

Demonstration Moors Project:
Moorland Management Plan for Balnaboth Moor:

The Cairngorms Moorland Project

26 February 2004

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Balnaboth Moor
The Cairngorms Moorland Project
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- 1 Introduction
 - 2 Methodology
 - 3 Key Interests
 - 4 Management Aims
 - 5 Site Description & Current Status
 - 6 Management Approach
 - 7 Muirburn & Grazing Plans
 - 8 Implementation
 - 9 Long term Maintenance Works
 - 10 Recommendations for Monitoring Programme
 - 11 Summary
 - 12 References
 - 13 Appendices
- 1: Management Options

1 Introduction

This management plan sets out proposals for the management of the moorland at Balnaboth Estate, one of two moors on which the Cairngorms Moorland Project is seeking to demonstrate best practice. The management plan aims to deliver benefits to grouse productivity, wider biodiversity and the socio-economic impacts associated with moorland management. The management plan should be read in conjunction with the Interpretive Plan, which has been developed by the Moorlands Interpretation Management Group in order to communicate the management practices and their effects to a range of audiences.

Balnaboth Estate is situated in Glen Prosen, on the southern edge of the Cairngorms in the Angus glens. It is owned and managed by Hector MacLean. The estate is managed in order to generate an income for the owner and comprises a range of activities. The sporting rights over the full moor area are let to David Laird, who runs the moor in conjunction with the neighbouring land in the upper glen.

2 Methodology

This management plan has been developed in conjunction with the owners and tenants (sporting and agricultural) of the moor at Balnaboth, and through discussion with the Cairngorms Moorland Project Demonstration Moors Group.

A literature review of relevant documents was undertaken in order to set this management plan within the wider policy and demonstration context. A number of these documents have been referenced in the management plan and are listed at the end.

Initial meetings were undertaken with Mr & Mrs Maclean, owners of Balnaboth Estate, and with David Laird, the sporting tenant in order to establish their objectives for the moor, and to obtain information on the past and current management. In addition, an initial survey of the moor was undertaken to gain an overview of the habitats and their condition, which is supported by the detailed ecological survey data from Ecological Research Associates (ERA).

The initial meetings provided an understanding of the current status of the moor and established the strategic aims. Following this, a series of management options were prepared for consideration. Through discussions with the owner and tenants, these options have been developed into the management proposals that are presented in this plan.

3 Key Interests

The main source of income on the estate is tourism, through the provision of 11 holiday cottages. The experience of the landscape and the nature conservation value of the estate are closely linked to this, providing a key asset to attract visitors. There is some public access provision focussed on the 'Minister's Path' on the

southern edge of the moor, which links Glen Prosen with Glen Clova, and there are proposals to install interpretation of the moor at a point on this route (Cairngorms Partnership 2000). However, walkers in general do not heavily use the moor. The owners are considering the development of more structured 'green tourism' activities to offer to holiday cottage residents.

The principle economic uses of the moor itself are the grouse shooting and the farming enterprises (sheep and cattle). Deer are not considered to be an economic resource due to the open nature of the landscape being unsuited to commercial stalking.

4 Management Aims

The owner wishes to ensure that the moor contributes a net income to the estate. Whilst there is no impetus to maximise the capital value of the moor, it is nonetheless recognised that the grouse moor in its present form is an important component of the capital value of the whole estate. It is therefore important that the management of the moor complements the other activities on which the estate's income relies. The sporting tenant wishes to optimise grouse numbers whilst encouraging environmental improvements.

The following strategic aims guide this management plan:

- To reduce grazing pressure from both deer and farm stock on the moor;
- To establish a heather management regime;
- To enhance the landscape amenity & biodiversity. In the context of this plan, the word 'biodiversity' is used to include a range of habitats and species that fully reflect the potential of the site.

5 Site Description & Current Status

If the impacts of changes in management practice are to be effectively demonstrated, it is important to establish a baseline from which variations can be measured. The baseline ecological survey has been undertaken by ERA and their results feed into this management plan. This section also sets out the current status of management, including burning and grazing regimes, shooting patterns, keeping, deer and other key management aspects that contribute to the baseline.

The moor forms the southern part of the shooting and stalking enterprise run by the sporting tenant. An intensive programme of heather burning, carried out in line with the muirburn code, has continued in the presence of heavy grazing by sheep, resulting in many heather stands being replaced by grasslands. However, some areas have not been burned for many years and now support tall 'leggy' heather. There are no conservation designations on the moor and it lies outside the National Park boundary.

Heather condition & burning

The area of Glen Logie was surveyed as part of a proposed Countryside Premium Scheme (CPS) Moorland Management Plan. This identified areas of suppressed heath which are indicated on Map 1 (where vegetation is suppressed due to climatic and altitude factors). 449 Ha were considered to be suppressed out of a total of 841 Ha. Our recent visit largely supports this interpretation. On Glen Tairie, such a survey has not been carried out, but an initial visit indicates that there are also areas of suppressed heath here.

Throughout the area (both tenancies) there has been regular and intensive burning for many years up to the present time. The pattern of burning is indicative of good practice, but because of the high pressure of grazing sheep, heather has been preferentially grazed by sheep and replaced to some extent by grasses, on a large scale.

On the recently burned areas (2-4 years) wavy hair-grass (*Deschampsia flexuosa*) has become dominant. Although this frequently occurs prior to the eventual re-appearance of heather as the dominant plant, there are indications that heather is being preferentially grazed relative to some other plants eg *Juncus squarrosus* and *Nardus stricta*, and mixtures of these and other grasses and rushes are gaining dominance. In areas burned over 5 years ago, the presence of heather declines with the increasing age of the burn area. On the richer sites, bent and fescue grasses (*Agrostis spp* and *Festuca spp*) that are palatable to sheep have replaced heather, but on poorer sites unpalatable species such as heath rush (*Juncus squarrosus*) and mat grass (*Nardus stricta*) have increased at the expense of heather. The process of change from heather to grassland appears to be more complete adjacent to sheep feeding sites where densities are highest. In some areas of Glen Tairie old stands of heather have a low cover but regular appearance of grasses and it may be unwise to burn some of these even without high sheep densities.

Sheep feeding takes place on sites dominated by mat grass (*Nardus stricta*). Approximately the northern third of the area has dense heather cover but much of this is at high elevation. A very high proportion (c. two thirds) of the good heather to the west of the West Burn has been burned in recent years. A number of the areas now recorded as grassland, poor fen or rush pasture (ERA, 2002) were almost certainly previously dominated by heather. There are a number of examples of rectangular burned areas that have become completely dominated by grasses.

On Spott hill heather has receded marginally up hill in recent years.

These conclusions are generally supported by the recent Habitat Condition assessment (ERA, 16.08.02).

Grouse numbers

The moor provided relatively high bags of red grouse during the late 1970's up to 1980. A decline during 1981 - 1984 was followed by an increase to former numbers between 1988 and 1991, with bags of around 600 birds. Red grouse declined dramatically from 1992 to the present with bags of only 20 – 50 birds, although in

1997 and 1998, 191 and 179 birds were shot respectively (Records supplied by David Laird).

Numbers of red grouse were counted in five blocks by ERA (ERA, 16.08.02). A total of 270 red grouse were counted; 41 coveys were counted with an average covey size of 5.4 birds.

Deer

Best estimates for deer numbers on the moor given by tenants are in excess of 350. Contract stalkers undertook a cull of 800 red deer across the wider Glen Prosen area in 2001 and there is a desire between the owner and sporting tenant to reduce further the number of deer on the moor considerably. There is 1 Forest Enterprise deer manager who has responsibility for covering Forest Enterprise land in Glen Prosen and Glen Isla.

The deer fence along the forest block to the west is now in disrepair and deer can move through it. According to the agricultural and sporting tenants, deer have significantly increased their use of the area in the last 5 years, particularly since the hill was not stocked with sheep during the 1999 season. The ERA study (ERA 16.08.02) supports our view on the impact of grazing generally, however, it does not differentiate between the likely causes. Trampling by red deer in the northern part and the ubiquitous presence of rabbits are mentioned (ERA 16.08.02). However, in many areas, the replacement of heather by grasses considerably pre-dates the increase in deer numbers by at least 10 years and this does not, therefore, support the view that deer are responsible for the impact on heather. However, it is likely that deer numbers and impact will increase unless they are rigorously controlled, especially in the event of a reduction in sheep numbers. There are no objective estimates of deer numbers or occupancy, but over the overall moor area of 1894Ha, 350 deer would represent an occupancy rate of 18 deer /square km. However, discussions with the tenants indicate that the deer mainly occupy the area of Glen Logie and Tairie (1390Ha), so over this area, occupancy rates may be up to 25 deer/ square km. However, it is unlikely that this number of deer are permanently resident as they will range onto neighbouring ground. Given that red deer range more widely than sheep, the significant impact is almost certainly due to sheep. However, rabbits have almost certainly had an important additional impact, especially over the past ten years as numbers have increased.

Deer are not considered to be an economic asset as the open landscape is not suited to commercial stalking, but it is possible that carefully designed patches of woodland regeneration could provide cover and improve the hill and woodland stalking. Roe deer have also increased and would continue to do so with an increase in woodlands. They would add to the species diversity and sporting value of the area.

Current keeping

The moor is managed by 2 keepers, who also have responsibility over the remaining area of the sporting tenant's business, beyond Balnaboth. Their work focuses on burning and the control of crows and foxes. Control of rabbits is

undertaken by the farmers. The keepers undertake an annual round of the known fox dens on the moor and records supplied by the Head Keeper, Alex Boath have been provided as follows;

Predators killed on Balnaboth Moor (2001)

| Species | Number | Method |
|-------------|--------|--------|
| Fox | 10 | Snared |
| Fox | 4 | Shot |
| Hooded Crow | 14 | ? |
| Rook | 26 | ? |
| Jackdaw | 33 | ? |
| Stoat | 43 | ? |

Similar numbers are reported in previous years.

Woodlands

At present there are conifer plantations at the base of the hill on Balnaboth estate, and a plantation enclosing 1850 acres owned by Forest Enterprise forms the western boundary of the moor. This boundary is formed by a deer fence that is now porous to deer, and the remaining boundaries of the plantation are also porous, allowing deer to move between the moorland areas on all sides.

The Cairngorms Woodland Framework identifies Balnaboth as being suitable for native species amenable to wet conditions, including birch, alder and willow.

Farming

Glen Logie:

The moor at Balnaboth is divided between two graziers. The western (Glen Logie) is farmed by an in-hand partnership with a total number of 650 sheep plus lambs. The sheep are managed between the upper and lower parts of the hill. Approximately 200 ewes have twins and remain on the lower ground for a longer period of time. The distribution of sheep throughout the year is therefore as follows:

| Period | No. ewes on lower hill | No. ewes on upper hill |
|--|------------------------|------------------------|
| Nov – Apr (<i>overwintering & lambing</i>) | 650 | 0 |
| Apr – end Aug (<i>twinned ewes remain on low ground</i>) | 200 | 450 |
| Sept – end Oct | 0 | 650 |

The stock fence is not completely effective and shepherding is required to maintain this distribution. Over the total area of 841 ha on Glen Logie, this represents a density of approximately 0.12 Livestock Units/Ha. 30 cattle are also present on the lower part of Glen Logie, from August to October, giving a total stocking density here of 0.14 Livestock Units/Ha.

Glen Tairie:

The eastern and southern parts of the moor (Glen Tairie), is farmed under a limited partnership of Spott Farm. The total number of sheep on this part of the moor (549Ha) is approximately 620 ewes plus lambs, giving a stocking density of 0.17 Livestock Units/Ha. 40 cows are also present on the lower part of Glen Tairie, giving a total stocking density here of 0.40 Livestock Units / Ha.

The sheep are similarly managed between the upper and lower parts of the hill, and approximately 200 ewes have twins and remain on the lower ground for a longer period following lambing. The distribution of sheep throughout the year is as follows:

| Period | No. ewes on lower hill | No. ewes on upper hill |
|--|-------------------------------|-------------------------------|
| Mid Nov – mid May (<i>over wintering and lambing</i>) | 620 | 0 |
| Mid May – mid Sept. (<i>twinned ewes remain on low ground</i>) | 100 | 480 |
| 1-2 weeks July (<i>dipping & clipping</i>) | 450 | 0 |
| Mid Sept. – mid Nov. | 0 | 620 |

There are also 40 cattle kept on the lower part of Glen Tairie from the second week in June until mid September or later.

Louping-ill has, to date, not been seen as a problem at Balnaboth. It is recommended that blood samples for louping-ill are taken in year one to establish whether treatment is required.

Biodiversity

Large numbers of waders, especially lapwing (a Local Biodiversity Action Plan (LBAP) priority species) and curlew feed and breed in the area especially favouring the wetlands. Snipe, another LBAP priority species also breed here. Black grouse (UK and LBAP priority species), red grouse (LBAP priority species), skylark (UK and LBAP priority species) and mountain hare (LBAP priority species) are all present. Red squirrels are common in the woodlands and capercaillie were common in Glen Prosen and Glen Logie but have declined in recent years.

A new native woodland has been planted at Buckhood Hill as a part of a Forestry Commission challenge fund scheme. This and any additional native woodland schemes will encourage the expansion of many species including capercaillie and invertebrates. Full details of the habitats and species present are given in ERA's Baseline Survey.

Archaeology

There are areas of archaeological interest identified by FWAG in a previous Countryside Premium Scheme application, comprising areas of rig cultivation and building sites in the lower parts of Glen Logie and Glen Tairie. Continued grazing is not perceived to be a threat to these interests (FWAG 2000).

6 Management Approach

Here we present some general conclusions, which, in our view, are unavoidable. We then proceed (Section 7) to present detailed recommendations for muirburn and grazing plans.

A significant and widespread decline of heather appears to have been exacerbated by a combination of intensive burning followed by a high density of sheep grazing. In the presence of the currently high densities of sheep, it is unlikely that this continuing process can be reversed unless burning is ceased immediately until an appropriate grazing and burning regime can be reinstated. A reduction or cessation of grazing and burning for a period, on at least some parts of the moor, will almost certainly facilitate the restoration of heather. This management plan therefore sets out to deliver this approach.

There are a number of areas where burning is not appropriate such as the large wetland areas and a number of areas of wet heath/ blanket bog dominated by deer sedge (*Scirpus caespitosus*) and cotton grass (*Eriophorum vaginatum*) with cross-leaved heath (*Erica tetralix*). All of the coloured areas on Maps 1 and 2 represent habitats that should not be burned. In addition the areas demarcated as being 'Suppressed Heath' should be excluded from the burning programme until heather has recovered.

In order to facilitate effective heather regeneration, we believe that a significant reduction in stocking density is required. This however, will impact on one of the principle income sources to the estate, and solutions that facilitate the management of grouse and sheep, while addressing the other objectives are proposed here.

The heaviest grazing occurs on the lower slopes of the moor, and it is here that heather loss is unlikely to be reversed. It is therefore appropriate to divide the moor into two, allowing a viable sheep enterprise to continue on the lower ground, but removing or reducing grazing on the upper ground. The existing fence-line that runs east-west (Map 1), is an appropriate line to consider, but upgrading of the fence will be necessary. Upgrading of the fence separating the two tenancies will also be necessary.

It is well known that high numbers of red grouse (as a basis for economic driven shooting) can be sustained by a traditional burning regime. However, in the absence of the high numbers of grouse moor keepers that was commonplace in the earlier part of the last century, coupled with the more recent desire to pursue multiple objectives, including nature conservation, there is a natural tendency for moorlands to support higher densities of predatory animals. Bearing this in mind, we believe that modifications of the muirburn regime, especially by leaving more areas of unburned heather, can provide important additional cover to red grouse and other prey species. However, it is accepted that such a regime over a large area would not support the same high numbers of grouse as a traditional burning regime. In addition, a smaller scale of patch burning can be helpful in this regard. These principles are embodied in the approach to management contained in this plan.

There is also potential for expansion of native woodland, particularly around watercourses, which may also enhance the stalking through the provision of more cover, and the following Muirburn and Grazing Plan incorporates woodland proposals.

7 Muirburn and Grazing Plans

We do not believe that the current management is sustainable against the stated objectives. The muirburn and grazing plan is based on the assessments of vegetation and range condition provided by ERA and follow the guidance provided in, 'A Muirburn Code' published by Scottish Natural Heritage (SNH) and 'Good Practice for Grouse Moor Management' published by the Moorland Working Group.

The Muirburn and Grazing Management Plan that follows takes into account the conservation of wind clipped summit heath, grasslands, rich flushes and the expanse of wetland habitats.

In the light of the issues raised above, a number of management options were considered (Appendix 1). In order to achieve the key objectives, it is vital that stock grazing levels are reduced on the hill. Given that the stock are important to the economic viability of the estate as a whole, incentives for stock reduction are necessary, and it is undesirable in the context of the project to exclude sheep altogether. The relative ease with which the moor can be divided into four parts by upgrading fences will facilitate the application of separate management regimes. At the start of the project, stock fences should be upgraded and renewed as necessary.

7.1 Muirburn Plan

The attached Map 1 illustrates the primary habitats on the Balnaboth moor. All of the coloured areas as well as those demarcated as 'Summit Heath' indicate habitats that will be damaged by burning and should therefore be excluded from the burning programme. In addition, the areas shown as 'Suppressed Heath' should be excluded from the burning programme until heather has recovered from suppression. On the remaining heath ground (white on Map), we recommend that the muirburn plan is based on the following matrix:

| | Burning | No Burning |
|------------------------|--|--|
| Grazing | Spott Farm tenancy south of the east-west stock fence to include Glentarie and Spott Hill. | Buck Hood Hill and southern part of Glen Logie |
| Reduced Grazing | Northern part of Glen Logie & Glentairie count area (unsuppressed areas only) | Northern part of Glentarie (excl. count area) |

We do not propose a prescriptive plan detailing exact areas to be burned over the 3 years of the project and beyond, as this decision should form a part of the annual

review, to be carried out in the light of the results of the monitoring programme and be considered according to the rate of heather growth.

There are approximately 300Ha appropriate for burning, excluding suppressed heath and other valuable habitats. Assuming the age of the old heather to be 20 years, approximately 15Ha of old heather should be burned each year, including year 1. In those areas to be burnt, the burning should continue to be managed in line with the muirburn code, with strips not exceeding 40m in width. Through the provision of additional labour, significantly smaller patch sizes should be encouraged to balance the greater area of unburned heather proposed. The attached Map 2 indicates the burning area, and more specifically, those areas that are not to be burned.

We anticipate that within this matrix, there are likely to be annual adjustments required. The annual burning plan should be agreed between the sporting tenant and the project officer.

7.2 Grazing Plan

Glen Logie

A reduction of 100 ewes from the total number is proposed. Currently there are approximately 450 ewes on the upper part of the hill during the sensitive time from April to August which would reduce this to 350, reducing the grazing pressure at this time. In September and October, 650 would reduce to 550. Small exclosures are proposed for the upper hill to allow monitoring of the heather condition against a control with no grazing. (See bottom left quadrant above)

Glen Tairie

A reduction of 100 ewes from the total number is proposed. Currently there are approximately 480 ewes on the hill during the summer which will reduce to 380, and later in the year (mid September – mid November) 620 will reduce to 520. Small exclosures are proposed for the upper hill to allow monitoring of the heather condition against a control with no grazing (See bottom right quadrant above). It is not proposed to alter the cattle numbers as they do not appear to cause an adverse impact on the vegetation.

The proposed changes in stocking density are set out in the tables below.

The first table shows the maximum likely stocking densities, ie: when all sheep are on the lower part during lambing and when all sheep have access to the upper hill, including twinning ewes (September/October on Glen Logie and September - November on Glen Tairie). The figures include the cattle kept on the lower parts of both tenancies. There are no changes in stocking proposed for Buck Hood Hill or Spott Hill.

| Maximum Stocking Densities (when all stock on area) | | | |
|--|-----------|---------------------|---------------------|
| Compartment | Area (Ha) | Max. Existing LU/Ha | Max. Proposed LU/Ha |
| Glen Logie Upper | 609 | 0.16 | 0.13 |
| Glen Logie Lower | 232 | 0.51 | 0.45 |
| Glen Tairie Upper | 242 | 0.38 | 0.32 |
| Glen Tairie Lower | 307 | 0.40 | 0.35 |
| Buck Hood Hill | 211 | 0.18 | 0.18 |
| Spott Hill | 293 | 0.17 | 0.17 |

In practice, the densities will vary below these levels in accordance with the management regime detailed in section 5. The densities during April to August on Glen Logie and May to September on Glen Tairie (when ewes are split between upper and lower) are shown in the second table:

| Split Stocking Densities (when stock split between areas) | | | |
|--|-----------|---------------------|---------------------|
| Compartment | Area (Ha) | Max. Existing LU/Ha | Max. Proposed LU/Ha |
| Glen Logie Upper | 609 | 0.11 | 0.09 |
| Glen Logie Lower | 232 | 0.23 | 0.23 |
| Glen Tairie Upper | 242 | 0.29 | 0.23 |
| Glen Tairie Lower | 307 | 0.15 | 0.15 |
| Buck Hood Hill | 211 | 0 | 0 |
| Spott Hill | 293 | 0.12 | 0.12 |

LU calculated as 1 ewe plus followers = 0.15LU, 1 cow plus followers = 0.75LU

It is expected that the reductions in grazing densities above will assist in securing improvements in heather quality, particularly when combined with the proposed burning regime.

Deer:

Red deer should continue to be rigorously controlled aiming to maintain average densities (ie occupancy) at less than 6 deer km². At present the lack of objective count data means that a particular cull target is difficult. However, in the first year of the project, the cull should seek to achieve as a minimum the figure of 800 in the wider Glen Prosen area, as achieved in 2001. As a guide for the project moor area, a target cull of 30 stags and 30 hinds (one-sixth of current estimate of 350 deer) plus accompanying calves should be introduced in year 1. The objective should be to reduce the deer occupancy to the above rate, and subsequent culls should be adjusted according to the response of vegetation. It is therefore vital that effective counting and monitoring is undertaken. In particular, monitoring by dung counting should be introduced into the programme so that occupancy can be estimated as a basis for deciding minimum annual cull levels. In addition, Forest Enterprise should be approached with regard to discussing mutually beneficial deer management to include the possible re-instatement of the western fence. The Deer Management group should also be involved in discussions.

Woodlands:

Native woodlands should be established along sections of the major burns, ie Burn of Glenlogie, West and East burns plus the Burn of Inchmill (Glen Tairie). In the southern part of the area, stock fencing will be required. Native woodland along burn-sides will enhance the biodiversity of the area, provide shelter for deer and improve conditions for many woodland species including black grouse and roe deer. It will also enhance the landscape value in the locality of the Ministers Path. On this scale it is not expected to be detrimental to moorland or red grouse interests.

Forest Enterprise should be approached with a view to restructuring the western forestry boundary to create a semi-natural upper tree-line with native trees and open moorland to benefit black grouse. Open areas to the west of the march should be combined with planted areas to the east (ie on Balnaboth).

Rabbit & Predator Control:

Rabbits are numerous and it is impossible to determine their impact on the grasslands. A rigorous control programme should be initiated. Predator control should be continued along current lines, though the need to control rooks is questionable.

Disease

Trichostrongyle worm burdens should be assessed from grouse bags and the use of anti-helminthics through medicated grit introduced if high worm burdens are detected.

Similarly, vaccination of sheep against louping ill should be considered if, through monitoring, grouse are found to carry high tick burdens, or if the disease is detected in sheep. The proposed removal of sheep from some parts of the moor may, in the short term increase tick burdens on grouse due to the reduced availability of hosts. However, in the longer term tick numbers should fall.

8 Implementation

Additional Keeper:

In order to deliver the management works proposed above, we recommend that an additional keeper is employed to provide additional input to Balnaboth moor. The extra labour resource will ensure that the maintenance works are undertaken effectively. The smaller patch size of burning recommended and the continuation of rigorous deer and predator control will benefit from a keeper who is focussed on delivering the project objectives at Balnaboth. This will also help to ensure that the benefits of this project extend beyond the current project time frame.

Fencing:

In order to manage the proposed grazing regime, it is necessary to undertake fence renewal and repair work in year 1. Given the division of the hill into grazing and non-grazing areas, it is impossible to secure stock management without ensuring that the following are effective fences:

Glen Logie east-west stock fence: 2200m
Glen Tairie east-west stock fence: 1400m
North-south stock fence: 3800m
March deer fence with FE Plantation

Stock Reduction:

The reduction of stock on the Glen Logie and Glen Tairie moors will require the agricultural tenants to reduce their overall stock numbers, in order to prevent overgrazing elsewhere. The following stock reductions are proposed to take effect in September 2003:

Glen Logie: Removal of 100 ewes

Glen Tairie: Removal of 100 ewes

9 Long-term Maintenance Work

The duration of the project determined by the funding secured is 3 years. However, as the management recommendations above indicate, the management approach necessarily operates over a considerably longer timescale. In order to ensure that the benefits of the management regime continue beyond the 3 year horizon, it will be necessary to plan to continue the following work:

1. Upgrading and maintaining stock fences as prescribed.
2. Adherence to the planned burning and grazing regime.
3. Monitoring as proposed below.

10 Recommendations for Monitoring Programme

We recommend the following monitoring programme:

1. Continue monitoring in line with baseline methodology
2. Use aerial photography every three years following assessment in year 1, to monitor sheep grazing and burning patterns and heather recovery.
3. Monitoring of control exclosures on upper part of moor
4. Annual monitoring of grouse bags.
5. Annual dung counts to estimate red deer occupancy.
6. Annual monitoring of predator control.
7. Annual recording of helminth burdens and anti-helminth measures.

11 Summary

There are clear opportunities to adjust management practice in order to reverse the decline in heather and enhance the moor for grouse and other species, together with broader landscape improvements. The development of management from the current baseline will provide valuable opportunities for demonstration, readily transferable to other moorlands.

In particular the proposed management will offer demonstration in the following areas:

- The effectiveness of a matrix of burning and grazing regimes on the regeneration and maintenance of heather;
- The integration of grouse moor management with farm, deer, woodland and biodiversity objectives;
- The benefits of additional labour focus to habitat enhancement and maintenance.

12 References

Mr & Mrs MacLean, David Laird, Andrew Walker and Patsy Paton have provided the information regarding the moor during meetings. Specific references are detailed below:

Cairngorms Demonstration Moors Programme, Baseline Surveys. Draft Report, ERA, 16.08.2002.

Cairngorms Partnership 2002: Interpretive Plan

Cairngorms Partnership: Cairngorms Forest and Woodland Framework

East Grampian Deer Management Group 2002: Deer Management Plan

ERA 2002: Tender- Baseline Monitoring Survey

Balnaboth Moor
The Cairngorms Moorland Project
26 February 2004

FWAG 2000: Countryside Premium Scheme application

Northern College 1995: Prosen School Interpretative Plan

Scottish Natural Heritage 1993: A Muirburn Code

Scottish Executive Moorland Working Group 1998: Good Practice for Grouse Moor Management

13 Appendices

Appendix 1: Management Options

In developing this moorland management plan, the following options were considered:

1. Continue the current regime.
2. Remove sheep entirely.
3. Rigorously exclude red deer as effectively as possible.
4. As 3 above plus the re-instatement of the western march fence.
5. Upgrade/construct a sheep fence bisecting the area along a west-east line from approximately Drumwhern (GR 336686) to Machormack (GR 303697) to permit continued heavy grazing on the grassy swards to the south while limiting grazing on the predominantly heather areas to the north.
6. Cease burning to the north of the fence to allow heather recovery in the absence of sheep. Follow this by re-commencing burning and grazing in accordance with an agreed Moorland Management Plan based on the ERA vegetation study (ERA, 16.08.02) (see 8 below).
7. Upgrade the north-south fence separating the two tenancies, which combined with option 5 above, creates four areas where grazing can be managed separately. A valuable option from the demonstration viewpoint might be to cease burning and grazing for a longer period in the north-eastern area.
8. Develop an agreed Moorland Management Plan, based on the ERA vegetation study (ERA, 16.08.02). This should pay particularly attention to areas that will continue to receive high pressure from sheep, such as the ridge between Glen Logie and Glen Tairie, to the south of the west-east fence. A reduced periodicity of burning or indeed a 'no-burning' regime may be appropriate here.
9. Expand native woodlands along the major burns, ie Burn of Glenlogie, West and East burns plus the Burn of Inchmill (Glen Tairie). In the southern part of the area, stock fencing will be required. Native woodland along burn-sides will enhance the biodiversity of the area, provide shelter for deer and improve conditions for many woodland species including black grouse and roe deer. It will also enhance the landscape value in the locality of the Ministers Path. On this scale it is not expected to be detrimental to moorland or red grouse interests.
10. Consider approaching the western neighbour with a view to restructuring the forestry boundary with native trees and open moorland to benefit black grouse.
11. Increase control of rabbits, crows and foxes.
12. Consider the use of anti-helminthics through medicated grit.
13. Consider vaccination of sheep against louping ill.