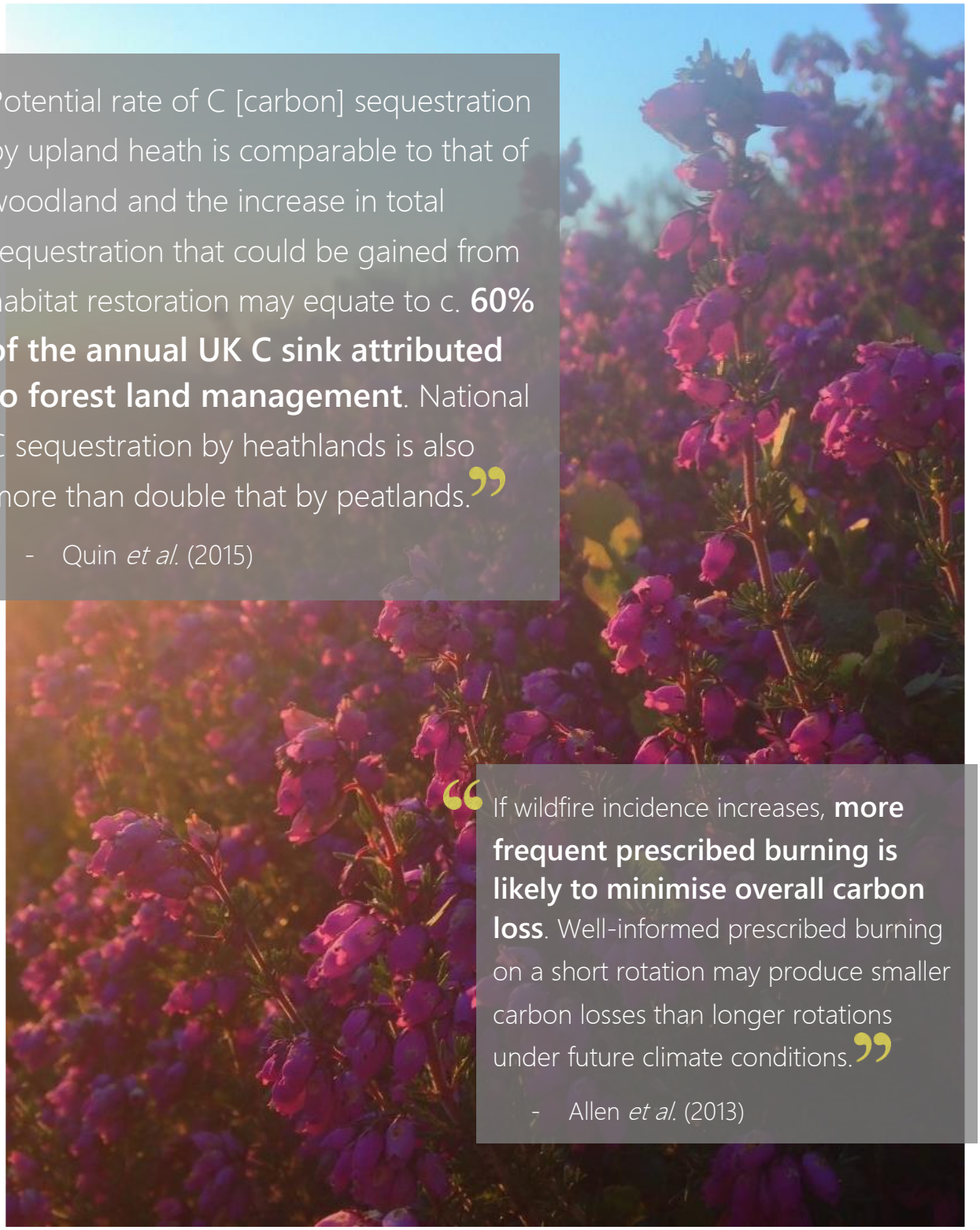
- Grouse moor managers have a vested interest in ensuring peatlands are in a good condition, not least because **peat is the basic building block for grouse habitat**.[9] Degraded habitats can compromise sustainable grouse and livestock production.[10]

- Grouse moor management is an important component of the UK's open uplands, supporting habitat mosaics, limiting wildfire and restoring peatland.[51,57] Privately funded **conservation labour** carried out for grouse moor management, including re-seeding heather and re-wetting deep peat, is equivalent to over 300 full-time jobs annually.[58]

- Responsible grouse moor managers are **actively working to restore peatland** that has been historically damaged by draining or inappropriate burning, by revegetating bare peat and blocking drainage ditches - **thousands of hectares have already been restored** and work is ongoing.[51,59–61] Drain blocking can be an effective way reduce dissolved organic carbon loss and water discolouration in disturbed peat catchments, although not all sites conform to this general pattern.[62]

- Natural England stated that **one of the biggest achievements in the SSSI improvement programme was the turnaround of grouse moor condition**, which covered 17% of the area of all SSSIs in 2011.[60] The burning code of practice, the blocking of drainage ditches and addition to the development of new management techniques had helped restore diversity on grouse moors.

- These factors, and the willingness of grouse moor managers to manage **responsibly and sustainably**,[57] led to a rapid and substantial increase in the proportion of grouse moors in 'unfavourable recovering' or 'favourable' condition: from 25% in 2004, to 96% in 2011.[60]



> Potential rate of C [carbon] sequestration by upland heath is comparable to that of woodland and the increase in total sequestration that could be gained from habitat restoration may equate to c. **60% of the annual UK C sink attributed to forest land management**. National C sequestration by heathlands is also more than double that by peatlands.
>
> - Quin *et al.* (2015)

> If wildfire incidence increases, **more frequent prescribed burning is likely to minimise overall carbon loss**. Well-informed prescribed burning on a short rotation may produce smaller carbon losses than longer rotations under future climate conditions.
>
> - Allen *et al.* (2013)

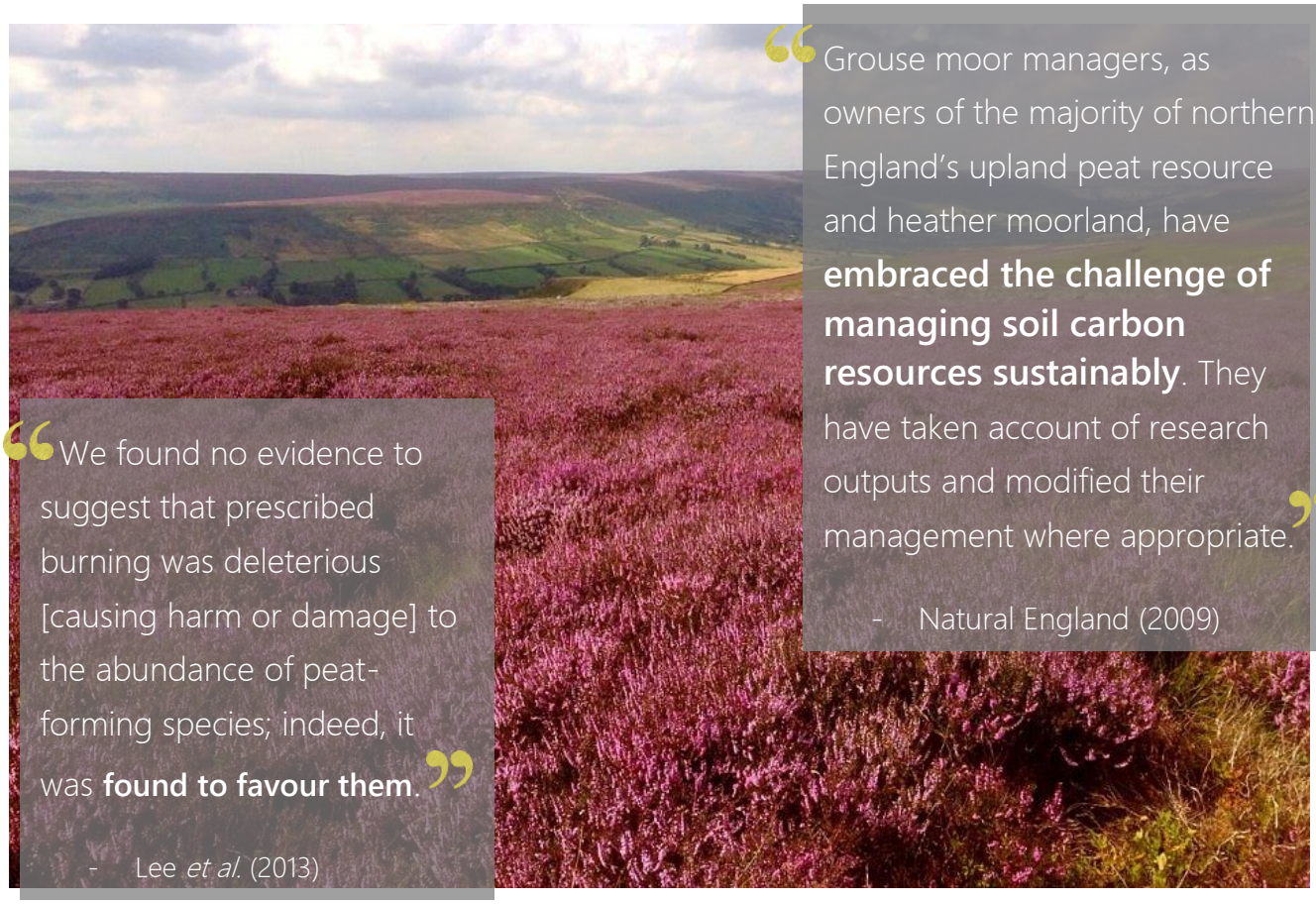
Revegetating bare peat can help to prevent downstream flooding

- Successful, proven '**Natural Flood Management'** techniques include re-vegetating bare peat, establishing flood storage areas and building leaky woody dams to slow water flow.[63]

- As described on pages 11 and 12, lower water tables may lead to less risk of downstream flooding in heavy rain – but higher water tables are better for carbon sequestration. Peatland restoration aims to block drainage ditches and 're-wet' peat, raising the water table but potentially increasing the risk of downstream flooding.[34,38] However, revegetation, particularly with *Sphagnum* mosses, can **mitigate the effects of surface runoff and slow water flows**.[42,63]

- In fact, increasing surface roughness through **revegetation may have greater flood prevention benefits** than lowering the water table.[41] Climate change is expected to lower water tables,[22] so revegetation may become even more important in future.

- Responsible grouse moor managers are **actively working to revegetate bare peat** - thousands of hectares have already been restored and work is ongoing.[51,59–61]



> "We found no evidence to suggest that prescribed burning was deleterious [causing harm or damage] to the abundance of peat-forming species; indeed, it was **found to favour them**."
>
> - Lee *et al.* (2013)

> "Grouse moor managers, as owners of the majority of northern England's upland peat resource and heather moorland, have **embraced the challenge of managing soil carbon resources sustainably**. They have taken account of research outputs and modified their management where appropriate."
>
> - Natural England (2009)

As an aside...

Grouse moor management helps to reduce the spread of invasive and potentially damaging species, such as bracken. Grouse moor managers contribute to controlling 57,000 hectares of bracken each year in the UK,[58] to stop it swamping and killing other moorland plants and providing a breeding ground for ticks, which can pass disease to grouse, other moorland birds and humans.[34,64] Many grouse moor managers privately fund tick treatments, benefiting grouse, upland waders and farmers.[65,66]

Predator control and habitat management

In addition to heather management via burning, mowing and cutting, grouse moor management involves legal predator control. This involves **limiting numbers of predators like fox and crow** to protect the grouse population. The methods used to legally control predators are regulated by law, guidance and codes of practice.

Key facts

Species are shown in the colour that represents their conservation status in *Birds of Conservation Concern 4*.

Legal predator control and heather management benefits a variety of UK birds

- **Legal predator control is well-recognised as a tool for conservation**. For example, in 2016/17, RSPB controlled 2,279 pests and predators on its reserves for conservation reasons.[67] Predator control may also **mitigate climate change effects** on birds by enhancing wader productivity, especially where climate effects occur alongside changing land use.[68]
- Bird **species diversity increases** on moors where more heather burning takes place.[69]
- A rich body of robust evidence demonstrates that grouse moors are **important strongholds** for many of the UK's most **threatened wading bird species** - including **curlew**, **lapwing**, **redshank** and **golden plover** – which benefit from the habitat management and predator control carried out for red grouse.[8,27,68,70–75] This is especially important in light of the fact that upland waders are under pressure from afforestation, overgrazing, drainage and predation, with declines of 31% in golden plover (1995-2015, Scotland) and 65% in curlew (1970-2015).[5]
- In addition to benefiting **red grouse** (which is unique to the British Isles), grouse moor management has been shown to benefit **ring ouzel**, **dunlin**, **sandpiper**, **short-eared owl**, **black headed gull** and **black grouse**.[8,71,72,74–76]

Jerzy Strzelecki / Golden plover / CC BY-SA 3.0

- Effects on **merlin**, **meadow pipit**, **whinchat** and **skylark** are varied, with some studies showing positive[8,70–72,75,77] and some negative[8,69–71,75] effects of grouse moor management on these species. Some passerines have not been found to benefit from grouse moor management and may do better away from moorland managed for grouse.[71,75] This may be because different upland bird species are associated with different conditions which may not be established on a grouse moor at any one time – for example, meadow pipit prefer grass-heather mixes.[27,69]

- When illegal persecution does not occur, raptors such as **hen harrier**, **peregrine falcon**, **kestrel**, **buzzard**, and **golden eagle** can thrive on moorland managed for grouse shooting.[8,70,75,78,79]

- Birds such as the **nightjar** are strongly associated with heathland and >50% heather cover; maintenance or restoration of such habitat has been cited as important for long-term conservation objectives of these birds.[80]

- A recent study surveyed 18 moorland estates across England and Scotland between April and June 2017. **Preliminary results showed 76 bird species** on the grouse moors, including 43 endangered ones. **Skylark** were 32% more prolific with gamekeeper protection and there were six times more **curlew**, eight times more **golden plover**, and 24 times more **lapwing** on sites with more predator control compared to areas with hardly any control. **Snipe** and **oystercatcher** were also much more prolific when protected from predators like foxes, stoats and crows.[81]

- Annual bird species counts at the Glenogil grouse shooting estate in Scotland reveal a **44% increase in bird species** counted on the estate over three years – rising from 63 in 2015 to 91 in 2017. Just under half of the bird species counted in 2017 were red or amber listed, demonstrating that the grouse moor is **supporting a range of species of conservation importance**.[82]

Illegal persecution must stop. Responsible grouse moor management must be, and can be, part of the solution.

- Researchers have noted that grouse moor management delivers biodiversity and conservation benefits, **with the exception of the illegal killing of raptors** - notably, hen harriers.[71,83] When hen harriers reach high breeding densities, their predation on grouse **limits grouse populations**, reducing grouse shooting bags and in some cases rendering shoots economically unviable, leading to their closure.[83–88] Diversionary feeding of hen harriers in an attempt to reduce predation on grouse has been trialled with some success, but has not yet increased grouse numbers enough to allow driven grouse shooting to occur.[79]

- Illegal persecution is not the only factor influencing hen harrier populations. **Fluctuations in prey populations, and habitat or land use change** can also have an effect.[69,88,89] However, evidence suggests that illegal persecution is a **limiting factor** for certain upland raptor populations, particularly hen harriers.[90–92]

- Researchers have noted that grouse moor managers have "the potential to be the hen harrier's best protector."[65] When hen harriers are not illegally persecuted, their nesting and breeding success improves when gamekeepers control generalist predators like fox and crow. This reduces nest predation and can **double the number of harrier chicks**

fledged. When moorland stops being managed for grouse, hen harrier breeding success and abundance has been shown to decrease, increasing again when grouse moor management is restored.[70,78,79,93]

- In an attempt to reduce illegal persecution, some researchers have called for a move away from more commercial driven grouse shoots, toward less commercial, walked-up shoots instead.[94] However, other researchers have pointed out that **to achieve the conservation benefits grouse moor management delivers, shooting income needs to be sufficient to employ staff to conduct habitat management and predator control**.[65]

- Research has shown that a 'quota' scheme could theoretically be a suitable strategy for hen harrier conservation in the UK, enabling coexistence between grouse shooting and hen harriers and establishing populations outside their current breeding distribution.[84,85,95,96] The Hen Harrier Recovery Plan, agreed by government, is underway and contains such an element in the form of **brood management.** This would be used when a 'threshold' on harrier density was reached in a particular area. In such cases, young would be temporarily removed from a grouse moor, raised in captivity and released back into other suitable wild habitat once they had fledged. This technique has been used successfully in France.[97]

- The **Hen Harrier Recovery Plan** was agreed by consensus following a long period of dialogue between land managers, shooters and conservation groups, supported by professional mediators. Brood management has proved contentious, however the recovery plan is the next important step in improving the future of our uplands. Success can only be achieved by stakeholders **working together, moving away from entrenched positions and engaging in constructive dialogue**.[84,95,98]

- Some have called for a ban on driven grouse shooting because of illegal persecution. However, **examples of what happens to biodiversity and wildlife when grouse moor management ceases are worrying**. The Berwyn Special Area for Conservation (SAC) was a grouse moor originally designated as an SAC for its high numbers of raptor species. When grouse shooting stopped, lapwing were lost, golden plover declined by 90% and curlew declined by 79%. Hen harriers declined by 49% and ring ouzel by 80%.[93] GWCT's Joint Raptor Study demonstrated that when grouse shooting became unviable due to hen harrier predation on grouse, and gamekeeping stopped: crow and fox numbers increased, breeding hen harriers and grouse declined, breeding wader populations dropped to very low numbers, and the status of both the Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA) was found to be unfavourable.[99]

- The above examples highlight the importance of grouse moor management in upland conservation efforts. **The uplands need management**; if left unmanaged they become a degraded asset. Should grouse moor management cease or become restricted, private **investment in upland habitat conservation and management - and subsequent biodiversity benefits – would be lost**,[65,100] with no notion of how these benefits would be publically funded. Strategies which ignore the socio-economic benefits obtained from grouse moor management are unsustainable.

- Last year, there were three successful hen harrier nests recorded in England. This year proved the **most successful hen harrier breeding season for a decade in England**,[101] with four successful nests on land managed for grouse shooting. **Partnership working** between the RSPB, estate staff, gamekeepers and local raptor workers enabled nest monitoring and protection.[102] This **demonstrates what can be achieved** when grouse moors are managed responsibly.[101,102]

- BASC condemns and abhors raptor persecution, publically appealing for its end. BASC has representatives on the Raptor Persecution Priority Delivery Group, and **BASC will continue to work for an end to illegal persecution in the UK**, and toward the conservation of raptors.

Isle of Man Government / Hen Harrier adult male / CC BY 2.0

> "The increase in hen harrier chicks this year is truly remarkable. These figures are a tribute to all those working hard for the survival of this breath-taking bird and show that **responsible management of grouse moors must be part of the solution**."
>
> - Andrew Sells, Chairman of Natural England (2018)

Economy, employment and tourism

Grouse shooting and moorland management play a **significant social and cultural role** in many upland communities, contributing to local employment, economy and business, shaping the landscape and influencing the environment. A widely-used definition for upland areas is **'Less Favoured Areas'**, an EU classification for socially and economically disadvantaged agricultural areas. An 'ageing' population is a concern in the uplands in general, as many young people tend to leave in favour of lower-cost housing and higher wages elsewhere.[22,103]

Key facts

Grouse shooting benefits the economy and delivers private investment into land management

- Research by Public & Corporate Economic Consultants (PACEC) estimated that grouse shooting, and moorland management for the purpose of grouse shooting, had a total economic value of approximately £67.7m in England and Wales in 2010. Around £15.2m of this was spent on goods and services such as travel and accommodation, activities which support supply chains. **An estimated £52.5m was spent on land management**, and of this around 10% was for government approved agri-environment work to cover some of the cost of providing specific public goods. The rest was privately funded.[104] For Scotland, a 2010 report estimated that grouse shooting was worth around £23m in Gross Domestic Product (GDP) annually.[105] Another source estimated that grouse shooting generated over £30m per year in wages alone.[106]

- Combining the above figures for England and Wales with those for Scotland allow the estimation that **grouse shooting in England, Wales and Scotland is worth nearly £100m annually**[59] – however differences in how these estimates of economic activity were arrived at should be borne in mind. Grouse shooting is clearly a strong incentive for investment in the UK uplands and remote rural areas.

- Much of the revenue from 'let' grouse shooting days is put back into the land – for example, via gamekeepers' wages, materials, equipment and work needed for conservation and management. In 2012/13, conservation labour carried out for grouse moor management (re-seeding heather, re-wetting deep peat, general heather

management and controlling bracken), was **equivalent to 314 full-time conservation jobs**. This is a known underestimate.[58]

Grouse shooting provides and supports employment in remote rural areas

- Grouse shooting has been estimated to support 1,520 full-time equivalent (FTE) jobs in England and Wales annually.[104,107] In Scotland, employment supported by grouse shooting has been estimated at between 1,072 jobs[105] to 2,640 FTE jobs[106] annually. A conservative estimate of the **number of jobs supported in England, Wales, and Scotland by grouse shooting might therefore be 2,500–4,000**.[59] Differences in how these estimates of employment activity were arrived at should be borne in mind, however.

Grouse shooting benefits rural business, especially critical in the tourism 'off-season'

- Recent research by moorland estate groups across Scotland surveyed 45 estates and found that more than £23 million flows directly into local businesses in trade generated by the activities of the estates. This figure does not include wages paid to gamekeepers or other staff, or the income accommodation providers receive from visiting shooters. The research found that local businesses like garages and building firms benefited from **business worth, on average, £514,886 from each estate**.[108]

- Surveys of upland communities revealed that 21-35% of respondents reported either direct or indirect **dependence on grouse shooting for their livelihood**.[109]

- Shooting tourism is especially important in rural areas during the usual 'off season' months. In Scotland, country sports (including grouse shooting) tourism has been estimated to account for 270,000 trips to Scotland and 910,000 **visitor overnight stays** annually.[110] Grouse shooting has been shown to **boost out of season hotel occupancy by 30%** or more in County Durham alone.[111]


Image by Keith Sykes

- A case study of a grouse shooting provider in Scotland revealed that products and supplies purchased by the shoot were generally **sourced from within a 10 to 15 mile radius** – such as fuel, feedstuffs, pesticides, quad bikes and other vehicles.[58]

- Restrictions on grouse shooting would significantly affect the businesses dependent on it. Some upland communities would **not be viable if grouse shooting was banned**. Studies show that when grouse shooting stops, this has a significant impact on the local economy and people, including job cuts.[99]

Grouse shooting has a socio-cultural role in upland communities

- Grouse shooting can **encourage the retention of young people in upland communities**. Surveys of upland communities revealed that 63% of respondents agreed that the grouse shooting industry contributed to keeping young people in the local area. In addition, 81% of respondents felt that grouse shooting was a **strong part of the community's culture and heritage**.[112]

- One of the most important community-level benefits of grouse shooting is the presence of gamekeepers and their families in upland communities. Survey respondents said that the presence of gamekeepers' children was **contributing actively to the retention of community services** such as schools.[112]

- The uplands offer a cultural ecosystem service, in that they provide non-material benefits to people. **Moorland is valued as a cultural asset**. It is particularly prized for its sense of openness, and heather is a feature that contributes to the quality of the experience.[113] More than 90% of English grouse moors fall within a National Park or an Area of Outstanding Natural Beauty (AONB) - but **landscape quality would be affected in the uplands through scrub and bracken encroachment**.[103] Without grouse moor management, therefore, cultural landscape quality would be affected.

- Visits to the uplands produce wellbeing benefits – physical (e.g. exercise) and psychological (e.g. recreation and relaxation). People's experience of and reaction to upland landscapes tend to be strong, and generally people value them for their sense of 'wildness', heritage and openness in addition to species assemblages.[113] **Without management for grouse, the uplands would look very different**, and people would lose the enjoyment of the iconic, vast swathes of purple heather that characterise UK uplands.

- Shooting provides a unique mix of wellbeing benefits for participants – from getting people active, to reducing social isolation and encouraging engagement with the natural environment. Research suggests shooting on the whole is actively **contributing toward government wellbeing targets** by providing personal, social and physical benefits.[114]

As an aside…

The estimated value of grouse meat is £490,000 annually.[115] Grouse is highly regarded as the 'King of Gamebirds'. It is a healthy meat that is prized by chefs. Grouse is a particularly lean and nutritious meat: roast grouse has less than one third of the fat, double the protein, and up to four times more iron and calcium than roast chicken.[116] The popularity of game meat is increasing rapidly.


Image by Ed Henderson

A summarised case study of a grouse shooting provider in Scotland:[58]

- **Support for local businesses:** The estate provides local jobs and income – both directly on site, and indirectly through the supply chain. Shooters usually stay for around five days on the estate or in a local hotel. Many suppliers used by the shoot come from within a ten to fifteen mile radius, and where possible supplies such as feedstuffs and vehicles are sourced locally. The estate works very closely with neighbouring estates, for example joint work between the keepers on predator control.

- **Support for local jobs and people:** There are three full time, fully trained keepers and one trainee keeper. There is also a full time gardener and full and part time housekeepers who provide refreshments for the shoot. The estate employs a forest manager and a squad of foresters who carry out work for the shoot as needed. The estate has over 220 houses, an integral source of housing for the local community.

- **Support for training and research:** The keepers have a range of necessary qualifications – from deer management to first aid, and from operating quadbikes to chainsaws. The gardeners too, have their own qualifications. The estate works with BASC and the GWCT to organise research and seminars.

- **Support for young people:** The estate supports young trainee keepers who are gaining work experience. The current trainee keeper is an apprentice attending the local college, completing a National Certificate (NC) in Gamekeeping and a Higher National Certificate (HNC) in Highland Gamekeeping. The estate works closely with local schools – including primary school field trips, talks from keepers, and open days for secondary schools and colleges. The estate has links with Barnardos' Get Ready for Work scheme.

Some people want to ban grouse shooting. We look at the unintended consequences for people and for the environment.

Which do you prefer?

With the benefits of grouse shooting

- Support for upland communities
- Thriving grouse
- Wader breeding success
- Increase in local tourism
- 75% of the world's heather moorland is conserved in Britain
- Investment in conservation
- Landscape-scale conservation
- Bracken and tick control

Losing grouse shooting creates the risks of

- Job losses lead to people leaving the area
- Bracken encroachment
- CLOSED FOR BUSINESS – Loss of tourism
- Loss of heather moorland
- Loss of grouse
- Fewer waders
- Increase in disease
- Loss of habitat management resulting in increased impact of wildfires

For more details on the benefits of grouse shooting you can download the '*glorious twelve benefits of grouse shooting*', as well as many other infographics highlighting the value of shooting, from the BASC website www.basc.org.uk

IMAGES BY LAURIE CAMPBELL AND MOORLAND ASSOCIATION

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