FARMLAND AND GRASSLAND HABITATS

CONTENTS

FARMLAND AND GRASSLAND INTRODUCTION:

The physical environment of the Cairngorms largely limits and determines the range of farming activities and changes that can be undertaken in the area. These constraints include climate, topography, soil conditions and remoteness from markets. Consequently large parts of the Cairngorms Partnership area are not farmed and the number of agricultural holdings in the area is smaller than most comparable sized areas in the UK. Nevertheless, agriculture is highly significant both to the economy and the environment of the area. It accounts for 8% of direct employment and involves 74% of the land. Changes to the agricultural landuse and management have profound implications for natural habitats and landscapes.

Although many people automatically think of farms as the conventional agricultural land holding, crofting is a significant form of landuse in the West and North of the Cairngorms Partnership area. There are approximately 117 crofts in the area between Grantown and Laggan, as well as seven '*common grazings*'. Given the nature of crofting systems, they have the potential to fit in well with the aims and objectives of the Cairngorms LBAP. Therefore, the farmland and grassland biodiversity issues and opportunities identified in this document also refer to crofts and crofting land.

Livestock farming dominates agricultural landuse, particularly in the upland/hill areas, with the majority of farms specialising in sheep or sheep and cattle. Grassland is therefore the most common farmland habitat. The type of grassland habitat is largely determined by the soil type and farm management regime. Most have been re-seeded or modified through the use of fertilisers, lime and selective herbicides and many have been modified by mowing practices e.g. silage and hay.

Arable land is quite rare, comprising less than 2% of the area and tends to be found in the valleys. Farming has changed considerably in recent years with a decline in the number of upland farms and crofts through consolidation of holdings and changes to other landuses (e.g. woodland). Successive national agricultural policies have encouraged the increased use of silage, a reduction in mixed farming, and a move toward intensification and specialisation resulting in a decline in cultivated, cropped land, an increase in permanent grassland and a switch to forestry on moorland agricultural grazings and to a far lesser extent on fields.

Farmland provides habitats for a range of species, including resident and migratory birds, mammals, invertebrates, fungi and plants, many of which depend upon the continuing traditional or modern farming methods for their survival. Generally, the farmland and grassland habitats in the Cairngorms have been managed in a less intensive manner than other areas in the UK. Particularly important areas have been recognised by designations such as SSSIs and Natura 2000 sites (SACs and SPAs). Consequently, *many of these areas are important or exceptional because of their historical human management*, not in spite of it. From the biodiversity conservation perspective, many traditionally managed farmland habitats mimic the natural grasslands that were once part of the area.

The links between farmland and grassland and other habitats is extremely important for many species. The habitat mosaics that exist in the Cairngorms result in the high populations of several species that use more than one habitat as well as being important for some species that particularly use edge habitats. Therefore, it is important to understand and consider the biological links between adjacent habitats. For example, farmland/woodland mosaics favour Roe deer and Badgers; farmland/wetland mosaics favour Water voles and breeding waders; Farmland/upland mosaics favour Twite, Mountain hare and Large heath butterflies; and Farmland/upland/woodland mosaics favour Black grouse and Buzzards.

Therefore, terms like '*appropriate grazing*', '*under-grazing*' and '*over-grazing*' are ambiguous unless a clear point of reference is made. For instance, when grazing for commercial livestock production, over-grazing from a plant conservation perspective might be considered under-grazing from a livestock management perspective. Similarly, the sword heights desired to meet separate conservation objectives can be quite different e.g. the ideal sword height for bees is much lower than that for tall herbs. Therefore, adequate surveying and identification of clearly defined objectives before formulating management plans is crucial if grazing management is to deliver the desired biodiversity objectives for grassland habitats.

The future of upland/hill farming and with it its characteristic habitats and species is increasingly uncertain. Amongst many factors, successive national policy changes (e.g. moves towards area instead of headage payments), collapses in farm prices, BSE, Foot and Mouth disease, the farming industry's public image and an ageing farmer population have all led to a downturn in the local farming sector. The effects of macro-economic factors, such as the policies of the EU, World Trade Organisation have also been felt across the area. The traditional role and direction of farming in the local, national and international context is increasingly being questioned by the public, farmers and politicians. In the next few years, this is likely to result in significant changes to local farming communities, landscapes and biodiversity. Some of these changes will be beneficial, whilst others will be detrimental to the local people and biodiversity of the area. How we choose to deal with these changes at a national level and in the forthcoming Cairngorms National Park will largely determine what opportunities there will be for biodiversity enhancement and conservation in this habitat.

It is the purpose of this chapter to:

- *Identify, where possible, the biodiversity issues and opportunities to maintain and enhance the important Cairngorms farmland and grassland habitats and species through the actions of local people and partners.*

OPPORTUNITIES FOR ACTION IN THE CAIRNGORMS:

The Cairngorms Farming Task Force (now called the Cairngorms Agricultural Forum) was established by the Cairngorms Partnership to deliver the strategic objectives for agriculture in the area. These strategic objectives make specific mention of the encouragement of nature conservation or environmentally sensitive management/stewardship of farmland in the Cairngorms. The Cairngorms Agricultural Forum involves representatives from farming, crofting, government and non-government agencies and organisations concerned with the sustainable management of farmland in the Cairngorms.

Large parts of the Cairngorms are covered by the national designated Environmentally Sensitive Area (ESA) scheme. Although most of the farmers in the ESA have entered the current scheme, it is now closed to new entries and its successor, the Rural Stewardship Scheme (RSS), is now operating.

There are many delivery mechanisms for action on the farmland and grassland habitats and species in the Cairngorms and the following list identifies some of the most important policy and funding opportunities for the area. These delivery mechanisms can target directly managed land (cultivated and grazed), boundary features (hedges, dykes and water margins) and insular, remnant features (woodlands and wetlands) on farms and crofts.

- Agri-environment schemes. The ESA scheme and its successor the RSS.
- Crofting schemes, such as the Crofting Community Development Scheme (which promotes community and co-operative crofting developments), the Crofting Counties Agricultural

Grants Scheme (which assists crofters with capital improvements) and the Livestock Improvement Scheme (which assists with the retention of cattle and quality improvements in livestock production). There are also ongoing developments to promote a Croft Entrant Scheme.

- SSSI, SAC and SPA designations can provide advice, support management incentives and monitoring for particularly important areas and species (e.g. EU LIFE Environment and LEADER + programmes).
- SNH's various conservation grants for both designated and non-designated sites and in particular, their Community Grant Scheme and the new '*Natural Care*' programme.
- Woodland Grant Scheme – incentives and constraints which can help integrate woodland and farmland management.
- Heritage Lottery Funding targeted at Area Partnerships and HAP projects.
- New Opportunities Fund – the Community Land Fund.
- Rural Challenge Funding.
- Scottish Golf Course Wildlife Initiative – promotes good environmental practice on golf courses including management and creation of species rich grassland in rough and out of play areas.
- Targeted and wildlife management advice from the Farming and Wildlife Advisory Group (FWAG), Scottish Agricultural College and free-lance consultants.
- Local farming and biodiversity projects such as the joint Cairngorms LBAP/FWAG Upland Grain project, the pilot rabbit clearance scheme and the Agricultural Waste Disposal project.
- The Cairngorms Management Strategy identifies the strategic issues and provides a vision for the future of farming and crofting in the Cairngorms.
- Local authority plans provide guidance on land-use/development issues.
- HIE and LEC Community Grant Fund.
- European transitional funds – Community Economic Development Fund for local community development.

Actions that would improve the biodiversity of farmland are numerous because of the complexity of habitats present. Actions undertaken in other 'non-farmland' habitats may have profound effects upon farmlands and grasslands and their species. Finally, as already noted, there are currently many areas where important farmland habitats and species are thriving in the Cairngorms. These can be used to demonstrate good management practice. However, it is important not to be complacent as not all farm management is benign and there is always room for improvement. Opportunities taken for promoting and developing good practice for biodiversity may increase tourism and recreation and foster a greater understanding of the role of farmland management in the countryside.

One of the biggest challenges will be to explore the biodiversity opportunities associated with the potential abandonment of uneconomic farmland. The expansion of native woodland in these situations could provide new sources of income for most farmers, contributing to the long-term viability of farms. For example, overseas wildlife (and tourism) has directly benefited from the creation of beautiful new mixed woodland in New England and Virginia on old abandoned farmland.

THE MAIN FARMLAND AND GRASSLAND BIODIVERSITY ISSUES:

The following six main issues currently affect or influence, to a greater or lesser degree, practically all the important farmland and grassland habitats in the Cairngorms. Biodiversity actions taken to address these main issues are also likely to benefit a whole range of important species in the area (Table 1). The issues related to specific habitats or species are detailed in the relevant individual accounts.

1. Lack of data/important information:

The issues:

- There is a lack of basic up-to-date information on the size, quality or management of several farmland habitats (e.g. boundary features, hay meadows or the arable production) and the status of many important farmland species in the Cairngorms.
- Several organisations have produced reports, papers, booklets and leaflets on different aspects of farmland and grassland habitat and species management. However, there is no catalogue or inventory of this information to make this resource readily available.
- Much of the published information on the threats to important farmland habitats and species in the Cairngorms is based on data collected outwith the area and may not be targeted to activities relevant in the Cairngorms.

The solutions, actions and targets:

- Identify the total area, and where possible quality and management, of all important Cairngorms farmland and grassland habitats – *by 2005*.
- Where there is insufficient information on the quantity and quality of an important habitat, target resources carefully by commissioning a Phase 1 survey of the appropriate area – *by 2007*.
- Where appropriate, commission relevant research on local issues of concern to important farmland and grassland habitats and species in the Cairngorms – *ongoing*.
- Produce and make freely available a regularly updated inventory of relevant information and advice on farmland habitat and species management – *by 2005*.
- Secure funding for additional monitoring to evaluate the effectiveness of agri-environment schemes in achieving biodiversity objectives – *at the earliest opportunity*.

2. Awareness raising:

The issues:

- Many agricultural habitats are of great importance for biodiversity, but often get undervalued due to their perceived '*artificial*' nature (e.g. arable/cereal areas).
- Properly consider the requirements of all important BAP species dependent upon agricultural areas when reviewing or negotiating changes to, or reform of, agricultural support schemes.

The solutions, actions and targets:

- Produce and make freely available a regularly updated inventory of relevant information and advice on farmland habitat and species management – *by 2005*.
- Local partners should consider employing a team of Farm Conservation Advisors, with no commercial obligations, to visit farmers on a regular basis to advise and educate farmers on relevant environment/biodiversity issues e.g. nutrient budgeting and riparian management – *at the earliest opportunity*.
- Raise the profile of the vital contribution of farming and crofting to biodiversity of the Cairngorms by encouraging all partners to recognise the importance of crofting and farming to biodiversity conservation in the Cairngorms – *ongoing*.
- Link awareness raising issues with the wider Cairngorms Education for Sustainable Development programme – *ongoing.*
- Establish a range of imaginative interpretation projects to illustrate the links between traditional farming and crofting and the area's rich biodiversity resource – *at the earliest opportunity*.

3. Access to appropriate policy and funding sources:

The issues:

- The current agri-environment scheme (RSS) is cash limited and therefore, unlike its predecessor (the ESA), farmers and crofters now have to compete for agri-environment

funding. Some farmers and crofters will be unsuccessful in securing funding and their plans, which would have been beneficial to biodiversity, will not be progressed.
- Most changes in farming practice have been driven by international macro-economic forces (e.g. The European Common Agricultural Policy). These have largely promoted increased food production and significantly decreased biodiversity. They have resulted in damage and destruction to farm wildlife and put at risk other habitats through soil erosion and pollution of water courses.

The solutions, actions and targets:
- Unless special provision is made, farmers and crofters in the Cairngorms may find it difficult to access appropriate agri-environment support schemes. Therefore, the single most important farmland and grassland biodiversity issue for the local partners will be to secure additional funding for future agri-environment initiatives – *at the earliest opportunity*.
- Since the Common Agricultural Policy is seen by many as the main problem, partners should encourage appropriate changes at the national and international level whenever possible to try and address the main issues.
- It is important that the provision of advice and guidance on the use of appropriate funding sources is made easily available, so that crofters and farmers can readily find access to any environmental support schemes that are open.
- Support the introduction of the Rural Stewardship Scheme and ensure that all farmers wishing to join the scheme have maximised their ranking score by taking full account of UK BAP and LBAP habitats and species – *by 2005*.
- Present a case to the National Park Authority for the Cairngorms National Park area to have its own unique agri-environment scheme – *by 2005*.
- The new SNH '*Natural Care*' programme may be able to target some appropriate farmland and grassland biodiversity action.
- Additional funding sources should be secured to allow current locally important biodiversity issues associated with farming and crofting to progress – *by 2005*.

4. Habitat loss and fragmentation:

The issues:
- Changes in overall landuse. The direct loss and destruction of farmland habitats is an important biodiversity issue for a number of habitats and species (e.g. loss of hay and cereals) through changes away from mixed farming systems towards specialisation and intensification or afforestation. For example, (1) the change from spring to autumn sowing has been detrimental to some farmland birds by removing important winter feeding opportunities and (2) improved drainage has led to a loss of wet or unimproved grassland and a conversion of extensive pasture to more intensive production.
- Changes in management regimes. The indirect loss of farmland habitats through neglect, abandonment, or over-exploitation is an important issue for many farmland and non-farmland habitats and species. Both under-grazing and over-grazing have profound biodiversity implications, for example, over-grazing can result in soil erosion, increased sediment inputs into streams and degradation of riparian habitats.
- Habitat fragmentation or isolation. Some grassland habitats (e.g. calcareous grassland) are only found in small, isolated and discontinuous sites. This habitat fragmentation may pose significant problems for natural ecological processes and species dispersal in particular, making their species particularly vulnerable to chance extinction events.

The solutions, actions and targets:
- Develop and promote cost-effective management regimes for important farmland and grassland habitats and species in the Cairngorms – *ongoing*. For example, the crofting system can assist with this particular theme given its extensive system of land use. It is important, however, to ensure that any assistance is sustainable and supports long-term

economic benefits to those adopting '*biodiversity friendly*' practices.
- Ensure that all habitat recreation schemes use appropriate and local origin seeds, to enhance success rates and to avoid problems with non-native species introductions. Assess the affordability and availability of seed stock, and identify actions required – *at the earliest opportunity*.
- Support moves outlined above enabling farmers and crofters to access appropriate policy and funding sources - *ongoing*.
- Raise the profile of the importance of traditional arable cropping and cattle grazing as important biodiversity management tools with partners – *ongoing*.
- The issue of reducing grazing pressure in 'hotspot' areas cannot be addressed by simply fencing off certain sites (due to its detrimental impact on certain BAP species e.g. Capercaillie and Black grouse). Reducing stocking densities of both domesticated and wild animals may be necessary and justified in some areas on biodiversity grounds - *ongoing*.
- Properly consider important strategic farmland and grassland habitat networks when developing new landuses or encouraging changes in current management regimes e.g. woodland expansion – *by 2005*.
- Encourage appropriate riparian and boundary tree planting where appropriate. However, tree planting is not necessarily always good for biodiversity on grassland and farmland habitats. It can destroy important areas for plants and fungi that require open habitats and it may also inadvertently create cover for predators to use when hunting species such as farmland waders. It is important to consider the value and biodiversity of existing sites, before embarking on management to change habitats.

5. Climate change and pollution:

The issues:
- Climate change may have profound and unforeseen changes on many upland areas, including farmland and grassland habitats and species. Predictions for the Cairngorms suggest that changes in the farmland and grassland habitats are likely to be relatively small and will be dependent upon land use and land manager responses to climate change.
- Acidification as a result of atmospheric sulphur and nitrogen deposition may alter nutrient levels in the soil and affect the composition and structure of vegetation communities.
- Inappropriate farming and crofting activities can cause damage and pollution to surrounding habitats, especially riparian woodland, watercourses and wetlands.

The solutions, actions and targets:
- Tackling the issue of climate change is discussed in the Introduction under the theme of common threads and recurring issues across all action plans.
- Farmers and crofters should carry out innovative management locally that might help to mitigate some of the effects of climate change on both farmland and non-farmland habitats – *at the earliest opportunity*.
- Farmers and crofters should follow the relevant codes of conduct to avoid pollution – *ongoing.*
- Partners should provide targeted advice on pesticide and fertiliser minimisation, nutrient budgeting and appropriate riparian management for all farms and crofts in the Cairngorms – *by 2010*.

6. Non-native/alien species:

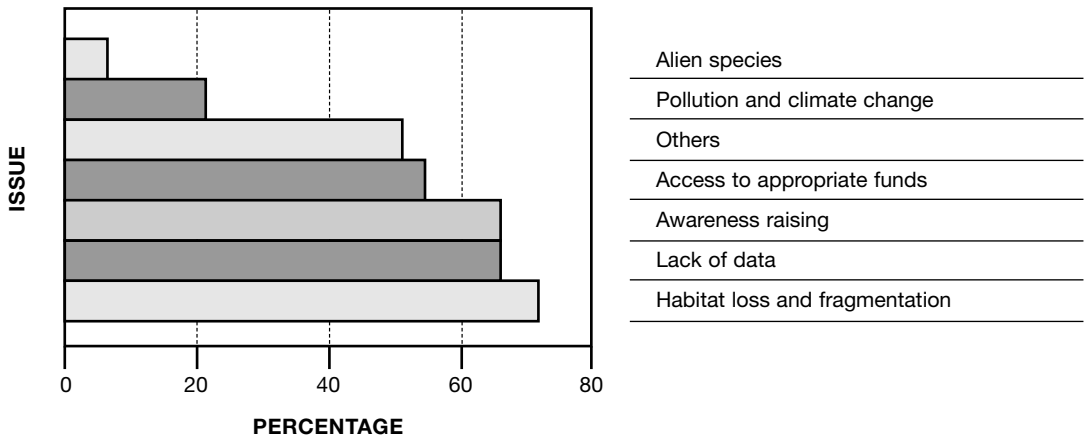
The issues:
- Introduced non-native species can potentially kill, harbour diseases or compete with native species and significantly impact upon a range of biodiversity based economic activities such as farming and crofting.

The solutions, actions and targets:
- Tackling the issue of non-native species is discussed in the Introduction under the theme of common threads and recurring issues across all action plans.

MAIN THREATS TO UK FARMLAND AND GRASSLAND PRIORITY SPECIES IN THE CAIRNGORMS:

Figure 1 identifies the main locally important issues affecting the 29 farmland and grassland Priority species in the Cairngorms. Habitat loss (or change), fragmentation and inappropriate management is an important issue for 72% of the Cairngorms farmland and grassland Priority species. Both awareness raising and lack of data were considered important issues for two thirds (66%) of Cairngorms farmland and grassland Priority species. Just over half of the Priority species (52%) require actions that are outwith the remit of the Cairngorms farmland and grassland HAP. These 'other' issues may relate to actions needing to be undertaken in other habitats or may refer to activities that have little to do with direct farmland habitat management. For species in such situations it might be important to consider co-ordinating a wide range of actions covering a number of non-farmland and grassland habitats. 55% of Priority farmland and grassland species require access to appropriate policy and funding mechanisms to deliver action that is apparently limited or lacking at present.

Figure 1. Locally important issues for UK Priority species (N=29) in Cairngorms farmland and grassland habitats.



One fifth (21%) of Cairngorms farmland and grassland Priority species are currently affected by, or sensitive to, pollution and climate change. Finally, two farmland and grassland Priority species (7%) have been adversely affected by non-native or alien species introductions to the Cairngorms area.

Please note that some caution should be used when examining and interpreting the summary data in Figure 1. The main issues and threats that score most highly for Priority species, may not necessarily be the ones that should be addressed most urgently. For example, changes to the Common Agricultural Policy could solve many of the problems identified under '*Habitat loss and fragmentation*', yet the '*Access to appropriate policy and funding sources*' section scores less than other locally important issues.

UK PRIORITY SPECIES AND LOCALLY IMPORTANT SPECIES ACCOUNTS:

The following Cairngorms farmland and grassland species accounts list the known local issues affecting both the UK Priority species and Locally important species (whose populations are considered to be of high UK importance). Where possible, each locally important issue is linked (by numbers in superscript e.g. drainage[4]) to the relevant '*Main farmland and grassland biodiversity issues*' section. For some species, a single over-riding issue is of paramount importance (e.g. Mink predation on Water voles), whereas others require a suite of co-ordinated action on issues across more than one habitat (e.g. Black grouse). Action by partners targeted at these broad biodiversity issues is likely to deliver substantial benefits for a range species. For further information on the local distribution of many Priority and Locally important species and the factors affecting local populations, please refer to the '*Biodiversity of the Cairngorms*' publication.

Brown hare:
Brown hares do well in areas of mixed arable and livestock production and benefit from moves away from farm specialisation and intensification such as measures promoted by agri-environment schemes. It is absent from the high Cairngorms.

Locally important issues:
- Loss of habitat diversity in the agricultural landscape[1,2,3,4].
- Changes in planting and cropping regimes, such as the move from hay to silage[2,3,4]. Reduction in arable production in the uplands[4].

UK importance of Cairngorms population:
- Low. UK Priority species and Locally important species.

Water vole:
The UK's fastest declining animal species has recently been found in small but important upland refuge areas across the Cairngorms. It is the subject of detailed survey work in the area.

Locally important issues:
- Predation by American mink[6]. This is considered to be the most important threat to the long-term survival of Water vole in the Cairngorms. Mink have wiped out most Water vole populations from the main stem of all the Cairngorms rivers, leaving small, but important populations in several headwaters and tributaries.
- The loss, disturbance and fragmentation of riparian habitats is thought to be important in other areas, but its relevance in Cairngorms is believed to be minimal.

UK importance of Cairngorms population:
- High and increasing steadily with extinction of populations in other areas. UK Priority species and Locally important species.

Pipistrelle bat:
A locally common species found along rivers with large trees and other suitable roost sites. Action for this species is likely to help other non-Priority listed bats.

Locally important issues:
- Loss of winter roost sites in buildings and old trees[1,2,4,#].
- Disturbance and destruction of roosts, including the loss of maternity roosts due to the use of toxic timber treatments[#].
- The reduction in insect prey abundance, due to atmospheric acid deposition and inappropriate riparian management is thought to be important elsewhere, but relevance in the Cairngorms is thought to be minimal.

UK importance of Cairngorms population:
- Moderate. UK Priority species and Locally important species.

Black grouse:

Black grouse are largely dependent upon suitable management of moorland, farmland, woodland and woodland edge habitats. The UK population has declined dramatically, mainly due to detrimental changes to several components of its habitat. It is currently the subject of local on-going research and conservation management across the CP area, where numbers are believed to be less than 2000.

Locally important issues:

- Habitat deterioration as a result of inappropriate grazing and agricultural improvement has removed key food plants such as blaeberry, heather, birch scrub and their associated insects for chicks[1,2,3,4]. This may also lead to fragmentation and isolation of habitats and subsequently small and isolated Black grouse populations[4].
- The shading out of the understory in maturing conifer plantations with high planted tree density[#].
- Drainage and over-grazing of wetland mires destroys important plant and invertebrate food[4,#]. Tall vegetation around boggy ground on moorlands is very important for nesting habitat.
- The re-seeding of traditional hay meadows and losses of upland arable production have removed food sources for the autumn and winter[1,2,3,4].
- Poor or inappropriate muirburn[#].
- Collisions with fences and possibly overhead power and telephone cables[#].
- Predation control. Foxes and crows may significantly reduce breeding success[#].
- Human disturbance during the breeding season (especially in late April-early May), particularly by birdwatchers may now be a contributory factor to poor breeding success in some areas. This threat is likely to increase as populations elsewhere decrease and more visitors come to the Cairngorms to see Black grouse[#].
- Loss of traditional cattle grazing from rough hill ground and woodlands which formerly maintained suitable wet flushes and/or open areas[4].

UK importance of Cairngorms population:

- High. UK Priority species and Locally important species.

Grey partridge:

This species has declined across most of the area, primarily as a result of changes in farmland management, especially the loss of upland arable areas. They need insects to feed chicks in the spring and summer, lots of seeds throughout the year and safe nesting cover. Grey partridges are highly sedentary and therefore particularly susceptible to detrimental management changes to their habitat.

Locally important issues:

- Loss of nest sites to farm intensification[2,3,4]. Probably important in some areas, e.g. Deeside and Glen Esk.
- Reduced food supplies and sources for chick food through the use of pesticides and herbicides important in other areas, but relevance in Cairngorms is unknown[2,3,4].
- Loss of winter stubbles, cereals and turnip fields (to grass) for feeding birds[2,3,4].
- Vulnerability of nests to predators in farmland with poor cover[4,#].
- Nest destruction caused by early mowing and other similar farm operations[2,3,4].

UK importance of Cairngorms population:

- Moderate. UK Priority species and Locally important species.

Corncrake:

The Corncrake was once common in the Cairngorms, but is now a very rare breeder. It requires traditionally managed hay meadows, or grass cut late for hay or silage.

Locally important issues:

- The main reason for the decline of the species has been the loss of traditional grassland habitat and inappropriate management practices, such as earlier cutting of hay or grass[4].

- One of the main objectives of the UK Corncrake action plan is to encourage the species back to areas in its former range away from the core population in the Western Isles[#]. In 2001 Corncrakes reappeared at one Cairngorms site and even with such small numbers, effort should be directed towards re-establishing them by bringing such sites under '*Corncrake friendly*' management at the earliest opportunity[2,3,4].

UK importance of Cairngorms population:
Currently Low. UK Priority species.

Redshank:
Strathspey is the top mainland site in Britain and Ireland for breeding farmland waders, including Redshank. Redshank require wet areas and local farmland traditionally managed for livestock, particularly cattle.

Locally important issues:
- Main populations now in relatively isolated pockets[4].
- Inappropriate grazing management (inc. both over and undergrazing)[3,4].
- Threat from loss of wet ground conditions through cultivation and drainage [3,4].

UK importance of Cairngorms population:
Very high. UK Species of Conservation Concern and Locally important species.

Lapwing:
Strathspey is the top mainland site in Britain and Ireland for breeding farmland waders, including Lapwing. Lapwing need bare ground or short vegetation for nesting from mid March-June and an abundance of soil and ground invertebrates throughout the year. Lapwing also require rushy areas of pasture and damp grassland areas or small shallow muddy pools as feeding areas for chicks.

Locally important issues:
- The heavy use of fertilisers and pesticides[2].
- Rolling and harrowing in nesting season[2].
- Loss of habitats created by spring cereal production[4].
- Retention of low intensity pastoral farming/hay production or late silage[4].
- Threat from loss of wet ground conditions through drainage [3,4].

UK importance of Cairngorms population:
Very high. UK Species of Conservation Concern and Locally important species.

Golden plover:
The main issues for this species are not fully understood[1], but many birds move off the high moorlands to feed on invertebrate rich fields on the lower ground. Also the intensification of lowland farmland on the Golden plover's wintering grounds is thought to be important to survival and ultimately to the number of returning individuals[#].

Locally important issues:
- Retention of low intensity pastoral farming/hay production or late silage[4].
- Retention of fairly heavily grazed fields for birds to feed on[4].
- Afforestation on moorland areas[#].

UK importance of Cairngorms population:
Moderate-high. UK Species of Conservation Concern and Locally important species.

Skylark:
Skylarks can be found on a wide range of open habitats, with densities probably highest on mixed farms in the local area. The UK Skylark population has declined dramatically over the last 30 years and this decline has been largely caused by the move from spring to winter cereals, as

well as intensified grassland management, particularly in lowland areas.

Locally important issues:

- The main issues for Skylark relate to detrimental changes in the wintering lowland areas[#] and lie outwith the influence of the Cairngorms. However, the heavy use of fertilisers, herbicides and silage are probably relevant[4].
- Numbers in Badenoch and Strathspey increased on moorlands in the 1950 and 1960s, when the species colonised the high plateaux, but since then numbers have declined on the plateaux, moorlands and many upland farms. These declines were attributed to overgrazing by sheep and perhaps the loss of winter stubbles[4].

UK importance of Cairngorms population:

Low. UK Priority species and Locally important species.

Spotted flycatcher:

This summer migrant is widespread throughout mixed woodland and farmland habitats in the CP area but may have declined, as it has in other parts of the UK.

Locally important issues:

- The reasons for the historical decline in the Cairngorms are unknown[1]. Elsewhere, the largest declines have occurred in areas of intensive agricultural production. This decline has also coincided with inclement weather conditions both during the breeding season and on migration [5].

UK importance of Cairngorms population:

Moderate. UK Priority species.

Song thrush:

This common species is widespread throughout the CP area. However, the population trend of Song thrushes in the Cairngorms is unknown.

Locally important issues:

- Song thrushes use a wide variety of habitats for feeding and nesting. The reasons for the national decline on farmland are not well known, but are thought to relate to detrimental changes in the wintering lowland areas [#] and lie outwith the influence of the Cairngorms. It is possible that these changes in the species wintering sites affect numbers returning to breed.

UK importance of Cairngorms population:

Moderate-high. UK Priority species and Locally important species.

Ring ousel:

Ring ousels visit the uplands during the spring and the summer to breed. In Britain, their numbers have been declining for many decades, but some parts of the Cairngorms have bucked the national trend and continue to hold important populations of Ring ousels e.g. Glen Callater. Ring ousels prefer a mixture of heather and short-grazed grass, with some bracken on steep rocky slopes for nesting and abundant ground invertebrates during the breeding season. It is important to avoid over-grazing, burning and intensive tree plantings in these preferred areas.

Locally important issues:

- Not properly understood[1], but currently being researched locally. Possible causes include landuse changes such as afforestation, changes to moorland and grassland grazing practices, the widespread 'improvement' of upland grasslands and increases in ground predator populations – but none of these possibilities have yet been confirmed.

UK importance of Cairngorms population:

Moderate-high. UK Species of Conservation Concern and Locally important species.

Linnet:
Linnets are found on farmland and rough grassland wherever there is a plentiful supply of seeds throughout the year. Although the UK population has suffered a significant decline in the last three decades, there is no information on population trends in the Cairngorms.
Locally important issues:
- Loss of wildflower seeds and some grains as a result of the removal of arable land locally[4].
- Loss of autumn and winter feeding areas (arable stubbles and turnips) [4].
- Loss of whins (gorse) by destructive agricultural and forestry practices [2].
- Changes in management of pastoral areas, through increased use of fertilisers, re-seeding, intensive grazing and early cutting for silage [3,4].

UK importance of Cairngorms population:
Low. UK Priority species.

Twite:
Twite use a mosaic of heather moorland, in-bye pasture and arable ground to feed and nest in. Nationally the population has declined through a combination of loss of heather, over-grazing, upland afforestation and agricultural intensification. These agricultural changes have resulted in grassland monocultures, reduced weed populations, a change from hay to silage and a loss of root fodder crops and winter stubbles.
Locally important issues:
- Not fully understood[1], but the reduction in arable stubbles and turnips in the uplands resulting in the loss of autumn and winter feeding areas is thought to be relevant [4].

UK importance of Cairngorms population:
Moderate-high. UK Species of Conservation Concern and Locally important species.

Tree sparrow:
Tree sparrows are now generally found on lowland farmland with arable and mixed farming systems. They have declined enormously in the last 3 decades due to intensive farming practices that removed a plentiful supply of seeds, insects and spiders to feed chicks in the spring and summer. Tree sparrows nest in colonies in trees, farm buildings, old bridges (and also nest boxes) and these natural colonies are often inadvertently destroyed without people being aware of a colony.
Locally important issues:
Never particularly common in the area, the reasons for the loss of Tree sparrows in the Cairngorms are not currently well known[1], but they are thought to include the following:
- Part of general decline in farmland birds, many of which share its diet of cereal, grass, insects and wildflower seeds. This has been attributed to changes in agricultural practices, especially the loss of winter stubbles, intensive use of grasslands and general reduction in mixed farming towards increased specialisation[1,2,3,4].

UK importance of Cairngorms population:
Low. Extinct in several areas including Badenoch and Strathspey. UK Priority species and Locally important species.

Bullfinch:
Bullfinch is a common breeding species found at low densities throughout woodlands and gardens in the area. In the autumn, Bullfinches also feed in flocks on heather seeds at the edge of moorland. The recent national decline on farmland was associated with loss of hedgerows and possibly the loss of arable weeds associated with farm intensification in the lowlands.
Locally important issues:
- Not currently well known[1], but none of the detrimental factors identified nationally are thought

to be particularly relevant to the Cairngorms.

UK importance of Cairngorms population:
Moderate. UK Priority species and Locally important species.

Corn bunting:

Corn buntings have declined dramatically across most of Britain, including Scotland, due to agricultural intensification, which has removed and destroyed its most important food sources and nesting sites. Corn buntings need nesting sites on the ground in arable areas that do not get destroyed, lots of seeds throughout the year and plenty of insects to feed their chicks in the spring and summer.

Locally important issues:

Not currently well known[1], but these are thought to include the following:

- Loss of extensive mixed farming with traditionally managed arable areas[1,2,3,4]. The heavy use of herbicides and silage are probably also relevant[4].
- Loss of winter food, in particular weedy stubble fields[1,2,3,4].

UK importance of Cairngorms population:
Low. Formerly common but now extinct in Badenoch and Strathspey and most other (all?) Cairngorm areas. UK Priority species.

Snow bunting:

Significant numbers of this largely montane species winter on farmland. In the winter mixed flocks of finches and buntings may be found feeding on farmland.

Locally important issues:

- Effect of predicted climate change scenarios[5].
- The loss of winter food, in particular weedy stubble and turnip fields may also affect this species, although there is no specific research that has shown this [1,2,3,4].

UK importance of Cairngorms population:
High. UK Species of Conservation Concern and Locally important species.

Reed bunting*:*

Reed buntings use a wide variety of habitats including wet farmland and grassland sites.

Locally important issues:

Detrimental factors are not currently well known[1], but these are thought to include:

- Part of general decline in farmland birds, many of which share its diet of cereal, grass, insects and wildflower seeds. This has been attributed to changes in agricultural practices, especially the loss of winter stubbles, turnips, decline in outdoor stock feeding, intensive use of grasslands and general reduction in mixed farming towards increased specialisation[1,2,3,4]. In the Cairngorms the loss of upland cereal production has been considered a contributory factor in the species' decline.
- Deterioration of wetland habitats. Loss of small ponds, unsympathetic river engineering, land drainage (both arterial watercourses and field drains) and excessive encroachment of scrub and carr are all likely to have had adverse effects on breeding and wintering populations (some encroachment is thought to be beneficial)[4,#]. The effects of cattle grazing in wetland areas are largely thought to be positive for this species.

UK importance of Cairngorms population:
Low. UK Priority Species.

Pearl-bordered fritillary *(a butterfly):*
This species requires open (grazed) woodland, unimproved grassland and woodland/moorland edge habitats, often with a south-facing slope.
Locally important issues:
- Loss of open clearings through canopy closure within forest systems [#].
- Cessation of grazing on unimproved grassland[2,3,4].
- Bracken eradication[2,3,4].
- Inappropriate grazing regimes in open woodland, especially overgrazing by sheep[2,3,4,#].

UK importance of Cairngorms population:
Moderate-high. UK Priority Species and Locally important species.

Northern brown argus *(a butterfly):*
This species distribution is governed by that of its food plant, Common rockrose, and occurs in many discrete sites less than 1ha in size and is consequently vulnerable to both local and widespread habitat change.
Locally important issues:
- Inappropriate grazing regimes. Both over-grazing and under-grazing can cause problems to the habitat [2,3,4].
- Loss of key habitat components, namely lightly grazed south facing slopes with the food plant Common rockrose[2,3,4].

UK importance of Cairngorms population:
High. UK Priority Species and Locally important species.

Mountain ringlet *(a butterfly):*
This is a montane or sub-montane species that favours slightly base rich grassland habitats at 350-800m altitude, where its larvae feed on the Mat grass *Nardus stricta*.
Locally important issues:
- Inappropriate grazing regimes. Both over-grazing and under-grazing can cause problems to the habitat [2,3,4].
- The effect of predicted climate change scenarios[5].
- Inappropriately sited new woodlands[#].

UK importance of Cairngorms population:
Moderate-high. UK Species of Conservation Concern and Locally important species.

Large heath *(a butterfly):*
Predominantly a species of peatland habitats where its food plant Cotton grass *Eriophorum spp* is found, this species distribution and status is probably masked by chronic under-recording.
Locally important issues:
- Inappropriate grazing regimes. Both over-grazing and under-grazing can cause problems to the habitat [2,3,4].
- Site drainage for agricultural improvement or new woodlands[4,#].
- Direct habitat loss through peat extraction[4,#].

UK importance of Cairngorms population:
Moderate-high. UK Species of Conservation Concern and Locally important species.

Sword grass *(a moth):*
A species of grassland and moorland edge, extending onto lowland farmland areas. Its larvae feed on grasses before changing on to broadleaved species such as Blackthorn and Bird cherry.
Locally important issues:
- Poorly understood. The factors causing the loss or decline nationally are not even known[1].

UK importance of Cairngorms population:
High. UK Priority Species.

Narrow-bordered bee hawk *(a moth):*
A species of unimproved grasslands, bogs, peatland sites and heather moorland, where its food plant Devil's-bit scabious is found.
Locally important issues:
- Agricultural improvement of unimproved grassland and heathland[2,3,4]. Inappropriate management of grassland, heathland and bogs[1,2,3,4,#].

UK importance of Cairngorms population:
Low. UK Priority Species.

Mason bee Osmia inermis:
The Mason bee *Osmia inermis* has only recently been recognised as a separate species from *Osmia uncinata*. Consequently, this species has been under-recorded and poorly researched. Nevertheless, the following issues are thought to be the main threats:
Locally important issues:
- Loss of herb rich grasslands with short swards (containing plenty of the pollen rich Bird's-foot trefoil) through agricultural intensification, commercial afforestation or cessation of grazing[1,2,3,4,#].
- The species has a boreo-alpine distribution and could be negatively affected by climate change[5].

UK importance of Cairngorms population:
High. UK Priority Species.

Ruby-tailed wasp Chrysura hisuta:
This Ruby-tailed wasp parasitises *O. uncinata* and *O. inermis*, the rare mason bees, and so is extremely rare and completely dependent upon healthy populations of its rare hosts.
Locally important issues:
- Reliance on its rare host species[#].

UK importance of Cairngorms population:
High. UK Priority Species.

A picture-winged fly Dorycera graminum:
This fly is associated with unimproved grassland, but little else is known about its ecological requirements. Adults have been frequently found in association with umbellifers. It has been recorded from grasslands in Strathspey.
Locally important issues:
- Unknown[1].

UK importance of Cairngorms population:
Unknown. UK Priority Species.

***Orange-fruited elm lichen**:*
Formerly found mainly on elms throughout the UK, this species is now found on a few remaining live elms and a limited number of other trees.
Locally important issues:
- Felling of host species[1,2,4,#].
- Loss of habitat due to Dutch elm disease [6].
- Pollution from atmospheric sulphur dioxide emissions [5].

UK importance of Cairngorms population:
Not known. UK Priority Species.

Pale bristle moss:
Found on the bark of mature broadleaved trees, often by rivers. The main threats/issues are not currently well known, but likely to include:
Locally important issues:
- Atmospheric sulphur dioxide emissions are believed to have been the main cause of the decline of this species, but may no longer be a limiting factor at its remaining sites[5].
- Felling of host trees[1,2,4,#].
- Ignorance about the species and its ecological requirements[1,2].

UK importance of Cairngorms population:
High. UK Priority Species.

***Purple ramping fumitory** (a plant):*
This species is endemic to the British Isles. It is a species of hedge-banks, arable land, waste ground and areas where soils has recently been disturbed. There is one record from the Cairngorms area.
Locally important issues:
Factors causing the decline are poorly understood[1], but may include the following:
- The destruction of hedge-banks and other field edge habitats[4].
- The demise of traditional crop rotation[2,3,4].
- The heavy use of herbicides are probably also relevant[4].

UK importance of Cairngorms population:
Low. UK Priority Species.

***Dark red helleborine** (a plant):*
This orchid is very local in the Cairngorms, being known from only four base rich areas.
Locally important factors:
- The Cairngorms populations are very isolated from other Scottish populations (>100km), making local losses serious as the species is unlikely to naturally re-colonise the area[4].
- One of the Cairngorms sites is next to a road, so there is potential risk from inappropriate road works at the site[4].

UK importance of Cairngorms population:
Moderate-high? Locally important species.

***Common rockrose**:*
This species is found on a range of base rich sites including rocky outcrops, in grassland and some open broadleaved woodland. There are a number of very good sites along public road-sides e.g. at Aboyne and Dinnet and these sites are also good for butterflies and moths that feed on rockrose. This species is considered a good indicator species for botanically rich sites.
Locally important factors:

- Salt off roads, either as spray on the verges or where piles are left, is very detrimental[2,5].
- Agricultural improvements are a threat[4].
- Inappropriate grazing levels (both over and under grazing) [4].

UK importance of Cairngorms population:
Moderate-high? Locally important species.

***Alpine lady's mantle**:*
This species is locally common in, but not confined to, flushed grasslands at higher altitudes.
Locally important factors:
- There are no obvious threats other than possibly climate change[5].

UK importance of Cairngorms population:
Moderate-high? Locally important species.

***Slender stonewort**:*
This species grows in several habitats, but is most often found in shallow water bodies such as farm ditches, ponds, lochans, flushes and pools. The species has a very local but widely dispersed distribution in Britain. It is only known from one site in the Cairngorms.
Locally important issues:
Although not well known[1], it is thought that the following are factors:
- Pollution from agricultural runoff[5].
- Afforestation (acidification) in some catchments[4,#].
- Encroachment of scrub and other vegetation at some sites[4,#].

UK importance of Cairngorms population:
High. UK Priority Species.

***Juniper**:*
This widespread species is found throughout the Cairngorms on farmland, grassland, moorland and woodland sites and is important for several species including Black grouse.
Locally important issues:
- Excessive grazing which prevents establishment of young bushes[2,3,4].
- Insufficient grazing which reduces the area suitable to Juniper regeneration. This may also cause the loss of adult bushes as other tree species shade out Juniper[2,3,4].
- Direct clearance of stands[4].
- Excessive burning which may destroy young regeneration and adult bushes[4,#].
- Low economic and cultural value attached to the species[2].

UK importance of Cairngorms population:
Moderate. UK Priority Species and Locally important species.

***Mountain scurvy grass**:*
An endemic British species showing no signs of declining. It is generally found above 600m asl on base rich grassland soils, often around wet or damp flushes.
Locally important issues:
- No known significant threats[1].

UK importance of Cairngorms population:
High. UK Priority Species.

Grouped species: Farmland and grassland fungi

- **A pink waxcap** *Hygrocybe calyptriformis*
  UK Priority Species and Locally important species.
- **An earth tongue fungus** *Microglossum olivaceum*
  UK Priority Species and Locally important species.
- **An earth tongue fungus** *Microglossum atropurpureum*
  UK Species of Conservation Concern and Locally important species.
- **An earth tongue fungus** *Geoglossum starbaeckii*
  UK Species of Conservation Concern and Locally important species.
- **A pink spored agaric fungus** *Entoloma bloxamii*
  UK Species of Conservation Concern and Locally important species.
- **An agaric fungus** *Mycena latifolia*
  Locally important species.
- **An agaric fungus** *Porpoloma metapodium*
  UK Species of Conservation Concern and Locally important species.
- **A fairy club fungus** *Clavaria rosea*
  Locally important species.
- **A fairy club fungus** *Clavaria zollingeri*
  Locally important species.
- **A parasitic agaric fungus** *Squamanita paradoxa*
  UK Species of Conservation Concern and Locally important species.

Locally important issues:

- Data deficiency [1].
- Agricultural 'improvements' including reseeding and fertilising grassland [2,3,4].
- Reduction in grazing and consequent increase in rank vegetation and scrub [2,3,4].
- Planting of unimproved grassland corners with trees (both exotic conifers and native broadleaves)[2,3,4].
- Air pollution can damage such fungi [5].

UK importance of Cairngorms populations:

Data deficient, but thought to be high

BOUNDARY FEATURES

Habitat definition:
In the Cairngorms there are three main types of so-called '*boundary feature*': hedges, walls and ditches, each with a distinctive biological character. Frequently they are linear features that provide opportunities for some species to disperse within otherwise inhospitable landscapes. Boundary features are also beneficial for reducing soil erosion by water and wind and snow blocking of roads. Hedges resemble woodland edge/scrub habitats and exhibit a wide range of variation and most are important relicts of rich woodland environments. Dykes and stone fanks (sheep pens) are stone walls and are typically found in upland areas, and provide a habitat for flowering plants, ferns, mosses and lichens. A wide range of invertebrates, reptiles, birds and mammals use dry stone walls for feeding, breeding or shelter. In low lying areas where the water table is perennially close to the surface, flooded ditches are used as stock proof boundaries to grasslands or as arterial drainage in arable areas. Drains are often the last refuges of rare aquatic plants or animals and when managed appropriately, they can support important assemblages of species.

Current status, distribution and significance of the habitat:
Drystone dykes are common in Deeside and the Angus Glens and are found on both lower and higher ground often marking the boundaries (marches) between neighbouring farms/estates. A recent study by the Drystone Wall Association reports that as little as 14% of dykes are in good condition and stock proof. There are approximately 500,000 miles of dyke in the UK, with about 150,000 miles in Scotland. Local estimates vary, but suggest that there are about 20,000 miles of dyke within the Cairngorms Partnership area, with some important areas, such as Deeside holding a significant proportion of dykes.

A fallen dyke is as valuable a habitat as a standing stock proof wall, especially where there are few other rocks, trees or rank vegetation nearby. Studies from the United States of America show that the upslope side of a wall to be richer in nutrients, damper and carrying a far greater variety of invertebrates than the downslope side of a wall. With age, dykes become important corridors for wildlife.

There is very little information on water-filled ditches, but they are now thought to be uncommon in the Cairngorms because many of them have been put into pipes. However, water filled ditches are an important habitat for a number of species and could easily be improved through sympathetic targeted management. Hedgerows are rare in the Cairngorms and are not particularly characteristic of the area.

The national biodiversity context:
There is a UK Habitat Statement for boundary features. This gives the following conservation direction and guidance to LBAPs, which may use some or all of the relevant measures identified nationally:

"Maintain the quantity and quality of boundary features, protecting features of conservation value and bringing derelict features into appropriate management."

Measures identified on a UK wide basis to consider further include:
- Protect boundary features important for wildlife from damage and destruction.
- Use existing measures such as agri-environment schemes to support the appropriate management of boundary features (currently ditches only).
- Extend boundary features to increase cover and connect isolated habitat fragments.
- Develop methodologies for the identification and management of important habitat features e.g. roadside verges.

Targets:
The following four objectives and targets have been identified for boundary features in the Cairngorms:

Main objectives/targets:
Target 1*: Ascertain the distribution, area and ecological status of boundary features in the Cairngorms – by 2005.*
Target 2: *A presumption against a reduction in overall length of boundary features in the Cairngorms – by 2006.*
Target 3: *Maintain and restore good ecological status/quality* of key boundary feature sites in the Cairngorms – by 2008.*
Target 4: *Ensure no net loss in the number and/or range of key LBAP species in the Cairngorms associated with boundary features – by 2008.*

* Measured using an appropriate standardised method for ascertaining good ecological status/quality.

Current factors affecting the habitat in the Cairngorms:
The following specific boundary feature issues were identified over and above those important issues detailed in the '*Main farmland and grassland biodiversity issues*' section:

Habitat loss and fragmentation:
The issues:
- Much of the drystone dyke resource is unmanaged/neglected and may be disappearing, particularly given the crisis in the farming sector today. The development of the Cairngorms National Park may bring added pressures on the remaining drystone dykes. There has been an increase in demand for natural rock from homeowners across the UK. In other national parks, locals and visitors (with disposable income) bring a local boom in stonework and the stone tends to be removed (bought or stolen) from valuable wildlife habitats.
- Filling in of ditches and increased use of pipes has removed many water filled ditches.
- Regular grass cutting, the use of herbicides and increased disturbance due to the laying and maintenance of services such as gas, electricity and telecommunications can all damage the biodiversity interest of boundary features.
- Road widening and alignment has resulted in the loss of traditional boundaries and verges in some areas.
- Inappropriate or unsympathetic management of roadsides and ditches can damage the biodiversity interest of boundary features.

The solutions, actions and targets:
- Relevant local authorities and private companies should put back drystone dykes, water filled ditches and hedges along new alignments when carrying out road maintenance in all future Cairngorms work programmes – *by 2005*.
- Encourage cost-effective sympathetic management/maintenance of ditches and other small 'micro-habitat' boundary features through appropriate agri-environment funding and consider buffering important edge zones from excessive grazing – *by 2006.*
- The protection and renovation of drystone dykes within the Cairngorms National Park should be identified as a priority for action - *by 2005*. It is suggested that a long-term package of professional training and education be considered alongside construction and maintenance programmes. This would have the potential to create and support local employment opportunities.

Practical action:

Barn owl boxes for the Angus Glens, Atholl and Glen Shee:
The Cairngorms LBAP and the Angus FWAG are working together to provide materials for local school children and volunteers to make Barn owl nest boxes. Many farmers and landowners in the south of the Cairngorms have expressed an interest in providing sites for these Barn owl nest boxes at the edges of fields or on the sides of buildings.

ARABLE LAND AND CEREAL FIELD MARGINS

Habitat definition:
Arable land is the area of crops, plus bare fallow ground in a field. Cereal field margins refer to strips of land lying between cereal crops and the field boundary, and extending for a limited distance into the crop (typically 6m width), which are deliberately managed to create conditions that benefit important farmland species. The size of these strips varies according to the area and type of farming and may, by nature be ephemeral, making the habitat extremely difficult to quantify.

In the Cairngorms Straths ESA, farmers have been encouraged to maintain traditional agricultural practices and leave 2m margins around fields with 6m unsprayed zones. On many smaller farms and crofts, there is little or no use of chemicals and crops are often not sprayed with pesticides. The cereal field margin as a UK Key Habitat is more relevant to lowland areas with large-scale, intensive farming. In the Cairngorms context it would therefore be more appropriate to consider promoting the traditional and sensitive management of all the remaining small-scale arable/cereal fields in ways that are beneficial to biodiversity. This includes simple rotational arable cropping, such as cereals, swedes/potatoes and grass with some liming.

Current status, distribution and significance of the habitat:
There are no published up-to-date figures on the current or recent area of cereal field production in the Cairngorms, but the total area of arable land is thought to be less than 2% of the Cairngorms Partnership area. Throughout this century until the 1970s cereal crops or grain were commonly grown on farms and crofts in the uplands/hills of Scotland and in particular the Cairngorms. Since then, a decline in the number of upland farms and crofts, technical advances in agricultural science and successive agricultural policies have encouraged the increased use of silage, a reduction in mixed farming, and a move towards intensification and specialisation. As a result, the growing of cereals or grain at altitude has become increasingly uncommon in the Cairngorms Straths over the last three decades. However, it can still be seen in some places like Corgarff and Tulloch despite the high altitude.

Only three formerly regular breeding bird species are known to have been lost from Strathspey in the last 30 years; Corncrake, Corn bunting and Tree sparrow. The loss of traditionally managed arable land is believed to be primarily responsible for this loss and decline of biodiversity (not limited to Strathspey). Yellowhammers are now also relatively rare and once again, the change away from arable towards permanent grass production is thought likely to be responsible.

Due to the current small extent of cereal or grain production in the Cairngorms, it is unlikely that the remaining area of habitat is of national importance. However, a number of nationally important species are associated with this habitat, making it at least of local importance with oats, barley or wheat the main the main types grown. It is difficult to over-estimate the importance of continued traditional arable production to biodiversity conservation in the Cairngorms. Unfortunately arable production is currently becoming uneconomic in the Cairngorms and unless financial incentives change it is likely to remain so.

The national biodiversity context:
There is a UK Habitat Statement for cereal field margins. This gives the following conservation direction and guidance to LBAPs, which may use some or all of the relevant measures identified nationally:

"Maintain, improve and restore by management the biodiversity of some 15,000ha of cereal field margins on appropriate soil types in the UK - by 2010. Maintain existing diversity and distribution of all populations of rare and declining species associated with arable land, where appropriate connecting fragmented populations."

Measures identified on a UK wide basis to consider further include:
- Protect arable areas important for wildlife from inappropriate land use.
- Consider the requirements of rare and threatened species dependent upon these areas when negotiating changes to, or reform of, agricultural support schemes.
- Review and use existing agri-environment measures such as set-aside, ESAs, (and subsequently the new RSS), to ensure the requirements of important species are taken into consideration.
- Provide farmers with practical advice and technology to enable them to manage land for the benefit of wildlife.

Targets:
The following four objectives and targets have been identified for arable land and cereal field margins in the Cairngorms:

Main objectives/targets:
Target 1*: Ascertain the distribution, area and ecological status of arable land and cereal field margins in the Cairngorms – by 2005.*
Target 2: *Ensure no net loss in overall area of traditionally managed arable land and cereal field margins in the Cairngorms – by 2006.*
Target 3: *Extend the area of traditionally managed arable land/cereal (e.g. low or no herbicides) cropping by 20% in the Cairngorms – by 2008.*
Target 4: *Ensure no net loss in the number and/or range of important LBAP species in the Cairngorms associated with arable land and cereal field margins – by 2008.*

Current factors affecting the habitat in the Cairngorms:
The following specific arable land and cereal field margin issues were identified over and above those important issues detailed in the '*Main farmland and grassland biodiversity issues*' section:

Habitat loss and fragmentation:
The issues:
- The loss of traditional crop rotation and to a much lesser extent the change from spring to autumn sown cereals, has caused loss of feeding on stubbles for wintering birds and loss of suitable conditions in the spring for ground nesting birds.
- Reduction in overall area of traditional arable production in the Cairngorms.

The solutions, actions and targets:
- Encourage a return to traditional rotational cropping of oats and other spring cereals through-out the Cairngorms – *by 2008* through appropriately funded schemes such as the Cairngorms Upland Grain Initiative and the Rural Stewardship Scheme.
- Intensively managed arable cropping (e.g. heavy herbicide, fertiliser and pesticide use) provides very limited biodiversity opportunities and should be discouraged in the Cairngorms.

Practical action:

The Cairngorms Upland Grain Initiative:
In 2000, the Cairngorms LBAP and Farming and Wildlife Advisory Group developed an exciting farmer-led initiative to encourage local farmers and crofters to plant and harvest small sacrificial areas of grain and fodder crops for declining bird species in Badenoch and Strathspey. Prior to the mid 1970s, cereal crops were commonly grown on farms and crofts in the uplands of Scotland, but since then this habitat has rapidly declined due to changing agricultural policies and practices. Many associated farmland species have declined too.

Twelve 'Upland Grain' sites were selected and monitored weekly for birds between April and January. Of the 50 species of bird recorded using the Upland Grain fields in the first year,

34 (68%) were UK listed Biodiversity Action Plan species. These included seven Priority species: Capercaillie, Black grouse, Grey partridge, Linnet, Skylark, Song thrush and Reed bunting, and a further 27 Species of Conservation Concern. Very large numbers of finches and buntings were recorded, with a flock of 1,100 birds at one site.

The first year was considered an overwhelming success, with strong local farming and crofting community support for the project. The pilot study clearly demonstrated the value of 'Upland Grain' sites for declining farmland biodiversity in the Cairngorms and beyond. The project has been carried forward with a number of partners and it is hoped to eventually widen the number of farmers and crofters participating.

CALCAREOUS GRASSLAND

Habitat definition:
Calcareous grasslands are found on shallow lime-rich soils and tend to be confined to small areas of limestone in the south and east of the Cairngorms and other basic rocks such as epidiorite and mica-schist. Calcareous grasslands contain an exceptional diversity of rare plants and a number of associated important BAP listed species, hence their alternative name of '*Species rich grasslands*'. The habitat is sometimes split into two sub-categories: lowland calcareous grassland and upland calcareous grassland. For the purposes of this HAP, these sub-categories have been included together under the general heading calcareous grassland.

Current status, distribution and significance of the habitat:
The total area, extent and condition of calcareous grassland in the Cairngorms is not known, but is certainly small and limited. Several protected areas such as Beinn a' Ghlo, Ben Vrackie, Caenlochan, Tulach Hill and Inchrory contain small areas of calcareous grassland. Some grassland sites along the River Dee may possibly be defined as calcareous. The Cairngorms Partnership area appears to contain only a very small proportion of the UK's calcareous grasslands. Nevertheless, these small areas do contain several rare plants, which may be significant in a Scottish context.

The national biodiversity context:
There is a UK Habitat Statement for calcareous grassland. This gives the following conservation direction and guidance to LBAPs, which may use some or all of the relevant measures identified nationally:

"Maintain calcareous grassland in all parts of the UK where it occurs, restore degraded calcareous grasslands, buffering and linking small, vulnerable or discontinuous sites."

Measures identified on a UK wide basis to consider further include:
- Protect calcareous grassland from inappropriate changes in landuse and management.
- Reduce the intensity of grazing in the upland calcareous grassland sites.
- Consider how existing measures, such as agri-environment schemes might establish links between fragmented calcareous grasslands; to allow plant and animal dispersal and facilitate management.
- Provide advice required to manage calcareous grasslands effectively; encourage technological and other innovation to assist in the sympathetic management of calcareous grassland.

Targets:
The following four objectives and targets have been identified for calcareous grassland in the Cairngorms:

Main objectives/targets:
Target 1: *Ascertain the distribution, area and ecological status of calcareous grassland in the Cairngorms – by 2005.*
Target 2: *Ensure no net loss of calcareous grassland in the Cairngorms – by 2006.*
Target 3: *Maintain and restore good ecological status/quality* of key calcareous grassland sites in the Cairngorms – by 2008.*
Target 4: *Ensure no net loss in the number and/or range of key LBAP species in the Cairngorms associated with calcareous grassland – by 2008.*
Target 5: *Where underlying geology and soils allow, attempt to establish habitat links between important isolated calcareous grassland patches – by 2008.*

* Measured using an appropriate standardised method for ascertaining good ecological status/quality.

Current factors affecting the habitat in the Cairngorms:
The following specific calcareous grassland issues were identified over and above those important issues detailed in the '*Main farmland and grassland biodiversity issues*' section:

Habitat loss and fragmentation:
The issue:
- The main issue for calcareous grassland in the Cairngorms is localised over-grazing from sheep, rabbits and deer. This adversely affects species richness with a particular loss of tall herb and shrub species, leading to fragmented and isolated calcareous grassland patches.

The solution, action and target:
- Ensure that all key calcareous grasslands in the Cairngorms are brought under sympathetic grazing management – *by 2006.*
- Concentrate efforts on reducing Red deer numbers where their impacts on calcareous grassland sites are significant and severe – *at the earliest opportunity*.
- Where underlying geology and soils allow, consider imaginative opportunities for establishing effective habitat links between important remnant calcareous grasslands – *by 2008*.

ACID GRASSLAND

Habitat definition:
Acid grasslands occur on acidic rocks such as sandstone, acid igneous rocks and on superficial deposits such as sand and gravel. This habitat type includes all semi-improved and unimproved grasslands occurring on such acid soils. The sites are often of limited biodiversity interest and are generally the product of heavy grazing of other more biologically rich 'Priority habitats' such as upland heath. The exact definition of this habitat from a Cairngorms perspective is difficult to ascertain. Previous surveys of the Cairngorms Partnership area under the Land Classification System (LCS) have categorised this habitat as either '*poor rough grassland*', dominated by *Nardus* and *Molinia species* or '*good rough grassland*' with acid, neutral and calcareous grasslands. Acid grassland, often rich in Tufted hair grass *Deschampsia cespitosa*, tends to extend into the moorland and montane zone. The overlap and relationship between acid grassland and these other upland habitat types should be considered when using this HAP.

Current status, distribution and significance of the habitat:
Large expanses of species poor acid grassland occur throughout the British uplands. The LCS classification system considers 13,400 ha of '*poor rough grassland*' mainly in the west of the Cairngorms and 42,500 ha of '*good rough grassland*' mainly below 600m asl. These defined areas are not exclusively 'a*cid grassland*' and tend to be mosaics of the other listed habitats. The combined total for *'poor'* and *'good rough grassland'* represents at least 8% of the Cairngorms area and 7% of the Scottish total. '*Good rough grassland*' is especially rich for grassland fungi, particularly where there is some base rich influence.

Acid grasslands are becoming more common in the Cairngorms with heavy grazing pressure responsible for the conversion of significant areas of heather moorland into species-poor acid grassland. The role of this plan is not to encourage the further expansion of species-poor acid grassland. Once 'new' habitats have been created, heavy grazing can further reduce the species diversity of the acid grassland habitat. As with improved grassland, although species diversity is limited, acid grassland can be an important habitat for nationally important populations of breeding farmland waders, especially where cattle and sheep graze wetter sites on floodplains, e.g. River Spey and River Dee.

The national biodiversity context:
There is a UK Habitat Statement for acid grassland. This gives the following conservation direction and guidance to LBAPs, which may use some or all of the relevant measures identified nationally:

"Maintain and enhance important areas of acid grasslands, restore areas of degraded acid grassland, in particular to buffer existing important sites."

Measures identified on a UK wide basis to consider further include:
- Identify the true extent and quality of the acid grassland resource.
- Encourage appropriate livestock grazing to conserve the habitat.
- Protect acid grasslands of conservation importance from inappropriate landuse management and intensification.
- Restore habitat adjacent to important or vulnerable sites.
- Research appropriate methods of managing and restoring acid grasslands in the uplands.

Targets:
The following four objectives and targets have been identified for acid grasslands in the Cairngorms:

Main objectives/targets:
Target 1: *Ascertain the distribution, area and ecological status of important acid grassland in the Cairngorms – by 2005.*
Target 2: *Ensure no net loss of key floristically rich acid grassland sites in the Cairngorms – by 2006.*
Target 3: *Maintain and restore good ecological status/quality* of key acid grassland sites in the Cairngorms through targeted medium levels of seasonal grazing – by 2010.*
Target 4: *Ensure no net loss in the number and/or range of key LBAP species in the Cairngorms associated with acid grassland – by 2010.*
Target 5: *Areas of acid grassland that are not floristically diverse, species rich or known to be of particular value for breeding birds, should be considered as sites for potential conversion to heather moorland (by low levels of grazing if present) or to native woodland (by planting or by natural regeneration) - whenever opportunities arise.*

*Measured using an appropriate standardised method for ascertaining good ecological status/quality, or '*biological barometers*' such as floristic diversity or breeding farmland waders.

Current factors affecting the habitat in the Cairngorms:
The following specific acid grassland issues were identified over and above those important issues detailed in the '*Main farmland and grassland biodiversity issues*' section:

Habitat loss and fragmentation and Lack of data/important information:
The issues:
- The main issue for acid grassland in the Cairngorms is long-term over-grazing, which adversely affects species richness. Removing or reducing Red deer (rather than sheep and cattle) from acid grassland sites in the Cairngorms may result in a return to floristically and mycologically diverse grasslands. However, grazing is important in maintaining a mosaic of short grassy areas favoured by fungi.
- There is now excellent practical advice available on how to successfully achieve and manage floristically diverse acid grasslands.

The solutions, actions and targets:
- Commission specific targeted research into the relationships between grazing levels, liming, ploughing, reseeding and the retention or recreation of floristically and mycologically diverse acid grasslands – *by 2010.*
- Concentrate efforts on reducing Red deer numbers where their impacts on acid grassland sites are significant and severe - *ongoing*.
- The new practical advice should be widely disseminated and used to create new sites and bring existing acid grassland sites under more favourable management – *effective immediately*.

Practical action:

Strathspey breeding farmland wader survey:
The results of a breeding bird survey co-ordinated by local farmers, volunteers and RSPB Scotland in spring 2000 showed that grassland in Strathspey is the top mainland site known in Britain and Ireland for Lapwing, Redshank, Curlew and Snipe (collectively known as farmland waders). The area surveyed comprised c50 farms/sites, all but two of which were in non-nature conservation designated land (i.e. outwith SSSIs). The work showed a clear link between traditionally managed farmland for livestock, particularly cattle and high concentrations of

nesting waders. Notably, Strathspey is still dominated by livestock farming and this is the single most significant reason why the area is the top mainland site in Britain and Ireland for nesting farmland waders. It is hoped that this study will prove a useful catalyst to stimulate ideas and action on how best to secure and fund the continued and enhanced management of these important farmland areas for years to come.

IMPROVED GRASSLAND

Habitat definition:
Grass dominated swards on all soil types which have been established by re-seeding or by modification of unimproved grassland by fertilisers and selective herbicides, mainly for agricultural or sometimes recreational purposes. It includes grassland that has been re-seeded for more than one year. Improved grassland tends to have a low species diversity is characterised by Timothy *Phleum pratense*, Rye grass *Lolium perenne* and Clover *Trifolium repens*.

Current status, distribution and significance of the habitat:
Improved grassland is found mainly in low-lying Straths throughout the Cairngorms area. There is approximately 36,000 ha of improved grassland (c3% of the Scottish total) representing c5% of the Cairngorms Partnership area. Improved grassland is a very important habitat for ground nesting birds such as Lapwing and Skylark, but it tends to be very poor for plants, fungi and invertebrates. Recent research has shown that the improved grasslands and acid grasslands of Strathspey hold the largest breeding population of farmland wading birds known on mainland Britain. Therefore, the primary aims of biodiversity management in the Cairngorms on improved grassland should be directed at supporting these important populations of breeding waders.

Radio-tracking studies from Northern England suggest that many breeding upland waders (e.g. Golden plover) come off the hills and feed on rich grassland fields at night. In the Cairngorms, grassland sites, such as Glen Esk, Strath Don and Kerloch have been important for upland waders for many decades.

The national biodiversity context:
There is a UK Habitat Statement for improved grassland. This gives the following conservation direction and advice to LBAPs, which may use some or all of the relevant measures identified nationally:

"Enhance areas of improved grassland which are of importance for wildlife and restore semi-natural vegetation on sites where this would enhance their value for wildlife".

Measures identified on a UK wide basis to consider further include:
- Protect important sites, which include areas of improved grasslands and enhance their potential for wildlife.
- Study methods for recreating semi-natural habitats on improved grassland and establish relevant habitat creation schemes.
- Target activities which would damage semi-natural habitats, including economic development, recreation and some forms of forest planting, to areas of improved grassland which have low biodiversity value or no potential for restoration to semi-natural habitats.
- Encourage environmentally sensitive farming methods for improved grasslands.

Targets:
The following four objectives and targets have been identified for improved grassland in the Cairngorms:

Main objectives/targets:
Target 1: *Ascertain the ecological status of improved grassland in the Cairngorms, using breeding farmland wading birds – by 2005.*
Target 2: *Ensure no net loss of key improved grassland in the Cairngorms – by 2006.*
Target 3: *Maintain and restore good ecological status* of key improved grassland sites in the Cairngorms – by 2008.*

Target 4: *Ensure no net loss in the number and/or range of key LBAP species in the Cairngorms associated with improved grassland – by 2008.*

* Good ecological status for improved grassland defined as management directed at supporting or increasing breeding farmland waders.

Current factors affecting the habitat in the Cairngorms:
The following specific improved grassland issues were identified over and above those important issues detailed in the '*Main farmland and grassland biodiversity issues*' section:

Access to appropriate policy and funding sources:
The issues:
- Deterioration of improved grasslands is likely due to the removal of reseeding grants, which in turn removes incentives to improve soil structure through liming, ploughing etc.

The solutions, actions and targets:
- Policy makers should consider the impact of recent funding changes on the carrying capacity of the improved grassland soil and ultimately the biodiversity dependent upon it – *by 2005.* Furthermore, the cumulative impact of these changes on the river catchments, including increasing acidity, should also be considered by all partners.

Practical action:

Biodiversity awareness on the farm:
Strathspey farmer Alastair MacLennan has recently won the prestigious NFUS and RSPB '*Excellence*' award for biodiversity. Alastair's 419 acre Balliefurth farm is managed in such a way that marries successful habitat and species protection with the commercial running of a family farm. The Farmland Biodiversity award is awarded annually to one farmer who has made an outstanding contribution to agriculture and biodiversity conservation in Scotland.

The judges described the farm as one of the best, if not the best example, of whole farm planning and integration, including diversification, in Scotland. In particular, habitats and species of national and local importance have been clearly identified and given special consideration in the management of the site. The site is one of several in the area that, when combined, make Badenoch and Strathspey the most important site on mainland Britain for breeding farmland wading birds.

In 2000, Balliefurth Farm became the only LEAF (Linking Environment And Farming) demonstration farm in the Highlands. The purpose of the demonstration farm is to show Integrated Farm Management works in practice i.e. producing quality food and environmental benefits at the same time. Through this initiative, Alastair provides education, awareness raising events and advice to a wide range of audiences from local school children to farmers, the media, politicians, concern groups, teachers and policy makers. Currently, interpretative signs are also being developed on the Speyside Way which runs through the middle of the farm.

UNIMPROVED NEUTRAL GRASSLAND AND HAY MEADOWS

Habitat definition:
Unimproved (species rich) neutral grasslands are those grasslands traditionally managed without 'agricultural improvements' such as re-seeding and concentrated fertilisers having been used. They contain a high proportion of broadleaved herbaceous species, relative to grasses and tend to be managed as traditional hay meadows or pastures. There are three recognised unimproved neutral grassland types, two of that are unique to the UK and the third which is otherwise only recorded in Ireland. The unimproved neutral grasslands in the Cairngorms include the UK listed key habitats: lowland and upland hay meadows.

Current status, distribution and significance of the habitat:
There are probably very few traditional and deliberately managed hay meadows left in the Cairngorms Partnership area. The largest areas of '*hay meadow*' type habitat are probably where river banks are mowed regularly for the benefit of fisherman. Although there is no formal inventory of sites, several small sites are known from most Cairngorm Straths and include some small agricultural sites in Glenlivet, Strath Avon and Glen Shee and several river bank sites along the Dee and Spey. Untreated roadside verges in Angus and Strathspey are thought to be similar to hay meadows and probably harbour many old grassland species. The small scale of most sites means that Cairngorms hay meadows are unlikely to be of national importance, but they may well be of local biodiversity importance and are probably under-valued.

The national biodiversity context:
There is a UK Habitat Statement for unimproved neutral grasslands. This gives the following conservation direction and guidance to LBAPs, which may use some or all of the relevant measures identified nationally:

"Maintain the extent of quality species rich neutral grassland sites in the UK, restore degraded neutral grasslands to buffer sites and restore the range of neutral grassland."

Measure identified on a UK wide basis to consider further include:
- Protect species rich neutral grassland from inappropriate changes in landuse.
- Encourage environmentally sensitive management of neutral grasslands.
- Review and use where appropriate existing relevant measures in agri-environment schemes.
- Develop a fuller understanding of restoration techniques with the aim of expanding remnant patches of unimproved grassland.

Targets:
The following four objectives and targets have been identified for neutral grassland and hay meadows in the Cairngorms:

Main objectives:
Target 1: *Ascertain the distribution, area and ecological status of unimproved neutral grassland and hay meadows in the Cairngorms – by 2005.*
Target 2: *Ensure no net loss in the area of unimproved neutral grassland and hay meadows in the Cairngorms – by 2006.*
Target 3: *Maintain and restore good ecological status/quality* of key unimproved neutral grassland and hay meadows sites in the Cairngorms – by 2008.*
Target 4: *Ensure no net loss in the number and/or range of key LBAP species in the Cairngorms associated with unimproved neutral grassland and hay meadows – by 2008.*

* Measured using an appropriate standardised method for ascertaining good ecological status/quality.

Current factors affecting the habitat in the Cairngorms:
The following specific unimproved neutral grassland issues were identified over and above those important issues detailed in the '*Main farmland and grassland biodiversity issues*' section:

Awareness raising:
The issue:
- Lack of recognition for the role traditional riparian fishery management plays in supporting the largest remaining areas of unimproved neutral grasslands/hay meadow in the Cairngorms.

The solution, action and target:
- Raise the profile of the important role riparian fishery management 'unwittingly' plays in maintaining the largest areas of hay meadow remaining in the Cairngorms – *ongoing.*

Habitat loss and fragmentation:
The issue:
- The use of fertilizers and the change from hay to silage has meant that most naturally diverse unimproved neutral grasslands/hay meadows are no longer floristically diverse. Research from set-aside schemes shows that floristic diversity increases hugely when herbicide and fertiliser use ceases.

The solution, action and target:
- Encourage the conservation and recreation herb rich hay meadows in the Cairngorms through appropriate agri-environment support mechanism – *ongoing.*
- Sward control and management of these sites could potentially also be manipulated by appropriately timed grazing. Investigate practical restoration and management research techniques – *at the earliest opportunity.*
- Once appropriate techniques are developed, a series of targeted trial restoration programmes should be developed for the Cairngorms – *by 2010*.

Table 1. 'Key' Cairngorms farmland and grassland species

Farmland and grassland habitat codes:
BF = Boundary features, AL = Arable land, CG = Calcareous grassland, AG = Acid grassland, IG = Improved grassland, NG = Neutral grassland. ◆ = Regularly used by species. *(P)* = UK Priority species, *(C)* = UK Species of conservation concern, *(L)* = Locally important species.

Species	BF	AL	CG	AG	IG	NG
Water vole *Arvicola terrestris (P)(L)*	◆					
Brown hare *Lepus europaeus (P)(L)*		◆	◆	◆	◆	◆
Pipistrelle bat *Pipistrelus pipistrellus (P)(L)*	◆					
Natterers' bat *Myotis nattereri (C)(L)*	◆					
Daubenton's bat *Myotis daubentonii (C)(L)*	◆					
Nathusius' pipistrelle Bat *Myotis nathusii (C)(L)*	◆					
Brown long-eared bat *Plecotus auritus (C)(L)*	◆					
Hedgehog *Erinaceus europaeus (C)(L)*	◆	◆	◆	◆		◆
Badger *Meles meles (C)(L)*	◆	◆	◆	◆	◆	◆
Mountain hare *Lepus timidus (C)(L)*			◆	◆		◆
Red deer *Cervus elaphus (C)(L)*			◆	◆		◆
Roe deer *Capreolus capreolus (C)(L)*		◆	◆	◆	◆	◆
Pigmy shrew *Sorex minutus (C)*			◆	◆	◆	◆
Common shrew *Sorex araneus (C)*	◆		◆	◆	◆	◆
Water shrew *Neomys fodiens (C)*	◆					
Stoat *Mustela erminea (C)(L)*	◆					
Weasel *Mustela nivalis (C)(L)*	◆					
Black grouse *Tetrao tetrix (P) (L)*		◆				
Grey partridge *Perdix perdix (P)(L)*	◆	◆			◆	
Corncrake *Crex crex (P)(L)*					◆	◆
Skylark *Alauda arvensis (P)(L)*		◆	◆	◆	◆	◆
Spotted flycatcher *Muscicapa striata (P)*	◆					
Song thrush *Turdus philomelos (P)(L)*	◆	◆	◆	◆	◆	◆
Bullfinch *Pyrrhula pyrrhula (P)(L)*	◆					
Tree sparrow *Passer montanus (P)(L)*	◆	◆				
Linnet *Carduelis cannabina (P)*	◆	◆	◆			
Corn bunting *Miliaria calandra (P)*		◆				
Reed bunting *Emberiza schoeniclus (P)*	◆	◆				
Pink-footed goose *Anser brachyrhnchus (C)(L)*					◆	
Grey-lag goose *Anser anser (C)(L)*					◆	
Quail *Coturnix coturnix (C)*		◆				◆
Redshank *Tringa totanus (C)(L)*					◆	
Lapwing *Vanellus vanellus (C)(L)*		◆	◆	◆	◆	◆
Snipe *Gallinago gallinago (C)(L)*					◆	
Curlew *Numenius arquata (C)(L)*		◆	◆	◆	◆	◆
Oystercatcher *Haematopus ostralegus (L)*		◆	◆	◆	◆	◆
Golden plover *Pluvialis apricaria (C)(L)*			◆	◆	◆	◆
Short-eared owl *Asio flammeus (C)(L)*			◆	◆		◆
Barn owl *Tyto alba (C)(L)*	◆	◆	◆	◆	◆	◆
Grey wagtail *Motacilla cinera (C)(L)*	◆					
Pied wagtail *Motacilla alba (C)(L)*	◆					
Meadow pipit *Anthus pratensis (C)*		◆	◆	◆	◆	◆
Dunnock *Prunella modularis (C)*	◆					

Wren *Troglodytes troglodytes (L)*	◆					
Stonechat *Saxicola torquata (C)*	◆					
Wheatear *Oenanthe oeanthe (C)*	◆		◆	◆		◆
Ring ousel *Turdus torquatus (C)(L)*	◆					
Fieldfare *Turdus pilaris (C)*	◆				◆	
Redwing *Turdus iliacus (C)*	◆				◆	
Greenfinch *Carduelis chloris (C)(L)*	◆	◆				
Chaffinch *Fringilla coelebs (L)*	◆	◆				
Brambling *Fringilla montifringilla (C)*		◆				
Goldfinch *Carduelis carduelis (C)(L)*	◆	◆				
Yellowhammer *Emberiza citrinella (C)(L)*	◆	◆				
Twite *Carduelis flavirostris (C)*		◆	◆	◆		◆
Redpoll *Carduelis flammea (C)*		◆				
Snow bunting *Plectrophenax nivalis (C)*		◆				
Toad *Bufo bufo (C)(L)*	◆					
Frog *Rana temporaria (C)(L)*	◆					
Common lizard *Lacerta vivipara (L)*	◆					
Pearl-bordered fritillary *Boloria euphrosyne (P)(L)*			◆	◆		◆
Northern brown argus *Aricia artaxerxes (P)(L)*			◆			
Sword grass *Xylena exsoleta (P)*				◆		◆
Narrow-bordered bee hawk *Hemaris tityus (P)*				◆		◆
Mason bee *Osmia inermis (P)*			◆			
Ruby-tailed wasp *Chrysura hisuta (P)*			◆			
A picture winged fly *Dorycera graminum (P)*				◆		◆
Large heath *Coenonympha tullia (C)(L)*				◆		◆
Small blue *Cupido minimus (C)(L)*			◆	◆		◆
Small pearl-bordered fritillary *Boloria selene (C)(L)*			◆	◆		◆
Mountain ringlet *Erebia epiphron (C)(L)*				◆		◆
Scotch argus *Erebia aethiops (L)*			◆	◆		◆
Dark green fritillary *Argynnis aglaga (L)*			◆	◆		◆
Slender stripped rufous *Coenocalpe lapidata (C)*				◆		◆
Broom tip *Chesias rufata (C)*	◆					
Slender stonewort *Nitella gracilis (P)*	◆					
Orange-fruited elm lichen *Caloplaca luteoalba (P)*	◆					
Pale bristle moss *Orthotrichum pallens (P)*	◆					
Purple ramping fumitory *Fumaria purpurea (P)*	◆	◆				
Juniper *Juniperus communis (P)(L)*	◆		◆			
Mountain scurvy grass *Cochlearia micacea (P)(L)*			◆			
Dark red helleborine *Epipactis atrorubens (L)*			◆			
Common rockrose *Helianthemum nummularium (L)*			◆			◆
Alpine lady's mantle *Alchemilla alpina (L)*			◆			
A pink waxcap fungus *Hygrocybe calyptriformis (P)(L)*				◆		◆
An earth tongue fungus *Microglossum olivaceum (P)(L)*				◆		◆
An earth tongue fungus *Microglossum atropurpureum (C)(L)*				◆		◆
An earth tongue fungus *Geoglossum starbaeckii (C)(L)*				◆		◆
A pink spored agaric fungus *Entoloma bloxamii (C)(L)*			◆			
An agaric fungus *Mycena latifolia (L)*			◆	◆		
An agaric fungus *Porpoloma metapodium (C)(L)*				◆		◆
A parasitic agaric fungus *Squamanita paradoxa (C)(L)*				◆		
A fairy club fungus *Clavaria rosea (L)*				◆		◆
A fairy club fungus *Clavaria zollingeri (L)*				◆		◆