Southern Uplands Partnership

Black Grouse Project Report

Final Report to the Project Steering Group by Tom Adamson
September 2007

Thomas Adamson
Black Grouse Conservation Officer
thomasadamson@hotmail.co.uk

Pip Tabor
Project Manager
piptabor@sup.org.uk
01750 725154

This report does not necessarily reflect the opinions or position of the individual supporting members of the partnership

Contents

Black Grouse Ecology

Black grouse are iconic game birds with habitat requirements that consist of reasonably dense vegetation cover for roosting, brood rearing and nesting and protection from predators. The ideal habitat structure would be a mixture of mature woodland such as Scots pine and birch, and a scrub layer providing a patchwork of young and widely spaced trees with a well-developed understorey of heather and bilberry and open, herb-rich, boggy areas that can support a diverse invertebrate population.

Black grouse often adapt to other habitats, such as open rough grazing and hay meadows. They are usually found on the moorland fringe dominated by heather, even with very few trees such as in the North Pennines.

The food preference indicates the ideal habitat requirements and in spring they prefer birch, larch shoots and bilberry. In the summer wet flushes and heather moorland is used to provide bilberry for the adult birds and invertebrates for the young, on which they are largely dependant during their first two to three weeks. In autumn and winter bilberry, crowberry, rowan, hawthorn, birch and heather are the preferred diet when available.

Black grouse are probably best known for lekking, where groups of males perform courtship displays. This is done throughout the year except when moulting in July and August. Males defend their territories in the surrounding habitat; hens only attend the lek in early April to mid May which is the period of peak activity at the lek. The cocks compete for the attention of the hens; consequently survey counts are carried out at this time of peak activity. The males display by crouching and circling the ground, spreading their tails wide, showing off the striking contrast of their glossy black plumage and the white under-tail coverts, while producing a very distinctive bubbling sound that on a still morning can be heard over half a mile away.

Leks tend to be traditional sites with dominant cocks holding the central positions within the lek and mating with the most females. Lek sites are usually no more than 0.5 ha, on relatively flat, open ground with short vegetation, usually grazed. This can be on pasture, on the moorland edge, peat bogs, or in forests on open glades and tracks.

Black grouse do not form pair bonds, once the males have mated with the females at the lek the female does everything from nest building to chick rearing. Black grouse nest on the ground in reasonably dense vegetation of about 40cm high, usually mature heather or rushes. The female makes a shallow depression and lines it with grasses and moss. She lays 6-11 eggs, sometime between late April and early June. She only has one brood a year, although if the eggs are destroyed she may have another clutch, but usually with fewer eggs.

Chicks hatch after about 3-4 weeks and leave the nest almost immediately; they are able to fly weakly by their second week. Once all the chicks have hatched, the hen leads them to feed in insect-rich vegetation, such as wet flushes with a mix of heather, bog myrtle, rush and white grasses (fescues and bents). The chicks become fully independent after two to three months. Cock poults leave the family group first around September, while the females remain with the hen until about October.

Population Status

Black grouse have undergone a serious decline in population and range in Britain over the last 100 years. An indication of past populations and subsequent declines can be seen from historical shooting bag records. The record bag for black grouse was obtained on Cannock Chase, Staffordshire, in 1860 when 252 black grouse were shot in a day's driven shooting. On 4th October

1869, 247 birds were shot by eleven guns at Glenwharrie, Dumfriesshire of which more than 200 birds were cock birds. The largest bag obtained in 'recent' years was on the 25th October 1910 on Auchenbrae, Dumfriesshire when 114 birds were shot, with over 74 cocks.

In England, black grouse have become extinct in many counties. They could once be found on the lowland heathlands of southern England but disappeared as far back as 1760 in Surrey. More recent local extinctions include Exmoor (1969), Derbyshire (1987), Lancashire and Staffordshire (1997). The species' range has retracted from the south, leaving a population in Wales and the North Pennines and parts of Northumberland, where the bulk of the population is found on the fringes of moorlands managed for red grouse. Recent spring counts of black grouse in England reveal that the population in 2007 has increased to an estimated 1,200 males, a 55% increase since 1998 when the population was just 773 males.

Decline in South East Scotland

Black grouse have been declining over the past 100 years across Scotland. There was a temporary reprieve during the 1950s-70s when large areas of the uplands were commercially planted with conifers. This provided an ideal but impermanent habitat for black grouse as once the trees grow and the canopy closes the under-storey vegetation is shaded out. Currently they are counterproductive through harboring large number of predators such as foxes, crows and raptors.

The latest UK black grouse survey in 2005, shows a decline of 29%in Scotland with the most severe declines recorded in south west (49%) and south east (69%). There are now estimated to be 257 (45-577, 95% confidence limits) males remaining in south east Scotland. Many consider this figure is an underestimate given that many leks have not been recorded. The survey estimated 3,293 displaying males in Scotland, a 29% decline from the 4,719 estimated in the first national survey in 1995-96. However, Scotland continues to hold a high percentage (66%) of the British population.

Other Recovery Projects

Dumfries & Galloway

In 2007, the RSPB lek survey in Dumfries & Galloway went well with fine weather and over 170 males counted, a significant rise on last year's 90. Some of this apparent increase is attributable to greater survey effort in Galloway Forest Park, as part of the Black Grouse Trial Management Project, with over 100 lekking males recorded. Analysis of 12 key leks from around the region, however, which have been monitored for the last ten years, shows the average number of cocks at these leks is up from 4.17 compared to 3.36 in 2006. Whether this apparent increase is real should become clearer in the next few years as more lek season data is collected.

In addition to the spring lek counts, advisory work has been carried out by the project officer on both state and private land, though the latter has been quite limited due to delays in the new agri-environment funding programme. Two significant projects are underway, which are hoped will have a significant impact on the Dumfries and Galloway black grouse population.

As mentioned above, work has now started in Galloway Forest Park on the Black Grouse Trial Management Project. The Forest Park was one of only two areas in Scotland to be chosen for this joint RSPB/Forestry Commission Scotland project and work has been ongoing since the spring. Extensive survey work has been carried out throughout the Forest Park and the project is now moving into the implementation stage. It is hoped that the landscape-scale management techniques trialed will provide a better understanding of the needs of black grouse on the ground.

The other exciting project now underway in Galloway Forest Park is the HLF-funded Turning Point for Black Grouse project. Extensive habitat management work will be carried out in an

important area of the Forest Park in an attempt to maintain and increase black grouse numbers. A lek-viewing facility is also being created to give members of the public a chance to see the birds without disturbing them. A recent forest fire in the area may well have been a blessing in disguise as many of the Sitka spruce ear-marked for removal are now gone and it is hoped that funds can now be diverted into other management works.

Future plans for black grouse work in the region include continuing with the projects mentioned above and increased advisory work on private land once agri-environment funding becomes available to landowners. The next few years should give more indication of whether the years of conservation work carried out for black grouse are finally paying off, following this very positive year.

North Pennines

The North Pennines Black Grouse Recovery Project is in its eleventh year. It is a partnership project between the Game Conservancy Trust, RSPB, Ministry of Defence, Northumbrian Water, North Pennines AONB Partnership and SITA Trust. The project has successfully met its first Biodiversity Action Plan target of stemming the decline of black grouse and maintaining them at their 1996 level of 800 males by 2005. Surveys show an increase in the population from 773 males in 1998 to 1029 males in 2006. The project is now working to deliver its 2010 BAP targets of 1000 males and increasing the range from 43 occupied 10km squares to 48 by 2010. The project has already met its first objective, with lek surveys this spring estimating the population to be now nearer 1200 males. The project is now concentrating its efforts to meet the objectives of range expansion.

Wales

The project officer visited the Welsh project in 2006 and even through little is published it appears black grouse are still dependant on predator control being undertaken. The Welsh black grouse population does not appear viable in the long term unless predator control is continued and expanded. The number of lekking males increased between 2006 and 2007, although project staff are not confident about productivity this summer due to bad weather.

Biodiversity on the Edge – Black Grouse in the Southern Uplands

Project Area

The initial project area ranged from Selkirk to Peebles and down to Moffat. It soon became apparent that the project area was too large, with some areas having no black grouse to build on. A smaller core project area was established either side of the A708 between Selkirk and Moffat and either side of the B709 to Innerleithen. The lek location map on page 9 shows the lek sites that form the core project area.

Habitat within Project Area

The project area incorporates a range of different habitats, most of which should support black grouse.

Conifer Plantations

Mature conifer plantations represent the worst habitat for black grouse, for as soon as the canopy closes it provides very minimal if any benefit to black grouse. There are many plantations within the project area, of which Elibank & Traquair, Cardrona, Cademuir, Yair Hill, Hunt Law, The Bank and Emblem Brae are managed by Forestry Commission Scotland. This adds up to around 100km (62 miles) of woodland edge. If this was feathered 100 meters into the woodland 1000ha of suitable black grouse habitat would be created. Of this 100km, 24km would directly benefit black grouse immediately, and feathering 100 meters into woodland would create 240ha of black grouse

habitat. Clear felling of mature dense conifer woodland planted on ideal black grouse habitats in the uplands would increase habitat value and reduced pressure from predators.

Scoping meetings for the re-design after felling have been attended for conifer plantations within the project area including Kirkhouse Forest, Berrybush Forest and Potburn. Recommendations to improve these include measures such as widening rides, creating open ground and thinning tree cover at the edge of compartments to provide a broad woodland edge. Protecting and establishing broadleaf trees, and avoiding planting on boggy ground to improve brood-rearing habitats. Any lek sites in clearings and on tracks should be protected and any vegetation kept short.

New Native Woodland

A good deal of new native woodland has been planted within the project area in recent years. Little, however, has been planted during the course of the project due to closure of the Scottish Forestry Grant Scheme (SFGS). Two large applications were proposed but on both occasions the price of the fencing made the schemes unattractive.. Combined with the likely increased difficultly in getting trees established, this resulted in the planting not going ahead.

Borders Forest Trust (BFT) has created some excellent woodland habitat within the project area on a range of landholdings, currently being used by black grouse.

The density of trees that black grouse require is low, with 5 - 200 stems/ha being ideal compared to 1100stems/ha typically planted for forestry in the past (this is to rise to1600 stems/ha). A sufficiently lower average could be achieved by planting areas in the middle of the site at higher density, thus allowing fewer trees on the perimeter and providing a better woodland edge. This is unlikely to be achievable at 1600 stems/ha.

The creation of native woodland not only creates potential habitat for black grouse but also for predators. This can cause significant problems and predator control should be stepped up in these areas.

Rough Grazing

Comprising a mix of grass and heather, this is the most abundant habitat within the project area, and is idea for black grouse. This habitat provides important feeding areas for adults and young broods, and this is usually where the lek site can be found. The altitude of the leks within the project area range from 240 – 490 meters with an average of 342 meters above sea and are mostly found on short grass.

Management here should aim to provide a mix of rough grazing, pasture, wet flushes (often provided by blanket bog or mire) and perhaps some broad-leaved trees and shrubs in the bottom of the valleys and cleuchs. Grazing of these areas should aim to allow grasses, rushes, sedges, heather and herbs to flower and set seed.

Bracken is of limited use to black grouse, only providing shelter in the absence of shrubs and other taller vegetation. Its encroachment onto moorland can be a problem. This can be avoided by preventing heavy grazing or by removal through the careful use of herbicides.

Wet Flushes

In the past, attempts have been made to improve heather growth by draining the peat. This had little success as the peat flowed into rivers, increasing erosion and most importantly for black grouse and breeding waders, reduced wet flushes for essential invertebrates for chicks. Open grip drains on moorland don’t benefit black grouse and can be hazardous through drowning of chicks. Blocking grips can reverse these negative effects by increasing the biodiversity and brood-rearing safety.

Heather Moorland
Good quality heather moorland mosaic through regular best practice burning can be found on only a few of the landholdings within the project area. These are those managed with red grouse shooting interests. Burning of heather is important to sustain a mosaic of different age patches and to sustain structural diversity.

Many landholdings have relatively small areas of rank and fragmented heather moorland that could be improved and expanded through stock reduction and/or re-seeding. Burning is the key requirement when good heather cover is recovered to ensure structural diversity. Burning is best undertaken by professional gamekeepers.

Project Outputs

Management Plans
Management plans were produced for 15 key landholdings that were occupied by black grouse. Plans consisted of a background to black grouse on the property and their current proximity to active leks that black grouse could disperse too. Management prescriptions were written for heather moorland & rough grazing, woodland, species rich grassland, unharvested crops, fences and predator control for each individual landholding. Plans were costed, but because new funding rates are not yet available, grant-levels available for these schemes could not be specified.

Lek Counts 2006
2006 was the first lek counting season carried out as part of the project. Every known location of a lek was visited twice to confirm presence or absence of black grouse. The project area was also surveyed for presence of any leks that had gone unnoticed in the past. Many sites identified as lek sites by landowners, were found to have no black grouse present. How recently these locations have been active leks is often unknown.

Good weather with many still, sunny mornings provided ideal conditions for surveying leks. Only a small number of grey hens were seen on the leks as part of the project survey but reports of sightings were fairly consistent at the end of April 2006.

Lek Counts 2007
The 2007 lek counts went smoothly, benefiting from last years work identifying locations of leks making counting much easier as known sites could be visited sooner, leaving more time for looking for additional leks.

Early morning fog caused some difficulty with many mornings having too dense fog at first light to conduct a reliable lek count; as a result more visits had to be made to get an accurate count.

As in 2006 few grey hens were seen during the lek counts but reports of grey hen sightings were fairly consisting towards the end of April 2007.

Analysis of Lekking Males
In 2006 a total of 68 lekking males where counted on eleven landholdings. This increased to 81 lekking males in 2007 an increase of 13males (19%) over fourteen landholdings. An additional three landholdings had black grouse present in 2007. Of these three new landholdings many of the leks had just a single bird lekking suggesting they had dispersed from neighbouring landholdings.

Of the fifteen landholdings surveyed over the two years seven went up, four decreased and four remained the same. Of the seven landholdings that increased, 6 are on keepered ground.

In 2006 we identified eighteen leks at an average altitude of 356 m; the 2007 lek count identified twenty-five leks at an average altitude of 342 m. Although the location of some leks moved on the landholdings, their altitudes remained very similar. Carrifran has some excellent black grouse habitat created by Borders Forest Trust and has the highest lek site within the project area at 490 m

The average number of birds attending a lek in 2006 was 3.7 with a range from 1 – 9. This average decreased to 3.4 males in 2007 with a range from 1 – 13. This decline in averages is due to a number of new leks being identified attended by just one lekking male. Only two leks had one male in 2006, this increased to eight single male leks in 2007.The section on gamekeeping within this report explains the population increase on keepered ground which was not replicated on un-keepered ground in the project area.

Genetics

DNA analysis from lekking birds taken from feather samples within the project area identified that the population is more closely linked to birds within the North Pennies than birds to the North.

Maps of leks

Gamekeeping

Areas managed for grouse shooting are not only good for grouse but also other ground nesting birds. Grouse moor gamekeepers strive to provide the best conditions for red grouse and in doing so benefit black grouse and many wading birds. According to the Game Conservancy Trust the following birds are thriving on moorland managed for shooting; red grouse, black grouse, curlew, oyster-catcher, lapwing, golden plover, redshank, merlin, dunlin and snipe.

Gamekeepers do much more than just control predators, habitat management through heather burning and providing areas for chick rearing such as wet flushes by blocking grips are also a key parts of a grouse keepers job. Gamekeepers' contribution to wildlife habitat can be summed up in that the EU's highest conservation designation is a Special Protection Area (SPA), and 74% of Britain's upland SPAs is managed as grouse moors

Within the project area, figures from lek counts have illustrated that the birds' dependence on gamekeepers has increased over the two years. In 2006, 66% of the black grouse recorded within the project area were found on keepered ground. This increased to 77% in 2007. The population of birds on keepered ground over this period increased by 38% whereas the population on un-keepered ground decreased by 17%. This clearly illustrates that the work of gamekeepers is very important if black grouse are to thrive. Where habitat work has been done on both keepered and un-keepered ground, black grouse are responding much better where predator control takes place. There has not yet been and is unlikely to be found a substitute for predator control. This predator control is best done by professional gamekeepers, and usually on grouse moors funded privately.

Two of the fourteen landholdings with black grouse present in the project area stand out as reasonably well managed grouse moors (both would benefit from additional keepers). These two alone hold 48% of the total black grouse population found within the project area. If this level of keepering was replicated across the project area it is likely that this project area could be the best location for black grouse within Britain. An ideal density for gamekeepers is one keeper to 3500acres.

This dependence on grouse moors is mirrored in the North Pennines project where over 90% of black grouse live on the fringes of grouse moors and a high density of gamekeepers appears to be the key to their success. The Southern Uplands project area is a better indication of the benefits gamekeepers bring to black grouse as grouse moor is a minority landmass land use that holds such a high percentage of the population, whereas in the North Pennines gamekeepers cover the majority of the landmass so it's unsurprising that they hold nearly all the black grouse population.

Raptors

The raptor debate has been present throughout the period of the project. The issue of raptor predation affecting the black grouse population has been raised on many occasions but until recently has only been based on anecdotal information. The anecdotal information suggested that raptor predation is having a significant impact on the ability of black grouse populations to consolidate and increase.

The recent publication of the results of a four year study of black grouse in north Wales, provides evidence of the impact that raptor predation has. In the study (Bowker, Bowker & Baines 2007) just one of 39 full-grown black grouse that had been tagged survived. 64% of the dead birds were killed by raptors (probably goshawk or peregrine) with the remaining 34 % falling prey to foxes. The research clearly identifies the impact that predation by raptors is having on black grouse. This study provides compelling evidence about the cause of the black grouse declines.

The Lothian & Borders Raptor Study Group was approached early in the project to try and get a picture of past and present raptor populations within the project area, specifically goshawks and peregrines. Unfortunately information was not forthcoming. The local RSG explained that while all their members are genuinely interested in Black Grouse conservation, several questioned why a black grouse conservation group should require information on raptor distribution. This was disappointing. While the RSG may not consider raptors to be a threat, having access to all relevant information would have helped a broader assessment and analysis.

Anecdotal information suggests that raptors have increased dramatically over the whole project area in recent years. As no quantitative Information on local raptor populations could be obtained, alternative data was used to get some understating of raptor population.

All birds within the UK have been put on different lists regarding their level of conservation concern. The Red List contains birds of the highest conservation concern, and includes black grouse, hen harrier and white-tailed eagle (the only two raptor species on the Red List).

The Amber List contains species of medium conservation concern and includes species such as red grouse, red kite, marsh harrier, golden eagle, osprey, kestrel, merlin, and peregrine falcon.

Finally the Green List contains species with no identified threat to their populations and includes species such as goshawk, sparrowhawk, buzzard, hobby and raven. The list also contains species that can currently be controlled legally for conservation protection such as the jay, magpie, jackdaw, rook and carrion crow.

The major difficulty facing the project officer has been interacting with conflicting parties such as landowners and gamekeepers, who have ascribed the decline in black grouse to rising raptor numbers, and conservation organisations such as the RSPB for whom habitat restoration and management is the priority.

While habitat management may help protect black grouse from raptors, the species' behaviour, particularly lekking on relatively flat, open ground with short vegetation in the spring will expose them to predation. Additional cover will, however, help protect greyhens when they are not on the lek. In the absence of forest edge habitat, structurally similar habitats such as moorland and heaths will be used.

It is well known that UK raptor numbers are increasing following declines. There are now increasing concerns that black grouse will, if they haven't already, enter a "protected species predation trap" where the best breeding efforts in the current climate cannot achieve a population increase sufficiently high be sustainable. Populations of raptor species have not yet reached their 'proposed' carrying capacity so, while the black grouse are currently struggling, protected raptor species are increasing, suggesting that the problem will be amplified in the future.

The suggestion of licences to control raptors has been raised a number of times. The land area occupied by black grouse in the UK is very small compared to that used by goshawk and peregrine. Zoning could, therefore, be an option to consider in the future whereby licences to control or relocate certain raptors could be issued to estates showing good environmental conditions through habitat management and sufficient predator control of foxes, mustelids and corvids.

With the current reduced population of black grouse, every bird removed through predation is a proportionately greater loss. The current population, therefore, needs to be given a chance to expand in safety before any long term sustainability can be achieved.

Conflicting opinions notwithstanding, the fact remains that black grouse is a Red List species and struggling while Amber & Green List raptors that prey upon them are doing well within the project area. In light of the new study in Wales, where raptors accounted for nearly two-thirds of the adult black grouse mortality (only 1 survived out of 39), strategic decisions need to be made at a higher level if we are to prevent a Red List species from disappearing as a result of predation from less endangered species.

Awareness Raising Events

Two events have been held by the project. The first event was on 20th June 2006 and was aimed at land managers and owners, 32 people attended. The day was divided into a morning discussion and an afternoon visit to Dryhope. Guest speakers from the Game Conservancy Trust were David Baines (Director of Upland Research), Phil Warren (Black Grouse Project Officer), David Newborn (Senior Scientist- North of England Grouse Research) and Craig Jones (Head Gamekeeper – Upland Predation Experiment). A talk and discussion was held in the first half with general ecology of black grouse and experience of the North Pennines Recovery Project being

explained. Open discussion was then held which was largely to do with the raptor issues discussed above.

The second half of the day was a visit to Dryhope to look at planting to benefit black grouse, as well as other practical issues such as fence marking, heather burning and predator control.

The second event was held on 18th January 2007 and was aimed at the public with 46 people attending. The evening consisted of presentations by two guest speakers. The first being Hugo Straker (GCT Regional Advisor – Central & Southern Scotland & Northern England) the second speaker was Dr Murray Grant (Senior Research Biologist for the RSPB)

Hugo Straker gave a presentation into the habits of black grouse and what could be done to improve their management. He highlighted the importance of predator control and habitat management, backing up the strong correlation between areas managed for red grouse shooting and areas that support black grouse.

Dr Grant then gave a talk about the work that RSPB had done and the effect this had on black grouse. He explained about new satellite imagery that can be used to identify habitat types and predict locations where black grouse populations should be found. Dr Grant didn't rate the importance of predator control as highly as Hugo Straker.

Following the presentations, the floor was opened to questions, and these covered a range of issues although much of the following discussion centered on predation, specifically raptors, similar to the previous event in June 2006. One local gamekeeper explained he witnessed his black grouse population wiped out by peregrine falcons. The RSPB response to this was that there was little or no scientific evidence to suggest that raptors have a significant effect on black grouse at the population level (this was prior to the Lake Vyrnwy study recently published in the science journal Wildlife Biology). Another gamekeeper suggested that there is a lot of anecdotal evidence from gamekeepers to suggest that raptors are a major problem. One questioner suggested that populations at such a low level are especially prone to the effects of predation. Many of the views within the raptor section of this report have been raised at both events.

Fence Marking

Reports from North Pennines indicate that black grouse collisions with stock fences can be frequent. So much so that during a one off search during 2000/01 1.4 carcasses per kilometre where found along fence lines. Studies in the highlands showed an average collision rate of 0.4 and 0.6 black grouse per kilometre per year on deer fences and came to the conclusion that such a rate was potentially damaging to the population. Conditions where stock fencing pose a particularly severe problem for black grouse include; exposed positions, proximity to lek sites and also favoured feeding areas.

These potentially dangerous fences should be marked to increase visibility. There are several options to do this including; coloured barrier netting, metal plates, plastic tags and bundles of heather. Metal tags where chosen for this project due to their long life and easy installation. To maximise visibility to flying birds the top wire was marked with at least one metal plate between each upright post.

Through funding from Leader+ and Scottish Natural Heritage the project was able to mark or supply fence markers to, Sundhope, Broadmeadows, Stanhope, Dryhope and a range of landholdings within the Blackhouse Forestry Complex. The exact distance marked is difficult to work out as every fence is different and one marker is required in between every post which varies considerably.

Fence markers can be purchased from Hartlington Fencing Supplies, Stonegarth, Hartlington, Skipton, North Yorkshire 01756 720318

Heather Burning

Scottish Natural Heritage and Leader+ also provided funding which allowed heather burning and swiping to be conducted on landholdings within the project area. Key parts of the landholdings within the Blackhouse Forestry Complex (situated within the Yarrow Valley) have been burnt. These areas have heather above the tree-line that had not been burnt for some time due to the close proximity to the forest and risk of fire spreading. As a result the heather mature, all one age and very limited structural diversity. This also added to the danger of the fire spreading because it is harder to control the fire with no previous fires to act as fire breaks or slow the fire down. Once heather is woody through reaching the degenerate stage the fire can burn too hot and result in damage to the seedbed. In extreme cases these hot fires can cause the peat itself to catch fire.

To get round this problem, the project was able to help provide a flail to cut fire breaks in the heather to allow the fires to be done in increased safety. Additional landholdings have already made use of the flail and this will continue into the future.

The fires were managed by cutting tracks in the heather with the flail that and then burning the heather within this fire-break, so that the wind or gradient directs the fire in a manageable way.

The habitat will have been improved as a result of the heather burning due to increased structural diversity within the heather moorland. The remaining longer heather will provide areas for nesting and cover, whereas the shorter recently burn patches will provide feeding areas for chicks, which can struggle to make their way through the old rank heather.

New Corvid Trap

The project officer has developed a new version of the Larsen trap (corvid trap) that is much more effective than previous versions; it has been used within the project area with good results. Stanhope estate was given a trap in spring 2007 and after meeting immediate success was given another two and caught 110 carrion crows between the new traps and cage traps, this compared to a normal count of around 65. The traps are now being put to use a various estates across the country. Estates within the North Pennines black grouse project are now using the traps with good results.

Controlling corvids aims to remove territorial birds throughout the nesting season that prey upon eggs and chick. The aim is to remove the territory holders and keep removing new birds as they come into the unoccupied territory throughout the spring. When birds are allowed to hold a territory they will soon find and destroy nests and chicks. New birds are opportunistic until they hold the territory long enough to know the locations of the nests, constantly removing corvids will minimise the development of this knowledge.

Funding Support for Habitat Works

Soon after the project started and management plans were produced for some key landholdings many of the funding schemes closed, including Rural Stewardship Scheme and Scottish Forestry Grant Scheme. Natural Care funding through SHN within the Tweedsmuir SSSI was however available throughout the project period.

Costed management plans produced for individual landholdings now await funding for implementation. When these plans were produced it was hoped that grant schemes could be included in the costing section to identify any shortfall. Because the new funding rates are not yet available this will hopefully be done at a later date.

Future Prospects

Information from lek counts and information from the North Pennies Project suggests the most advantages thing that could happen is the increase in gamekeepers and grouse shooting within the project area. This would not only bring in money, but land mangers and gamekeepers on the ground to carry out management such as predator control and heather burning. Studies at Otterburn by the Game Conservancy Trust are also indicating that an increase in wading birds should also result from increased gamekeeping.

Now that scientific evidence has been provided illustrating the effect raptors have on black grouse, this will hopefully result in organisations taking part in sensible discussions as to measures that will ensure black grouse thrive into the future.

The new rural development programme which integrates all agri-environment schemes in Scotland is expected to be launched in January 2008. The programme includes Land Management Options (non-competitive) and rural Priorities (competitive) for farming, forestry and primary processing sectors. There will be prescriptions, some of which will assist management for black grouse. The Management Plans prepared by the project should help the development of strong applications.

The Southern Upland Partnership is now planning a much larger uplands project for launch in 2008-09 incorporating many aspects of the uplands management. In promoting this, black grouse will almost certainly play a major role.

Public Awareness, Lek Viewing

Early in the project there was hope that sites could be set up for the public to view the leks, but it was soon apparent that the population is too unstable to support viewing due to possible lek disturbance. Where lek viewing was available in the past, problems occurred where birds were disturbed by unsympathetic birders arguing about the best seats in the hides! In the future if populations improve enough it is possible that lek viewing sites could be set up to allow viewing, but the population has a long way to go before this can be done with confidence.

Throughout the project anyone interested has been able to join the project officer on lek counts with a relatively high number of people joining over the two years.
The public were invited to the second event held in January 2007 at Selkirk, which was well attended. Although not so many general members of the public attended, the majority of attendees worked within the countryside sector.

Future Research Proposals

1. Clarifications of raptor populations and distribution in the Borders
2. Research ways to avoid the “protected species predation trap”
3. Research impacts on black grouse numbers when goshawks & peregrines are removed

Partners in Project

Southern Uplands Partnership
Scottish Borders Council
Scottish Natural Heritage
RSPB
Game Conservancy Trust
Leader+
Scottish Executive

Summary

The black grouse project has run for two years and over this time lek counts have shown an increase in lekking males of 19%. Much of this increase has taken place on landholdings managed for red grouse shooting. Declines have taken place on un-keepered ground, illustrating the dependence on gamekeepers given that the habitat is similar across the project area, and where the habitat is better on keepered ground is still a result of gamekeeping. In 2006, 66% of the black grouse recorded within the project area were found on keepered ground. This increased to 77% in 2007. The population of birds on keepered ground over this period increased by 38% whereas the population on un-keepered ground decreased by 17%. Carrifran is managed by Borders Forest Trust (BFT) and is the only landholding in the project area not keepered that has shown an increase in numbers.

15 key landholdings have had management plans produced which will await opening of agri-environment schemes in Scotland expected to be launched in January 2008

Heather burning and fence marking has taken place through funding from SNH and Leader+

A new version of the traditional Larsen trap has been developed and used within project area and has proven more efficient at catching crows.

Two well attend events have been held, the first aimed at land manger and owners within the project area and the second aimed at the general public.

Soon after the project started and management plans produced for some key landholdings many of the funding schemes closed, including Rural Stewardship Scheme and Scottish Forestry Grant Scheme. The new rural development programme which integrates all agri-environment schemes in Scotland is expected to be launched in January 2008. The programme includes Land Management Options (non-competitive) and rural Priorities (competitive) for farming, forestry and primary processing sectors. The Management Plans prepared by the project will be very relevant to applications.

Early in the project there was hope that sites could be set up for the public to view the leks, but it was soon apparent that the population is too unstable to support viewing due to possible lek disturbance.

The project officer has raised concerns about predation by raptors, but has only been able to supply anecdotal evidence. Recently however a scientific study was published that took place on the Lake Vyrnwy in North Wales. By the end of the study, just one of 39 full-grown black grouse that were tagged survived. 64% of the dead birds were killed by raptors (probably goshawk or peregrine) with the remaining 34 % falling prey to foxes. The conclusion of the research identifies the impact that predation by raptors is having on black grouse.

The Southern Upland Partnership is planning a larger uplands project incorporating many aspects of uplands management. Black grouse will almost certainly play a major role in this. If further habitat enhancements are carried out as a result of the project and management plans being implemented. This along with possible new thinking on the predation by raptors will hopefully see black grouse increase in number in the future to a sufficiently high level that they can be enjoyed by all within the Southern Uplands.

Acknowledgments

The project would like to thank the following the help and support they have given throughout the project.

Pip Tabor (SUP)
Sir Michael Strang Steel (SUP)
Andy Tharme (SBC)
Greg Macfarlane (FCS)

Hugo Straker (GCT)
Neville Morgan
Simon Thorpe (Heather Trust)
David Baxendale
David Baines (GCT)
Peter Gordon (RSPB)
Mike Fraser (RSPB)
Sarah Eno (SNH)
John Savory
David Beevors
Phil Warren (GCT)

References & Recommended Reading

Baines, D (1994a) Seasonal differences in habitat selection by Black Grouse *Tetrao tetrix* in the northern Pennines, England. Ibis Vol. 136, no. 1, pp. 39-43

Baines, D (1990a) Long term changes in the European black grouse population. Game Conservancy Annu. Rev.; No. 22. p. 157-158.

Baines D, Sage R.B. & Baines M.M (1994) The implications of red deer grazing to ground vegetation and invertebrate communities of Scottish nature pinewoods. *Journal of Applied Ecology* 31 : 776-783.

Baines D. & Summers R. W (1997) Assessment of bird collisions with deer fences in Scottish forests. *Journal of Applied Ecology*. 34(4):941-948.

Baines, D., Warren, P. & Calladine, J (2002) Spatial and temporal differences in the abundance of black grouse and other moorland birds in relation to reductions in sheep grazing. *Aspects of Applied Biology* 67, 245-252

Baines D., Wilson I.A. & Beeley G (1996) Timing of breeding in black grouse *Tetrao tetrix* and capercaillie *Tetrao urogallus* and distribution of insect food for the chicks. Ibis 138 (2) 181-187.

Bowker, G. Bowker, C & Baines, D (2007) Survival rates and causes of mortality in Black Grouse at Lake Vyrnwy, North Wales, UK *Wildlife Biology* Vol 13 (3) pp. 231–237

Cayford, J.T (1995) Black Grouse and Forestry: Habitat requirement and Management. Forestry Commission technical Paper 1. Forestry Commission, Edinburgh, UK.

Cayford J.T. & Walker F (1991) Counts of male black grouse *Tetrao tetrix* in North Wales. *Bird Study* Vol. 38, no. 2 : 80-86

Donald, C & D. O'Hara (2003) RSPB Black Grouse conservation work in northern Scotland. Sylvia, *Journal of Ornithology* 39:3-7

Kurki S, Nikula A, Helle P. & Linden H (2000) Landscape fragmentation and forest composition effects on grouse breeding success in boreal forests. *Ecology* Vol. 81, no. 7, pp. 1985-1997.

Lack D (1939) The display of the Blackcock. *British Birds* 32: 290-303

Redpath S. & Thirgood S (1997) Can raptor predation limit or regulate grouse populations? I. Functional and numerical response of raptors. *Wildlife Biology* 3 : 288

Rintamäki P.T, Lundberg A, Alatalo R.V. & Höglund J (1998) Assortative mating and female clutch investment in black grouse. *Animal Behaviour* 56 : 1399-1403.

Robel R.J (1969b) Movements and flock stratification within a population of Blackcocks (*Lyrurus tetrix*) in Scotland. *Journal of Animal Ecology*, 38: 755-763

Summers, R. W, R. E. Green, R. Proctor, D. Dugan, D. Lambie, R. Moncrieff, R. Moss, and D. Baines (2004) An experimental study of the effects of predation on the breeding productivity of Capercaillie and Black Grouse. *Journal of Applied Ecology* Vol 41 (1): 513-525.