

## Preliminary results from a translocation trial to stimulate black grouse *Tetrao tetrix* range expansion in northern England

Collection of papers from the 4<sup>th</sup> International Black Grouse Conference

Kim MC EWEN, Philip WARREN\* and David BAINES

Game & Wildlife Conservation Trust, The Gillett, Forest-in-Teesdale, Barnard Castle, County Durham DL12 0HA, UK; \*e-mail: pwarren@gwct.org.uk

Received 25 August 2008; Accepted 2 March 2009

**A b s t r a c t.** Following the instigation of conservation measures, black grouse in England have increased in numbers from 773 males in 1998 to 1029 males in 2006, but their range has not expanded. Range expansion may be limited by the low dispersal rates of male black grouse, with yearling males dispersing on average 0.8 km, compared to 9.3 km by females. To expand the range of black grouse into suitable habitats on the fringe of their range we commenced a translocation trial in the winter of 2006/7. Two release sites were selected which were considered to have suitable habitat to sustain a lekking group, had full time predator controllers operating and were within the dispersal range of yearling females. Thirteen males equipped with radio transmitters were released, eight at one site, five at the other. All were observed lekking and females were subsequently seen at both release sites.

**Key words:** translocation, range expansion, radio telemetry

### Introduction

Black grouse *Tetrao tetrix* in the UK are a species of high conservation concern, following a decline in numbers and range over the past 150 years (G l a d s t o n e 1924, B a i n e s & H u d s o n 1995, H a n c o c k et al. 1999). They are recognised as a ‘Priority Species’ under the UK Government’s Biodiversity Action Plan (BAP) ([www.ukbap.org.uk](http://www.ukbap.org.uk)), with a Species Action Plan in place to increase both numbers and range by 2010. Following the instigation of conservation measures in England (W a r r e n & B a i n e s 2004), black grouse have increased from 773 displaying males in 1998 to 1 029 in 2006 (W a r r e n & B a i n e s 2008), but their range has remained relatively stable. Conservation efforts are now focused on expanding their range into formerly occupied areas on the current fringe of the range. Female black grouse possess good dispersal abilities (C a i z e r g u e s & E l l i s o n 2002, M a r j a k a n g a s & K i v i n i e m i 2005), with juvenile females in northern England dispersing on average 9.3 km (W a r r e n & B a i n e s 2002). Male dispersal is more limited, with males in northern England dispersing only an average of 0.8 km. These findings suggest that yearling females may disperse into and re-colonise areas of suitable habitat on the fringe of the range where there are no males present. Therefore to stimulate range expansion we have instigated a trial to establish new leks on the fringe of the range by moving males to attract dispersing females. This paper reports on the preliminary results from this trial.

### Study Area

Black grouse in England are now restricted to the northern Pennine hills (W a r r e n & B a i n e s 2008), which incorporates parts of County Durham, North Yorkshire, Cumbria

---

\* Corresponding author

and Northumberland. In this region, 90% of the remaining black grouse are found associated with grouse moors, where full time gamekeepers are employed to rotationally burn heather *Calluna vulgaris* and control generalist predators, to provide harvestable surpluses of red grouse *Lagopus lagopus scoticus* for driven shooting (Hudson & Newborn 1995). Black grouse frequent the transition zone between heather moorland managed as grouse moor on the higher ground, and rough grazing managed by hill farmers for sheep and cattle on the valley slopes. Here black grouse utilise a mosaic of habitats throughout the year including blanket bog, rough grassland, heather moor, herb-rich meadows and pastures (Baines 1994, Starling - Westerberg 2001, Beeston et al. 2005).

## Materials and Methods

The trial was developed according to the International Union for the Conservation of Nature and Natural Resources (IUCN) guidelines on re-introduction (IUCN 1998). Candidate release sites were required that had suitable habitat mosaics that could support lekking groups of black grouse and were within the average dispersal distance of juvenile females (9 km) from existing lekking groups, where numbers had increased between the 1998, 2002 and 2006 national surveys. Selected release sites were on the fringes of grouse moors where gamekeepers controlled predators and where human disturbance was considered to be low.

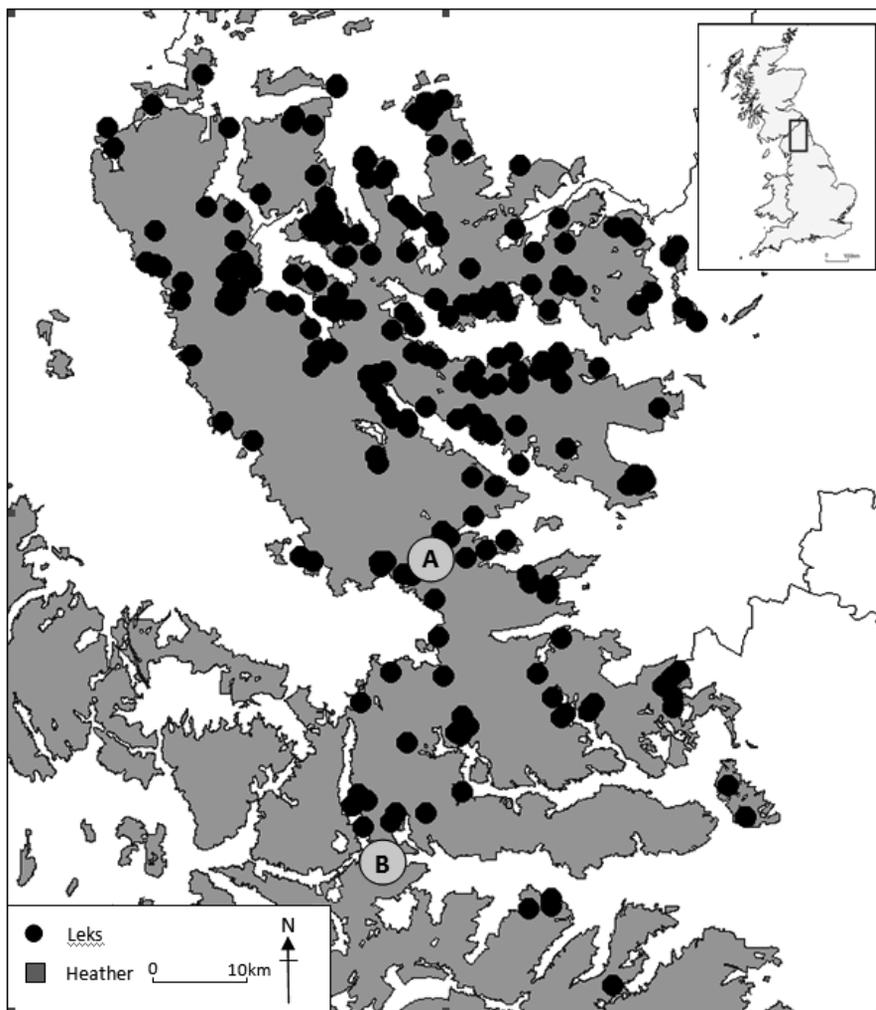
To identify candidate release sites we used a MapInfo GIS package ([www.MapInfo.com](http://www.MapInfo.com)), with the 1998, 2002 and 2006 distribution of black grouse leks (Warren & Baines 2008) and a 9 km radius buffer layer, overlaid onto a map of managed grouse moors. Twelve candidate sites were initially identified, which were then assessed according to the following criteria to identify the two most appropriate sites. First that heather moorland and rough grazing comprised greater than 50% of the area within a 1.5 km radius of the intended release area determined from field visits and aerial photographs. In addition, to ensure that these habitats were in good condition and protected from agricultural intensification, we consulted the DEFRA Magic website ([www.magic.gov.uk](http://www.magic.gov.uk)) to ensure that 75% of the land within the 1.5 km radius of the release site were within agri-environment schemes. Release sites were also required to be on grouse moors where gamekeepers controlled predators. Potential human recreational disturbance at the candidate release sites was minimised by selecting sites with few Public Rights of Way using 1:25 000 Ordnance Survey maps.

Donor lekking groups from which males could be removed were selected that had greater than ten displaying males and were stable or increasing from the 1998, 2002 and 2006 surveys (Warren & Baines 2008). Up to two males were removed from any one lekking group. Males were located at wintering grounds within 1.5 km of lek sites at night time roosts using a high powered lamp and caught with a hand-held net and placed in transportation cages and taken to the release sites immediately. The males were released directly into areas of tall heather, away from obstructions such as fences and overhead wires. The handling time from catch to release took less than three hours. Twelve of the thirteen males were fitted with 17-g necklace radio-transmitters (Biotrack Ltd, UK). Males were located weekly, by triangulating, using a portable Telonics receiver and Yagi antenna, with birds only flushed in the event that the bird had not moved from its last location. Dawn observations were undertaken weekly from March through to May to observe lekking behaviour and lek formation.

## Results

Two release sites were selected, the first at Lunedale, County Durham, situated between two lekking groups and the second at Mossdale, North Yorkshire, which is on the southern fringe of the range (Fig. 1). Thirteen males were moved, five (three adults, two juveniles) were released at Lunedale between the 16 and 26 November 2006 and eight (all adults) were released at Mossdale between 21 February and 28 March 2007 (Table 1).

At Lunedale, two of the adults returned back to their capture sites 6 km away, one within four days of release and the other after three months in mid-February. The two juveniles were observed lekking together on the 12 April and on a further four occasions up to 24 May, at a site 2.5 km from the release site. The remaining adult was observed feeding with one of the released juveniles in mid-March but subsequently the signal was lost. In July, a female with a brood was observed within 200 m of the new lek established by the juvenile males.



**Fig. 1.** The location of the two release sites, Lunedale (A) and Mossdale (B), in association with the distribution of leks in northern England in 2006 and the extent of heather moorland.

**Table 1.** The distance from donor sites and date of release of the translocated males and the distance of observed lekking males from the release sites and their fate.

Release Site	Age	Distance from donor to release site (km)	Release date	Distance observed lekking from release site (km)	Status on 1 September 2007
Lunedale	Adult	5.5	16/11/2007	Returned to donor site	Alive
	Juvenile	5.5	16/11/2007	2.5	Alive
	Adult	5.5	16/11/2007	Returned to donor site	Alive
	Adult	24.4	26/11/2007	Radio Failure	
	Juvenile	24.4	26/11/2007	2.5	Alive
Mosssdale	Adult	40.2	21/02/2007	1.5	Dead
	Adult	40.2	21/02/2007	Not tagged	
	Adult	50.8	13/02/2007	8.6	Alive
	Adult	50.8	13/02/2007	8.2	Alive
	Adult	13.8	13/03/2007	Returned to donor site	Alive
	Adult	13.8	13/03/2007	6.8	Alive
	Adult	47.1	28/03/2007	8.0	Dead
Adult	47.1	28/03/2007	9.7	Alive	

At Mosssdale, one of the adults returned to its capture site, 14 km away, within four weeks of release. One was observed lekking 8 km from the release area with an untagged male, with two females present on 9 May. This male was observed lekking at the same site with the untagged male on a further four occasions up to 30 May and on the 25 May was observed lekking with two untagged males. The other five males were observed lekking individually on average 7 km (range 1.5 – 9.7 km) from the release site.

No mortality was recorded until August when two adult males were recovered at Mosssdale, but their cause of death could not be ascertained.

## Discussion

The preliminary results of this trial show that males can be caught at night time roosts, moved and released successfully. From our small sample, it is evident that males need to be moved a minimum distance of 15 km from their capture site, as three of the four adult males moved less than this distance, returned back to their pre-release areas. Our data suggest that juveniles may be more suited to translocation than adults, as both juveniles translocated remained and displayed within 2.5 km of the release site, whereas adults tended to be more mobile. Survival of the released males was good with no deaths within six months of translocating suggesting that the techniques used were appropriate and selected sites and their environs were suitable.

The success of the trial is also dependent on attracting females to settle and breed. At the Lunedale release site a female with chicks was observed and at Mosssdale, two females visited a lek. Following wet weather post-hatching breeding success in northern England in 2007 was very low, at only 0.3 chicks per female. This will have severely limited natural recruitment and has affected the release programme in 2007/08. Originally, we intended to move similar numbers of juveniles and adults to the release areas, but few juveniles were produced to translocate. Consequently 20 adult males, ten to each site will be released in winter 2007/08, with a further 20 juvenile males, ten to each site released in winter 2008/09.

To date seven males have been successfully moved in November to the Mossdale release site and no further deaths have been observed.

#### A c k n o w l e d g e m e n t s

We would like to thank the landowners and gamekeepers at both the donor and recipient sites for their generosity donating males and allowing access to the study areas. We would also like to thank Mike Richardson, Dave Newborn, Michelle Phillips, Richard Goswell, Tom Hornby and Liam Stokes for their assistance with the catching and transfer of males. We would also like to thank Sita Trust for funding the monitoring component of this trial and the North Pennines Black Grouse Recovery Project partners (Game & Wildlife Conservation Trust, RSPB, Natural England, Ministry of Defence, Northumbrian Water and the North Pennines AONB Partnership) for funding the wider work of the project.

#### L I T E R A T U R E

- Baines D. 1994: Seasonal differences in habitat selection by black grouse *Tetrao tetrix* in the northern Pennines, England. *Ibis* 136: 39–43.
- Baines D. & Hudson P. 1995: The decline of black grouse in Scotland and northern England. *Bird Study* 42: 122–131.
- Beeston R., Baines D. & Richardson M. 2005: Seasonal and between-sex differences in the diet of black grouse *Tetrao tetrix*. *Bird Study* 52: 276–281.
- Caizergues A. & Ellison L.N. 2002: Natal dispersal and its consequences in black grouse *Tetrao tetrix*. *Ibis* 144: 478–487.
- Gladstone H.S. 1924: The distribution of black grouse in Britain. *British Birds* 18: 66–68.
- Hancock M., Baines D., Gibbons D., Etheridge B. & Shepherd M. 1999: Status of male black grouse *Tetrao tetrix* in Britain in 1995–96. *Bird Study* 46: 1–15.
- Hudson P.J. & Newborn D. 1995: Red grouse and moorland management. *Game Conservancy Trust, Fordingbridge, UK*.
- IUCN 1998: Guidelines for re-introductions. Prepared by the IUCN/SSC Re-introduction Specialist Group. *Gland, Switzerland and Cambridge, UK*. Available at [www.iucnsscrsg.org/policy\\_guidelines.html](http://www.iucnsscrsg.org/policy_guidelines.html)
- Marjakangas A. & Kiviniemi S. 2005: Dispersal and migration of female black grouse *Tetrao tetrix* in eastern central Finland. *Ornis Fenn.* 82: 107–116.
- Starling-Westerberg A. 2001: The habitat use and diet of black grouse *Tetrao tetrix* in the Pennine Hills of Northern England. *Bird Study* 48: 76–89.
- Warren P. & Baines D. 2002: Dispersal, survival and causes of mortality in black grouse *Tetrao tetrix* in northern England. *Wildl. Biol.* 8: 129–135.
- Warren P. & Baines D. 2004: Black grouse in northern England: stemming the decline. *British Birds* 97: 183–189.
- Warren P. & Baines D. 2008: The current status and recent trends in numbers and distribution of black grouse *Tetrao tetrix* in northern England. *Bird Study* 55: 94–99.