

Appendix 4

Capercaillie; background information

The Scottish capercaillie population declined significantly between the 1970s and 1990s. From an estimated 20,000 birds in 1970, numbers fell to 2189 birds in the first national survey in 1993/94. A survey in 1998/99 estimated a population of just 1073 birds (95% C.I. 549-2041) - a decline of 51% between the two surveys. The 2003/04 survey gave an estimate of 1980 birds, which could potentially be considered an overestimate in light of results developing from the 2009/10 survey which indicates a population size of 1285 (a non-statistically significant decline) (Ewing *et al.* 2012). Despite this uncertainty, it is considered that the national population of capercaillie is currently stable after a period of rapid and significant decline (Eaton *et al.* 2007). However, the national population is still small (the UKBAP target for the species was 5000 birds by 2010 and this target has clearly not been met) and its range is contracting significantly. The 2003/04 Capercaillie national survey suggested that the range of Capercaillie had contracted into core habitat, with over 60% of all birds recorded occurring in Strathspey (Eaton *et al.* 2007). This figure has recently been estimated to now be c.75% in Strathspey (Poole, 2010) due to reductions elsewhere. 77% of Capercaillie cocks observed during lek surveys from the spring of 2012 were in Strathspey (Table 9.). Although capercaillie numbers have held up in Strathspey, the population is now extremely vulnerable elsewhere. Capercaillie persist in other areas (Deeside, Donside, Easter Ross, Moray and Perthshire) but these populations are more fragmented, numbers are lower and breeding success poorer. The Strathspey capercaillie population is crucial to the long-term survival of the species in the UK.

Table 1. Summary of total and average number of cocks on active leks in Scotland in 2012:

| Region | No. of active leks | Min No. of cocks | Mean cocks/lek |
|----------------------------|--------------------|------------------|----------------|
| Perthshire and Loch Lomond | 2 | 3 | 1.50 |
| Deeside and Donside | 12 | 19 | 1.58 |
| Moray and Nairnshire | 9 | 12 | 1.33 |
| Easter Ross | 6 | 13 | 2.17 |
| Strathspey | 42 | 155 | 3.69 |
| TOTAL | 71 | 202 | 3.00 |

The Cairngorms SPA is one of five SPAs in Badenoch and Strathspey. Together with a number of undesignated woodlands they form a network of habitat for the species that contains the meta-population described above. The other SPAs are Abernethy Forest, Kinveachy Forest, Craigmore Wood and Anagagh Wood. The network of habitat is functional because of the relative proximity of the SPAs to the other woodlands which often act as stepping stones between them. The distance capercaillie will disperse has been subject to a number of studies. Storch (1995) radio-tracked 40 capercaillie in the Bavarian Alps and found that throughout the year distances of females from the leks they attended in spring averaged 1.3 km (Standard Error = 0.1 km). In winter and spring males aggregated within a 1 km radius of the lek, but dispersed within a 3 – 4 km radius during summer. Storch (2001 cited in Moss *et al.* 2006) concluded that most males settle close to their chick range but young female dispersal distances were typically 5 – 10 km. A radio-tracking study of males at leks in Russia and Norway recorded average dispersal distance of males to summer range of 2.3 km, SE = 0.37 (Russia 2.2.km, SE = 0.70; Norway 2.4 km, SE = 0.43) (Hjelford *et al.* 2000). Storch &

Segelbacher (2000) summarised known movements as average seasonal movements of 1 – 2 km for adults and median dispersal distances of < 10 km for juveniles. The distances recorded in a Scottish study (Moss *et al.* 2006) are somewhat longer than those above, which may be related to the fragmented nature of Scottish forests. This study showed first-winter dispersal distances of 13 hens radio-tracked ranged within 1 – 30 km (median: 11, mean 12.3, SD 9.8).

Habitat suitable for capercaillie in Scotland is heavily fragmented into comparatively small areas of forest. None of the capercaillie populations in these individual woodlands have the capability to be self-sustaining in the long term. For genetic diversity to prevent inbreeding depression, discrete groups of birds must be linked with nearby groups (i.e. recruiting and exporting birds) forming a meta-population. Conservation of capercaillie requires consideration at this meta-population scale as well as at the scale of individual sites.

Sensitivity of capercaillie to disturbance

Capercaillie is listed in Schedule 1 Part 1 of the Wildlife and Countryside Act 1981 and Annex 1 of the EU Birds Directive. It is a criminal offence to intentionally or recklessly disturb leking or breeding capercaillie. According to Article 6.2 of the EU Habitats Directive: 'Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, ***in so far as such disturbance could be significant in relation to the objectives of this Directive.***' Article 7 of the Habitats Directive states that Article 6.2 applies to the Birds Directive.

There is a growing body of evidence indicating capercaillie and other grouse species are adversely affected by disturbance resulting from human recreational activities. Our knowledge on the impacts of recreational disturbance has increased during the last few years due to the increasing body of research undertaken, although it is difficult to measure scientifically. Human disturbance and disturbance by dogs can affect capercaillie by reducing the availability of otherwise suitable habitat (including habitat used for roosting, feeding, nesting and brood rearing), displacing the birds from leks, disrupting behaviour patterns, increasing the risk of predation, separating chicks from hens and the direct killing of chicks and adult birds. These effects can occur separately or additively. Capercaillie are sensitive to disturbance at all life stages but especially so when attending leks, incubating eggs (late April to mid June) or rearing broods (late May - late August but critically during June and July when the chicks are small and dependent on the hen for warmth), which coincides with when people are mostly likely to be using the woods. Reported responses to disturbance include a decline in local capercaillie numbers (Brenot *et al.* 1996 cited in Thiel *et al.* 2007) and abandonment of lek sites (Labigand & Munier 1989 cited in Thiel *et al.* 2007).

Capercaillie have been shown to avoid habitat close to tracks, which may reduce overall carrying capacity in forests with a high density of tracks. Fewer droppings are found in areas of woodland close to heavily used tracks. A study in neighbouring Abernethy Forest estimated that 21-41% of suitable woodland habitat at Abernethy could be lost due to avoidance of tracks by capercaillie (Summers *et al.*, 2007). The studies looking at the distribution of capercaillie droppings on transects in Boat of Garten woods found that droppings were sparser within 700 m of a much-disturbed zone near the village (significantly so up to 250 m), and within 250 m of tracks (significantly so up to 120 m). Results were consistent with those from other studies at Anagach Woods and Glenmore Forest. Distances between tracks of > 500 m are required to provide capercaillie with relatively peaceful havens between tracks. Cocks' droppings were about twice as common as hens, suggesting a sex ratio skew (consistent with evidence that suggests hens are more susceptible to disturbance than cocks). In the most recent Strathspey study at Glenmore, findings indicated that capercaillie avoid areas around busy entry points (Moss *et al.*, 2010).

A study in Central Europe showed that flushing distance was greater in the presence of regular disturbance events (Thiel et al, 2007). Flushing distances are greater in open forests where the availability of cover is low (Thiel et al, 2007). Other European studies show that raised stress hormone metabolite levels were noted in capercaillie regularly disturbed by off-piste skiers, (Thiel et al., 2005, 2008). Repeated flushing, such as could occur due to increased disturbance caused by new residents, increases the energy burden. This impact is likely to be of greatest significance in very cold weather, when birds are already close to their physiological limit (Zeitler, 2000). Disturbed capercaillie are also likely to be more visible and will need to spend more time feeding to counteract the increased energy losses, possibly increasing exposure to predators. It has been recommended that the establishment of regulations requiring hikers to stay on trails and closing trails where inter-trail distances fall below 100m (Thiel et al, 2007). An example of such management in the Bayerischer Wald National Park, Bavaria, resulted in capercaillie returning to the surrounding woodland (Scherzinger 2003 cited in Summers et al. 2007).

Habitat structure has been shown to modify the alert distance of a number of bird species, with increasing bird tolerance associated with greater availability of escape cover (Fernandez-Juricic et al. 2001). In the specific case of capercaillie, Thiel et al. (2007) recommended planting or preserving evergreen conifer trees along track verges thus reducing the degree of visibility between capercaillie and recreationists. This could increase the habitat available to capercaillie in forests with predictable recreation activities.

Grouse experts questioned as part of the Delphi study (Marshall, 2005) suggested that dogs off leads during the breeding season were the most significant issue for capercaillie in Scotland. Dogs off-lead can have a greater impact by flushing birds further away from paths, so further limiting the amount of available habitat; can separate broods from the hen which could result in chicks becoming cold and wet; and dogs can catch and kill both chicks and adult birds. Due to the large size, especially of males, chicks require a large amount of energy to grow to adult size during a short period. Due to poor nutritional qualities of their food, they are more susceptible to the effects of disturbance than smaller birds and have a higher mortality rate over a longer period. Chicks are more robust, and therefore more likely to survive, if a hen has good energy reserves during egg development.

The main period of sensitivity for breeding capercaillie in relation to dogs has been defined by the Caper BAP Group as between 1st April and 15th August. This is currently being reconsidered following a recommendation from the Caper BAP Group to extend the end date. CNPA, as the Access Authority, has sought further advice from the Cairngorms Local Outdoor Access Forum, who have recommended that the dates are not altered until further work on a CNPA led Strathspey-wide capercaillie framework considering habitat management, recreation and development management is complete.

In summary, capercaillie are very vulnerable to disturbance. They are ground nesting and are therefore most vulnerable at the early part of their lifecycle as eggs or chicks. At this stage, they can be directly killed by dogs, or killed by predators such as crows or foxes when the hen is flushed from the nest or brood, or killed by exposure if a hen is flushed. Capercaillie is also very vulnerable to disturbance on the lek. While some cock birds become over-aggressive, the vast majority of males are very easily driven away. Although capercaillie is vulnerable to disturbance at all times of year, they are especially so in spring and summer. The Capercaillie BAP (Biodiversity Action Plan) Group highlight the period between 1 April – 15 August as the most critical period. It is concluded that capercaillie are sensitive to disturbance by people and dogs, and that dogs off leads present the greatest risk. Off-path recreational use is likely to be more disturbing than on-path use because it is less predictable and birds are less likely to habituate to it. Evidence from Boat of Garten woods shows that use by capercaillie of the parts of the woods within 125 m of paths and tracks is reduced and that this disturbance has a significant impact on their behaviour.

Loss of capercaillie habitat

It is reasonable to assume that the existing level of disturbance means that apparently suitable habitat for capercaillie is effectively unavailable to them. Research on habitat use through analysis of droppings suggests that there is an avoidance of certain areas. This is probably attributable to the disturbance experienced from existing sources and cumulatively creates a larger area of unavailable habitat. Capercaillie need large areas of habitat. Chicks require high quality protein food to grow rapidly, which can be distributed patchily over a wide area. Chicks are born precocial and move constantly over a big area to find food and avoid predation (Wegge *et al*, 2007).

As highlighted above, capercaillie have declined significantly in recent times. Studies have suggested that the national decline was driven by low productivity (Moss *et al.*, 2001). A programme of targeted habitat management in capercaillie core areas seems to have halted the population decline in Strathspey. Among the factors that may limit capercaillie populations in Scotland are habitat fragmentation and limited habitat availability. In order to address this conservation groups including the Caper BAP group are seeking to ensure opportunities to increase the amount of habitat that is available are developed to ensure that connectivity is increased. This is also a key priority for the CNPA as set out in the National Park Plan and in the new Cairngorms Nature Action Plan. Additional effort needs to focus on increasing productivity and addressing issues that may impact upon it i.e. reducing disturbance.

As already highlighted, Strathspey is the most important area of woodland in the UK for capercaillie, holding c.75% of the population (Poole, 2010). The species requires large, connected areas of woodland for the meta-populations to function effectively. Therefore, the woodlands of Strathspey need to be considered as one ecological unit for the purposes of capercaillie management. Any Appropriate Assessment needs to be as certain beyond reasonable scientific doubt that direct habitat loss and/or reduction in available habitat through habitat avoidance by capercaillie due to disturbance do not result from any development.