

*Report 3 of 3 for RSPB, SNH, FCS and GWCT*

## **Black grouse conservation review**

### **Conservation effort in Scotland**

Robert Hawkes  
(2013)

**For further information on this report please contact:**

Chris Bailey (Advisory manager, RSPB Scotland)  
2 Lochside View, Edinburgh Park, Edinburgh, EH12 9DH  
Telephone No: 0131 317 4130  
Email: [chris.bailey@rspb.org.uk](mailto:chris.bailey@rspb.org.uk)

**This report should be quoted as:** Hawkes, R.W. (2013) Black grouse conservation review: Conservation effort in Scotland. *RSPB report to Forestry Commission Scotland, the Game and Wildlife Conservation Trust and Scottish Natural Heritage.*

*This report, or any part of it, should not be reproduced without the permission of RSPB. This permission will not be withheld unreasonably. The views expressed by the author of this report should not be taken as the views and policies of the Royal Society for the Protection of Birds, Scottish Natural Heritage, Forestry Commission Scotland and the Game and Wildlife Conservation trust. This report is from a partnership project with partners: Forestry Commission Scotland, the Game and Wildlife Conservation Trust, the Royal Society for the Protection of Birds and Scottish Natural Heritage.*



## Executive summary

**Context:** The aim of this paper is to evaluate the effectiveness of current black grouse conservation in Scotland. A large proportion of the Scottish black grouse population are found on private land, therefore, in addition to work on nature reserves and the National Forest Estate, recovery projects have been developed to support their conservation. In this paper we evaluate current and recent conservation action and make recommendations for future improvements and prioritisation.

**Approach:** This report reviews the extent of conservation work and advice across Scotland, alongside the targeting guidance available. The appropriate black grouse options of the Scotland Rural Development Programme (SRDP) are also appraised.

**Results:** Between 2007-2012 black grouse conservation has been delivered through five recovery projects, alongside management on at least 12 nature reserves and 22 forests on the national estate. It is worth noting, however, that the figures reported here are a minimum. In reality, a lot more conservation work has probably occurred (e.g. positive management on sporting estates).

During 2011 advisory staff visited at least 159 farms/estates and assisted 289 applications of potential black grouse benefit. This work was primarily carried out through recovery projects. A lack of land managers willing to enter SRDP, low black grouse densities and conflicting land use pressures have hindered some projects. Several issues regarding the existing black grouse package were noted.

**Conclusions:** Whilst causality cannot be demonstrated, correlations between conservation effort and population rises have been observed in recent studies. Recovery projects have assisted black grouse conservation across several regions, providing both monitoring and management outputs. However, three projects have already finished and the remaining two are expected to reduce their commitment towards black grouse. To meet the targets of the Scottish black grouse Biodiversity Action Plan group future action needs to adopt a landscape scale approach within areas of conservation concern.

# Glossary

- BCTP: Bird Conservation Targeting Project
- CON: Conservation Officer
- BFT: Borders Forest Trust
- FCS: Forestry Commission Scotland
- FDP: Forest Design Plan
- GWCT: Game and Wildlife Conservation Trust
- LTFP: Long Term Forest Plan
- NBN: National Biodiversity Network
- NFE: National Forest Estate
- NGO: Non Governmental Organisation
- NTS: National Trust Scotland
- PO: Project Officer
- RDC: Rural Development Contract
- RP: Rural Priorities
- RPAC: Regional Proposal Assessment Committee
- RSPB: Royal Society for the Protection of Birds
- SAC: Scottish Agricultural College
- SAF: Species Action Framework
- SBAP: Scottish Biodiversity Action Plan
- SNH: Scottish Natural Heritage
- SRDP: Scotland Rural Development Programme
- SUP: Southern Uplands Partnership
- SWT: Scottish Wildlife Trust
- TMP: Trial Management Project

# Contents

1) Introduction .....	5
2) Methods.....	7
2.1 Identifying the level of conservation effort across Scotland .....	7
2.2 Identifying the level of advisory support available for black grouse .....	8
2.3 Identifying targeting guidelines within North and South Scotland.....	9
2.4 Identifying the gaps and limitations of SRDP .....	9
3) Results.....	10
3.1 Conservation effort across Scotland .....	10
3.2 Advisory support available for black grouse .....	23
3.3 Targeting guidelines within North and South Scotland .....	25
3.4 Gaps and limitations of SRDP .....	27
4) Discussion .....	29
4.1 Monitoring.....	29
4.2 Management guidance .....	29
4.3 Conservation delivery.....	30
4.4 Gaps and limitations of delivering black grouse conservation through SRDP .....	34
5) Conclusions .....	36
6) Recommendations .....	37
7) Acknowledgements .....	40
8) References .....	41

# 1) Introduction

In recognition of long term declines (Holloway 2006, Sim *et al.* 2008), black grouse (*Tetrao tetrix*) are a 'red listed' species (Gregory *et al.* 2002) and were a priority under the UK Government's Biodiversity Action Plan (BAP). Despite the discontinuation of the UK BAP process in 2008, meeting the Scottish black grouse BAP group (SBAP) target of maintaining a population of 3250 males across 230 10km<sup>2</sup> grid squares by 2030 remains a conservation priority for the group's partner organisations (Biodiversity Action Reporting System 2006) (Appendix 1). Black grouse are also recognised as a species of high conservation concern within Forestry Commission Scotland's (FCS) Woods for Nature programme and the Species Action Framework (SAF). Given the wide ecological requirements and distribution of this species, designing effective management represents a significant challenge.

With the aim of restoring populations through targeted management advice, a number of distinct black grouse recovery projects were initiated (Table 1). A number of statutory bodies and Non Governmental Organisations (NGOs) have also delivered positive management, primarily through: (i) work on nature reserves/estates, (ii) work on the National Forest Estate (NFE) and (iii) best practice advice to land managers. A range of approaches have been employed, from small schemes aimed at enhancing local habitats to landscape scale strategies linking together multiple leks. Finance for this work has come from a range of sources, including £8 million committed through the Scotland Rural Development Programme (SRDP) black grouse package (Hawkes 2013).

In 2007, the black grouse SBAP group developed a set of national guidelines to maximise the effectiveness of conservation management. In declining populations the aim was to halt further losses and maintain present range, with preference given to collaborative work around leks containing 4+ males, or 3+ males where positive management is underway in adjacent areas. Within stable or increasing populations preference was given to areas holding 4+ males. Encouraging range expansion was a lower priority. To separate the 'declining' southern population from the 'expanding' northern population, the Scottish range was split through

northern Argyll and central Forth (Appendix 2). These guidelines were fed into the development of relevant strategies, programmes and recovery projects undertaken at the time (e.g. SAF, Woods for Nature, and SRDP).

Maximising the efficacy and value for money of management is crucial, especially in light of future resource constraints (Cole *in prep*). Prior to this review the extent and approach to conservation work at a national level, the adequacy and level of use of existing guidelines, and the limitations of current land management incentives were unclear.

Table 1: The funders and duration of five black grouse recovery projects between 2007-12.

<b>Project</b>	<b>Partners</b>	<b>Project duration</b>
Argyll and Stirling Recovery Project	SNH, FCS, RSPB, Scottish Power, GDF Suez	2002 - 2005 (Argyll only) 2009 - 2011
Dumfries and Galloway Project Officer	RSPB supported by SNH Area Frameworks Agreement	1998-2004 (black grouse officer) 2005 - 2010 (species officer)
Southern Uplands Partnership Project	SUP, SNH, European Agricultural Fund, Leader, Scottish Government, RSPB, Scottish Borders council	2009 - 2012
Lammermuirs Project	GWCT, SNH	2010 - present
North Scotland Advisory Work	RSPB	2006 - present

## Objectives

1. To appraise the effectiveness of recovery projects and other conservation efforts across Scotland (between 2007-12) in relation to black grouse numbers and range.
2. To appraise the level of advisory support for black grouse conservation.
3. To appraise black grouse targeting guidance.
4. To appraise the black grouse SRDP package.

## 2) Methods

### 2.1 Identifying the level of conservation effort across Scotland

To establish the extent of black grouse management in Scotland between 2007-12, conservation practitioners from RSPB, Game and Wildlife Conservation Trust (GWCT), Scottish Natural Heritage (SNH), FCS, Southern Uplands Partnership (SUP), Scottish Wildlife Trust (SWT), Natural Trust Scotland (NTS), and Borders Forest Trust (BFT) were approached. Positive management on sporting estates or from development mitigation funds (e.g. wind farms) was not considered due to time constraints and the lack of a co-ordinating body for these elements. Management undertaken through SRDP or previous grant schemes were not considered directly, the former being addressed in a separate report (Hawkes 2013). Conservation efforts were grouped into one of the following categories:

- Management through a recovery project (>50% black grouse focused).
- Management on a nature reserve.
- Management on the NFE.

For each recovery project information was collected on the project's: objectives, geographic extent, approach, funders and duration. The coordinator of each project was also asked to list any limitations which had hindered their work. For each identified nature reserve and forest area, the duration, lead co-ordinators, funders and management techniques were identified. To provide an indicator of management extent the number of lekking males recorded within each project area or holding during 2011 was identified and related to the last national population estimate (2005) (Sim *et al.* 2008). All programmes were digitised into ArcGIS (ESRI 2011) and superimposed over the known black grouse range. Range was defined as all Scottish parishes containing a lek record held by the Bird Conservation Targeting Project (BCTP), a partnership initiative between the BTO, Natural England, the RSPB, and SNH. The BCTP dataset used within this report contains all lek records held by the RSPB and BTO between 2005-09 (plus any 2010 data available), this includes data from; most localised monitoring groups, the

National Biodiversity Network, other RSPB datasets (e.g. RSPB led surveys, partnership surveys, the trial management project), biological record centres, and BTO datasets (including preliminary data from the 2007-2011 Bird Atlas). The extent of management within the Northern and Southern populations (Höglund *et al.* 2011) was assessed using the population divide defined by the SBAP group in 2007 (Appendix 2).

## 2.2 Identifying the level of advisory support available for black grouse

To identify the number of black grouse management plans influenced by advisory staff, practitioners from the organisations highlighted in section 3.1 were consulted. Any individual who contributed or encouraged at least one black grouse application was approached. Only applications completed in 2011 were counted as many respondents held no account of earlier records. Advisory input through land agencies (e.g. the Scottish Agricultural College) was generally low and often assisted by a member of RSPB staff. To avoid double counting, land agent support was omitted from this analysis. Advisors were asked to group their effort into the following categories:

- Farms/ estates visited.
- Input into agricultural SRDP plans.
- Input into forestry SRDP plans.
- Input into FCS Forest Design Plans (FDP) on the NFE.
- Input into Long Term Forest Plans (LTFP) on the NFE.
- Input into mitigation projects.

Sufficient information was not always available to accurately assess the extent of advisory work. For example many advisors did not hold information on the total area of black grouse habitat affected by successful applications. To minimize the risk of including support unavailable to the wider public, this analysis excluded individuals offering advice exclusively on



their own holding(s), e.g. the SWT and NTS. Advice capacity was assessed either side of the central black grouse belt (appendix 2) by categorising the geographic origin of each advisor.

## 2.3 Identifying targeting guidelines within North and South Scotland

To explore if and how the application of targeting guidance, outlined by an individual, organisation or the SBAP group, differed between North and South Scotland, practitioners were asked to identify what: 1) lek sites they target (e.g. 3+ males), and 2) management techniques they generally recommend. As guidance generally varies geographically, responses were considered at the RPAC scale. Management techniques were grouped into the following categories:

- Woodland management.
- Ancient and wood pasture management.
- Woodland creation.
- Moorland management.
- In by management.
- Predator control.
- Deer control.
- Fence marking/removal.

## 2.4 Identifying the gaps and limitations of SRDP

To identify gaps and limitations within the existing SRDP black grouse package, advisory staff and case officers (from SNH and FCS) involved with black grouse applications were asked to identify any concerns they had and to explain the potential implications for conservation.

## 3) Results

### 3.1 Conservation effort across Scotland

#### 3.1.1 Recovery projects

Five recovery projects have occurred across Scotland between 2007-11 (Fig 1). In all cases SRDP has been the main mechanism for delivering positive management whilst many have also input into other management plans, e.g. Forest Design Plans (FDP). During 2011 a total of 2006 displaying males were counted within the boundaries of these projects. Not accounting for population change since 2005 this figure suggests that 60% of black grouse in Scotland have been covered by a project. This figure is, however, only a rough indicator of recovery project extent. In most case these initiatives will have only targeted a limited number of leks within their respective region.

Two of these projects have focused solely upon black grouse ('Argyll and Stirling Recovery Project' and 'Southern Uplands black grouse Project'), whilst the remaining three have also supported other species. Most projects have focused within the south (4), covering a large proportion of the known black grouse range. Although Figure 1 infers a lack of support within some areas, other advisors (e.g. RSPB conservation officers and GWCT advisors) have assisted black grouse management across the country (see section 4.2).

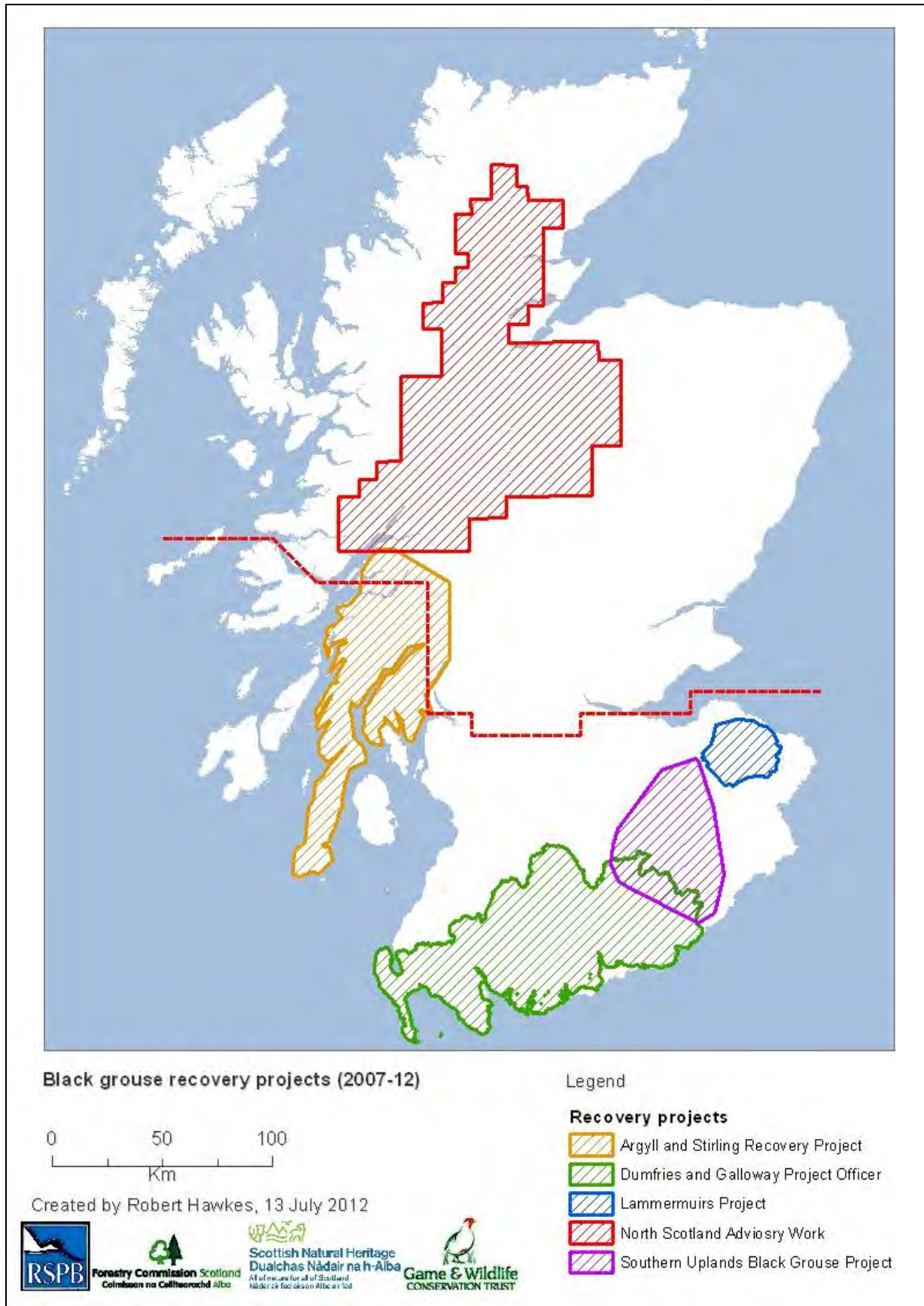


Figure 1: Black grouse advisory projects between 2007-2012

## **Argyll and Bute project**

**Objective:** To provide a better understanding of black grouse within Argyll and improve numbers and range through positive management. Running between 2009-11 this project was coordinated by a project officer and supported by RSPB, SNH, FCS, Scottish Power, and GDF Suez.

**Project area and population:** This project covered approximately 4449 km<sup>2</sup> across Argyll, Stirling and Loch Lomond national park. During 2011 a total of 241 displaying males were recorded within the project's boundaries. Between 2009-2011, black grouse numbers at 19 consistently monitored leks increased slightly, from 90 to 99 males.

**Approach:** Spring lek counts were carried out each year by the project officer and approximately 35 volunteers. Effort was made to contact all landowners/tenants/agents surrounding core lek sites (3+ birds) and advice was provided to those who were keen. To encourage SRDP uptake practitioners were also invited to one of two advisory workshops.

**Limitations:** Habitat implementation is completely reliant upon the willingness of landowners to adopt positive measures. Only a few of the landowners who attended the workshop sought further advice whilst many did not incorporate the recommendations of the project officer into their final application. Landscape scale management represents both a financial and practical challenge; core populations within Argyll (leks with 3+ males) are widely dispersed. The financial return offered by woodland management SRDP options deterred many commercial foresters.

**Project future and recommendations:** The project finished at the end of 2011 with no plan for continuation in the future. Employing an officer dedicated specifically to black grouse has provided a greater monitoring capacity and allowed a proactive approach. Successful applications were typically the result of good contacts with agricultural agents, thus maintaining strong stakeholder relations is vital to encourage future uptake.

## **Southern uplands black grouse project**

**Objective:** To provide a better understanding of the Borders black grouse population and arrest regional declines through positive management advice. Running since 2010 this project is coordinated by a project officer and supported by SNH, LEADER, The Scottish Government, RSPB, Scottish Borders Council, European Agricultural Fund, and SUP.

**Project area and population:** The project covers approximately 2588 km<sup>2</sup> across The Borders. During 2011 a total of 390 displaying males were identified across the project area. Between 2010 and 2011, a rise of 91 males (+44%) was observed across those leks monitored in both years. Although the causality of this rise cannot be determined, favourable weather during the 2009 and 2010 breeding seasons, potentially coupled with improvements in habitat quality and predator management, may have facilitated this observed increase.

**Approach:** Spring lek counts were undertaken by the project officer and nine volunteers. Four distinct clusters of potentially connected leks were identified, centred on the largest lek. The presence of moorland and blanket bog habitats within each cluster were mapped to assess the availability of suitable habitat. Management advice has been targeted towards these areas.

**Limitations:** A lack of reliable voluntary support has hindered survey coverage through the region. Many localised populations are isolated and showing signs of decline whilst mature exotic coniferous plantations have potentially reduced local habitat quality and population connectivity. Although the officer has attempted to minimize the impact of various regional pressures (e.g. over grazing, commercial forestry), these are often beyond the control of the project. Many land managers are unwilling to enter an SRDP agreement.

**Project future and recommendations:** The project ended in October 2012. Employing a project officer with good local knowledge has allowed the project to build strong stakeholders relations with local land owners. Any future project will probably continue a similar targeted approach; however, increasing interest in cross borders (South Scotland and North England) and cross region (The Borders and Dumfries and Galloway) work could create future opportunities.

## **North Scotland advisory work**

**Objective:** To monitor upland bird species of conservation concern and provide best practice management advice. Black grouse work is delivered through an RSPB upland advisor, reserve staff and conservation officers. An upland advisor has been in post since 2006.

**Project area and population:** Support is available over 11177 km<sup>2</sup>; however, only a portion of this area is proactively targeted for black grouse. The most recent survey counts from all monitoring programmes within North Scotland, which were undertaken over a four year period, total 1181 displaying males. Monitoring within the Speyside region has shown a decrease from 310-220 males between 2007-09, and an increase from 220- 299 males between 2009-11.

**Approach:** Black grouse monitoring has occurred through one off surveys, alongside annual monitoring within Staphspey, The Beaully catchment and Sutherland. Using these findings, advisory staff have proactively encouraged management where range expansion is a possibility. Awareness-raising events for land managers, government agencies, commercial agencies (e.g. Scottish Forests) and advisory organisations (eg. SAC) have also been run.

**Limitations:** The uplands advisor is responsible for managing several species of conservation concern, therefore black grouse support is limited towards target areas. Many parts of North Scotland also lack frequent monitoring (Hawkes and Corrigan 2013).

**Project future and recommendations:** The amount of RSPB staff time spent on black grouse monitoring and advisory work is expected to decline in North Scotland. The RSPB will continue to support landowners, agents and government on a range of upland species. Assisting public and private forest plans has been the focal means for delivering positive black grouse management, and is expected to remain a key technique.

## **GWCT's advisory project (Lammermuirs work)**

**Objective:** To provide a regular lek monitoring system through coordinating black grouse study groups and encouraging SRDP uptake, with the view of increasing black grouse numbers and range. To date, advisory support has been greatest within the Lammermuirs. This project has run since 2010, supported by GWCT and SNH.

**Project area and population:** This project covers approximately 769 km<sup>2</sup> across the Lammermuirs. No lekking males were observed during 2011 within this region but four sightings were confirmed. This project has also input into Strathspey, Deeside and Strathdon, where anecdotal evidence has suggested a recent rise in lekking males.

**Approach:** All study groups are reliant upon the voluntary support of landowners, who routinely report any sightings to the project officer. Through bi-annual workshops and demonstration events positive techniques have been showcased to local land managers. Within the Lammermuirs advisory support has been proactively targeted towards remaining populations to encourage recovery and range expansion.

**Limitations:** Black grouse in the Lammermuir hills are sparsely distributed and extremely low in numbers. Conflicting land use demands and low population densities have limited any recovery. The lack of financial incentive associated with some moorland management options has deterred many land owners from entering an SRDP agreement. Outwith the Lammermuirs on ground delivery of SRDP has been low.

**Project future and recommendations:** In 2011 there was a significant change in land ownership across the Lammermuirs. GWCT is already engaging with the new owners to scope the potential for future management. The Lammermuir hills has also been cited as a potential 'stepping stone' between The Borders and North England population (Warren *et al*, 2011b). GWCT will continue to engage with study groups across Scotland.

## **Dumfries and Galloway recovery project**

**Objective:** To support black grouse monitoring and encourage black grouse recovery through best practice advice within Dumfries and Galloway. This project has run through two distinct phases 1998-2004 and 2005-2010, the earlier stage was coordinated by a black grouse project officer whilst the latter focused on a wider species assemblage (e.g. nightjar). Both RSPB and SNH were project partners. This was a separate initiative to the Galloway forest park trial management project.

**Project area and population:** The project covered an area of 6410 km<sup>2</sup> across Dumfries and Galloway. During 2011 a total of 194 displaying males identified across the project area, a similar number to 2007 across comparable leks.

**Approach:** Coordinated by RSPB staff and relying upon voluntary support black grouse monitoring has occurred throughout this region since 1980. Management advice has been given to private and statutory land managers.

**Limitations:** Many practitioners did not adopt the recommendations of the project officer, thus the benefits of many applications may be limited. Others were unwilling to enter SRDP, often due to the low capital returns offered by some options, e.g. the Woodland Improvement Grant.

**Project future and recommendations:** Since the end of the project in 2010 advisory support has been provided by the RSPB at a reduced capacity. Herein the RSPB will continue to coordinate monitoring and proactive advisory work around core declining leks (3+ males). Other applications will only be supported on a reactive basis. Many land owners surrounding core lek site are yet to enter any agri-environment agreement. Therefore, maintaining strong relationships with advisory agencies (e.g. SAC) and public bodies (e.g. FCS) will remain a key strategy for supporting future management.



### 3.1.2 Nature reserves

RSPB, SNH, NTS, BFT and SWT, have carried out black grouse management work across 12 nature reserves since 2007 (Table 2). In many instances management was carried out as part of management trials, attempting to monitor black grouse response to new techniques. All reserves are within a parish with known black grouse occupancy, with a larger quantity within the north (10) relative to the south (2) (Fig 2). All work is expected to remain ongoing.

During 2011 a total of 376 displaying males were counted within the boundaries of these reserves. Not accounting for population change since 2005 this figure suggests that 11% of black grouse in Scotland occur within reserves actively managed for the species. Some reserves did not contain any leks.

A range of management techniques have been used across these reserves, including; fence removal/markings (8), woodland creation (6), moorland management (6), deer control (6), woodland management (5), predator control (3), grassland management (1), and bog restoration (1). A range of initiatives have financed this work, with many receiving government grant support (e.g. SRDP, Woodland Grant Scheme).

### 3.1.3 National Forest Estate

Work on the NFE has been reported for 22 forest areas; however, this is probably an underestimate (Table 3). Two of these areas include 'Galloway Forest Park' and 'Fort Augustus', where management was undertaken as part of a Trial Management Project (TMP), assessing how black grouse respond to forestry practices. All identified work has occurred within a parish with known black grouse occupancy, with a greater number of forest areas south of the central divide (Fig 3). FCS continues their action towards black grouse through their Woods for Nature programme.

During 2011 a total of 309 displaying males were counted on the NFE (Patterson 2012), a potential underestimate as monitoring is restricted to a limited number of forests. Not

accounting for population change since 2005 this figure suggests that 9% of black grouse in Scotland occur on the forest estate.

All reported forests have received positive habitat management (Table 3). The practices include stand restructuring (e.g. selective thinning, clear felling, feather edging), forest creation (e.g. new native planting) and open ground management (e.g. heather swiping). Predator control (5) and deer fence removal/markings (6) have also been implemented within some areas.

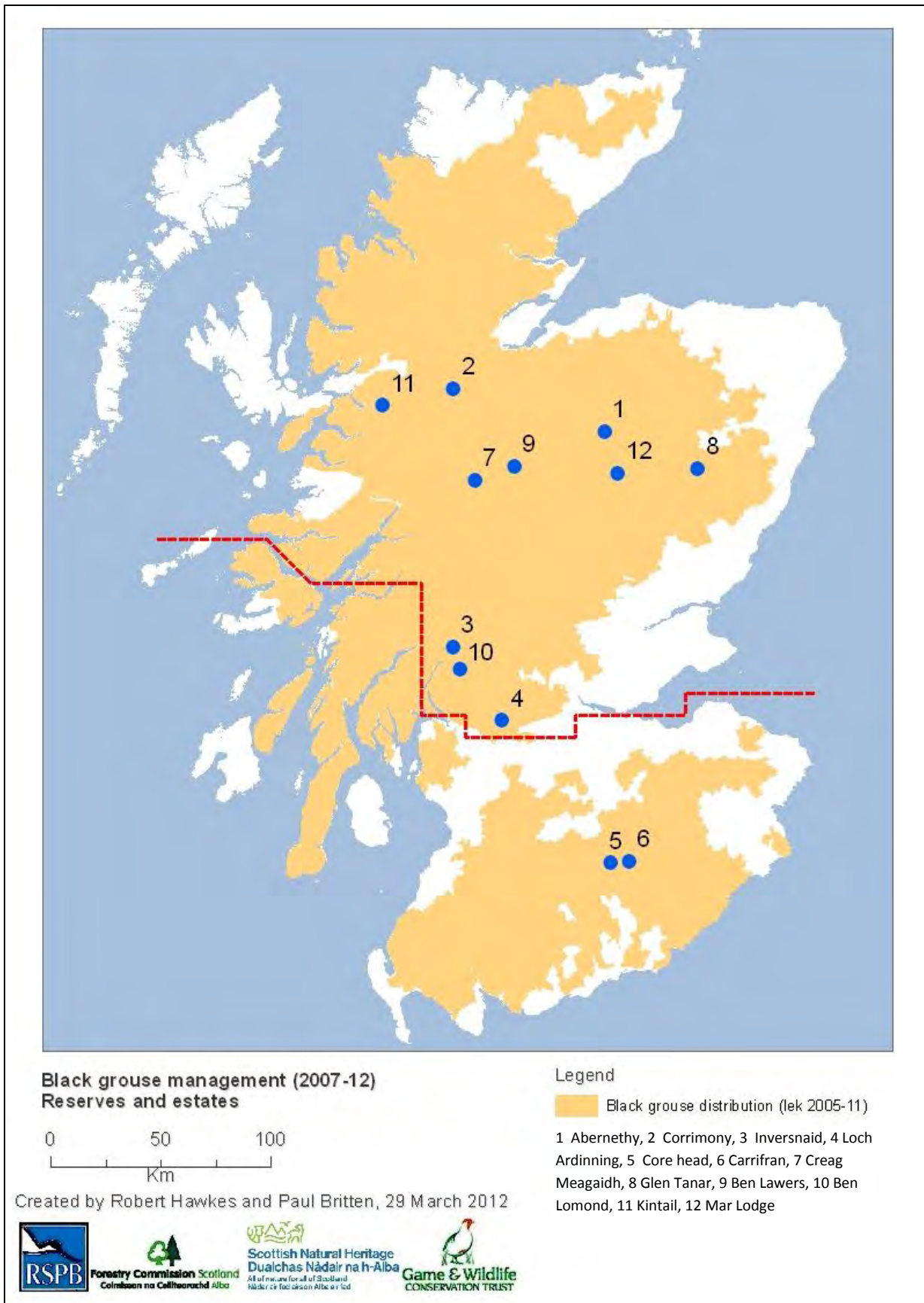


Figure 2: Nature reserves where dedicated black grouse management has occurred between 2007-2012.

Table 2: Nature reserves where black grouse have been actively managed since 2007.

Name of holding	Managing body	Funding source	Management options			Start of management	End of management
			Predator control	Fence marking/removal	Habitat measures		
Abernethy	RSPB	SRDP, RSPB, EU capercaillie LIFE project	Yes	Yes	Woodland creation, Forest edge restructuring, Forest thinning, Deer control	1988	On going
Corrimony	RSPB	Scottish Forestry Alliance, RSPB, EU LIFE	No	Yes	Grazing management, Deer control, Heather cutting, Heather burning, Native woodland creation	1997	On going
Inversnaid	RSPB	RSPB	No	Yes	Grazing management, Native woodland creation	?	On going
Loch Ardinning	SWT	SWT	No	No	Grassland and heathland management	2001	On going
Creag Meagaidh	SNH	SNH	No	Yes	Woodland creation, Grazing management, Supplementary feeding, Deer control	Early 1980's	On going
Glen Tanar	SNH	SNH	Yes	Yes	Forest edge restructuring	Unknown	On going
Core head	BFT	Tubney Charitable Trust, SRDP	No	No	Grazing management (in progress)	2009	On going
Carrifran	BFT	BFT, WGS	No	Yes	Woodland creation, Grazing management, Deer control	2000	On going
Ben Lawers	NTS	SRDP	No	No	Wood restructuring, Woodland creation	2000	On going
Ben Lomond	NTS	Heritage Lottery Fund	No	Yes	Blanket bog restoration	1998	On going
Kintail	NTS	Millennium Forest for Scotland Trust	No	Yes	Woodland restoration (through deer exclosures), Deer control	1994	On going
Mar Lodge	NTS	NTS, SNH, SFGS	Yes	Yes	Deer control, Woodland edge restructuring, Clearfell (creating open space)	1995	On going

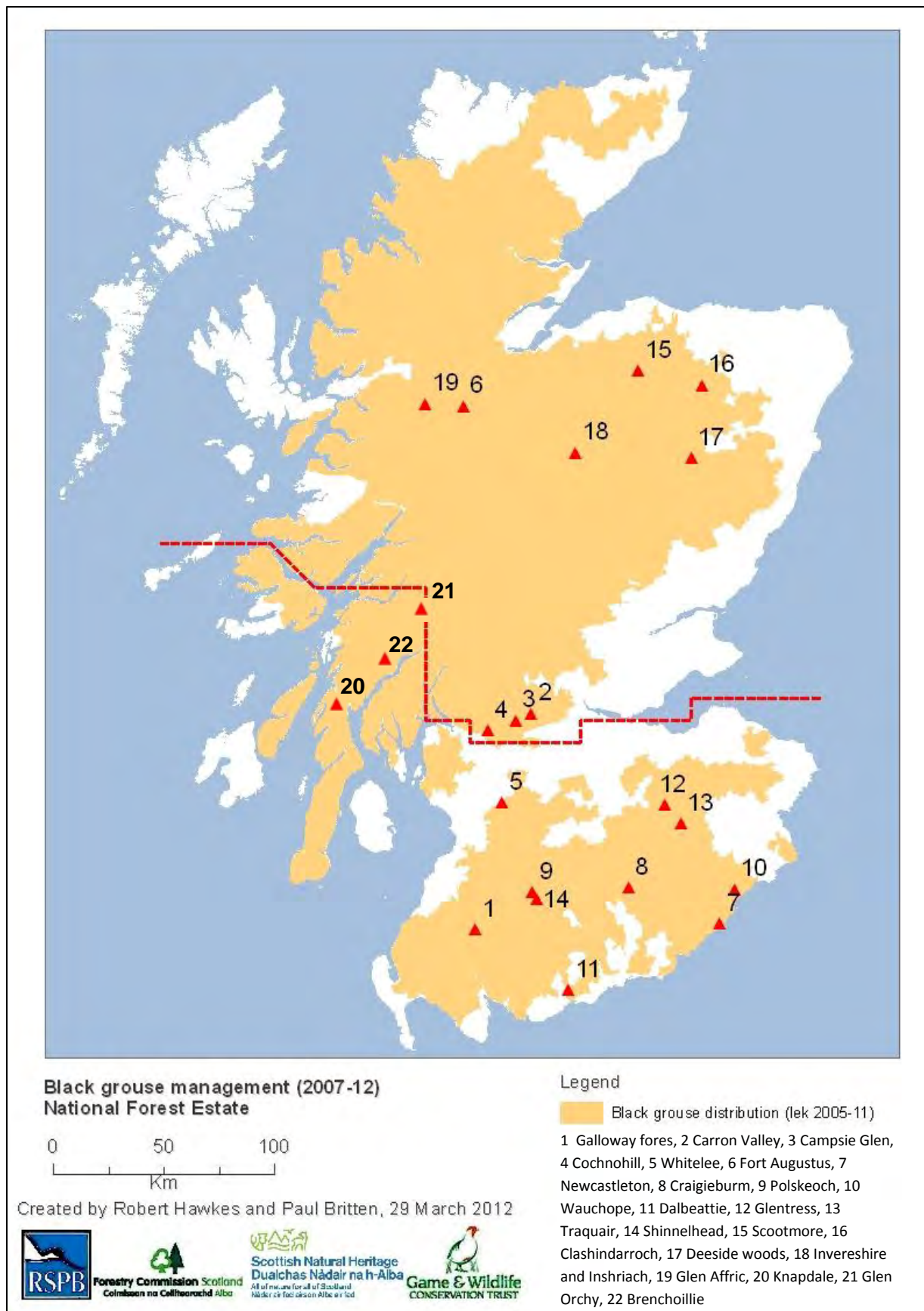


Figure 3: Areas of the National Forest Estate where dedicated black grouse management has occurred between 2007-2012.

Table 3: National Forest Estate blocks where black grouse have been actively managed since 2007.

Name of estate/ block	Organisation	Funding source	Management options			Start	End
			Predator control	Fence marking/ removal	Habitat measures		
Galloway Forest District	FCS	FCS;SNH; RSPB	Yes	Yes	Improving stand structure and diversity; heather swiping; Drain blocking	2000	On going
Carron Valley	FCS	FCS	No	No	Forest edge restructuring	2008	Unknown
Campsie Glen	FCS	FCS	Yes	Yes	Woodland creation	Unknown	Unknown
Cochnohill	FCS	FCS	No	No	Woodland creation	2009	Unknown
Whitelee	FCS	FCS	Yes	No	Deforestation; Bog removal	2007	2020
Fort Augustus (and surrounding forest blocks)	FCS	FCS	No	Yes	Stand restructuring; Woodland creation; Thinning; Forest edge restructuring; Naturalisation; Drain blocking	From 2005	2010
Newcastleton	FCS	FCS	No	No	Clear fell (creating open space); Broadleaf	2010	2012
Craigieburn	FCS	FCS	No	No	Woodland creation (broadleaf);	2009	2012
Polskeoch	FCS	FCS	No	No	Woodland creation (broadleaf); Clearfell	2008	2009
Wauchope	FCS	FCS	No	No	Woodland creation (broadleaf); Ditch blocking; Bracken spraying	2006	2012
Dalbeattie	FCS	FCS	No	No	Pond scrapes; Heather swiping; Woodland creation (broadleaf)	2007	2010
Glentress	FCS	FCS	Yes	No	No	2012	2012
Traquair	FCS	FCS	No	No	Heather swiping	2007	2007
Shinnelhead	FCS	FCS	No	No	Clearfell (creating open space); Restock	2012	2012
Scootmore	FCS	FCS	No	Yes	None	2012	2012
Clashindarroch	FCS	FCS	No	No	Wetland creation and woodland edge improvements	Unknown	Unknown
Deeside woods	FCS	FCS	Yes	no	None	2002	2010
Invershire & Inshriach	FCS; SNH	FCS; SNH	No	Yes	Grazing management; Deer control	1980's	On going
Glen Affric	FCS; SNH	FCS; SNH	No	Yes	Restructuring	Unknown	Unknown
Knapdale	FCS	FCS	No	No	Heather cutting, Removing sitka spruce, brashing sitka branches	2006	Ongoing
Glen Orchy	FCS	FCS	No	No	Heather and rush cutting	2011	Ongoing
Brenchoillie	FCS	FCS	No	No	Clearing Sitka spruce	2012	2013

## 3.2 Advisory support available for black grouse

During 2011, 14 staff across RSPB, GWCT and SUP supported black grouse management through a recovery project (4) or part of a wider RSPB role (10). Because the Dumfries and Galloway recovery project finished in 2010 only four recovery projects were recorded. In total, advisors visited 159 farms/estates and assisted 289 applications (Table 4).

### **Advisory capacity within North and South Scotland**

More farms/estates were visited and a higher number of applications were supported in the south. Support towards public forestry management (FDP) and input towards agricultural Rural Development Contracts (RDC) through SRDP was also higher in the south. However, forestry RDC input was greater in the north. Input towards positive habitat management through mitigation funds (e.g. wind farm developments) was higher across the south.

### **Advisory capacity through project officers and wider advisory roles**

Advisory officers working as part of a recovery project visited 136 farms (average 34 per officer) and input towards 142 applications (average 36 per officer) of relevance to black grouse. RSPB staff working as part of a wider role visited 23 farms (average 3 per officer) and input towards 147 applications (average 15 per officer).

Table 4: RSPB, GWCT and SUP advisory support during 2011 in North and South Scotland. n.b. \* = a recovery project, CON = Conservation Officer (an RSPB role responsible for dealing with regional conservation issues)

Advisor	No. Farms/ estates visited	No. Agricultural SRDP plans	No. FCS FDP	No. LTFP input	No. Forestry SRDP plans	No. Mitigation project plans
<b>South Scotland</b>						
Dumfries and Galloway CON (RSPB)	20	16	7	15	7	2
Dumfries and Galloway (RSPB)	0	0	0	0	0	1
Borders CON (RSPB)	0	0	0	0	0	10
Ayrshire CON (RSPB)	0	0	1	1	0	3
Central Scotland South CON (RSPB)	0	0	?	2	?	5
Argyll CON (RSPB)	0	0	6	6	0	0
Argyll and Stirling PO (RSPB)*	40	28	2	19	15	0
Borders PO (SUP)*	59	10	?	1	6	0
East Lothian Senior Advisor (GWCT)*	5	9	1	?	8	?
<b>Total</b>	<b>124</b>	<b>63</b>	<b>17</b>	<b>44</b>	<b>36</b>	<b>21</b>
<b>North Scotland</b>						
Central Scotland North CON (RSPB)	2	7	2	3	9	3
Grampian CON (RSPB)	0	0	5	3	2	0
Tayside and Fife CON (RSPB)	1	2	1	10	7	0
Uplands advisory officer (RSPB)*	32	8	1	7	27	0
North Highland advisors (RSPB)	?	0	3	3	3	2
<b>Total</b>	<b>35</b>	<b>17</b>	<b>12</b>	<b>26</b>	<b>48</b>	<b>5</b>



### 3.3 Targeting guidelines within North and South Scotland

All advisory practitioners within South Scotland identified declining populations containing leks with 3+ males as a priority for proactive engagement (identifying and approaching landowners) (Table 5). Across North Scotland proactive targeting is only offered within Forth and The Highlands. Within Forth, targeting was similar to the south, whilst practitioners within The Highlands prioritised edge of range populations. Reactive advice (the landowner/agent contacting the advisor) is generally available throughout the remainder of the Scottish range.

In all cases, advice was dependant upon a combination of factors including, the objectives of the landowner, the surrounding landscape and the demographic factor(s) limiting the local black grouse population. However, favoured management techniques were noted between regions:

- Woodland creation - Dumfries and Galloway and The Highlands.
- Woodland management - Argyll and The Highlands.
- Moorland management - all southern regions and Forth.
- Predator control - The Borders and The Highlands.
- Grassland management - The Borders.

Advisory officers within Grampian and Tayside did not consistently recommend any set of techniques; their advice is dependant upon the individual case. No response was provided for Clyde Valley or Ayrshire.

Table 5: Black grouse targeting guidance used by advisory officers within seven RPAC regions.

<b>Region</b>	<b>Organisation lead</b>	<b>Population targeting</b>	<b>Option targeting</b>
<b><u>South Scotland</u></b>			
Dumfries and Galloway	RSPB	Declining populations with leks containing 3+ males	Moorland management and woodland creation
Argyll	RSPB	Declining populations with leks containing 3+ males	Woodland management, moorland management
The Borders	GWCT, SUP	Declining populations with leks containing 3+ males within areas of high potential connectivity	Moorland management, grassland management, predator control
<b><u>North Scotland</u></b>			
Forth	RSPB	Declining populations with leks containing 3+ males	Moorland management
Tayside	RSPB	Both declining and core stable populations	Dependant upon the situation
Grampian	RSPB	None	Dependant upon the situation
Highlands	RSPB	Expanding populations	Woodland creation, woodland management, predator control

### 3.4 Gaps and limitations of SRDP

Advisory practitioners and case officers have identified several limitations with the existing black grouse package (Table 6). The Woodland Improvement Grant (WIG) currently includes a large number of sub options aimed at an array of woodland management techniques. A lack of specialism for black grouse conservation has led to a complex process which has confused many land managers and agents. No up front payment for the new native woodland creation grant and the low capital returns offered by the Woodland Improvement Grant (WIG) and moorland options were highlighted as deterrents.

The SRDP scoring system does not incentivise management within areas of high conservation concern or around priority lek sites (e.g. 3+ lekking males). Respondents highlighted this as a missed opportunity to encourage SRDP support within areas where management is required. Land managers entering an agreement are not obliged to monitor any form of biodiversity response, e.g. black grouse numbers or vegetation change. This has limited our understanding of SRDP effectiveness.

Table 6: Issues with the SRDP black grouse package as identified by advisory staff and case officers, the source of each comment is highlighted in italics. Please note, the comments identified here represent the views of individuals and not necessarily those of their organisation.

---

<b>Comment</b>
<b>Woodland Improvement Grant:</b> The WIG is not readily tailored towards black grouse conservation. Land owners currently select which options they wish to undertake from a generic list, available across all Rural Priority packages. As a result, applications generally take a large amount of time and require professional guidance to create a proposal that is potentially beneficial to black grouse ( <i>RSPB</i> ). WIG is often perceived as financially uncompetitive by landowners ( <i>RSPB</i> ), deterring them from adopting this option.
<b>Woodland Improvement Grant: Enhancing/modifying a deer/stock fence (in black grouse and capercaillie core areas):</b> Current guidelines for deer/stock fence marking are unclear and vary between guidance documents and current SRDP criteria ( <i>RSPB</i> ).
<b>Woodland creation – Native woodland planting:</b> The financial structure of this grant is a deterrent for some land owners, as successful applicants only receive a payment once they have completed the work ( <i>RSPB</i> ). The existing criteria stocking densities state a minimum of 1600 stems per ha, which has been cited as too dense for black grouse ( <i>RSPB</i> ). Concern was expressed over the lack of web guidance outlining how planting should be designed to benefit black grouse ( <i>FCS</i> ).
<b>Grazing grants:</b> Existing grants offer no guidance on minimum stock reduction levels which may be of benefit to black grouse. As a result, case officers have to assess the ‘quality’ of applications on a case by case basis ( <i>SNH</i> ). Several respondents also noted that applications which focus solely on grazing restrictions generally receive a low score, relative to new native woodland creation grants ( <i>RSPB, SUP</i> ). Low payment rates offered by these options have deterred land owners from entering the scheme.
<b>Moorland restoration and away summer grazing:</b> Moorland restoration or away summer grazing is not supported through RP. This was noted as a potential limitation ( <i>RSPB</i> ).
<b>Monitoring:</b> Recording the response effect of management (either through vegetation or population change) is not a component of the black grouse package. This effectiveness of SRDP management upon black grouse are unknown ( <i>FCS, SNH</i> ).
<b>Targeting:</b> The location and status of the lek site(s) targeted by the applicant are not considered within the scoring process, the current system does not incentivise SRDP uptake within areas of conservation concern ( <i>SNH, FCS, RSPB</i> ).

---

## 4) Discussion

### 4.1 Monitoring

An up-to-date understanding of lek distributions is required to target management effectively (Cole *et al. in prep*), whilst an overview of local productivity and survival can help to identify what demographic stage is limiting population growth (Baines *et al. 2007*). An understanding of local population trends can also help to inform management, identifying areas of conservation concern and the potential effectiveness of management.

These monitoring techniques have been used to inform the black grouse English BAP group conservation strategy, which outlines where and how management should take place across 14 regions (Warren *et al. 2011a*). Within Scotland however, although widespread lek monitoring is undertaken throughout their range, this is not annually collated at a national level or disseminated to advisors outside of specific recovery projects. Case officers and advisors often lack this information; whilst an accurate understanding of population productivity, survival and trends is limited and not widely publicised. Developing a national monitoring scheme was one of the recommendations of the monitoring review (Hawkes and Corrigan 2013).

### 4.2 Management guidance

Decisions on black grouse management are generally informed by expert advice and guidance material. In 2007, the SBAP group developed a set of national guidelines and an associated targeting map to help prioritise management. These guidelines highlighted 10 km<sup>2</sup> squares where conservation action was a priority across the northern and southern Scottish populations. Although some regional black grouse strategies have been updated since, the current national map is based on lek records and guidance developed prior to 2007.

Conservation practitioners appear to follow SBAP guidelines; encouraging management around leks with 3+ males and advocating range expansion within the north. Practitioners across the

south also consider areas of known decline as a priority, whilst stable/ increasing populations are also targeted within the north. Informed by recent localised rises in lekking males (e.g. those reported by study groups in Perthshire, Speyside, Deeside and Donside (Dugan 2012)) some practitioners consider black grouse management within North Scotland as a lower conservation priority than before.

Where black grouse conservation advice has been given, moorland management, woodland creation and woodland management were the most frequently recommended prescriptive approaches. These advisors generally recommended woodland options (woodland creation and woodland management) in the Highlands, whilst moorland options were more frequently advocated across Southern Scotland. Predator control was only recommended within two RPACS, the Borders and the Highlands. Although these variations largely reflect the local landscape character and major rural businesses, management choices can influence the success of conservation (Baines 1996, Grant *et al.* 2009, RSPB *unpublished data*). There is currently a lack of understanding concerning which options deliver the most for black grouse and whether their effectiveness differs between regions. Existing SBAP guidelines do not recommend any set of options as a conservation priority.

### 4.3 Conservation delivery

Covering an estimated 60% of the black grouse population, in Scotland, recovery projects have been the primary approach for delivering positive management across Scotland. Outwith these recovery projects, RSPB staff and land agents have also offered best practice support on a case by case basis. Positive conservation management has also occurred on nature reserves and parts of the NFE. Encouragingly, all identified efforts are within the Scottish black grouse range with the majority of work having occurred across the south, the region of greatest recent declines (Sim *et al.* 2008). Similarly, committed SRDP expenditure through the black grouse package has been greatest within the south (Hawkes 2013), potentially linked to higher levels of advisory support. As we do not fully understand how black grouse respond to management,

accurately evaluating the effectiveness of current conservation efforts is not possible within this report.

### **Recovery projects and advisory support**

Work on nature reserves and the NFE is limited by the location, availability and objectives of individual sites; as such, advisory support is a crucial tool for delivering management across the wider landscape. The success of advisory work is dependant upon the availability of sympathetic landowners willing to undertake positive management. Therefore, wider landscape management has generally been delivered opportunistically. Advisory support has been made available through a combination of approaches, including; recovery projects (generally undertaken by a project officer), regional RPSB staff, and land agents (e.g. SAC). Compared to other avenues of advisory work recovery projects have probably delivered the most for black grouse, as proportionately these officers have visited more farms/ estates and input into a greater number of applications.

Since 2007, five recovery projects have taken place. Combining black grouse monitoring with positive management advice, project officers have targeted large areas by proactively engaging with local land managers and business sectors. This approach has provided a better understanding of regional populations and delivered management within areas of conservation concern. Case officers, foresters, and land agents recognise these advisors as an essential contact for best practice guidance. Although these posts have input into a large number of management plans, several common limitations existed between these projects.

All five projects required volunteers to assist with monitoring. Where volunteers were lacking the known distribution of black grouse was often incomplete, hindering targeting guidance. Limiting management, many land managers are unwilling to adopt positive techniques or enter an agri environment contract, in part due to a number of inadequacies with RP. Where black grouse exist at low densities or over a wide area, low management uptake has hindered any

attempt to deliver conservation on a landscape scale. Finally, regional land use conflicts are frequently cited as a barrier to recovery projects (e.g. non native commercial forestry).

Employing a project officer with a complete black grouse focus and a good understanding of local land use sectors can help minimize these limitations. It is also important for any officer to build and maintain strong stakeholder relationships throughout the project. Although agri-environment uptake will always occur on a case by case basis, projects have benefited from targeting effort towards areas of good black grouse numbers and potential connectivity (informed through monitoring). In some cases, where land managers within target areas are deterred by the capital rates offered by SRDP, additional funds (e.g. wind farm mitigation money) have been used as a 'top up' incentive. Within regions where black grouse conservation is not a top priority a wider upland species post could be created. This has worked well in North Scotland, where black grouse management has been supported alongside other priority species (e.g. capercaillie, breeding waders).

Regional RSPB staff and land agencies have also provided black grouse management advice. Although their input is generally lower, such advisors often hold a permanent contract, which unlike most project officers offers stability over longer periods. At the time of writing, three recovery projects have finished (the 'Argyll and Stirling recovery project', the 'Dumfries and Galloway project officer' and the 'Southern Uplands black grouse project'). Within areas of conservation concern, the loss of recovery projects is a potential threat to the future stability of black grouse populations.

### **Nature reserves**

Black grouse management has occurred across at least 12 nature reserves since 2007 (ten of which are designated for their nature conservation value). Unlike wider advisory work on private land holdings, black grouse conservation on these sites is often a primary management objective. These reserves have adopted a variety of habitat measures, with some sites also undertaking localised predator control and fence removal/markings. A recent study at three of



these reserves (Abernethy, Corrimony, Creag Meagaidh) noted a significant rise in productivity and lekking males following the application of targeted management (Grant *et al.* 2009). It is possible that similar benefits have also been realised elsewhere. Positive management across all 12 nature reserves work is likely to remain ongoing; however, for many sites, this is dependant upon continued agri-environment support.

### **National Forest estate**

NFE management for black grouse has taken place across at least 22 forests areas since 2007. In 2010/11 alone this involved 10,000 ha of predator control, 4546 ha of habitat improvement, 22.3 km of drain blocking, and 14,270 m of fence removal (Patterson 2012). Suitable forestry management can create a number of opportunities for black grouse (Haysom 2001, Pearce-Higgins *et al.* 2007, Owen 2011). It is possible that these efforts have benefited local populations. It is hoped that a recently established NFE monitoring programme will provide a better indication of where future management is needed.

FCS have extended their 'Woods for Nature' programme until 2014, with black grouse remaining a priority species on the NFE. It is anticipated that the results of a five year TMP, exploring the effect of different forestry practices upon black grouse, will help to inform future management.

### **Other mechanisms of conservation delivery**

Conservation action reported within this paper does not cover the full extent of black grouse management within Scotland. For example, sporting estates managed for red grouse shoots often provide the right conditions for black grouse to benefit (e.g. grazing control, muirburn, low predator densities) (Baines 1996, Starling-Westerberg 2001, Summers *et al.* 2004), especially where small pockets of trees or scrubs are locally available (Warren *et al.* in press). Other initiatives of potential benefit to black grouse include: wind farm mitigation projects,

community conservation projects, and additional estates undertaking management outwith a grant scheme.

#### 4.4 Gaps and limitations of delivering black grouse conservation through SRDP

SRDP probably represents the largest capital incentive towards black grouse management in Scotland, recovery projects and many nature reserves depend upon this support. Although over £8 million has been invested through the black grouse package (Hawkes 2013), advisory practitioners and case officers contacted as part of this report identified several concerns about the existing scheme. Table 7 highlights the key issues reported by these practitioners, the implications for black grouse conservation and what could be done to resolve the problem.

Table 7: Issues with the SRDP black grouse package and their potential implication towards conservation. Potential solutions are also provided

<b>Issue</b>	<b>Implications</b>	<b>Potential solution</b>
A lack of black grouse specific conservation guidance with some grants (i.e. woodland improvement grant, new native woodland and grazing grants).	The current system is confusing for land owners wishing to adopt favourable black grouse management, potentially reducing the effectiveness of the resulting applications.	Developing alternative models for key options (e.g. lower new native woodland stocking densities).
Moorland management grants generally receive a low score compared to woodland creation.	Enhancing moorland habitats is not a national priority; as such, applications do not always achieve a high enough score to receive RPAC approval.	Altering the scoring criteria to reflect moorland management as an important technique of black grouse.
The payment structure/rates of new native woodland grants and the woodland improvement grant.	No up front payment with new native woodland grants and the low payment rates of woodland improvement grants have deterred some applicants.	Altering the payment structure of existing options.
The effectiveness of existing SRDP management is unknown.	We are currently unaware how or whether the scheme is delivering for black grouse.	Studying black grouse response to grant application.
Two potentially important management techniques are not included as an option (moorland restoration and away summer cattle grazing).	Although this was only highlighted as a limitation in one instance, not covering the full range of suitable techniques could limit the efficiency of management.	Including both techniques as an RP option.
No incentive to carry out black grouse management within priority areas (e.g. surrounding leks with 3+ males).	The current scoring system does not assist applications targeting key lek sites, potentially deterring applicants within priority areas.	Altering the scoring criteria to reflect the importance of black grouse conservation within said areas.

## 5) Conclusions

It is widely accepted that current black grouse conservation efforts will need to be maintained if the SBAP objectives are to be realised. To date, management has been delivered throughout the Scottish range on nature reserves, sporting estates, the NFE, and through advisory roles. Encouragingly, the level of advisory support is currently highest across Southern Scotland, where black grouse have recently faced the largest declines.

A number of issues are currently limiting the efficacy of black grouse conservation delivery, including: the adequacy and use of monitoring information, the relevance of existing SBAP guidelines, our understanding of how black grouse respond to key options and the structure of SRDP. Additionally, the loss of advisory projects, which support black grouse conservation across the wider landscape, is a threat. Although work for this species is likely to continue, the extent and efficiency of future management is dependant upon continued financial support and coordination amongst all SBAP partners.

The majority of the Scottish black grouse population exist beyond nature reserves and the NFE. Therefore to provide future management within areas of conservation concern, SBAP partners will need to adopt a landscape scale approach to conservation. Ideally this will link together protected areas, reserves, the NFE, and areas managed sympathetically by other land managers, helping to maintain population connectivity and encourage recovery. Developing new recovery projects within areas of conservation concern and providing reactive advisory support throughout the remainder of the range could represent one such approach.

## 6) Recommendations

This section outlines a number of recommendations to the black grouse SBAP group, identifying the major limitations of conservation delivery and how these could compromise the objectives of the group (appendix 1). It is intended that these will provide a basis for informing future work priorities and resource provision between SBAP partners.

### 6.1 Monitoring information

**The issue:** Information on lek distributions, productivity, survival and trends is not always available or efficiently fed into conservation work

**Relevance to SBAP objectives:** For the SBAP group to ‘report black grouse trends and supply data to national conservation recording incentives’ and ‘provide best management practice advice to landowners’ adequate monitoring information is required.

**Potential solutions:**

1. Local monitoring initiatives could communicate their findings, providing SBAP partners with an annual report of black grouse performance (Hawkes and Corrigan 2013). Where possible, information should be recorded on the National Biodiversity network (NBN) and used to inform an SBAP conservation strategy.
2. An up to date understanding of population productivity and survival across the Scottish range would provide an evidence basis for targeting appropriate action towards the demographic stage(s) limiting recovery or growth.

### 6.2 Prioritising management

**The issue:** There is a lack of understanding and common agreement concerning which key options should be delivered where, whilst current SBAP guidelines need to be reviewed.

**Relevance to SBAP objectives:** Agreement on updated targeting and management guidance is needed between SBAP partners if we are to ‘identify gaps in knowledge relating to black grouse’, ‘disseminate best practice management advice to practitioners’ and ‘to provide collaborative advisory publications’.

**Potential solutions:**

1. Review targeting guidance in time for the second round of SRDP.
2. Monitoring information should be used to regularly up date targeting maps.
3. SBAP partners should review existing guidelines periodically.

### **6.3 SRDP structure**

**The issue:** Several issues exist with the current SRDP black grouse package, potentially compromising the efficiency of management.

**Relevance to SBAP objectives:** ‘Resolving key barriers to black grouse conservation work’ and ‘working with Scottish government, and its agencies to produce best practice management prescriptions for inclusion in public land management incentive schemes’ are key objectives of the SBAP group.

**Potential solutions:**

1. Continue advocacy work to reinforce the importance of targeted SRDP support for black grouse.
2. Informed by the concerns outlined in Table 8, partner organisations should input into the next round of SRDP through working groups.

### **6.4 Management delivery**

**The issue:** Although conservation action is likely to continue, this report noted a likely loss of future advice capacity.

**Relevance to SBAP objectives:** Conservation management is the primary mechanism for achieving the SBAP targets of population recovery and range expansion.

**Potential solutions:**

1. SBAP partners could develop recovery projects within priority areas, supporting management decisions on nature reserves and the NFE whilst encouraging wider buy in through SRDP
2. Conservation delivery between SBAP partners should be better coordinated, focusing within key hotspots as identified by targeting guidance.
3. Several organisations are shifting to a broader ecosystem approach to conservation. Many management techniques for black grouse have wider ecosystem benefits (e.g. moorland management can also provide suitable wader habitats). To encourage future support (e.g. recovery projects) conservation action could focus on a wider group of upland species.

## **6.5 Management effectiveness**

**The issue:** The benefits of management conservation management are widely unknown, understanding where and whether management is delivering for black grouse is crucial if SBAP partners are to continue resourcing expensive recovery work.

**Relevance to SBAP objectives:** ‘Identifying gaps in knowledge relating to black grouse’ is a key task of the SBAP group. Providing a better understanding of how and where management is delivering will help to support future decisions.

**Potential solutions:**

1. In line with the recommendations from the second conservation review project report (Hawkes 2013), research could investigate the effects of management (through SRDP or otherwise) on black grouse performance.

## **7) Acknowledgements**

We would like to thank all the practitioners who contributed towards this report, and the Bird Conservation Targeting Project partners for providing the black grouse distribution data. The constructive inputs of Chris Bailey, Sue Haysom, Gordon Patterson, Phil Warren on earlier drafts are also highly appreciated.



## 8) References

Baines, D. (1996) The implications of grazing and predation management on the habitats and breeding success of black grouse *Tetrao tetrix*. *Journal of Applied Ecology*, 33, pp 54-62.

Baines, D., Warren, P., & Richardson, M. (2007) Variations in the vital rates of black grouse (*Tetrao tetrix*) in the United Kingdom. *Wildlife Biology*, 13, (Suppl 1), pp 109-116.

Biodiversity Action Reporting System. (2006) Targets and outcomes, National and local targets, *Tetrao tetrix* (Black grouse). Accessed at: [http://ukbars.defra.gov.uk/archive/outcomes/targets\\_nationals.asp?X=%7B16909245-B7D0-4FAD-9B6954B49A80B3D0%7D&C=1&flipLang=&txtLogout=](http://ukbars.defra.gov.uk/archive/outcomes/targets_nationals.asp?X=%7B16909245-B7D0-4FAD-9B6954B49A80B3D0%7D&C=1&flipLang=&txtLogout=), Accessed on: 12/04/2012.

Cole, J., Gordon, J., Fraser, A., Boles, Y., O'Brien, M., & Grant, M. (2012) A Review of Management Prescriptions Advocated and Considered by RSPB staff for Black Grouse *Tetrao tetrix* in Britain: An update and revision, *RSPB report*.

Dugan, D. (2012) Black Grouse Study Group: Speyside News, *Unpublished report*.

ESRI. (2011) ArcGIS Desktop: Release 10. Redlands, CA: Environmental Systems Research Institute.

Grant, M.C., Cowie, N., Donald, C., Dugan, D., Johnstone, I., Lindley, P., Moncreiff, R., Pearce-Higgins, J.W., Thorpe, R. & Tomes, D. (2009) Black grouse response to dedicated conservation management. *Folia Zoologica*, 58, pp 195-206.

Gregory, R.D., Wilkinson, N.I., Noble, D.G., Robinson, J.A., Brown, A.F., Hughes, J., Procter, D.A., Gibbons, D.W. & Galbraith, C.A. (2002) The population status of birds in the United Kingdom,

Channel Islands and Isle of Man: an analysis of conservation concern 2002–2007. *British Birds*, 95, pp 410–450.

Hawkes, R.W., and Corrigan, A. (2013) Black Grouse Conservation Review: Monitoring in Scotland, *RSPB report to Forestry Commission Scotland, the Game and Wildlife Conservation Trust and Scottish Natural Heritage*

Hawkes, R.W. (2013) Black Grouse Conservation Review: Scotland Rural Development Programme spend, *RSPB report to Forestry Commission Scotland, the Game and Wildlife Conservation Trust and Scottish Natural Heritage*

Haysom, S.L. (2001) Aspects of the ecology of black grouse (*Tetrao tetrix*) in plantation forests in Scotland. *Unpublished PhD Thesis, University of Stirling*.

Höglund, J., Larsson, J.K., Corrales, C., Santaf, G., Baines, D., and Segelbacher, G. (2011) Genetic structure among black grouse in Britain: implications for designing conservation units. *Animal Conservation*, pp 14 (4), pp 400-408.

Holloway, S. (2006) The Historical Atlas of Breeding Birds in Britain and Ireland: 1870–1900. *British Trust for Ornithology & Poyser*, London.

Owen, J. (2011) Provision of habitat for black grouse *Tetrao tetrix* in commercial forest restocks in relation to their management, *Unpublished PhD thesis, University of Stirling*.

Patterson, G. (2012) Woods for Nature: FCS Biodiversity Programme Progress Report 2010/11. Accessed at: [http://www.forestry.gov.uk/pdf/WoodsforNatureProgressreport2010-11.pdf/\\$FILE/WoodsforNatureProgressreport2010-11.pdf](http://www.forestry.gov.uk/pdf/WoodsforNatureProgressreport2010-11.pdf/$FILE/WoodsforNatureProgressreport2010-11.pdf), Accessed on: 03/05/2012.

Pearce-Higgins, J.W., Grant, M.C., Robinson, M.C., & Haysom S.L. (2007) The role of forest maturation in causing the decline of black grouse *Tetrao tetrix*. *Ibis*, 149, pp 143-155.

Sim, I.M.W., Eaton, M.A., Setchfield, R.P., Warren, P.K., & Lindley, P. (2008) Abundance of male Black Grouse *Tetrao tetrix* in Britain in 2005, and change since 1995-96. *Bird Study*, 55, pp 304-313.

Starling-Westerberg, A. (2001) The habitat use and diet of black grouse *Tetrao tetrix* in the Pennine hills of northern England. *Bird Study*, 48, pp 76-89.

Summers, R.W., Green, R.E., Proctor, R., Dugan, D., Lambie, D., Moncrieff, R., Moss, R., & Baines, D. (2004) An experimental study of the effects of predation on the breeding productivity of capercaillie and black grouse. *Journal of Applied Ecology*, 41, pp 513-525.

Warren, P.K., Atterton, F., and Baines, D. (2011a) Strategic Approach to Delivering Black Grouse Biodiversity Action Plan Targets in Northern England, *Unpublished report*.

Warren, P.K., Atterton, F., and Baines, D. (2011b) Evaluating the habitat use and connectivity between black grouse in Northern England and those in southern Scotland, *Unpublished report*.

Warren, P., White, P., Baines, D., Atterton, F., and Brown, M. (*in press*) Variations in Black Grouse *Tetrao tetrix* winter survival in a year with prolonged snow cover

# Appendix 1

## Black grouse SBAP objectives (May 2012)

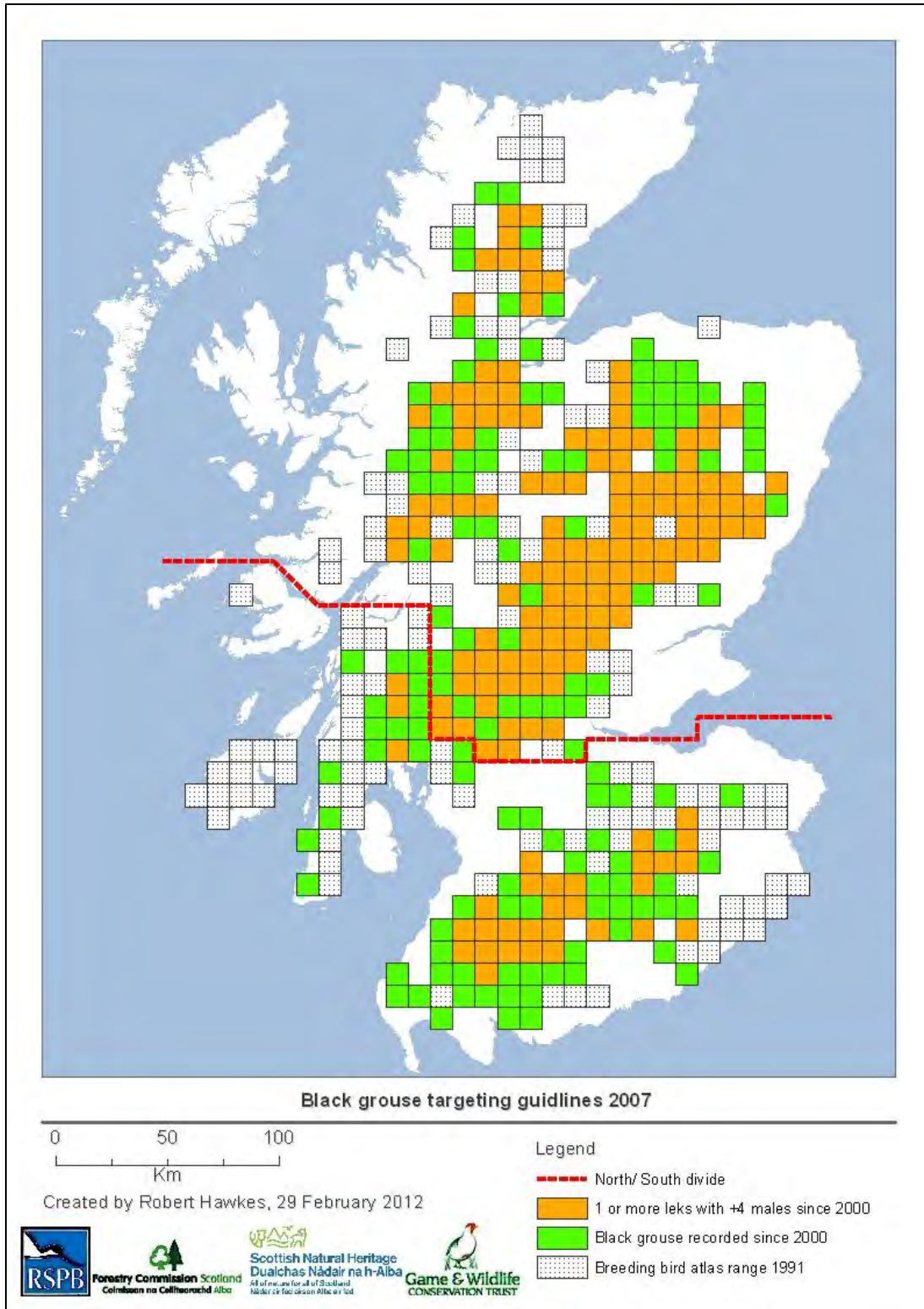
### Targets

- Black grouse status: 3250 males by 2030
- Black grouse range: 230 10km<sup>2</sup> grid squares by 2030

### Key tasks

- To coordinate monitoring efforts to track the Scottish population status of black grouse and develop best practice survey methodologies.
- To develop appropriate reporting of black grouse population trends and to supply data to national conservation recording initiatives, such as the National Biodiversity Network.
- To identify gaps in knowledge relating to black grouse. To develop collaborative scientific research proposals, and share information on most recent research.
- To provide best management practice advice to landowners based upon best available science.
- To disseminate best practice management advice to practitioners through a variety of communication tools.
- To collaborate on black grouse demonstration events, conferences and advisory publications.
- To work with Scottish Government, and its agencies to produce best practice management prescriptions for black grouse for inclusion in public land management incentive schemes.
- To identify key barriers to progress with black grouse conservation and seek resolution of these issues.

# Appendix 2



The national black grouse targeting guidelines agreed by the black grouse SBAP group in 2007 based upon known lek locations from 2000 to 2007