# Real Wilders

How grouse management compares with alternative land uses in delivering for climate and wildlife

## INSIDE



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# FOREWORD

This excellent report does not claim that driven grouse management is the only way to manage the UK's uplands, there is plenty of room for different approaches to coexist, it is a case of 'and' not 'or'. To contrast it with, for example, managed rewilding is to set up a false dichotomy. Far better to see these different approaches as on a spectrum with much common ground and many shared goals.

However, the story of post-war area-based conservation in the UK uplands is a cautionary tale that politicians and policy makers interested in land management would do well to heed. Too often focussed on a limited set of outcomes, one big idea has replaced another, from intensive agriculture to commercial conifer plantations and now native tree planting or natural regeneration. And yet, throughout this period, grouse moor management consistently protected many of our most valued upland habitats and today when demands on our uplands are greater than ever before, it is able to deliver collective benefits, including biodiversity, carbon storage, food production and recreation.

The experiences of the Working Conservationists featured in these case studies reflect this constancy in an age of change. They have lived through often contradictory approaches where the next best thing in management is pursued at all costs, in many cases with damaging consequences. This is well illustrated by Lindsay Waddell's decision to fill in all the peatland drains on the Raby Estate 40 years before the idea of 'rewetting' was fashionable. At the time, DEFRA through the CAP was still giving farmers like myself up to 90% grants for drainage to improve grazing (see page 9).

Policy makers also appear quick to forget that conservation designations in the uplands were often established to protect the wildlife and dwarf shrub habitat that driven grouse management maintains. In England 74% of upland SSSIs are managed as grouse moors. So, to make that management difficult or even impossible by applying restrictive legislation to, for example, prescribed burning or predator control, risks losing the species and habitats that are meant to be protected.

The danger of this kind of top-down 'desk-top conservation' policy, decided in offices many miles from the moors, is that it ignores the people on the ground who live and work in these environments and care for them passionately. The world's most successful conservation projects are based on putting such individuals and their communities

at the heart of the decision-making process. We should value the knowledge and views of those who are out on the hill every day observing minute changes in the landscape and taking account of the complexities and variations of habitat and wildlife.

Both the science and the eye-witness accounts in these pages reveal that grouse moors are a last refuge for many iconic and much-loved species now threatened with extinction in other parts of the UK due to changes in land use. My own Scarborough and Whitby Constituency includes around two thirds of the North Yorkshire Moors National Park. The success of ground-nesting birds on our heather moorland bears testament to generations of tried and tested practice from dedicated keepers and enlightened estate owners. This is in stark contrast to some areas where shooting was discontinued over 40 years ago, before the term 'rewilding' was even coined. Here we see that not only are there no grouse but also no lapwings, curlews nor indeed many of the other species dependant on that complex managed ecosystem. Heather has given way to bracken, scrub and saplings. What has been achieved over decades could be lost in a few short years if unproven, fashionable theories and fads replace the tried and tested. Future generations will not thank us if we make the wrong calls now. ■

Rt Hon Sir Robert Goodwill MP

*Rt Hon Sir Robert Goodwill MP farms in North Yorkshire and has been the Member of Parliament for Scarborough and Whitby since 2005. He is Chairman of the House of Commons Environment, Food and Rural Affairs Select Committee.*

# CONTENTS




*Managed grouse moors are the optimal habitat for breeding merlin*

DAVID RAW
Durham Upland Bird Study Group


*Curlews boomed when our hill was looked after as part of a grouse moor*

PATRICK LAURIE
Curlew conservationist


*Botanical variety and diverse heather depth correlate with abundance of birdlife*

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# INTRODUCTION

Between the 1940s and 1980s, moors that stopped grouse shooting lost 41% of their heather, while moors retaining shooting lost only 24%. For decades, in many parts of the UK uplands the incentive to protect grouse has kept the damaging impacts of commercial forestry or overgrazing at bay and protected some of our rarest species. Like rewilding projects, which manage deer to preserve plantations, grouse managers believe wildlife management is necessary to achieve a balance. These days most grouse managers regard themselves as Working Conservationists who maintain environments at private expense for the wider public to enjoy. They are not set rigidly in their ways, instead they recognise the need to adapt to the latest evidence. They want trees on the fringes as well as dwarf shrubs on the hill, they want to see birds of prey and rare waders as well as grouse and they recognise the value of the range of peat forming plants from bilberry to *sphagnum* moss.

To give a broader perspective, these case studies include the testimonies of experts outside the grouse management community who recognise its value. Evidence also comes in the form of peer-reviewed science and each section has a summary of a relevant GWCT study. More of this kind of research is needed before abandoning management principles which have stood the test of time and protected globally rare heather moorland for decades. As they have in the past, changes in flora and habitat structure through abandonment could have unforeseen negative impacts.

The case studies show what has been lost historically when different elements of grouse management are restricted or absent. This includes the impact of inadequate predation management on the productivity of ground-nesting birds such as capercaillie, the heightened risk of wildfire caused by a reduction or cessation of controlled burning and the devastating effect of both afforestation and intensive agriculture on moorland bird assemblages.

But it's about the positives, too. Regardless of how you view driven grouse management, it is impossible to deny the extraordinary chorus of breeding birds on a keepered moor in spring that Lindsay Waddell describes hearing for the first time when he came down to the Raby Estate in Country Durham (see page 8). That sound offers hope for upland peatlands and the endangered birds that depend on them. ■

# A bastion for birdlife

The Raby Estate in County Durham was planting trees and rewetting long before the current trend, providing a haven for a wide range of threatened bird species

## ESTATE FACTS

**LOCATION:** Teesdale, County Durham

**ACREAGE:** 30,000

**TYPE OF FARMING:** sheep and beef

**CONSERVATION MEASURES:** rewetting, tree planting, cutting, controlled burning, extensive grazing, predation management, wildlife monitoring

Lindsay Waddell believes tree planting in the uplands can be integrated into grouse moor management. In the distance is one of many native woodland plantations he established over 30 years ago.

When it comes to demonstrating the conservation benefits of grouse moor management, it doesn't get better than Raby. The 30,000-acre estate has the highest density of waders in Britain outside the Orkneys, about a third of all the black grouse left in England, and a breeding population of merlin of regional importance, as well as large numbers of passerines and a whole suite of raptors. When retired headkeeper Lindsay Waddell first came down from Scotland, he hadn't seen anything like it.

He said: *"Brought up in an Angus glen, I was used to a good selection of birds, but my move south brought me into contact with a completely different density of ground-nesting birds. I shall never forget one of my first spring mornings at Raby. The sound of the dawn chorus was almost deafening. The whole assemblage was at it: black grouse, curlew, lapwing, snipe, redshank, skylark, and many more."*

So how has the estate been so successful in maintaining such an extraordinary abundance of red-listed species when alternative land uses have seen them disappear? In the 70s and 80s, CAP headage payments, subsidies based on the number of sheep on the ground, led to vast swathes of the UK's heather moorland being destroyed by overgrazing. Lindsay explained: *"Once sheep remove most of the heather, bilberry, cotton grass and other plants from the surface, if you get the wrong kind of grass growing back, it is very difficult for those dwarf shrubs to re-establish themselves. The impact on biodiversity is massive. From keeping the whole suite of moorland birds, you completely remove some of them. It's not much good for black grouse, red grouse, and even a lot of the pipits prefer the dwarf shrub mix, which has a knock-on impact on predators like merlin."*

The fact that Raby was managed for grouse, meant that subsidies to overgraze were resisted as sheep production was not its primary objective. At the same time, entirely eradicating herbivores from the ecosystem would be damaging. Grazing plays a vital role in maintaining the grass swards on the in-bye land next to the moors, which are the favoured breeding places of lapwing, redshank, oystercatchers and other waders; and sheep on the hill help prevent vegetation growing rank or being lost entirely due to the natural regeneration of woodland. Lindsay said: *"In everything, keeping the balance is very important. If you had no grazing, mostly non-native trees would recolonise and the main breeding ground for waders in this country would be lost because they need wide open spaces."*

Grouse management is often wrongly blamed for the huge ditches dug across vast swathes of heather moorland, which were funded by the government in the mistaken belief it would improve grazing and, therefore, productivity following wartime food

shortages. These drains or 'grips' are a danger to grouse chicks, whereas keeping water on the hill, particularly in drier summers, is of great benefit to them. Rewetting is the current trend in upland management, but Lindsay was blocking grips 40 years ago. Ironically, his work was being part-funded by English Nature, while at the same time MAFF was still offering grants for digging drains.

## *"The sound of the dawn chorus was almost deafening"*

He said: *"Though, these days, the rewetting of these places is flagged up as something new, we were doing this way back in the 1980s to stop the erosion of peat by excessive water flow. We plugged up the whole drainage system on 16,000 acres of moorland on Raby over about 5-10 years, which saved numerous broods of grouse as well as lambs from getting trapped in the drains. Today they have refilled with vegetation with small pools along their length providing ideal habitat for numerous species of sphagnum and invertebrates, an important food source for the chicks of moorland birds."*

Tree planting at Raby is another example of where a measured approach has been in contrast to ever-changing and potentially damaging government policy. About 30 years ago, concerned that the black grouse population was suffering due to a series of severe winters, Lindsay began establishing plantations of native trees on the edges of the moor to provide food and shelter for the red-listed species. On one occasion, in spite of Natural England support, he struggled to get permission because at the same time Defra schemes prohibited tree planting on the grounds that it spoiled the integrity of the open moorland. In the end, a compromise was reached whereby trees were allowed as long as they didn't protrude above the skyline.

Lindsay said: *"We planted a lot whenever the opportunity arose, and they've proved very beneficial to black grouse in particular. There is room for more tree planting around the fringes of grouse moors, and a lot of other moor owners have followed suit since then. Grouse moor management done well is the best of both worlds because you end up with a mixed landscape that's good for your upland breeding waders and passerines as well as species that benefit from tree cover."*

Historically, grouse management saved large areas of the uplands from commercial sitka spruce plantations,

## Wildlife Highlights


CURLEW




BLACK GROUSE


HEN HARRIER


LAPWING




SKYLARK


WHINCHAT

which were also incentivised by government grants. Raby resisted the temptation to plant forestry and the estate even purchased a piece of land next to a grouse moor to prevent it becoming a conifer plantation. Tree plantations are a threat to upland bird assemblages, both because they harbour predators and because many species are not adapted to closed canopy woodland.

David Raw a volunteer field-worker from the Durham Upland Bird Study Group has been studying merlins in the area for over 30 years to provide one of the most comprehensive breeding studies of the species in the UK. He said: *"Merlins are birds of the open moor and close canopy woodland wouldn't be appropriate."*

As ground-nesting birds, merlins also benefit from the legal control of generalist predators by current headkeeper Andrew Hyslop and his team. Andrew said: *"We carry out predator control for the grouse, but by doing so we are protecting all ground-nesting birds including curlew, lapwing, hen harriers and merlin."*

Raby prides itself on the fact that you can see the full suite of raptors on the moor and many breed there. This is in part due to the abundance of food in the form of the passerines and small mammals that thrive under grouse management. David said: *"Merlin is a Schedule 1 species, and it was recently red-listed with a UK population of only 1,100-1,350 pairs. But here in Durham we have a good proportion. Pairs on Raby, in particular, show really good productivity. Managed grouse moors are the optimal habitat for breeding merlin, providing heather for nesting sites, predator control and their principal prey, meadow pipits and skylark. We get a tremendous amount of cooperation from the keepers, who are immensely proud of their merlin. We are allowed free access to complete the studies and we share information. Together we build a comprehensive independently verified picture of productivity each season."*

## *"Managed grouse moors are the optimal habitat for breeding merlin"*

Raby's grouse moors are listed as SAC and SPA, affording them the highest level of protection, and many of the birds listed in the original designations, like golden plover and curlew, are still in abundance. Lindsay believes it would be disastrous if grouse management were to cease in favour of a light touch or abandonment approach and points to the example of Langholm Moor, which is a short flight for a wader over the Scottish border from Raby.

*"Upon the cessation of the game management at the end of the final piece of work there in 2018 the bird populations of the Langholm moors have pretty much slid to oblivion,"* he said. *"I've heard that most of the ground-nesting birds, including the raptors, have suffered serious declines. Merlin are down from seven pairs to one left nesting in a tree, a strategy the bird employs when being predated at ground level. It's become a classic example of moorland scrubbing, with a lot of non-native pine trees taking over what was an open landscape but will soon be no more than a woodland. It's an SPA for hen harriers, but how long it will stay like that I don't know."*

There are no plans to leave Raby to a similar fate, but recent changes in regulations have caused the effective abandonment of large areas of heather moorland. Andrew Hyslop is deeply concerned that Natural England's decision to ban controlled burning on deep peat in designated areas will eventually make the

RESEARCH IN PRACTICE

### Langholm Moor

Simon Lester
*Headkeeper, Langholm Moor Demonstration Project (LMDP) 2008-2016*

The LMDP was intended to investigate whether a grouse population could be recovered from low numbers in the presence of breeding raptors. The moor covered almost 12,000ha of land then owned by Buccleuch Estates and the project was a joint initiative between Buccleuch Estates, the GWCT, Scottish Natural Heritage, the RSPB and Natural England. When it began, Langholm Moor was a failing SPA for hen harriers and a failing SSSI for habitat and upland bird assemblage, with one merlin's nest up a tree. By the end of the project, we had double figures of merlin nests on the ground and all raptor species had increased, along with red grouse, black grouse and waders. This was all achieved by employing grouse moor management measures including the removal of 1,600 foxes and 2,081 crows. By the time keepering ceased in 2016, Langholm moor was back in favourable condition. ■


habitat unsuitable. He said: *"We are doing our best using grazing and cutting, but in many instances these methods are impractical. If you take any of the management tools away, you are severely restricting our ability to ensure the breeding success of the red-listed species."*

Over decades, Lindsay has seen grouse management's remarkable conservation success continue as fads for upland land use come and go, but he is concerned that current direction of policy and ideology threatens its legacy at a time when many of the species associated with it need it most. He said: *"There is a real risk that the rewilding bandwagon takes over from the reality and economics of traditional upland land management as myths are perpetrated regarding exactly what a grouse moor is. It is not a monoculture of heather, indeed far from it. It is a mosaic of the whole suite of moorland dwarf shrubs with room for larger cover on the periphery to aid a wide range of species."* ■

Clockwise from above: Raby headkeeper, Andrew Hyslop demonstrates the depth of the peat with his walking stick. He is concerned that banning controlled burns on such areas will lead to devastating wildfires; David Raw has been monitoring merlin on the moor for 30 years. Government grants to drain the uplands for agriculture caused damaging erosion; in the 1980s, long before the current trend for rewetting, Lindsay was blocking up the grips, helping *sphagnum* and other mosses retain moisture. Moorland on Raby is not a monoculture, but a mix of dwarf shrub species.

# The wrong trees in the wrong place

The recent extinction of the curlew in southern Scotland is a warning of the threat to rare species posed by the current trend for woodland creation

## IMPACT OF AFFORESTATION

**5,000** PAIRS OF BREEDING CURLEW LOST FROM SOUTH WEST SCOTLAND

**1,750** PAIRS OF CURLEW LOST FROM THE SOUTHERN CHEVIOTS

**20%** OF FORMER UK MOORLAND IS NOW COVERED WITH CONIFEROUS PLANTATIONS

Large commercial forestry plantations in Galloway have lead to increases in the number of foxes and crows, which predate on eggs and chicks. When predation management stopped it limited curlew productivity to unsustainable levels.

Over the last ten years, curlews have emerged as a leading priority for conservationists in the UK. Their numbers have declined by more than two thirds since the mid-1990s, and there are now real fears that the birds could become extinct as a breeding species, particularly in Wales and the south of England. This decline is even more concerning because the UK holds a large proportion of the world's Eurasian curlew population, which is classified by the IUCN as 'Near Threatened'.

Research has shown that curlews can live for up to 30 years, and adult birds have a high annual survival rate. Declines stem from the fact that breeding success is often very poor, and the number of chicks produced each year is too low to replace the slow but steady loss of older birds. Each breeding season represents another tiny loss, which slowly accumulates over many years and perhaps even decades. This has meant that curlew declines can be difficult to see and understand on the ground.

Conservationist Patrick Laurie runs a hill farm near Dumfries in South West Scotland where he has witnessed the steady decline of this iconic wader throughout his lifetime. He said: *"When we look to address the causes of curlew decline, we often need to work back in time to confront problems which might have started 20 or 30 years ago. The situation is confusing and complex, and it doesn't help that adult birds will return to the same fields each year to lay their eggs, regardless of whether or not they are successful. It's no wonder that farmers and conservationists find it easy to assume that all is well. At the same time, curlews have always been widespread, abundant birds. Many people find it hard to imagine that they could ever be in trouble."*

Since the curlew's decline is linked to poor breeding success, research has focused upon eggs and young birds. It has become clear that curlew chicks are experiencing a range of complicated problems, which vary between different regions. In some lowland areas, breeding attempts are being destroyed by agricultural operations, particularly where these are linked to intensive grassland management. Silage is cut too soon or too frequently, and the speed and intensity of that work has driven a number of local populations to the brink.

In the uplands, extensive areas of woodland creation have destroyed curlew habitats. The problem is particularly acute in southern Scotland, which has seen

a huge increase in commercial forestry. Afforestation also leads to increases in the number of foxes and crows. These generalist predators steal eggs and eat chicks at levels that often prove to be unsustainable.

Patrick has recorded 119 curlew nesting attempts in Galloway over several years and only a single chick was produced during that time. He said: *"Curlews were always here when I was growing up. When I got into conservation, we were doing everything we could to protect black grouse, and nobody gave a second's thought to curlews. They had always been so common; it was hard to imagine they'd ever go downhill."*

## *"In the uplands, extensive areas of woodland creation have destroyed curlew habitats"*

Patrick's farm lies in a good area for curlews, with a mix of moorland, white grassland and improved pasture where sheep and cattle are grazed. This entire area was managed for shooting, including driven grouse, until the 1960s, and a neighbouring beat still holds the record grouse bag for this part of Galloway. The old game books reveal not only a wealth of grouse in those days but also golden plover, black grouse and mountain hares being shot right up to around 1964. After this, pieces of moorland were gradually sold off for a range of interests and the land's sporting value declined dramatically. Many of the old beats were planted with commercial forestry in the 1970s and 80s, and records show that various species vanished soon afterwards.

Retired shepherd Jim Hamilton remembers the collapse of lapwings on the hill once the moors were broken up. *"Lapwings were the first to go. They crashed very quickly, and soon we were left with little more than a handful of birds. Within ten years, they had all gone. Since that very steep decline, the birds on the hill have just been petering out. For a while, it seemed like curlews would survive the change, but they're fading away now too. It's a very sad state of affairs, and it started when the hill was broken up and keepers left."*

Jim went on to explain: *"The driving force behind these declines was increased predation, which coincided with a change in grazing patterns. Fox and crow numbers seemed to boom in the new forestry plantations, and there was an increase in sheep stocking, which ate out*

*some of the best habitats. Curlews found their nests were more vulnerable to predation at precisely the moment when predator numbers were rising. It seems obvious to me that if we want birds like curlews for the future, we have to base our work on predator control. Even the most vocal critics of shooting will admit that grouse moor keepers provide a rock-steady foundation for curlews and a variety of other wading birds."*

Without gamekeepers, it became impossible for busy shepherds to keep on top of predator numbers and the curlew population began to decline. Patrick said: *"In 2010, the hill held roughly 12 pairs of curlews, but it's telling that we simply don't know for sure. Back then, nobody really thought of counting them. The number of birds on the hill steadily dwindled until 2021, when we were left with a single pair. Their nesting attempt failed, and no more birds came after them. That was the end of curlews here. Curlews boomed when our hill was looked after as part of a grouse moor, and the number of birds collapsed as various aspects of that management were withdrawn. The same forces which drove out mountain hares and golden plover in Galloway simply took much longer to drive out curlews, but the end result was always inevitable."*

Working with local curlew enthusiast John Murray, Patrick ran a survey of curlews across a large part of Galloway during the spring of 2022. The search uncovered a woefully small number of birds still breeding in the landscape. John afterwards commented that the result was worse than anybody thought. He said: *"People knew that curlews were doing badly here, but nobody realised it was this bad. Even in former 'hotspots', the number of birds was depressingly low, and the only positive stories came from farms and estates where predator control is carried out. That said, even some of these places were struggling. It seems like predator control is an important tool, but it has to happen across big areas to be really effective. In this landscape of small hill farms and new forestry, there just aren't enough people working together in the same direction."*

Against national trends of decline and collapse, it's clear curlews that breed on land managed for grouse shooting actually do very well. Their numbers are stable on many moors, and on some they are even increasing. That's partly down to the issue of scale; bigger estates can make decisions across extensive areas of upland habitat, and they can drive changes across large areas to make a real difference. When you compare a map of curlew distribution with grouse moor management, the link is very clear. England's population of curlews lines up almost precisely with the Peak District, the Yorkshire Dales and the Pennines, all of which are associated with grouse moor management. The same is true in Scotland, where extraordinarily high densities of curlews are found in the grouse shooting heartlands of upland Angus, Aberdeenshire and Perthshire.

These birds owe their success to a programme of predation management during the rearing season and the provision of varied habitat associated with grouse moor management. In many areas, curlews choose to nest in patches of recently burnt heather, and there are clear benefits linked to the sort of careful grazing management required by grouse. Importantly,

RESEARCH IN PRACTICE

## Ground-nesting birds in South West Scotland

Dr Nick Hesford
*GWCT Advisor Scotland*

I co-authored a scientific report titled *Changes in the abundance of some ground-nesting birds on moorland in South West Scotland*, published in 2018, which found severe declines for several species of ground-nesting birds. The study looked at trends for moorland birds in the region, compared to the whole of Scotland, and then focused on two Special Protection Areas (SPAs), Langholm and Muirkirk, to examine changes in land use and moorland bird numbers. The report found clear declines for several species of ground-nesting moorland birds in South West Scotland that closely mirror those seen elsewhere in the UK and which may be attributed to land-use change, including afforestation, agricultural intensification or abandonment, as well as a decline in the extent of grouse moor management. Grouse moor management can help retain heather moorland, and may form stable habitats where prescribed burning, sympathetic grazing and predator control can help conserve numbers of some upland birds. The effect of losing grouse moor management was clearly shown in both case studies, where significant declines in ground-nesting birds occur in tandem with the loss of keepering. ■

*"Curlews boomed when our hill was looked after as part of a grouse moor"*

curlews are particularly associated with the moorland fringe, those bits of wet, often rushy moorland that are found around the moor itself. Those connections between farming and sporting management are crucial, and it's clear that predator control and habitat management extends beyond the areas that are most productive for grouse.

For Patrick, it is important that this success is recognised, as well as the devastating impact on a range of iconic species when grouse management is halted. He said: *"Curlew are extraordinarily popular birds. It's hard to put a finger on precisely why they are held in such high esteem, but there's no doubt that everybody loves them. The sound of a curlew calling in the spring is a landmark of the changing seasons, and while many species live alongside these birds on moors and the lowland floodplains across the UK, curlews have come to represent a wealth of farmland and upland biodiversity."* ■

Clockwise from above: curlew chicks are highly vulnerable to predation; some of the best habitats were destroyed by over grazing; natural regeneration of natives on the moorland edge is an example of the right trees in the right place; Patrick Laurie remembers when curlew were widespread and abundant; one of the last curlew photographed by Patrick on his farm in 2016.

# Fighting fire with fire

The abandonment of heather management in the Peak District National Park threatens rare birds and peatlands, as evidenced in a ground-breaking new report on the growing risk of catastrophic wildfire

## ESTATE FACTS

**LOCATION:** Fitzwilliam Wentworth Estate, Derwent Edge, Peak District

**TYPE OF FARMING:** sheep

**CONSERVATION MEASURES:** wildfire risk assessment, controlled burns, cutting, gully blocking, extensive grazing, predation management, tree planting, *sphagnum* planting

## WILDFIRE RISK IN NUMBERS

INTENSITY BEYOND FIRE & RESCUE SERVICE CONTROL

**3.4**M FLAME LENGTH

**800**M/HOUR RATE OF SPREAD

POTENTIAL INTENSITY ACCORDING TO NEW REPORT

**7.6**M FLAME LENGTHS

**2,393**M/HOUR RATE OF SPREAD

*"An increase in combustible vegetation has been caused by change in management practice"*

Headkeeper Nick Gardner demonstrates how heather has been left to grow rank over vast swathes on the Peak District National Park.

In 2018, the blaze on Saddleworth Moor in the Peak District National Park affected 2,400 acres with a loss of some 40,000 tonnes of $CO_2$ at an estimated cost of £8.76m, but these disastrous events could pale in comparison with future wildfires according to a new report. Peak District National Park – Wildfire Risk Assessment 2022 was commissioned by the Peak District National Park Authority and co-authored by the Fitzwilliam Wentworth Estate, which manages Bradfield Moor in the North Peak.

Focused on 38,000 acres of the Derwent Valley area, the project was based on a pioneering combination of fire behaviour analysis by co-authors Incendium Group (the experts) and local knowledge of land managers on the ground (the practitioners). The project produced an evidence base to inform future mitigation strategies, including a heat map demonstrating the potential for flame lengths up to 7.6m and rates of spread 2,393m/hour, making it way beyond the fire and rescue service's capacity to control. Anthony Barber-Lomax, former resident agent at Fitzwilliam Wentworth Estate and co-author of the report, said: *"The modelling revealed that without intervention to mitigate the risk, the fuel load is such that a blaze could become uncontrollable over a huge area. It's not a case of if, but when."*

Commenting on the report, Andrew McCloy, chair of National Parks England, said: *"It is really heartening to see such proactive work from the moorland community. This cements our relationship; it's about working together. National parks are a national asset in largely private hands, and we can only deliver for the government for population, nature and climate in partnership."*

A combination of factors has heightened the risk of wildfire in recent years. Less rain and warmer weather in spring and summer caused by climate change has dried out vegetation. Higher visitor numbers – there are on average 13 million visits every year – means more chance of a barbecue, campfire or cigarette starting a blaze. But of greatest concern to many land managers is the increase in combustible vegetation or 'fuel load' caused by a change in management practice. Where previously controlled 'cool' burning of the surface vegetation was carried out to rejuvenate heather and other moorland plants, which are naturally adapted to burning, this practice was recently banned on deep peat in designated areas and is largely discontinued on huge areas of moor owned by conservation organisations and local councils. As a result, the firebreak effect of controlled burns has been dramatically reduced, and the heather on vast swathes of moorland has grown tall, bracken has encroached, and birch scrub is beginning to take hold, all contributing to a massive build-up of combustible material.

In some areas, controlled burns have been replaced by cutting the heather or rewetting the peat to make

it more fire resistant by blocking up drainage gullies and damming streams. Nick Gardner, habitat manager on Bradfield Moor, part of the Fitzwilliam Wentworth Estate, believes these measures play a part but are no substitute for managed burning when it comes to reducing the destructive power of wildfire. He said: *"The trouble with cutting is you are not getting rid of the fuel load – you are just dropping it to the floor. I've strategically burned up to cut areas whilst fighting wildfires in the past thinking I'd use it as a stop, but it just goes over. Like most other grouse moors we've rewetted natural gullies eroded by nature over time. Rewetting will slow the spread and protect deep peat to some extent, but fire will still travel through those areas."*

Those calling for further restrictions on managed burns claim there is a consensus around the scientific evidence that it releases far more carbon than alternatives, both in the act of burning and by drying out the peat. However, Andreas Heinemeyer, Associate Professor of Environmental Research at the University of York, contests this. He has undertaken a ten-year study comparing the carbon budgets of so-called 'cool burns', cutting, and simply leaving the heather to grow rank. He would like his study to be allowed to continue on the grounds that a 20-year cycle will give a much clearer picture as it captures the full management cycle, but his findings already challenge the view that cool burns have the biggest net carbon emissions.

## *"A blaze could become uncontrollable over a huge area. It's not a case of if, but when"*

He said: *"What we have found is that, considered over the first five years, burning equates to a big loss of carbon, whereas with cutting you have not lost to combustion, but you then start to lose carbon through decomposition of the brash year on year. Certainly, over ten years, it looks like burning does not have the anticipated large carbon loss, particularly when you add charcoal production into the process, which is a long-term carbon store. The other alternative to cutting is rewilding, or just letting it grow, but you will get a build-up of fuel and large amounts of biomass transpire a lot of water. The Peak District is already an inherently dry area, so this will increase peat decomposition by drying it out further and also the risk of the peat burning in a wildfire."*

## Wildlife Highlights


CURLEW


LAPWING


MERLIN


MOUNTAIN HARE


SHORT-EARED OWL


OYSTERCATCHER

As well as reducing areas of overgrown vegetation, grouse managers play a vital role in the prevention and containment of wildfires, providing what is, in effect, a privately funded fire and rescue service. Nick said: *"When there is a wildfire, gamekeepers often spot it first as we are out on the ground. Even if it's not on your moor, the message goes out that there's a wildfire and everybody turns up – it's like having a rapid response team. We also know how to access difficult areas of the moor, avoiding obstacles like gutters and hags. The fire departments are always grateful when we turn up with our ATVs with fogging units. They only have backpacks that hold 10 litres of water whereas we're coming up with 500 litres and they are restricted in terms how late they can stay, but we'll stay out until it's out."*

If they remain unmanaged, large parts of the Peak District also risk losing local populations of some of the UK's most threatened bird species, many of which are listed on the national park's many designations. In contrast, wader species on Peak District grouse moors far exceed the national figures, with curlew and golden plover thriving on the mixed heights of vegetation created by controlled burning and benefitting from predation management carried out by the gamekeepers.

Anthony said: *"It's the predation management, which is the key measure. That is understood by conservation organisations, and they do instigate a certain amount, but they come under a lot of pressure because that's not really what the public expect of them, so they are stuck between a rock and a hard place trying to protect the birds."*

Another potential negative impact from the light touch management of moorland is the effect of the natural regeneration of woodland on waders and ground-nesting raptor species. Tree planting on peatland is restricted, but this will not protect moorland from self-seeding trees. Nick and other keepers across the Peak District invest a lot of time and effort removing saplings before they become trees, by which time they cost far more to remove.

As if loss of habitat and predation pressure weren't enough, a huge increase in the tick burden in recent years poses a threat to waders and grouse, as it can prove fatal to their chicks. One of the only ways to reduce the number of ticks on the hill is to use sheep dipped in insecticide as mops to pick them up, but many moors are no longer grazed, and Natural England has restricted the number of sheep allowed on Bradfield Moor. Anthony feels the right balance has not yet been achieved. He said: *"We have 400 ewes on 3,500 acres. It's nothing; they may as well not be there and so as a result we've got scrub vegetation coming in places, the presence of which conflicts with the habitats designated by the SSSI."*

The sheep issue illustrates the difference between what could be termed 'desk top conservation' decided by remote policymakers, and the approach of the habitat mangers on the ground, or 'working conservationists', who are constantly monitoring what's happening and attempting to adapt measures to suit. After seeing birds struggling, Nick sent some chicks for post-mortem, which showed they had died from blood

RESEARCH IN PRACTICE

## Cutting can damage *sphagnum* moss

Dr Siân Whitehead
*Postdoctoral Research Scientist, GWCT English Uplands*

In England, regulations were recently updated to restrict heather burning following reports of negative effects, and this has led to a shift toward heather cutting. Results from our 2020-21 heather cutting experiment on grouse moors in Upper Teesdale showed that while cutting reduced vegetation height by an average of 62%, moss depth fell by nearly 40%. When the cut areas were assessed, it was clear that in some places the important peat-building *sphagnum* mosses had been 'scalped' and other mosses had been completely removed. We also found that cutting resulted in a largely flat and uniform surface, regardless of the size or complexity of the moss hummock and hollow structure that was present before cutting. Our results indicate that heather cutting has an immediate impact on the moss layer and these short-term effects may influence its future response. Given how important healthy moss layers are to functioning blanket blogs, it is vital that long-term monitoring of cut vegetation is conducted. To be a sustainable alternative to heather burning, the negative effects of heather cutting need to be mitigated by benefits to land management and the ecosystem, and these need to be considered in relation to the emerging evidence around the effects of burning. ■

*"Wader species on Peak District grouse moors far exceed the national figures"*

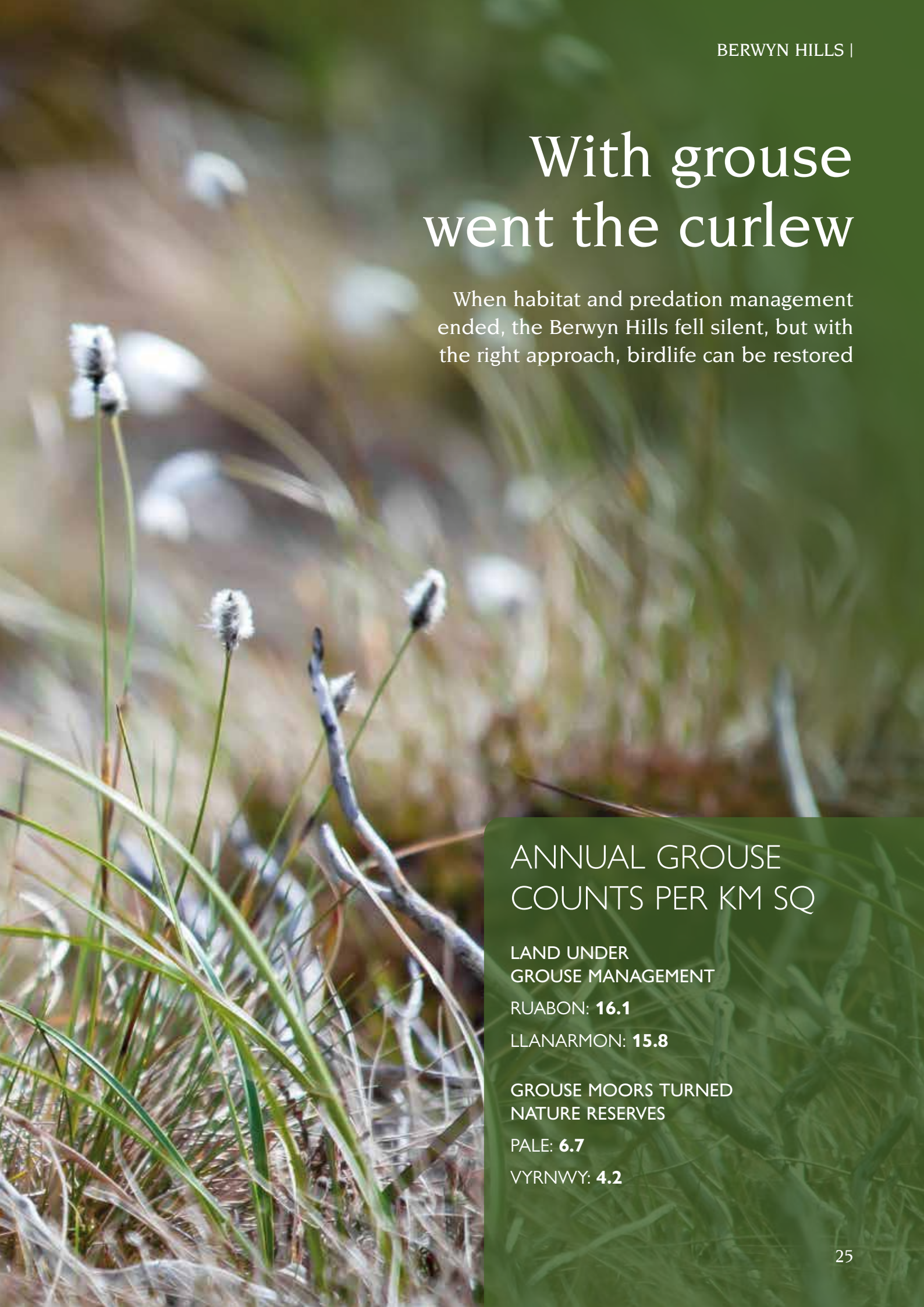
loss due to tick infestation. He would now like to decrease tick habitat by removing bracken and control them by increasing sheep numbers, both of which are restricted. The objectives of Natural England and the moorland habitat managers are the same – to protect vulnerable species – but the former appears hampered by policy rather than focused on outcomes.

The same is true for managing moorland vegetation: there is a real risk that restricting burning in favour of cutting or abandoning management altogether will be counterproductive and fail to meet the common goal, which is to protect the vital carbon sinks that are the UK's unique heather moorland ecosystems. Andreas said: *"We need to have an adaptive management approach because we don't have the scientific evidence that burning is always bad, that cutting is always better, or that doing nothing will achieve what we want."* ■

Clockwise from above: Anthony Barber-Lomax co author of the new report on wildfire risk; Nick Gardner on an area of cool burn showing the moss layer intact; in contrast peat exposed and damaged by wildfire; far from a monoculture, on the Fitzwilliam Wentworth estate grouse moor management maintains a variety of dwarf shrub species and mosses with woodland at the fringes.

# With grouse went the curlew

When habitat and predation management ended, the Berwyn Hills fell silent, but with the right approach, birdlife can be restored



## ANNUAL GROUSE COUNTS PER KM SQ

**LAND UNDER GROUSE MANAGEMENT**

RUABON: **16.1**

LLANARMON: **15.8**

**GROUSE MOORS TURNED NATURE RESERVES**

PALE: **6.7**

VYRNWY: **4.2**

With the advent of driven grouse shooting in the 19th Century, many moor owners in Wales chose to prioritise management for grouse over farming or forestry. This provided employment for gamekeepers, who produced the mosaic habitat of different heights and types of vegetation alongside predator management to increase the numbers of grouse. It was so successful that it funded grand sporting lodges, tracks to access the moor and even train stations.

After the Second World War, the government's focus turned to combatting food shortages, and grants incentivised more intensive agriculture. This resulted in a rapid increase in grazing and draining along with large areas of upland being planted with commercial forestry to address the national shortage of timber. It is estimated that Wales lost 46% of its heather habitat during that dramatic change and driven grouse shooting all but disappeared.

The end of grouse management on the Berwyn uplands of North East Wales provides a lesson on the negative impact on ground-nesting birds when habitat and predator control is removed. The Warren & Baines study published in 2012 (see panel opposite) documents dramatic declines in the breeding numbers of red-listed species in North Berwyn between 1983 and 2002. In just 30 years, breeding lapwing were no longer found within the sample survey squares, golden plover were 90% fewer, curlew 79%, ring ouzel 80%, black grouse 78% and red grouse 54%. In contrast, over the same period carrion crow, a generalist predator species classified as of 'least concern' by the IUCN Red List, experienced an increase of 526%.

## *"It is estimated that Wales lost 46% of its heather habitat"*

Ornithologist Keith Offord, who has conducted continuous monitoring and observations of birdlife on the Berwyn since the 1970s, has serious concerns about the impact of predation on red-listed species. He said: *"I used to take curlew for granted and could never have predicted the disastrous decline in their breeding population, which has taken place over recent decades. I have no doubt that the burgeoning corvid population, especially on surrounding farmland and forests, has been a significant driver of this decline. Other ground-nesting moorland species including hen harrier are equally at risk from corvid and fox predation. This season, I was monitoring a hen harrier nest under licence. From a distance of around 350 metres, I observed the adult female leave the site where she was incubating eggs. A passing crow obviously spotted the white eggs and dropped like a stone onto the nest. Fortunately, I was able to intervene, scaring the crow away and the pair went on to fledge four young."*

Keith's view is backed by peer-reviewed research, including the GWCT's 2010 Upland Predation Experiment, which found an average threefold improvement in breeding success in lapwing, golden plover and curlew, when predator control was carried out alongside habitat maintenance. Conversely, the study showed that, without predator control, fledging rates fell below sustainable levels, meaning that these species would continue their decline to local extinction as they are currently doing in Wales.

Further research conducted by the RSPB noted that: *"Curlew population changes over an 8-10-year period were positively related to gamekeeper density (a surrogate of predator control intensity)."* Yet, in spite of this, the RSPB has failed to reverse the decline of many red-listed species on its Vyrnwy Reserve, which includes a former grouse moor, in the Berwyn Special Protection Area (SPA). Despite valiant efforts and the considerable cost of improving breeding habitat for curlew over 441 acres, their number on the reserve continue to decline and data indicates predation as the limiting factor in improving productivity.

Like Vyrnwy, there has been no meaningful predator control conducted on nearby Pale Moor, which is run by Natural Resources Wales and the annual grouse counts on both reserves indicate numbers at very low levels. The contrast with Ruabon and Llanarmon, private estates, also within the Berwyn SPA where grouse management has been continued, is striking. Pale has 6.7 grouse per $km^2$ and Vyrnwy only 4.2, in contrast with a stable population at Ruabon of 16.1 grouse per $km^2$ and 15.8 per $km^2$ at Llanarmon. Grouse are now red-listed as 'critically endangered' in Wales, and they could be regarded as an indicator species for the health of Welsh upland habitats.

Many experts across the conservation sector now recognise the need to integrate effective predation management with the restoration of a mosaic of dwarf shrub habitat, to prevent the extinction of Wales's most threatened moorland birds. Keith Offord is emphatic about the need for controlled burning and cutting to improve habitat. He said: *"My surveys of areas of varying management show that botanical*

*variety and diverse heather depth correlate with diversity and abundance of birdlife. While I understand concerns regarding peat and carbon capture, opponents of traditional management practices, such as controlled burning, offer few, if any, practical alternatives to maintain diversity, protect against wildfire, and prevent heather moorland simply reverting to forest with the subsequent potential impact on all species dependent on this habitat."*

As well as cutting and managed burns, ecologist Nick Myhill, who works with local farmers on common land in Powys, has shown that grazing both sheep and, importantly, cattle also plays a vital role in moorland restoration. Cattle graze in a complementary way to sheep, tackling monocultures of molinia grass to allow more varied vegetation to return, and their heavy hooves create pools that benefit invertebrates and *sphagnum* moss. Nick has employed novel technologies such as no-fence GPS collars that enable the careful management of grazing pressure. He said: *"The majority of our Welsh uplands won't be restored with sheep alone. On common land, hardy cattle wearing GPS collars can be more easily kept within each graziers' heft. They turn molinia back to high nature-value grassland, complementing bracken control measures, and opening up wetlands for wildlife."*

Will Duff Gordon runs Ireland moor, which was part of the Powys Moorland Partnership, a Sustainable Management Scheme (SMS) funded by Welsh Government with the aim of reinstating active moorland management to increase biodiversity. He believes that, with the right kind of support, both financial and by being allowed to use the full range of conservation measures, grouse management integrated with other land uses has the capacity to deliver vital public goods on a landscape scale. He said: *"The Welsh uplands are a huge and largely under-exploited asset when it comes to mitigating climate change and delivering sustainable land management outcomes. Existing commons grazing associations and recent SMSs such as the Powys Moorland Partnership and North Wales Moorland Partnership represent large-scale collaborative action on standby to deliver. We look forward to policy makers extending the Sustainable Farming Scheme to cover the uplands where habitat management and predator control can reverse the decline of breeding curlew. This needs to be supported by nature-friendly farming on the adjoining farms in the valley. We need a holistic approach from river to mountain top."*

Another private land manager with a passion for conservation is Richard Price, who runs Rhiwlas estate,

## Wildlife Declines

in North Berwyn between 1983-2002






near Bala, which has been in his family for generations. The old game books from Rhiwlas show that in the early 20th Century the average annual grouse bag was 1,000 brace, with a record season of 2,000 brace shot over 7,400 acres of carefully managed heather moorland. Richard said: *"In those days my great-great-grandfather, R.J. Lloyd Price, had six full-time keepers and all the grazing rights. He kept his own flock of Welsh mountain sheep, which were shepherded by the keepers."*

In Wales, vast areas of heather moorland have been left unmanaged.

During his tenure, Richard has made great efforts to restore grouse and other declining birds to his 2,000-acre moor. He is realistic about there being no likelihood of returning to driven grouse shooting at Rhiwlas, but he is frustrated by the difficulties private land managers like him face in delivering urgently needed increases in biodiversity. He said: *"Excessive bureaucracy is my biggest problem. I need to employ a full-time person in the office to cope with the paperwork required to enact measures, which I and my keeper know will deliver more curlew and other red-listed species on our land. It's frustrating when we know what is needed is long-term attention to creating mosaic habitat through burning and keeping on top of predators. Government-funded projects are too short-term to deliver lasting gains."*

Grouse shooting has become a contentious subject in recent years and has rightly addressed the previous generation's shameful legacy of the illegal killing of birds of prey. At the same time, Matt Goodall, GWCT advisor in Wales, believes the debate has become so polarised that the conservation successes of estates carrying out grouse management often go unsung. He said: *"It's very frustrating that ideological opposition to game management means the people doing incredible work to restore Wales's rarest species dare not risk publishing their impressive breeding bird numbers.*

*"Moreover, Welsh Government seem to be walking away from 'proper' predation management. The imminent ban on humane cable restraints is a case in point. Without this vital tool, which is completely different to the traditional snare, restoring Wales' lost wader populations will be impossible. Politicians recognise the need for predator control but want to cherry pick the methods. They don't understand that killing predators in an ineffective programme is unethical as the outcome doesn't justify the means."*

Today, there is a new and more enlightened generation of moor owners and keepers, who have zero tolerance of wildlife crime, embrace public access and collaborate with a wide variety of stakeholders from grazing associations to local communities. Modern grouse managers are more 'working conservationists' than gamekeepers who have a vital role to play in forging a brighter and more sustainable future for our uplands. It is Welsh Government's task to empower them to help restore Wales's precious birdlife before it's too late. ■

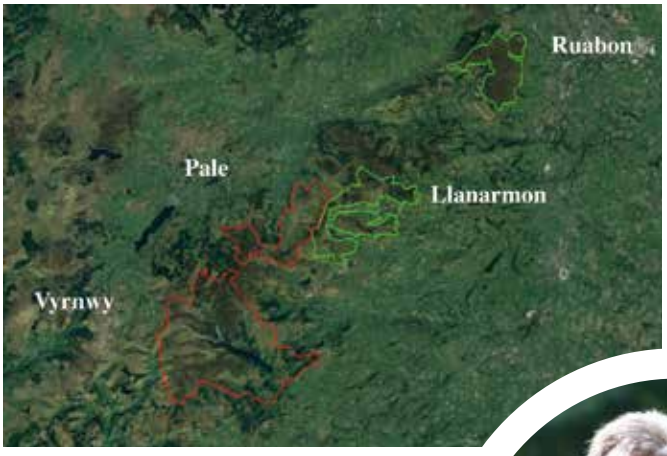
RESEARCH IN PRACTICE

## Berwyn Report Methodology

Dr Dave Baines
*Head of GWCT Uplands Science*

The study *"Changes in the abundance and distribution of upland breeding birds in the Berwyn Special Protection Area, North Wales 1983-2002"* (Warren & Baines 2014) drew on historical shooting records from 1880 to 2011 from three Berwyn moors and the nearby Ruabon moor. We also carried out surveys using pointing dogs between 1995 and 2010 to assess mean spring grouse numbers over the same four moors. In addition, changes in abundance of the wider moorland bird community were assessed by comparing baseline data from a survey carried out from 1983-1985 by Natural Resources Wales and their follow-up survey conducted in 2002. The two surveys were carried out on the same 14 sites across 107 1km$^2$ plots using the standard method of two observers walking parallel transects 200m apart and noting the exact location of every bird encountered. Each plot was surveyed once in April/May and again in June/July. ■

*"Botanical variety and diverse heather depth correlate with diversity and abundance of birdlife"*




*"Habitat and predator management can reverse the decline of breeding curlew"*

Clockwise from above: for Nick Myhill, cattle are key to restoring moorland; there are far higher bird densities on Ruabon and Llanarmon than neighbouring Pale and Vyrnwy; at Rhiwlas estate, wildlife restoration has been hampered by bureaucracy; Will Duff Gordon believes private land managers can deliver landscape scale conservation. Centre: Keith Offord has been monitoring birdlife on the Berwyns since the1970s.

# Last call for the capercaillie

Pine martens are driving one of Scotland's most majestic native birds to extinction. Current conservation efforts are failing, and a new approach is needed before it's too late

## ESTATE FACTS

**LOCATION:** Kinveachy, near Aviemore, Highlands

**ACREAGE:** 30,000

**BUSINESSES:** farming, forestry, fishing, stalking and shooting

**DESIGNATIONS:** SSSI for native pine woodlands and associated species, SPA for capercaillie and Scottish crossbills

## CONSERVATION IN NUMBERS

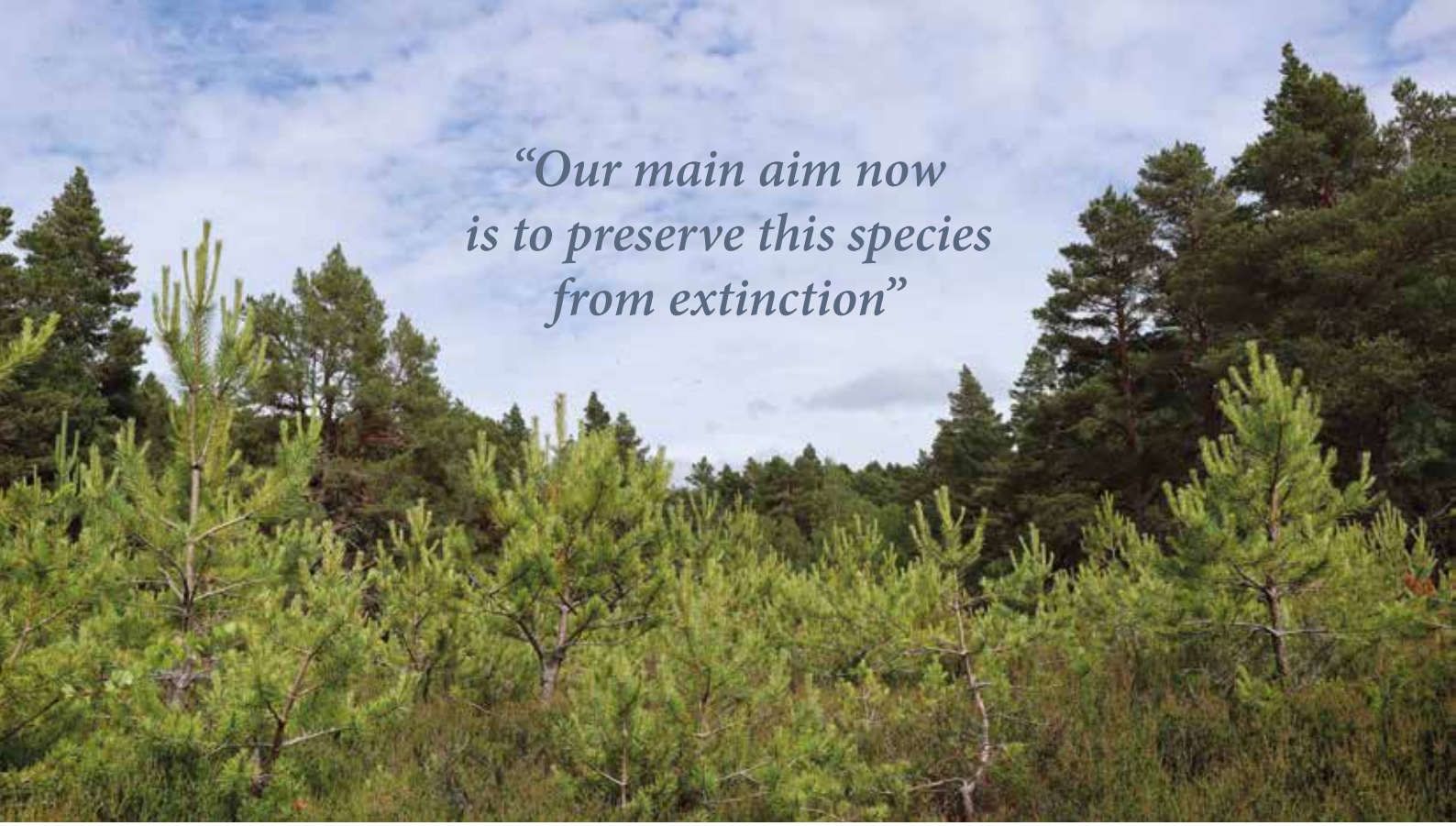
**20%** OF CAPERCAILLIE IN SCOTLAND LIVE AT SEAFIELD AND STRATHSPEY

**1** OF THE TOP FIVE SITES IN SCOTLAND FOR CAPERCAILLIE

**2** FULL-TIME CAPERCAILLIE KEEPERS

**54**KM DEER FENCES REMOVED OR MARKED TO REDUCE COLLISIONS BY CAPERCAILLIE

**30%** AMOUNT OF TREE COVER AT SEAFIELD AND STRATHSPEY ESTATE (COMPARED TO **12%** IN SCOTLAND)




Deer are culled to allow natural regeneration (above), but unlike on other estates they are not excluded and play an important role in maintaining brood rearing habitats for young caper.

Recent downward trends in Scotland's capercaillie are far more worrying than anything we have seen to date. There's a serious risk that the birds will soon pass beyond the point of no return, and that's when a number of factors will begin to cascade against the birds, driving them into extinction. Conservative estimates suggest that we could lose the capercaillie from Scotland in the next 20 to 30 years, but it's hard to know for sure because scarcity has made the birds extremely hard to monitor. That makes it desperately difficult to help them at a time when they need support more than ever before.

Kinveachy Forest is part of Seafield and Strathspey Estates, and is home to one of the last real strongholds for capercaillie in Scotland. While numbers remain viable at Kinveachy, the estate has not been immune to the declines that have struck so heavily elsewhere. Head gamekeeper Ewan Archer currently manages a team doing everything they can to turn things around for these extraordinary woodland grouse, but he is well aware of the challenges they face on the estate. As he explains: *"Capercaillie numbers have been dropping since the estimates of the 1970s, and our main aim now is simply to preserve this species from extinction. If we continue with the current lack of productivity, we're very concerned that we'll lose this bird altogether."*

Even in their heyday, the capercaillie population was closely monitored at Kinveachy. In-depth studies monitored numbers, productivity and lek counts, so the estate was better placed than many to identify real problems when numbers appeared to crash. Ewan's predecessor, Frank Law, remembers the birds in their abundance, even back to a time when they were driven and shot on formal capercaillie days. *"We'd aim for a bag of 10 or 20 birds in a day,"* he says. *"They were common back then. You'd expect to see a few of them every time you went into the forest, usually in the morning when they came out to find grit on the forest tracks."*

Seafield and Strathspey Estates stopped shooting capercaillie when declines were identified, but the birds have continued to decline ever since, even after they were given full legal protection in 2001.

Capercaillie are closely associated with Caledonian pine forests, and individual birds will use a mosaic of habitats including moorland, bog forest, and stands of mature conifers depending on the season. At a national level, these habitats have been badly fragmented and degraded during the 20th Century, and it's not hard to see why the birds have steadily declined in the face of major changes. Kinveachy carries a number of prestigious designations for its woodland habitats. Parts of the estate are recognised as a Site of Special Scientific Interest and, given that almost 20 percent

of Scotland's birds are found there, it's also listed as a Special Protection Area for the birds. The forests on the estate are in excellent condition and getting better.

A vast amount of work has gone into regenerating extensive areas of ancient woodland, which was felled as part of the war effort, and Kinveachy is meeting its woodland creation goals through deer management and careful monitoring. Deer are culled to allow natural regeneration, but the year-round presence of herbivores at low densities means that brood-rearing habitats are kept open in a condition that is well suited to young capercaillie. Although it represents a great deal of hard work, this approach is more productive than the use of fences to exclude deer altogether.

Striking a balance with deer is not easy, but there's every sign that Ewan's team is getting things right. Kinveachy covers a large area, but capercaillie naturally move across even larger spaces during the course of a year. There is a sense that some neighbouring land managers are pulling in different directions when it comes to deer management and capercaillie conservation, and it's possible that Kinveachy is surrounded by less productive habitats where predator control is not treated as a high priority. This is an important issue to consider, even where collaboration and partnership working is generally good.

*"Neighbouring land managers are pulling in different directions when it comes to capercaillie"*

However, beyond discussions around habitat creation and management, it's also clear that the birds themselves are not responding. Without tackling other root causes of capercaillie decline, Ewan's fear is that at Kinveachy, *"we're going to have a pristine woodland that is expanding in size and character but without its full potential biodiversity."*

The estate is a clear example where good habitat management alone is proving insufficient for capercaillie. GWCT Research Assistant Kathy Fletcher is confident that poor productivity is driving declines, and this means that female birds are unable to produce enough youngsters each year to replace natural losses. There is some evidence to suggest that the problem is exacerbated by poor weather and recreational disturbance, but predation is a major concern. Kathy's

## Wildlife Highlights


SCOTTISH CROSSBILL


CRESTED TIT


WHITE-TAILED EAGLE


GOLDEN EAGLE


BLACK GROUSE


PINE MARTEN

work has contributed to a wider understanding of how crucial predator control can be for capercaillie. As she explains: *"We know that when predators like crows and pine martens are in high abundance, capercaillie are found at lower densities, and this is borne out and confirmed by a recent report for the capercaillie Scientific Advisory Committee (SAC), which was commissioned by NatureScot in 2021."*

The SAC report is very clear about the current drivers of decline, and it confirms what many gamekeepers and researchers have been saying for years. Habitat is not the limiting factor for capercaillie in Scotland, and acknowledging the hard work of estates like Kinveachy, it's clear that more good habitat becomes available every year. In the words of the report: *"Predation is a significant contributor to variation in breeding success. Increases in some nest predators (notably the pine marten) in recent years are likely to be contributing to the decline in capercaillie breeding success and hence population size."*

A proactive engagement with predator control at Kinveachy means that foxes and carrion crow numbers are kept at a very low level, but pine martens are fully protected by law. There is currently no legal mechanism that allows them to be managed, and here is the root of the issue.

## *"One protected species could drive another to extinction"*

The pine marten is a native species to Scotland, although historical persecution meant that their impact was confined to a handful of marginal sites until relatively recently. As part of an extensive expansion across Scotland over recent years pine martens returned to Strathspey during the 1970s. Their numbers have grown substantially ever since, and they have quickly become a common species in the area. Hard data are difficult to come by because capercaillie have become so scarce, but there is enough evidence to suggest that pine martens have become a very significant predator of capercaillie. Both are protected by the same level of legislation, but it's clear that one protected species could soon drive another into extinction.

For Frank Law and Ewan Archer, predator control is clearly a crucially important tool for conserving capercaillie, but the work is only of limited value if pine marten numbers remain unmanaged. While some conservation organisations have tried to find a way around the issue, a range of land managers insist that the only practical way to save capercaillie is to introduce a legal mechanism to permit the lethal control of pine martens. As Frank Law explains: *"It might be possible to trial a range of new conservation measures in the future, but now is not the time. We might only have four or five hundred of these birds left in Scotland. If we had four or five thousand, maybe there would be an opportunity to take our foot off the gas and see what else we can do. The goal now is simply to keep them in Scotland, full stop. We can still turn this situation around. It would be an act of folly to miss this opportunity."*

Many of the non-lethal techniques put forward as alternatives, are impractical. Trapping and relocating

RESEARCH IN PRACTICE

## Counting caper

Kathy Fletcher
*Senior Research Assistant, GWCT Scottish Uplands*

Each spring, most estates with capercaillie make a single visit to known lek locations to count the number of lekking males (and any females visiting the lek). However, we know that productivity is the driver for the population decline, so it is also important to know how well (or badly) the females breed in areas that may be under different management regimes. In August, after the long-term red grouse surveys have been completed, staff from GWCT Uplands and Scotland teams head into Kinveachy with their trained pointing dogs. The same area of forest is surveyed each year (under a Nature Scot disturbance licence) to allow an accurate comparison with previous data. By recording all adults seen and how many young are found with females, we can get an estimate of productivity and adult density. These surveys used to be undertaken across a much wider area, but some of the other landholdings are uncomfortable explaining to the visiting public the difference between the potentially detrimental daily disturbance from dogs off lead in proximity to paths and the importance of collecting these data with highly trained dogs once each year. ■

Clockwise from above: pine marten predation must be addressed to prevent extinction; Seafield and Strathspey estates have managed to balance their deer population with ancient woodland regeneration; headkeeper Ewan Archer believes the capercaillie should be saved as part of Scotland's natural heritage; once widespread, capercaillie have dwindled to 300-400 birds. Capercaillie © Jude Dinham-Price

martens is extremely complex and expensive. Attempts to provide diversionary feeding for martens are only in the earliest stages and results are unclear. GWCT's Scotland director Rory Kennedy believes a way through could lie in contraceptive baits, a technique currently being trialled with grey squirrels. He said: *"The problem with issuing special licences for controlling pine marten is that to be effective, it would need to take place on a landscape scale. Many estates surrounding Seafield and Strathspey will not countenance lethal control on ideological grounds. In addition, the current inability to address pine marten predation is used as a reason for many landowners to avoid the clear recommendations of the SAC, regarding the need for crow and fox control across the entire capercaillie range. We need to address this, if we are to save this species. Diversionary feeding combined with contraceptive population control could provide a workable outcome palatable to all parties."*

There are many factors to consider for the future. In parts of Scandinavia and Russia, pine martens and capercaillie are able to find a more natural balance, which does not depend upon human intervention. It's clear that capercaillie numbers are now so low in Scotland that normal rules do not apply, and while it's important to plan for a more natural future where predator and prey can find a lasting balance, the first challenge is to protect what we have to ensure these birds have a future at all. If we fail in this and lose the capercaillie from Scotland, there's a risk that our pristine and resurgent Caledonian pine forests will always feel a little empty. ■

Game & Wildlife
CONSERVATION TRUST

## AN EVIDENCE-LED ORGANISATION

On the complex and often controversial issues involved in moorland management it is vital that policy is based on science. The GWCT employs 22 post-doctoral scientists and 50 other research staff with expertise in birds, insects, mammals, farming, fish and statistics and it is not afraid to change its advice based on new findings from its peer-reviewed research. As a result of this evidence-led approach, statutory bodies including Defra, Natural England, Scottish Natural Heritage and Natural Resources Wales have based much agri-environment policy on GWCT research. The Trust is also responsible for a number of Government Biodiversity Action Plan species and is lead partner for grey partridge and joint lead partner for brown hare and black grouse.

As the UK's leading independent wildlife research charity, the GWCT is uniquely placed to incorporate the pioneering approach of private land managers into national conservation policy. For more than 80 years it has worked closely with farmers and gamekeepers to publish ground-breaking science, including some of the longest running farmland wildlife monitoring projects in the world. In addition, the Allerton Project in Leicestershire and Auchnerran demonstration farm in Aberdeenshire allow research to be applied in the context of real farming businesses.

Past experience has shown that where funds are more specifically targeted, and land managers respond voluntarily, rather than through compulsion, with the benefit of good advice, better outcomes can be achieved. Specialist knowledge is a key ingredient for success, and the GWCT's advisory service provides practical advice across the UK on how to manage land with the aim of increasing biodiversity.

Few organisations have the same degree of trust from land managers established over generations, and with ever greater pressure on the countryside to produce food, and deliver a range of public benefits, the future of our wildlife depends on that trust.

**Find out more about the GWCT and support us at www.gwct.org.uk**