# A Study to Identify Best Management of Upland Habitats in County Wicklow

Mary Tubridy & Associates March 2013

WicklowUplands
COUNCIL

This project was part funded by County Wicklow Partnership through the European Agricultural Fund for Rural Develpment: Europe Investing in Rural Areas

NDP National Development Plan 2007 - 2013

Comhshaol, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

LEADER

County Wicklow Partnership

The European Agricultural Fund for Rural Development: Europe investing in Rural Areas.

**Author:** Mary Tubridy, Mary Tubridy and Associates, March 2013

with assistance from Brendan O' Hanrahan

**Email:** mtubridy@gofree.indigo.ie

**Project Co-ordinator:** Cara Doyle, Wicklow Uplands Council

on behalf of:

**Wicklow Uplands Council Ltd.**
Roundwood Parish Hall
Main St, Roundwood,
Co. Wicklow
www.wicklowuplands.ie

**Contact:**
**Tel:** +353 1 2818406
**Email:** info@wicklowuplands.ie

**Cover photo:** by Gwen Paskins

*'You don't make one of those farmers overnight'*

Comment by member of the Vegetation Management Working Group

# Contents

# Glossary

**AA** - Appropriate Assessment. The assessment carried out to discover the significance of a development on a Natura site or species.

**AEOS** - Agri-Environmental Options Scheme. This scheme replaced the Rural Environment Protection Scheme (REPS).

**AE** - Agri Environment.

**Annex I Habitat** – Priority type habitat listed in Annex 1 of the EU Habitats Directive (Directive 92/43/EEC).

**BFCP**- Burren Farming for Conservation Programme.

**Booleying** - summer cattle grazing in the Uplands.

**CAP** - Common Agricultural Policy.

**Coillte Teoranta** - The Irish Forestry Board.

**Commonage** - land managed in common by farmers.

**CFP** - Commonage Framework Plan.

**CSO** - Central Statistics Office.

**CWP** - County Wicklow Partnership. LEADER company in Wicklow.

**DAHG** - Department of Arts, Heritage and Gaeltacht.

**DAFM** - Department of Agriculture, Food and the Marine.

**DARD -** Department of Agriculture and Rural Development, Northern Ireland.

**DED** - District Electoral Division. Smallest unit for which agricultural census information is available.

**DOECLG -** Department of the Environment, Community and Local Government.

**DOEHLG -** Department of the Environment, Heritage and Local Government.

**Doubles -** Ewes pregnant with twins.

**EFNCP** - European Forum on Nature Conservation and Pastoralism.

**Estover -** Traditional right to remove heather, bracken or gorse from the hills, for fuel or animal bedding.

**EU Birds Directive -** Earliest directive from the EU (add ref. 69?) requires protection to migratory types and rare species such as birds of prey.

**EU Habitats Directive -** Latest directive from EU under which Natura sites (for habitats and species) are designated and managed. Directive 92/43/EEC.

**Fee simple -** Ownership of land without authority to manage it for all uses.

**FOI -** Freedom of Information.

**FS -** Forest Service, Department of Agriculture, Food and the Marine.

***GAEC*** - Good Agricultural and Environmental Condition.

***GPS*** - Global Positioning System.

***Headage payments*** - Finanacial support provided to farmers based on number of stock.

***HNV*** - High Nature Value. Type of farmland of high biodiversity value farmed less intensively due to natural constraints.

***IFA*** - Irish Farmers Association.

***LMO*** - Land Management Options.

***LU*** - Livestock Unit. Describes a stocking rate per hectare in relation to the stocking rate of a dairy cow.

***Natura 2000*** - Network of Natura sites designated under the Habitats Directive containing sites important for habitats and species.

***NHA*** - Natural Heritage Area.-Designated under the Wildlife (Amendment) Act 2000

***NI -*** Northern Ireland

***NPWS*** - National Parks and Wildlife Service

***REPS*** - Rural Environmental Protection Scheme

***SAC*** - Special Area of Conservation. Site designated under the Habitats Directive part of the Natura network.

***Singles*** - Ewes pregnant with one lamb.

***SFP*** - Single Farm Payment. Paid on a hectare basis to farmers at a level which relates to headage payment during certain base years.

***SMR*** - Statutory Management Requirements.

***SPA*** - Special Protection Area designated under the Birds Directive **Directive 2009/147/EC** (**Birds Directive**)on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended).

***SRDP*** - Scottish Rural Development Programme.

**RP** - Rural Priorities under the Scottish Rural Development Programme.

***WDMB*** - Wicklow Dublin Mountains Board. An informal network of statutory and non governmental organisations concerned with development in the mountains.

***WEB*** - Working and Educating for Biodiversity. Network of Irish biodiversity non-governmental organisations.

***Wethers*** - Castrated male sheep.

***White grass*** - local name for *Molinia caerulea* (also called purple moor grass).

***WMNP*** - Wicklow Mountains National Park.

***WUC*** - Wicklow Upland Council.

# Acknowledgements

The preparation of this report was greatly assisted by the members of the Vegetation Management Study Group of Wicklow Uplands Council (WUC).

Particular assistance was given by

- Declan Byrne of Teagasc shared results from his thesis on farming in West Wicklow.
- Wesley Atkinson provided access to information in National Park files.
- Patrick McGurn, Project Officer HNVF attended workshops and meetings in Wicklow.
- Aidan Dempsey, Chief Fire Officer, Wicklow County Council.
- Comdt Derek Hanley, Glen of Imaal provided information on sheep grazing management.
- Matthew Mc Greehan, Louth IFA and Cooley sheep farmer provided an analysis of a local initiative to develop a co-ordinated approach to controlled vegetation burning.
- John Carslake, Gamekeeper, and Eamonn Brennan, Glenfarne Gun Club provided information on controlled burning and the grouse management project associated with the Boleybrack Grouse Project.

Photographs were provided by Faith Wilson, Cara Doyle and Fiona Wheeldon, NPWS. Many of the maps were prepared by Brendan O'Hanrahan.

# Summary

This report contains a review of Upland biodiversity and farming in Wicklow. It was commissioned by the Wicklow Uplands Council following two well attended public meetings in 2011 which discussed recurring problems associated with vegetation burning and highlighted the opportunity offered by a targeted agri–environmental scheme. The issue of vegetation management had been highlighted previously by WUC and it had made a submission to government in 2008 (WUC and WDMB, 2008) proposing a revision of dates on which burning is allowed. Following the public meetings a working group was set up by WUC and funding was provided by County Wicklow Partnership to engage the services of an ecologist. Research was informed by an analysis of farming and biodiversity, a review of the literature on management for farming and biodiversity in the Uplands, and EU and Irish policy on agri –environment. The research is timely as decisions are imminent on the nature and scope of future supports offered by the CAP to farming and agri–environment measures.

The analysis of agri-environmental policy confirms that there is growing interest in targeted schemes which link farming and biodiversity management. Support for High Nature Value Farming is a policy aspiration in Ireland and for the EU. While detailed research on the relationship between Upland biodiversity and farming has not been carried out in Ireland, this study suggests that both are in decline and that interventions, involving a partnership approach, are urgently required.

Action is required to manage burning. Burning dates were changed without any consultation with Upland farmers who now commit an offence if they burn within the traditional burning period. There are strong conflicting views on the issue of changing the burning dates. An amendment to the Wildlife Act should be introduced to return to controls which operated until 2000 and to bring them back in line with the UK and Northern Ireland. To support good practice, burning groups should be set up comprising farmers and the regulatory authorities to ensure burning maximizes benefits to farming and biodiversity and does not threaten public safety.

Action is needed to improve the management of Upland vegetation. Upland sheep farming is in decline and as a result there is a loss in biodiversity. If current trends continue, biodiversity values will reduce further and many areas on the lower slopes of the Uplands will become valueless for forage, further increasing the risk of fire. A Sustainable Uplands Agri-environmental Scheme (SUAS) is required to integrate farming and biodiversity. Discussions within the working group have informed the specification for such a scheme, details of which are contained in this report. Under the scheme the rate of payment would be linked to the quality of biodiversity and the achievement of specific management tasks. It is envisaged that the average payment would be c.€7,000. Incentives need to be provided to farmers who farm commonage.

To implement the recommendations WUC needs to act immediately in conjunction with like-minded individuals and organisations interested in development of policies and programmes which work for people, the economy and biodiversity.

# Chapter One: Introduction

## 1.1 Background to the study

The unenclosed land in the Uplands of Wicklow is almost all of value for biodiversity and much is of European importance for habitats and birds (Fig. 1.1).

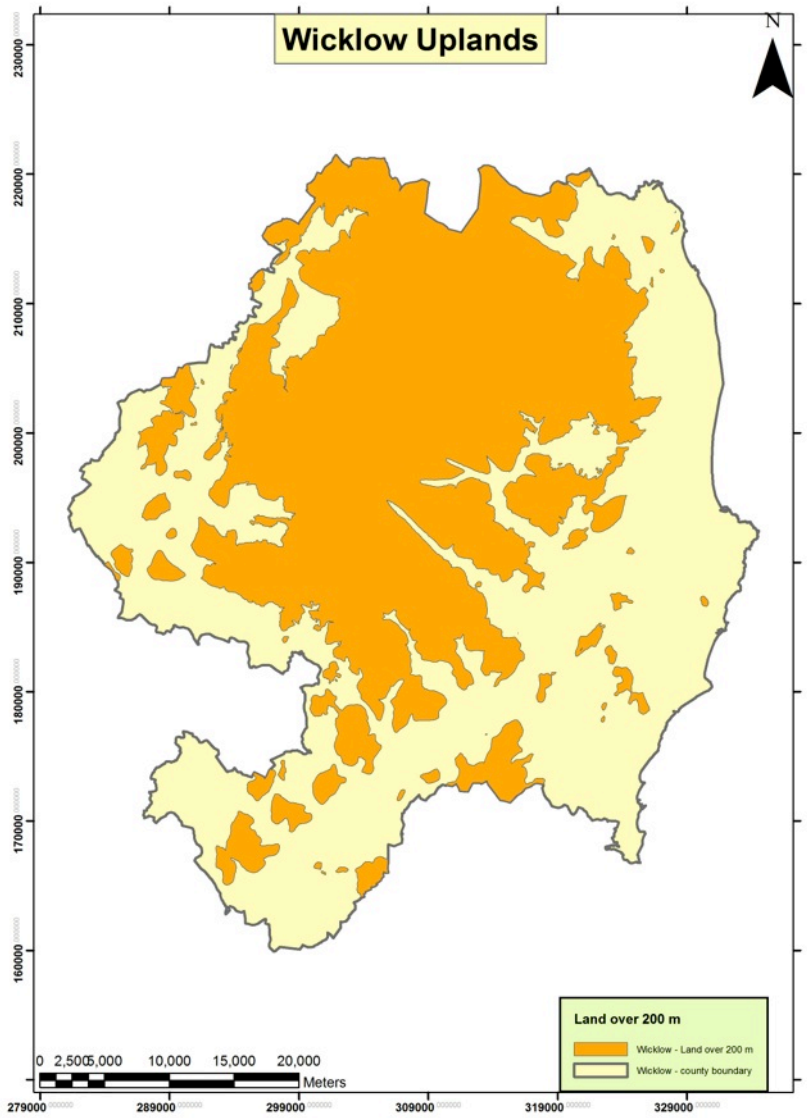


**Fig. 1.1** Land over 200m in County Wicklow

This is recognised by the designation of a substantial area as a Special Area of Conservation (SAC) and Special Protection Area (SPA). The dry and wet heaths and blanket bog which cover about two-thirds of the SAC are Annex I habitats, listed in the Habitats Directive (92/43/EEC) with blanket bog being a priority habitat. The merlin, a tiny Upland raptor is given protection under the Birds Directive (79/409/EEC a2009/147/EC).

Although a large portion of the mountains have been designated as an SAC/SPA, adequate resources have not yet been directed at maintaining or improving the condition of these habitats or enhancing their biodiversity. The NPWS assessment (NPWS, 2007) concluded that nationally dry heaths were of inadequate status and wet heath and blanket bog were unfavourable (bad) for structures and functions. While no field based assessment has taken place in Wicklow, a recent report by ecologists (Wilson and Curtis, 2008) has suggested that Upland habitats within the SAC and National Park are also in poor condition.

Throughout Ireland and particularly in Wicklow, traditional hill sheep farming, which is principally responsible for biodiversity in upland habitats, is in decline. Coupled with this has been the rise in the extent and frequency of unregulated burning; resulting in part from restrictive permissible burning dates (in addition to carelessness and vandalism), which has a detrimental effect on biodiversity and agricultural values. Uncontrolled wildfires threaten the conservation status of the Natura 2000 sites including designated SACs and SPAs and pose a serious threat to forestry and private upland properties.

Following cross community discussions over the last two years Wicklow Uplands Council decided to commission this study to examine best practice of vegetation management in the Uplands.

## 1.2 Wicklow Uplands Council

The principal role of WUC (www.wickowuplandscouncil.ie) is to represent the shared interests of the Wicklow Uplands and to act as a forum for discussion between local farming, community, environmental and economic interests on Uplands issues. Some of the farming representatives who are active in WUC are also members of the Wicklow Mountains National Park (WMNP) advisory group. Since its formation in 1997, WUC has sponsored research and has carried out practical projects relevant to Uplands management either independently or in partnership with statutory and non-statutory agencies. Strategic planning has covered forestry, landscape management and outdoor recreation. WUC co-ordinated the production of the County Wicklow Outdoor Recreation Strategy (County Wicklow Partnership and Wicklow County Council, 2009). Interpretative panels have been produced and erected in towns and villages to promote local heritage and tourism. In co-operation with local statutory agencies a service has been provided for the collection of illegal dumping in the Wicklow/Dublin Uplands (www.projectpure.ie). In the context of Uplands management, efforts have focused on improving access for walkers to the mountains along agreed access routes. WUC members have had a long standing concern with the impact of the revised burning dates in the Uplands. This resulted in discussions and consultation leading to a submission to the then Department of Environment, Heritage and Local Government (DOEHLG) (WUC and WDMB, 2008) proposing a revision of the dates and support for a sustainable vegetation control programme. A campaign has recently been launched to promote responsible dog ownership by prohibiting dogs on privately owned land where livestock are present. This was considered necessary due to the number of dogs in the hills associated with increasing recreational use.

This study was managed by a sub-committee of WUC titled 'Vegetation Management Working Group' containing representatives of farming and sheep farming organisations and invited representatives of NPWS, Irish Uplands Forum and Teagasc. The initial objective was to prepare an application for funding under the EU LIFE programme to carry out a large-scale five year research project examining the relationship between biodiversity and Uplands farming. When this project was abandoned due to lack of matching funding, WUC applied for and were awarded a LEADER grant from County Wicklow Partnership to carry out this study titled 'A Study to Identify Best Management of Upland Habitats in County Wicklow'.

## 1.3 Study brief

The objectives of the study are;

- To compile a comprehensive account of information already available on the natural resources associated with the study area.
- To create a blueprint for best future management of the Wicklow Upland habitats which creates the optimum balance between biodiversity and farming.
- Identify research needs.
- To create a better understanding of the current management issues affecting the Uplands.
- To consult with the relevant stakeholders in identifying best future management of the Wicklow Uplands including; upland farmers, foresters, ecologists, farming scientists and farming advisors such as Teagasc, land managers, including Coillte, the Forest Service, NPWS, local authority fire services and recreational users.
- To investigate the possibility of developing a coherent fire management structure for the Wicklow Uplands based on the Cooley Mountains example in County Louth.

## 1.4 Approach

A reading list accompanying the brief provided a preliminary list of materials to be consulted. Due to the short time available to compile this report (December 2012 to early March 2013) there was considerable reliance on consultations carried out and information collected by a previous researcher, Brendan O'Hanrahan. Expertise and experience within the Working Group, set up by WUC to manage the project and additional consultations informed the analysis of specific issues. Recommendations were discussed regularly with this group.

## 1.5 Methodology

The references and bibliography sections at the end of the report contain background materials and web sites which were consulted. They include books, reports, guidelines and scientific articles on Uplands farming and

Uplands biodiversity. Specific topic areas included EU and Irish policy, upland ecology in Scotland, Wales, Northern Ireland (NI) and Ireland, farming in the Uplands in Wicklow, agri-environmental schemes in Uplands areas in UK and NI, including the Burren agri-environmental scheme. Land management practices associated with agri –environmental schemes and burning regulations and management. Due to the short time period a limited amount of data was collected on Upland land management in Wicklow. Unfortunately no comprehensive long term records exist of biodiversity or land management practices. Detailed records of sheep numbers are only available on a DED basis since 2000. NPWS provided digital files describing the location and date of burning incidents within the Wicklow Mountains SAC since 1998. Digital files were also provided from the results of a habitat mapping exercise in the SAC in 2007 (O'Donovan, 2007).

## 1.6 Consultations

Consultations within the Working Group and between the Working Group and agencies and researchers were a critical component of the research. Appendix 1 contains a list of twenty four public and semi-public meetings which took place between 2010 and 2012, the accounts of which were recorded and circulated by Cara Doyle, WUC's Co-ordinator to members of the Working Group. Working group meetings occurred both indoors and outdoors. Meetings took place with farmers in other Uplands areas (Comeragh and Cooley Mountains). They featured a day long peer review workshop in October 2012 facilitated by Brendan O' Hanrahan on the management of farmed uplands and the possible shape of a new Uplands Agri-environmental Scheme. Meetings also took place with farmers in other Upland areas (Comeragh and Cooley Mountains)

**Fig. 1.2** On-site discussion meeting 2012

Meetings in the Cooleys covered their efforts to set up a Cooley Mountains Fire Management Group. Discussions took place with John Finn of Teagasc's Agri-environmental section and various specialists in NPWS HQ (Ciaran O'Keeffe, Caitriona Douglas and Andy Bleasdale). Consultations benefitted from current interest in the scope of the next CAP. WUC participated in the preparation of a joint submission to the Department of Agriculture, Food and

the Marine (DAFM) which argued for an Uplands Agri-environmental Scheme under the new Rural Development Programme associated with the CAP (National Uplands Working Group, 2013 C/O Mountaineering Ireland).

## 1.7 Report structure

The first chapter of the report introduces biodiversity and farming in the Wicklow Uplands. This is followed by detailed accounts of particular management practices and their impact on biodiversity. The final chapters describe initiatives to resolve the controversy over burning and support the integration of farming and biodiversity. A possible role for WUC is elaborated in the final chapter.

# Chapter 2 Biodiversity and farming

## 2.1 Introduction

This chapter provides an account of biodiversity (wildlife) in the Uplands, a review of Uplands sheep farming and a limited policy review on the integration of biodiversity and farming. A report prepared by the NPWS for the EU (NPWS, 2007) provides a national evaluation of the habitats found in the Uplands. The account of biodiversity and habitats in Wicklow is based on information contained in the Wicklow Mountains National Park Plan (NPWS, 2005), McElheron (2005) which describes merlin in the Park and reports produced by ecologists (O'Donovan, 2007, Wilson and Curtis, 2008 and Smith et al 2010) on biodiversity in designated sites. In this account habitats are named according to the system used in the EU Habitats Directive (EC, 1996). No published accounts of biodiversity exist for Upland areas outside the designated sites.

## 2.2 Biodiversity

### 2.2.1 History

Biodiversity, the diversity of plants and animals and their habitats (places where they live) is the expression of the relationship between land use and the environment. In the upper reaches of the mountains > 360m where poor grassland, low heather and intact blanket bog are found, environmental factors dominate. At lower altitudes biodiversity is more complex and reflects the effects of thousands of years of mainly farming related management. This influence is still considerably less than in enclosed land in the lowlands. In the unenclosed land it included tree clearance between 9,000 and 6,000 years ago (Mitchell and Conboy, 1993). This was followed by turf cutting, grazing by sheep, deer and goats, drainage, burning and the more recent influence of recreation. Recognition of the particular value of biodiversity where environmental factors are still important has resulted in the designation of much of the unenclosed land in Wicklow as an area of biodiversity importance.

### 2.2.2 Habitat Diversity

Mountain summits

The mountain tops have soils and vegetation which reflect extreme environmental conditions. They would never have been covered by trees and are only occasionally grazed. Habitats could include rare types designated for international protection such as (4060) Alpine and Sub-alpine (Boreal) Heath, characterized by low growing shrubs such as ling heather, bell heather and bilberry and herbs such as bent grass, wavy hair grass and heath bedstraw.

**Fig. 2.1** Summit of Knocknaclohoge Mountain (*Photo by Faith Wilson*)

More grass like vegetation is likely to have sheep's fescue, bent grass and mat-grass as well as heather. The rare plant dwarf willow (a low growing tree) may be found in these areas. The summits and steep slopes of mountains may also have cliffs and scree associated with them. These have two other habitats of international importance:

(8210) Calcareous rocky slopes with chasmophytic vegetation (granite cliffs) and (8110) siliceous scree of the montane to snow levels which may be important for rare arctic alpine plants. The latter habitats are found at Lugnaquilla, Camaderry, Tonelagee, Carrigshouk, Barnacullian, Lough Bray Upper, Ballinrush and Sally Gap.

Blanket bog

Blanket bog, an internationally important habitat (active and growing blanket bog (7130) is a priority habitat) has been present for c. 7,000 years and is found wherever a deep layer of undecayed plant material (>50cm) has accumulated to form peat. As the name suggests it spreads to cover flat and sloping areas; sometimes to summits but generally just below them. A typical area with blanket bog is found in the Sally Gap area. It extends from Djouce to the Sally Gap and northwards to Kippure and Castlekelly.

**Fig. 2.2** Pool system in the blanket bog near the Sally Gap (*Photo by Faith Wilson*)

Blanket bog in Wicklow is important for biodiversity as it is the only example of extensive upland blanket bog in eastern Ireland. Its presence is the principal reason for the designation of areas in the Wicklow Mountains as being of international biodiversity importance. Blanket bog is of very low value for grazing. Diversity in wetness, slope and management (burning) are responsible for different appearance and quality. Good quality blanket bog will not have been burnt, cut or drained. It will have a significant cover of bog moss, lichens, deer sedge, crowberry and heath rush. Little ling heather will be present and if present, plants will be very slow growing and never > 50cm high. Other plants include cross-leaved heath, possibly bilberry and bog rosemary (very rare) and tall hummocks of *Rhacomitrium*, white grass (*Molinia*) and occasional bog cotton, deer sedge and tormentil. Poorer quality blanket bog will only have a few of these plant species and mainly white grass (*Molinia*) plus bog cotton, deer sedge and tormentil. Little sheep grazing will occur in blanket bog but there may be signs of deer (paths and wallows). Burning if it occurs is not likely to benefit grazing, as heather plants, though low, are very old and are unlikely to regrow.

Wet heath

This habitat is also of international importance (4010) Northern Atlantic wet heaths with (*Erica tetralix)*. It is similar to blanket bog as it is also associated with wet conditions. However peat depth is only between 15-50cm and pools are absent. It is of significant age c. 7,000 years and is also of little value for grazing.

It might have ling heather, some bog moss, plus cross-leaved heath, heath rush, cotton-grass, white grass (*Molinia*) and sedges. Burning, if it occurs, is not likely to benefit grazing as heather plants, though low, are very old and are unlikely to regrow. Hot burns in this environment could cause plasticisation of the peat and peat erosion.

Dry heath/grassland mosaic

This habitat will be more familiar to farmers as the heather and grassland associated with it are the principal source of forage for sheep. The heath dominated area is also of international importance (European dry heaths (4030)). It started to develop when trees were removed between 9,000 and 6,000 years ago at altitudes between 300-400m. It was more extensive in the Uplands and according to O' Donovan (2007), much of it was planted with coniferous forestry. Its peaty soil will always be shallow <15cm. Ling heather is the most common heather and cross-leaved heath (associated with wet areas) will be absent. Despite its importance to farming few accounts have been prepared of this habitat in the Wicklow Mountains. Fig. 2.3 shows the extent of areas with heath type vegetation associated with the designated area (Special Area for Conservation, SAC) in the centre of Wicklow.

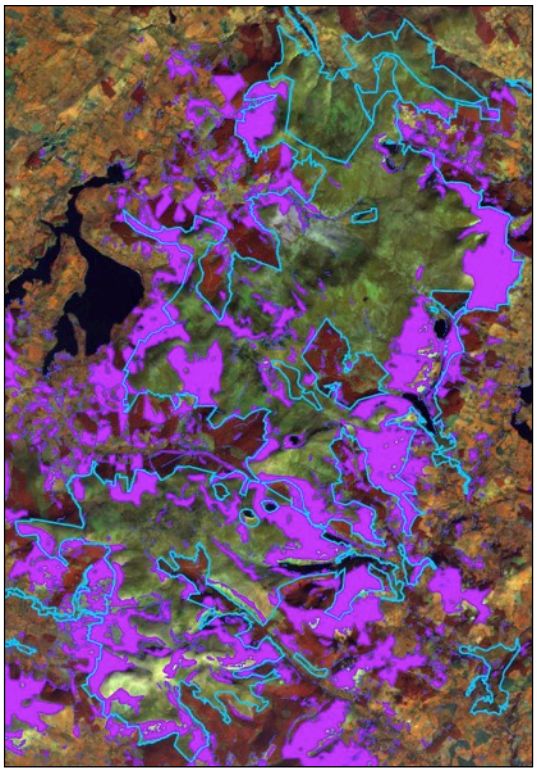

**Fig. 2.3** Distribution of heath (purple) in the Wicklow Uplands SAC (blue outline) from the Irish Forest Service (IFS) data set overlaid on a Landsat 7 image (Cooper and Loftus 1998)

A report on the ecology of the Sugarloafs (Smith et al, 2010) characterized dry heath vegetation as having ling heather, western gorse (the low growing species), bell heather, bent grass, bilberry and heath bedstraw. Burning when it occurs at the optimum period in the life cycle of heather will benefit grazing in this habitat.

Grassland

The grassland associated with dry heath and also present at a lower altitude is not an internationally important habitat. Despite its extent and importance to farming, no detailed accounts are available of this habitat.

Other habitats
Other habitats in the Uplands include coniferous woodland (WD4 according to Fossitt, 2000) scrub (WS1 according to Fossitt, op cit) with tall gorse and wet grassland (GS4 according to Fossitt, op cit) which has rush species, compact rush, soft rush, white grass and cross-leaved heath. Single tall trees in coniferous woodland provide safe nesting sites for merlin, which forage over the open habitats (McElheron, 2006).

### 2.2.3 Heather ecology

Heather ecology has been well studied, particularly in the UK and Scotland as the species is closely associated with grouse. Its life cycle (Table 2.1) is described in four stages, the duration of which is dependent on soil, wetness and altitude.

**Table 2.1** Heather (*Calluna*) growth stages

| Growth stage | Age (years) | Appearance | Forage | Biodiversity value |
|---|---|---|---|---|
| **Pioneer** | 1-5 | Height 0-20cm. Shoots obvious | Shoots easily accessible for sheep. | Good for Grouse |
| **Building** | 5-15 | Plant forms a bush c50cm high | Less nutritious for grazing animals | Less nutritious for grouse |
| **Mature** | 15-25 | Heather dominant, stems become woody. Height >50cm.Mosses appear. | Poor | Nesting sites for song birds. Seeds and buds may be eaten by grouse |
| **Degenerate** | >25-30 | Plant become open, lower stems covered in mosses. | Poor | Nesting sites for song birds. Seeds and buds eaten by grouse |

Regeneration can occur through sprouting from cut or burnt shoots, layering, which occurs when old shoots fall to the ground and the germination of seed which can remain viable for up to ten years. Regeneration from cut/ burnt stems is more rapid when the plant is growing vigorously in the pioneer/building phase. Thus this is the optimal period for burning/swiping.

### 2.2.4 Species diversity

Rare plants

The Uplands have rare arctic alpine plants usually growing above 360m in heathy grassland or on cliffs. A recent survey has highlighted a widespread decline in these species, including club moss (possibly) due to recreation (Wilson and Curtis, 2008).

**Fig. 2. 4** The rare Alpine clubmoss (*Diphasiastrum alpinum)* recently found between the South Prison and the summit of Lugnaquilla *(Photo by Faith Wilson).*

Birds

Almost 100 different bird species have been recorded in the National Park (NPWS, 2005). Birds associated with the upper slopes include raven, meadow pipit and red grouse. Stonechat, skylark, whitethroat, golden plover, snow bunting and wheatear are more common at lower altitudes.

Particular species of birds present in the Uplands are protected under the EU Birds Directive:

- Merlin which feeds on small birds, small mammals and insects present in bog, heath and grassland.
- Ring ouzel which feeds on worms, slugs, insects, berries and seeds near rocks and scree.
- Peregrine falcon which hunts small birds, rabbits and small mammals present in bog, heath and grassland. It nests on cliff edges.

Red Grouse

Red Grouse is a characteristic Upland bird which relies on heather and heather dominated habitats for foraging and nesting. While not listed under the Birds Directive it is considered at risk in Ireland (Lynas et al (2007).
Males establish territories in the autumn months before the breeding season and call at dawn and dusk. Eggs are laid in early to mid-April, depending on temperature. Chicks hatch in late May and feed on invertebrates, moss capsules and young heather shoots. Males will continue to live within 4km of where hatched. Hens will travel further. While grouse populations in Wicklow have traditionally been considered very healthy there has been a report of a decline in the Dublin Mountains (via Eamonn Brennan, Glenfarne Gun Club pers. comm.). Pilot projects are taking place at several locations in Ireland to re-introduce rare upland raptors and improve grouse populations. Associated with this national initiative, red kites (which feed on small mammals such as rats) have been successfully re-introduced to Wicklow. These projects involve partnerships between gun clubs, the NPWS and a national environmental organisation, the Golden Eagle Trust (www.goldeneagle.ie). To restore grouse populations, managed burning and predator control has taken place in Leitrim as part of the Boleybrack Grouse

Project (Eamonn Brennan and John Carslake, Boleybrack Grouse Project) (www.nargc.ie/habitat-conservation/boleybrack-grouse-project.aspx).

**Fig. 2. 5** Grouse droppings *(Photo by Fiona Wheeldon, NPWS)*

**Fig. 2. 6** Red Grouse *(Photo by Fiona Wheeldon, NPWS)*

Mammals

Deer are common in the Uplands. The native Irish Red Deer in Wicklow are considered to have interbred with Sika deer which were introduced in 1860 (Purser et al, 2010). Other mammals of note include Irish hare, goat and fox, otter (the latter is protected under the EU Habitats Directive), pine marten and badger. Since the demise of the estate system the only form of official management of the deer herds in Wicklow is licensed shooting. Deer populations are now considered unsustainable, resulting in economic and ecological damage (Wilson and Curtis, 2009). A study commissioned by the Wicklow Deer Management Group and funded by the Heritage Council (Purser et al, 2010) concluded that a collaborative approach to deer management is urgently required. If carried out it would involve the co-ordination of control measures, the first comprehensive census of deer in Wicklow and a greater understanding of the relationship between upland farming and deer grazing.

## 2.3 Biodiversity management

### 2.3.1 Evaluation of biodiversity

Biodiversity monitoring focuses on habitats and species requiring protection under the EU Habitats and Birds Directives. See Figures 2.8 and 2.9 for these types of protected areas in the Uplands.

While no formal field based assessment has been carried out, desk based assessments carried out by the NPWS in 2007 concluded that the upland habitats found throughout the country and also present in Wicklow were in poor ecological condition (NPWS, 2007). The authors of the desk based review carried out a survey of arctic alpine plants in the upper slopes and summits in the Wicklow Mountains SAC (Wilson and Curtis, (2008)). Their field observations confirmed the results of their desk research. They suggested that grazing should be confined to land below 600m, culling of deer should take place and recreational use, grazing and burning should be better controlled. While burning impacts were criticized, their report suggested that its absence accounted for the decline of certain rare species.

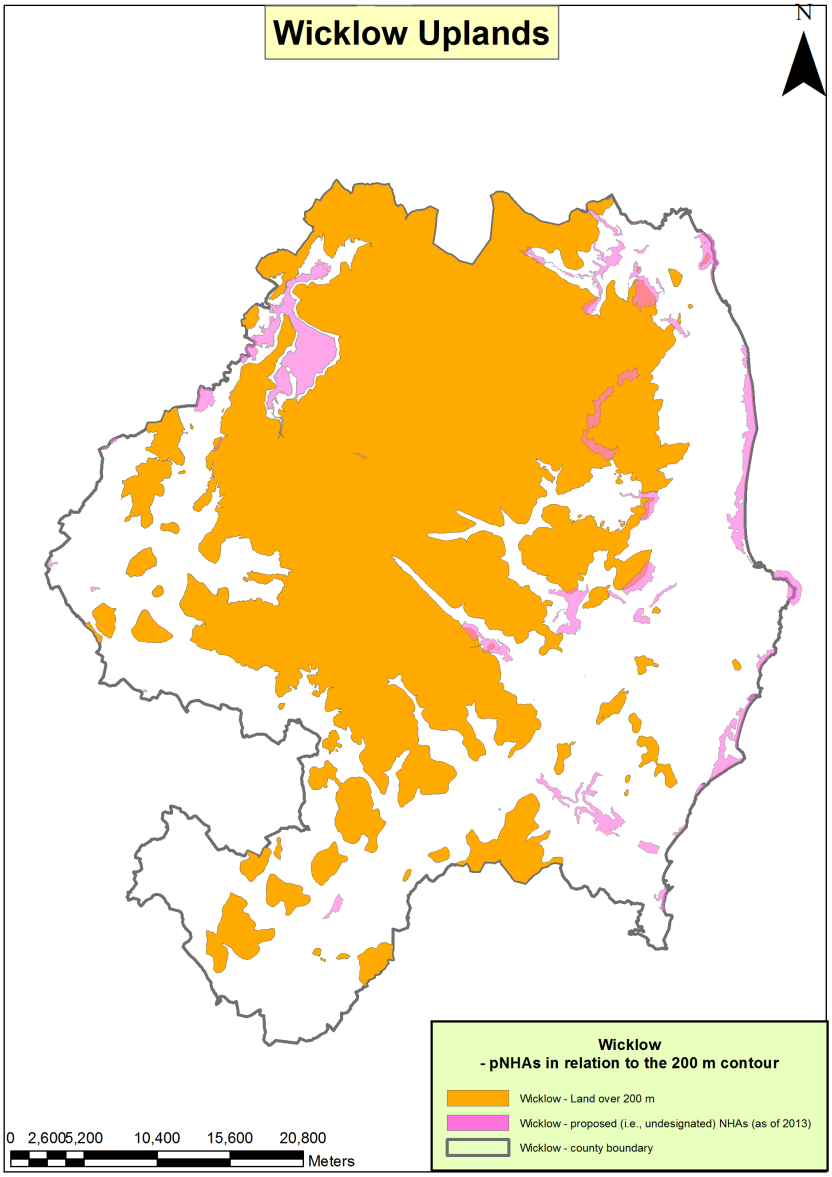


**Fig. 2.7** Natural Heritage Areas in County Wicklow

National Heritage Areas (NHAs) are areas of national biodiversity importance under the Wildlife (Amendment) Act 2000. Within these, landowners are expected to notify NPWS of works which may affect biodiversity. The NPWS role is advisory only. Currently the NPWS website does not have any information on these NHAs as the NHAs in Wicklow are proposed NHAs and have not been designated officially under the Wildlife Act.

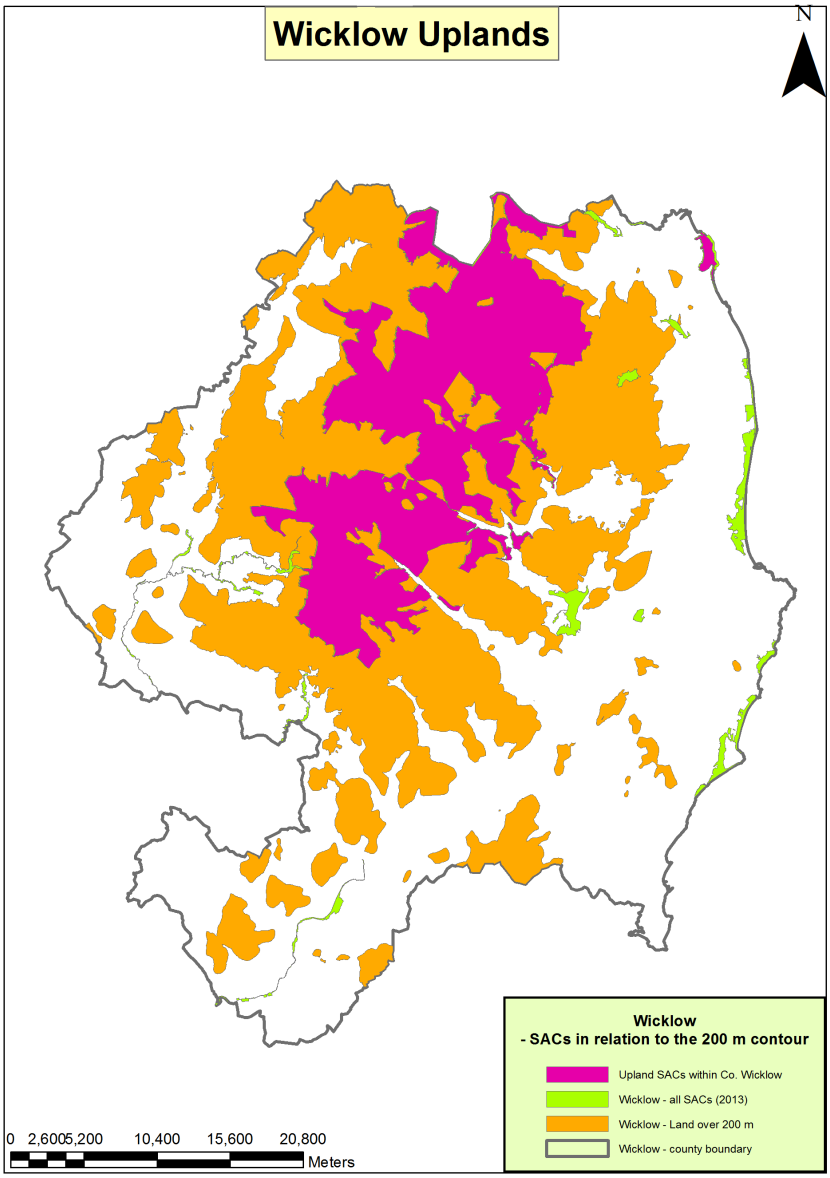


**Fig. 2. 8** Natura sites in County Wicklow designated under the EU Habitats Directive

In contrast to NHAs, a Natura site implies stricter control as they are designated under the EU Habitats Directive. Natura sites contain important habitats and species listed for protection under the EU's Habitats and Birds Directives. NPWS is obliged to maintain the important EU habitats and species within these areas in good condition. Reports are available on the NPWS website providing brief descriptions of the principal Upland Natura sites and Wicklow Mountains SAC, (http://www.npws.ie/protectedsites/specialareasofconservationsac/wicklowmountainssac/) and http://www.npws.ie/media/npwsie/content/images/protectedsites/sitesynopsis/SY004040.pdf ) covering the Wicklow Mountains. The Wicklow Mountains SAC has been designated under the Habitats Directive because of the presence of EU protected habitats in the Uplands as well as otter, lakes,

and old broadleaved oak woodlands. It has been designated under the Birds Directive because of the presence of merlin and peregrine falcon. This designation has important implications not just within the Natura site but also within a 15km radius.

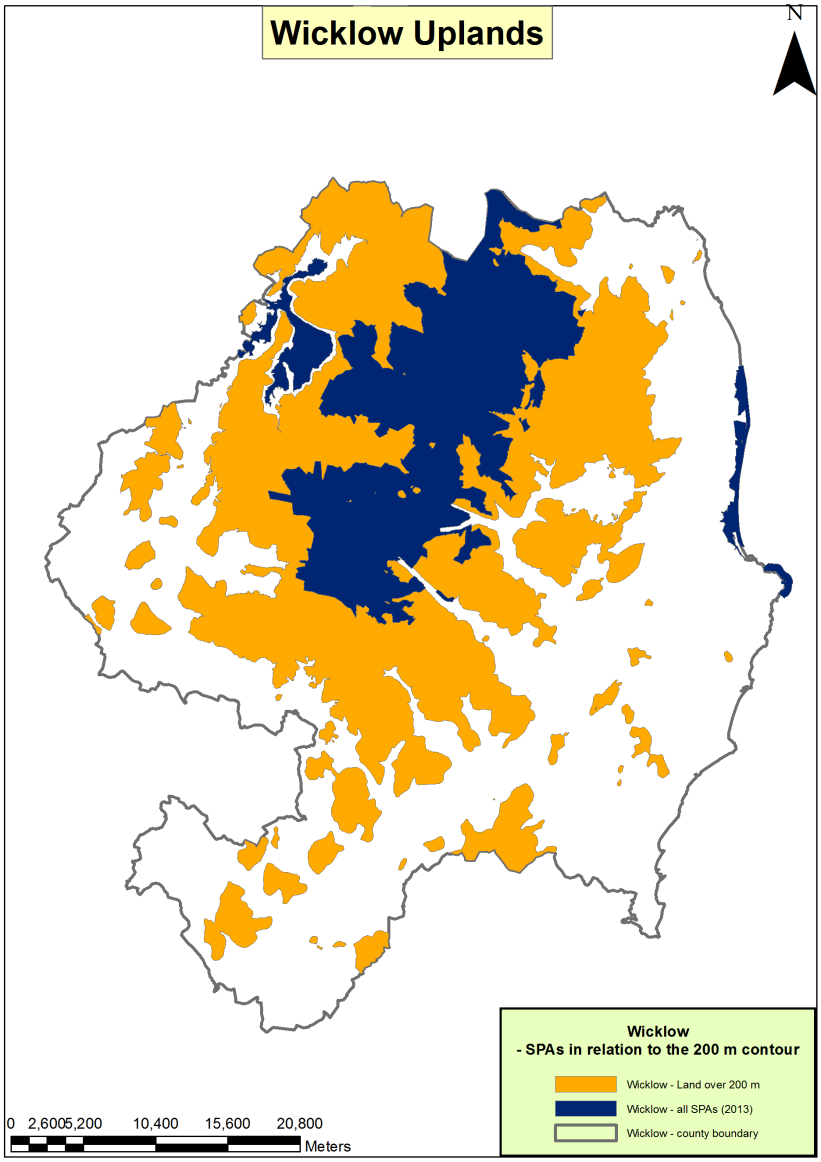


**Fig. 2.9** Natura sites in County Wicklow designated under the Birds Directive (SPAs)

Current practice, as required under the Habitats Directive is that any operation being proposed within a Natura site or its environs should be subject to an ecological assessment to determine its impact on these habitats and species. The scale of the assessment will vary depending on the sensitivity of the habitat or species and type of impact proposed.

The National Park (area 20,000 ha) covers almost all of the Wicklow Mountains SAC and was established in 1991 with a core area comprising the Glenealo Valley and Glendalough Nature Reserves. Nature Reserve is a

national designation (under the Wildlife Act) in which nature is given priority over any other use. Further land has been purchased from private owners or transferred from Coillte Teoranta. Operations are guided by a Management Plan 2005-2009 (NPWS, 2005) which was prepared in consultation with the community. The park has an extensive educational programme and the website (www.wicklowmountainsnationalpark.ie) contains information on upland ecology. Some deer surveys have been carried out and digital maps have been prepared showing the extent of burning within the Natura site. Associated with the implementation of this plan a programme of controlled burning and swiping was carried out to enhance grouse habitat in the Djouce area c5 years ago (Wesley Atkinson, Park Manager, pers. comm.)

## 2.4 Farming

### 2.4.1 Introduction

Farming in the hills is very different to farming in the lowland in terms of:

- Quality of land.
- Enterprise options/economic returns.
- Harsher weather/reduced growth patterns/isolation.

The account of farming was compiled with the assistance of members of the Vegetation Working Group and involved an examination of census information on sheep numbers from a selection of Upland DEDs.

### 2.4.2 Farming/land use history

Farming in the Uplands has a long history starting with tree clearance on the lower slopes between 9,000 to 6,000 years ago. Under the estate system the unenclosed hills were used for grazing, turbary or estover (removal of heather, bracken or gorse for fuel or animal bedding). Historical records suggest that summer cattle grazing (boolyeying) was occurring in the 17$^{th}$ century (Gurrin, 2006). Sheep farming has an equally long history (www.wicklowsheep.ie). When agricultural records started in 1854 there were 78,000 ewes recorded for Wicklow (CSO, 1997). Associated with game management it is likely that controlled burning took place. Estate records suggest that there was tension between landlords and tenants about vegetation burning (Enda Mullen, NPWS, pers. comm.). Vermin including raptors were probably exterminated to protect grouse. While organised burning for game waned in the mid 20$^{th}$ century the practice continued to be carried out by farmers to maintain forage for sheep and cattle.

Similar to other Upland areas the estate system also left a legacy of commonage. While tenant farmers obtained title to their good land when estates were broken up, the system converted their right under the estate system to graze the unenclosed hill into a share (listed in their folio) or a traditional right to graze or cut turf. While the burning of vegetation is not mentioned in these folios it is a traditional right.

According to the Central Statistics Office (CSO, 2000), there are 144 commonages in County Wicklow (Fig. 2.10).

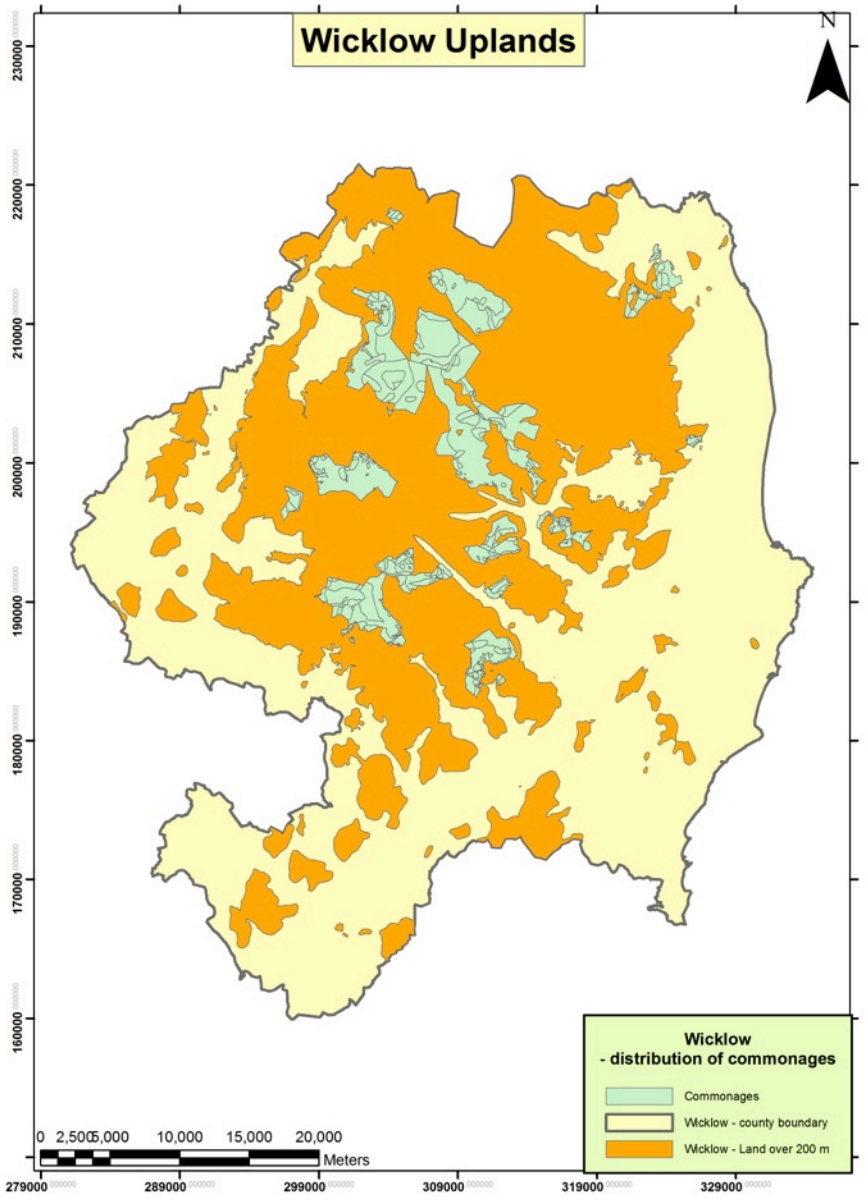


**Fig. 2.10** Wicklow Upland commonages mapped by NPWS and subject to Commonage Framework Plans

Approximately 317 farms use commonage. While some hills are owned outright (fee simple and rights), ownership may still be vested in the original estate, who thus have limited management powers. Coillte acquired ownership (fee simple) of the land which they planted. While NPWS acquired grazing rights and fee simple of much of the land within the National Park, in some areas farmers retained their grazing rights.

Within certain townlands in the National Park grazing is carried out under licence. Farmers are required to remove sheep for two months each year. In the Glen of Imaal the Defence Force charge a small fee for grazing which is regarded as essential for army operations. Four herders are also employed to manage the various flocks which graze the 4,000ha all year round (Comdt Derek Hanley, pers. comm.). Fig. 2.11 shows the pattern of seasonal grazing over the last four years.

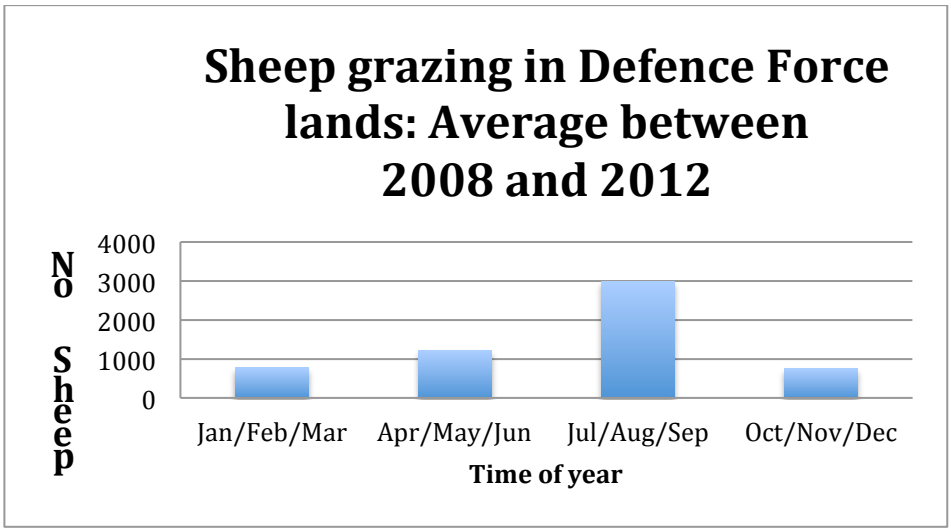


**Fig. 2. 11** Pattern of grazing in the Defence Force lands at Glen of Imaal

Sheep numbers climbed greatly in Wicklow during the 1980's in response to headage payments (Fig. 2. 12) before falling significantly since 1991.

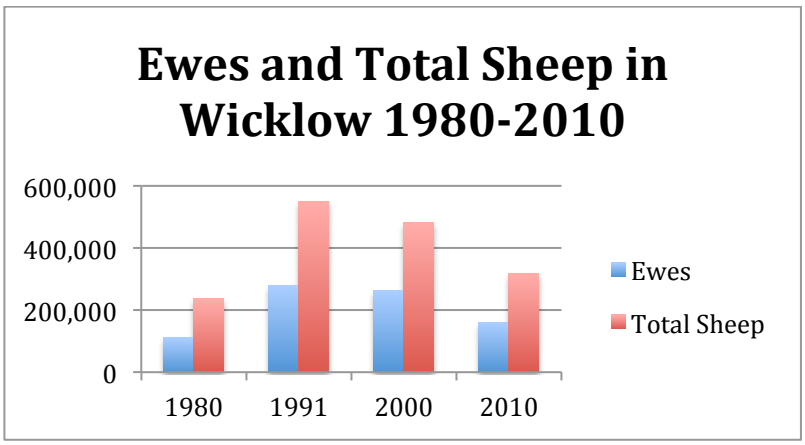


**Fig. 2. 12** Sheep numbers in County Wicklow between 1980 and 2010

It appears that there was a minor impact on biodiversity. Surveys revealed little evidence of overgrazing and thus low levels of destocking were required in the Uplands in the vicinity of the National Park (NPWS, 2007).

### 2.4.3 Traditional sheep farming

Traditional sheep farming involves regular movement of sheep on and off the hills over the year. Between the middle to end of October and mid December sheep (ewes only and in lamb) are brought to the hills. Depending on weather conditions they will stay there until the end of January. Vigilance is required because if snow occurs they need to be collected immediately and brought down to the lowland. Supplementary feeding (such as mineral supplements) are rarely used on open hills as deer are as likely to benefit as sheep. When they are brought down they are scanned. Barren ewes are returned to the hill. Singles are kept down for two weeks for supplementary feeding depending on condition and then returned to the hill. Doubles are kept in the lowland fields and given supplementary feeding until they lamb. All sheep are brought down for lambing in a sheep shed or an enclosed field in April. Ewes with single strong lambs go back to the hill in mid May. Ewes with twins stay down until mid July. All are shorn in June. Wethers (male sheep) are left in the lowland. Female lambs are returned to the hill with ewes to learn grazing and roaming range as they may be required for replacements. All sheep are then brought down at the end of September/October in preparation for sale. Lambs are weaned and sold at local marts usually to lowland farmers for fattening. Elderly ewes are culled. Some lambs are occasionally kept for finishing. Other operations include dipping, dosing and worming for flies, scabies and liver fluke a few times a year depending on need. Regular inspections are needed to ensure that the flock is healthy and not at risk from dog worrying or rustling, particularly during lambing. Problems with dog worrying and rustling have increased significantly in recent years.

### 2.4.4 Trends in upland sheep farming

The traditional practice described above is a dying tradition. Ewe numbers were obtained from upland District Electoral Divisions (Fig. 2.13).

**Fig. 2.13** Upland DEDs (7) sampled for ewe numbers

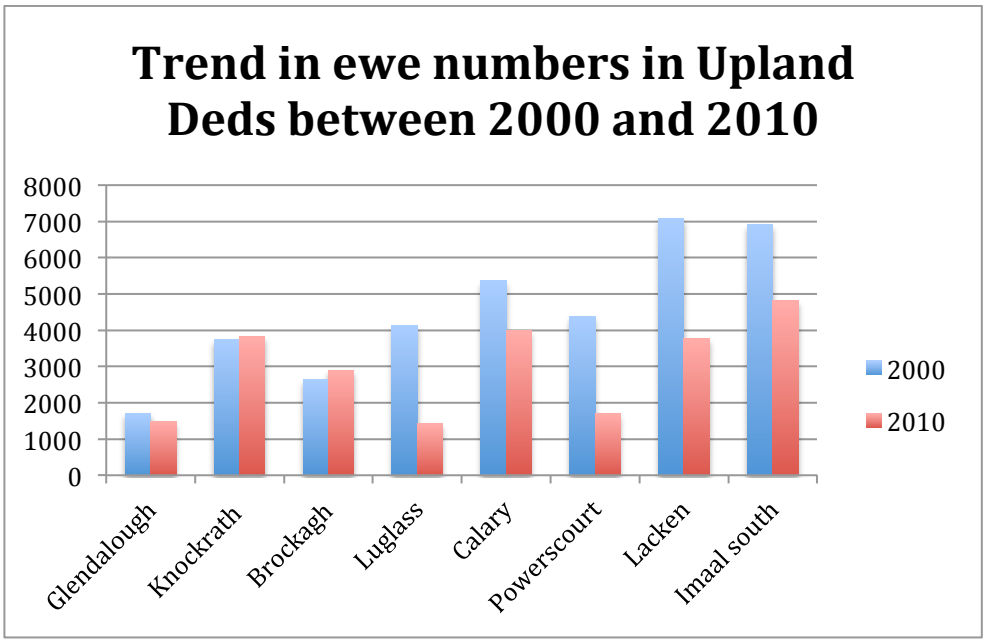


**Fig. 2. 14** Ewe numbers in Upland DEDs

The pattern between 2000 and 2010 showed a marked decline in ewe numbers (Fig. 2. 8) in keeping with the reported county wide reduction. A small scale survey of three commonages in Glenmalure (Pat Dunne, pers. comm.) also confirms a pattern of declining numbers of farmers (Table 2.2 matched in some situations by increasing flock size among those remaining. Local consultations suggest that this pattern is repeated throughout the Wicklow Uplands.

**Table 2. 2** Users of commonage in Glenmalure 1984-2012

| | **Number of farmers 1984** | **Number of farmers 2012** |
|---|---|---|
| **Commonage 1** | 7 | 1 |
| **Commonage 2** | 5 | 1 |
| **Commonage 3** | 8 | 1 |

A survey of farming on a commonage in West Wicklow (Byrne, 2002) showed that only five out of eleven shareholders use their commonage. Most of them benefit from the Single Farm Payment but do not farm the commonage. Two farmers with rights do not declare them for Single Farm Payment or put up any sheep.

Grazing practices have also changed. Local consultations suggest winter grazing is becoming rare i.e. between December and January. As there are fewer farmers it is more difficult to herd flocks. As there are fewer sheep they tend to travel further, requiring more time for herding. With fewer farmers there is less manpower available for herding.

Current practice is to put up dry ewes after weaning and take them back down for mating. The importance of manpower is confirmed by the lack of any signs of a decline in sheep numbers over the last four years in the Glen of

Imaal (Comdt Derek Hanley, pers. comm.). In the Glen of Imaal four herders are employed to manage sheep flocks.

National surveys of income from different farming systems consistently show that the income from sheep farming is relatively low (Table 2.3). While there has been little recent research on hill farming a Teagasc report (Teagasc 2000) found that there has been virtually no change in financial returns to the Blackface Mountain or Cheviot system over the period 1993 to 1998. A survey of the economics of upland sheep farming in Connemara (Buckley et al, (2008) confirmed its reliance on direct and indirect payments particularly REPS.

Table 2.3 National Farm Survey 2011 (Teagasc, 2012)

| **Size (ha)** | **<10** | **10-20** | **20-30** | **30-50** | **50-100** | **>100** | **All** |
|---|---|---|---|---|---|---|---|
| Dairy | | | 26,287 | 56,067 | 91,035 | 117,100 | 68,570 |
| Cattle Rearing - | | 5,134 | 5,744 | 15,086 | 24,063 | | 10,453 |
| Cattle Other - | | 4,851 | 11,548 | 19,005 | 29,309 | 62,380 | 14,573 |
| **Sheep** | | **8,311** | **12,198** | **20,125** | **26,603** | | **16,805** |
| Mixed Livestock | | | | 35,093 | 65,802 | 113,038 | 34,902 |
| Tillage | | | | 16,436 | 45,394 | 111,322 | 35,296 |
| All | 3,070 | 5,716 | 10,742 | 20,125 | 53,529 | 93,941 | 24,461 |

The farmers in Byrne's survey expressed little interest in REPS.

Local consultations suggest the reasons for the decline in Upland farming are:

- Poor economic returns in comparison to other enterprises. While there has been little recent research on hill farming a Teagasc report (Teagasc 2000) found that there has been virtually no change in financial returns to the Blackface Mountain or Cheviot system over the period 1993 to 1998.
- Disenchantment of farmers with the revised burning regulations which make it illegal to burn vegetation during the optimal period.
- Progressive ageing of the hill-farming population. Hill farming if not necessarily a 'young man's job', is at least one for fit and energetic individuals.
- Concern about dogs worrying sheep. Lambs are not put on the hill because of the fear of sheep stealing and worrying by dogs. As a result the tradition by which replacement lambs become familiar with a particular home range is being lost.
- Lack of assistance with large-scale operations. Since fewer farmers use the hill, the potential pool of co-operating neighbours or shareholders is continually shrinking.
- Fear of non-complying with regulations governing biodiversity, burning and Good Agricultural and Environmental Condition (GAEC). Increased regulations now attached to land use many of which are not farmer friendly. The recently produced Code of Practice for Prescribed

> Burning (Department of Agriculture, Food, and the Marine, 2011 ) is of little value to farmers. This is particularly because the approach taken is geared towards larger organisations, rather than individuals or small groups of farmers.

The situation in Wicklow could explain the national trend in declining sheep numbers (as upland sheep farmers are important suppliers to lowland sheep farmers). Census results report that the national sheep herd has declined by a third since 2000 (Central Statistics Office, 2010).

Other factors are the influence of competitive pressures, aging population of farmers and the difficulty of combining off-farm work and the continuation of traditional sheep farming. The national projection for agriculture (Teagasc, 2008) predicts a further decrease in sheep numbers, despite an improved market into Europe. Management through commonage offers particular challenges which have been little researched in Ireland (Leonardo Da Vinci Vetpro, 2012).

## 2.5 Agri-environmental supports

Due to the reliance of hill farmers on direct and indirect supports, the withdrawal of REPS was of major financial significance to Upland farmers (Buckley et al, 2008). Upland farmers can join a less financially rewarding scheme AEOS (Agri-environmental Options Scheme). A plan is prepared by a Teagasc advisor which focuses on the management of stocking levels to restore areas damaged by overgrazing. The prescription on grazing management on commonages is guided by the relevant Commonage Framework Plan which involved an examination of the impact of grazing on commonages c 10 years ago. The required stocking rate is expressed with reference to the impact of the stocking rate at the time of the survey. It provides for a maximum payment of €4000/year compared to €12,000 under REPS. There is no stipulation about when grazing can occur. Burning is allowed during the legal burning period and the removal of gorse is permitted. Bracken can be controlled by herbicides but only in exceptional circumstances and no new tracks or paths can be created.

Single Farm Payment is a payment/ha for each farmer paid at a level determined in early 2000s. It has remained unchanged since then and is dependent on farmer's compliance with GAEC (Good Agricultural and Environmental Condition) under EU regulation, Council Regulation 73/209 Annex 111. In the context of Uplands this implies:

- Protection of old grassland pasture
- Avoiding the encroachment of unwanted vegetation on agricultural land.
- Compatibility of grazing with Commonage Framework Plans
- Protection and preservation of habitats
- Burning within legal season
- Control of invasive species including blackthorn and tall gorse.

Certain cross compliance measures conflict with priorities for biodiversity. Under GAEC, scrubby vegetation, such as tall heather of little value as forage, is regarded as an unwanted invasive. However this type of vegetation can also be viewed as a habitat as its presence may provide an increased cover of valuable native species, nesting sites for birds and food for wildlife. Therefore its appearance on land eligible for Single Farm Payment can lead to penalties.

## 2.6 Other land uses in the Uplands

### 2.6.1 Recreation

Despite being in part private ownership walkers freely roam throughout the unenclosed land. While farmers with land along the Wicklow Way receive a small annual payment most farmers in Wicklow do not benefit financially from recreation. Resources have been dedicated to the installation of infrastructure to facilitate sustainable access, such as robust paths and boardwalks in popular areas. However most trails in the mountains are informal tracks vulnerable to erosion. A survey of rare plants on mountain tops drew attention to the impact of recreation (Wilson and Curtis, 2008). Anecdotal evidence suggests that walkers are increasingly using and widening these informal paths in order to avoid areas with tall vegetation.

### 2.6.2 Forestry

Coniferous forestry is a feature on the lower slopes, mainly managed by Coillte. The presence of forestry increases the sensitivity of the Uplands to fire. Where practical, 6m wide fire breaks were established adjacent to forests to minimize fire risk (Tim O' Regan, Coillte, pers. comm.). When resources permitted these fire breaks were strimmed. Controlled preventative burning took place to reduce the risk of fire reaching forests and Coillte staff often assisted farmers to carry out controlled burning on their land. Due to cutbacks Coillte's resources are now dedicated to fire fighting.

## 2.7 Training /networks/supports

The Teagasc advisory network principally provides support to farmers on land management and sheep husbandry issues and assists in the preparation of applications for AEOS. The Irish Farmers' Association is the principal representative organisation for farmers with a membership of c.950 in Wicklow. Wicklow members sit on national committees of the IFA such as the Hill Sheep Committee which represents hill sheep farmers throughout Ireland. Local farm related networks include the Wicklow Cheviot Sheep Owners Association (400 members) which is involved in promotion and marketing of Cheviot sheep (*www.**wicklowsheep**.ie)*.

## 2.8 Policy review

There is a general acknowledgement within Ireland and Europe that agriculture has to balance overly intensive farming and land abandonment with each having negative consequences (Indecon, 2010). Arising from an EU regulation (Council Regulation (EEC) No 2078/92 ) the government introduced

the Rural Environment Protection Scheme (REPS) in 1994. This offered financial support to farmers who operated according to particular environmental standards. Farmers who participated voluntarily were paid /ha depending on size of farm up to a maximum of 40 hectares. Less intensive small farmers owning designated land selectively benefited from this scheme. Those in targeted areas of high environmental sensitivity received higher payments, €242 per hectare for the first 40 hectares, €24 per hectare for the each additional hectare up to 80 hectares and €18 per hectare for each additional hectare up to 120 hectares. Funding for REPS came from the EU (75%) and Irish government (25%). These payments quickly became essential to farmer's income. However in 2011 this scheme was withdrawn.

While the EU does not have a specific policy for farming in upland areas, reports sponsored by it have stressed that mountain farming is a key asset for maintaining valuable habitats, unique landscapes and cultural heritage from north to south and east to west of Europe (EC, 2009).

The working paper highlights instances of European Rural Development Programmes which specifically target mountain areas. The Spanish RDP states that "certain opportunities exist in certain mountain areas including protection of landscapes and traditional animal husbandry". It also elaborates on policy responses, including the need to support handicapped/disadvantaged areas, ensure environmental protection and sustainability and protection of forests (European Network for Rural Development, 2009).

Decoupling of support payments from stocking levels has led to the issue of land abandonment arising with the resultant deterioration of the countryside and loss of biodiversity (AFCon Management Consultants and Jim Dorgan Associates, 2006). While the issue of undergrazing has been recognized in the Burren and underpins the rationale behind the Buren Farming for Conservation Project it has not been described or widely acknowledged elsewhere in Ireland. Ireland's obligations under the Habitats Directive and the National Biodiversity Action Plan (DAHG, 2011) require that Natura habitats are maintained in good condition. However official reports to the EU (NPWS, 2007) state that typical upland habitats are in poor condition. The most recent projections available indicate that the decline in sheep numbers is likely to be slightly greater than originally forecasted (DAFM, 2007-13).

Undergrazing and abandonment is likely to be exacerbated in areas which are marginally productive for agriculture. The Rural Development Programme 2007-13, Ex-Ante Evaluation (AFCon Management Consultants and Jim Dorgan Associates, 2006) stated that agriculture is operating in a competitive market as a result of demand for land for other purposes, rising labour costs, ageing population, a reduction in supports and more open European markets.

The loss of farming in Upland areas is essentially a socio-economic problem as economic incentives are lacking for the individual farmer which leads to intensification or more often abandonment of High Nature Value farmland (EU, 2011).

The 2010 and 2020 targets for putting an end to biodiversity losses within the

EU have not been realised. Biodiversity measures are poorly supported even in comparison to other aspects of environmental protection. Not meeting 2015 targets (on a global level) will incur a cost to society of 545 billion (EU, 2011). It is acknowledged that agri-environmental schemes which recognise High Nature Value Areas can be a very cost-effective measure for conserving biodiversity while preventing the negative aspects of intensification and abandonment (EU, 2011).

While Irish government policy has officially recognised that farming is important in High Nature Value Areas there is increasing awareness that policy responses are inadequate. The Rural Development Strategy Programme 2007-13 stated that "the maintenance of farming in these areas is therefore extremely important from a biodiversity perspective" and "the baseline analysis indicates the contribution of agriculture to the environment. It is important to maximise that contribution and to compensate farmers for the public good aspects of their enterprises". While REPS provided support for farmers who operated to higher environmental standards in the Uplands, this scheme was withdrawn in 2011.

Discussions are now taking place to agree the rationale and programmes associated with the new CAP. As measures will include greening of single farm payments and the allocation of 30% of the budget under Pillar 2 (Matthews, 2013) there is an opportunity for the government to establish schemes to support environmentally friendly farming in the Uplands.

The shift to the area-based model of payment is strongly supported by a group known as WEB (Working and Educating for Biodiversity) (WEB, 2012) who state that extensive farming provides a range of public goods, such as biodiversity, that are not rewarded by the open market and that agri-environment schemes are the only effective means of ensuring the conservation of semi-natural pasture habitats in Ireland, most of which have been lost to intensification, afforestation, and scrub encroachment associated with land abandonment.

The Heritage Council has commissioned and supported case studies and research into high nature value farming, with a view to informing the development of national policy. Some of these case studies were undertaken by the European Forum for Nature Conservation and Pastoralism (*www.efncp.org/ ).* EFNCP is a European network lobbying the EU for more effective support for high nature value farming. Studies have been carried out in Connemara, the Aran Islands and the Iveragh Peninsula, to describe farming in these areas and to develop specifications for agri-environmental schemes to support high nature value farming (O'Rourke, 2010, McGurn and Moran, 2010, McGurn, 2011).

An informal group consisting of farmer representatives, recreational users and ecologists (supported by the Heritage Council and the European Forum for Pastoralism) have made representations to the government to support an Upland Agri-environmental Scheme (Helen Lawless, MI, pers. comm. secretary to the group). A member of the Working Group for this project

represents IFA in this network. This submission has emphasised the need to support an Uplands Agri-environmental Scheme which can help to meet Ireland's obligations under rural development policy.

Representations to the Department of Agriculture, Food and the Marine on the revision of the CAP have emphasised the success of the Burren Farming for Conservation Programme which has been able to create a market for environmental protection (James Moran, Burren Farming for Conservation Programme,
http://media.heanet.ie/oireachtas/asx.php?Channel=Committee3&Date=20130115&StartTime=05:19:00.000&Duration=01:30:30.000)

Reports on mountain farming in the EU stress that agri-environmental schemes should offer an enhanced opportunity to market Irish agricultural products effectively taking advantage of our reputation for environmental protection and sustainable agriculture. Mountain agriculture is in general associated with valued landscapes and quality products and benefits from a widespread positive image in Europe (EU, 2009).

## 2.9 Conclusions

The obvious links between biodiversity, land uses and farming can lead to conflict or synergy. Ecologists consider upland habitats to be in poor condition and usually threatened by farm practices such as grazing and burning. Farmers are aware that traditional hill farming is in decline and can see evidence of land abandonment. If current trends continue it appears that both biodiversity and hill farming will decline. A decline in biodiversity will have major implications for the NPWS and Irish government as official guardians of habitats and species of European importance. The disappearance of hill sheep farming will result in the loss of considerable expertise and an economic opportunity. It will also have an impact on sheep farming elsewhere as these farmers are an important source of stock for lowland sheep farmers.

There is obviously a need for an improved management system. This should be informed by an understanding of biodiversity at the farm level and possible impacts of farm management practices. The current Agri-environmental Scheme is not well funded. It does not require a farm survey, neither does it consider seasonality of grazing nor measures to encourage co-operation between farmers.

# Chapter 3 Management for farming and biodiversity

## 3.1 Introduction

This chapter describes types of management works to maximise the value of the Uplands for biodiversity and farming. The analysis is based on the consultative process which informed the report, a review of management works in Uplands Agri-environmental Schemes in the UK and a report produced by Patrick McGurn (2011) for the European Forum for Natura and Pastoralism on the scope of an agri-environmental scheme in Connemara.

## 3.2 Grazing

### 3.2.1 Forage value of vegetation

Upland areas are complex environments offering varying potential for foraging at different times of the year. Traditional farming practice maximised its potential. Table 3.1 summarises results of research on the digestability of upland vegetation and grazing preferences of upland grazers.

**Table 3.1** Grazing value of the most common plants (from Armstrong, 1996)

| **Plant type** | **Attributes** |
|---|---|
| Rushes | Evergreen. Low digestibility. Fibrous. |
| Upland grassland (bent/fescue) | Most digestible of the semi-natural vegetation types. Grassland with a more varied species mix is more digestible. Dead material is of low digestibility. Therefore while more or less equally digestible all year, obviously less so in winter when little fresh material is produced. |
| White grass or Purple moor-grass (*Molinia*) | Deciduous, broad-leaved grass. Spring growth can be quite digestible but this drops off quickly. The dead material present over winter has negligible nutritional value and is relatively indigestible. |
| Heather | Significantly more digestible between May and July when shoots produced. Young growth is more valuable as these (1-2 year) shoots have increased nitrogen content. Used more over winter (when grass is less digestible) and mid-summer (for fresh shoots). |
| Bracken | Contains cyanide and other chemicals which are toxic to most animals. Any associated bent/fescue under the bracken can be a very useful food resource, especially in spring before the bracken fronds shade out the grass and in autumn when ungrazed grass becomes available as the bracken dies back. |

**Table 3.2** Grazing preferences

| **Grazing Animal** | **Preferred Height of Vegetation** | **Plants Consumed** |
|---|---|---|
| Sheep | >= 3cm | Avoid mat-grass and rushes (*Juncus* |

| | | |
|---|---|---|
| | | spp.). Prefer short grass and young shoots of heather. Castrated males (wethers) eat rough vegetation more readily than ewes. |
| Cattle | > 6cm | As they have a larger gut, they prefer longer vegetation and they are more liable to eat rough vegetation such as mat-grass and white grass (Molinia) than are sheep/ deer. |
| Deer | >4cm | More likely to eat heather and trees than are sheep. |

There is thus a close relationship between the nature of the vegetation (and thus biodiversity), the type of grazing animal, the period when grazing occurs and the intensity of grazing. This is confirmed by Fig. 3.1 which shows the seasonal diet of sheep in upland pastures.

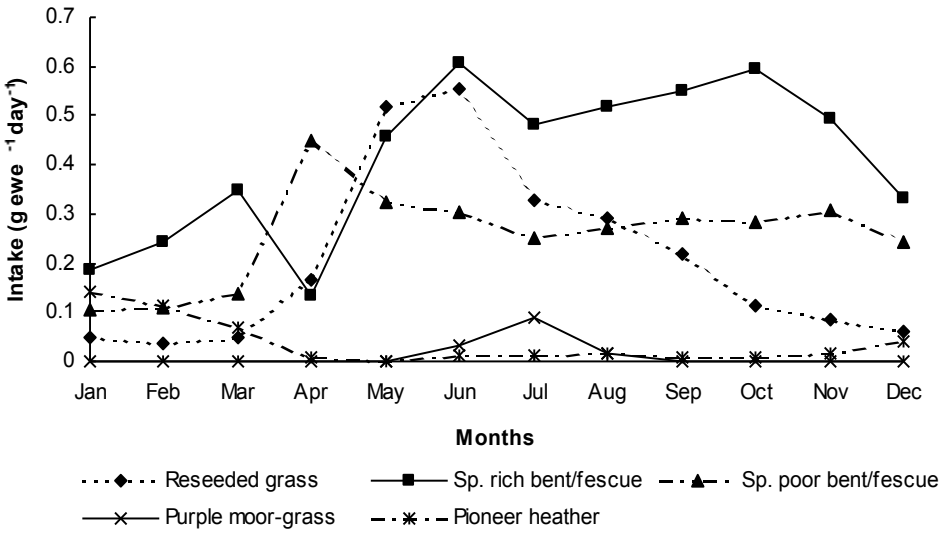


**Fig. 3.1** Typical forage used by sheep in improved and unimproved pastures, showing seasonal changes in diet composition at 1 ewe $ha^{-1}$ (Armstrong, 2009)

Developing mechanisms to describe and support the optimum grazing system is a feature of current upland agri-environmental schemes in Scotland, UK and Wales.

**Table 3.3** Management of grazing through Agri-environmental Schemes in the UK

| **Country and habitats** | **Stocking rates LU/ha in Upland Habitats** | **Other considerations** |
|---|---|---|
| Scotland* Management of | Plan can propose manipulation of stocking | Approach is to produce a plan which satisfies |

| | | |
|---|---|---|
| moorland grazing Moorland grazing on Uplands and peatlands Packages in SRDP | rates, for sheep and cattle and offer financial support for shepherding costs and introduction of cattle grazing. | authorities. There is particular emphasis on grouse and deer management as well as sheep. No set stocking rates. |
| Wales (Glastir) 'Upland heath' | <0.4LU Apr-June<br><0.2LU July-Sept<br><0.1LU/Ha Oct-March<br>Never below<br>0.2LUApr-Sept<br>0.05LU July-Sept | No prescription on type of grazing animal. |
| Northern Ireland** Habitats with different stocking rate requirements. | 0.3LU March-October (dry heath), .25LU (wet heath) and .075LU (blanket bog) | Prohibition on cattle grazing in blanket bog and in wet heath (winter only). |

Wales and Northern Ireland set lower stocking rates for bog and wet heath recognising their sensitivity to poaching (i.e. erosion caused by grazing) and poor forage. In Northern Ireland winter grazing is prohibited in almost all Upland habitats. In Wales, winter grazing is allowed at a lower stocking rate. While the obligation to maintain grazing is enshrined in the Welsh scheme it is not in Northern Ireland.

### 3.2.2 Grazing management in Wicklow

To qualify for a support payment under the Upland Grassland Scheme a stocking rate of 2 ewes/ha must be reached. To qualify for AEOS the stocking rate must follow that recommended in the relevant Commonage Framework Plan or plot number. While no stocking rate is set, under Single Farm Payment (SFP) farmers are obliged to adhere to GAEC (code of Good Agricultural and Environmental Condition) and Statutory Management Requirements (SMR) associated with cross compliance (http://www.teagasc.ie/environment/cross_compliance/crosscompliance.asp). The SMRs require compliance with EU directives on the protection of biodiversity.

A government proposal (Pat Dunne, pers. comm.) is currently being considered to manage upland grazing. This involves removing Single Farm Payments (SFP) from non-active shareholders and obliging active farmers to adhere to a stocking rate in a range between a defined minimum and maximum level. Where grazing rights are shared in a commonage, all holders of commonage must agree on their allocation to meet the target. While the proposal to remove payment from inactive farmers is welcomed by the farming and non-farming community, there is widespread concern over the latest approach to setting stocking rates. The main concerns are:

1. That the scheme does not give any recognition to the impact of deer grazing (very significant in Wicklow, but not Connemara).
2. It lacks details on the seasonal pattern of grazing, particularly as this has undergone considerable change in recent decades.

3. There is no flexibility if conditions change e.g. if forage improves through burning.
4. There is no system of monitoring to ensure prescriptions are being adhered to.

## 3.3 Burning

### 3.3.1 Introduction

Burning is an ancient farming practice which is still common in land with a high cover of rough vegetation such as heather. In Wicklow and throughout the country, burning traditionally took place at the end of winter/beginning of spring (end March/beginning of April) when last year's growth was dry and easily burnt and before new growth appeared. (Pat Dunne, pers. comm.). When weather conditions were suitable and the farmer was on the hill, a small patch of low heather (c. 20-30cm high) was set on fire. This practice was repeated throughout the season when convenient and weather conditions were favorable. Taller heather > 30/40 cm was not burnt. This practice led to a mosaic of small burnt patches and continued appearance of low heather bushes of value as forage. Within Wicklow heather burning was often carried out by gamekeepers to manage grouse. While this practice is accepted as part of the history of land use on the Uplands (Wilson and Curtis, 2011) and estate records refer to it, no detailed accounts have been produced describing its management.

Research on the relationship between biodiversity and burning in the UK/Scotland has been well researched as heather burning is closely associated with grouse management. Codes of good practice have been developed in Scotland, England and Wales which have been endorsed by farmers and ecologists. The Countryside Management Handbook from Northern Ireland contains detailed guidance on heather burning. In Ireland, 'A Draft Code for Practice for Prescribed Burning' has been prepared by the Forest Service largely in response to the threat to forestry of uncontrolled fires. Table 3.4 compares dates when burning is permitted in the UK and Ireland and their relationship to agri-environmental schemes.

**Table 3.4** Current management of burning in UK and Ireland

| **Country** | **Dates when burning is permitted in the Uplands** | **Relationship to Agri-environmental Scheme** |
|---|---|---|
| Scotland* | 1st October to 15th April inclusive. Extended to 30th April on the authority of the landowner. Licensing system allows for derogation. | Grant aid for habitat management plan involving burning which follows Muirburn Code. |
| England** | 1st October to 15th April. Licensing system allows for derogation. | Burning supported as part of Agri-environmental Scheme and must follow statutory |

| | | |
|---|---|---|
| | | regulations. |
| Wales | 1st October to 31st March (Uplands)<br>1st November to 15 March elsewhere. Licensing system allows for derogation. | Burning supported as part of Agri-environmental Scheme. |
| Northern Ireland** | 1st September to 14th April. Licensing system allows for derogation. | Burning supported as part of Agri-environmental Scheme. |
| Ireland*** | 1st September to February 28th/29th No licensing system /derogation possible. | No relationship between agri-environment and burning. |

* Burning practice must be according to Muirburn Code
** Burning practice must be according to Heather and Grass Burning Code and Regulations 2007
*** Under Section 40 of the Wildlife Act (1976) as amended by Section 46 of the Wildlife (Amendment) Act 2000, burning vegetation in uncultivated land from 01 March to 31 August is illegal.

### 3.3.2 Current regulation of burning

Burning operations are closely regulated to meet the requirements of legislation concerned with wildlife, forestry and public safety.

The most controversial regulation relates to burning dates. Burning can only occur between 1st September and the end of February. This is significantly shorter (by six weeks) than the period permitted under previous legislation (between 1976 and 2000) which allowed burning to 15th April. It contrasts with the burning period in nearby countries, even in Northern Ireland, with similar types of habitats and environmental conditions.

If burning within one mile of a forest (under the Wildlife (Amendment) Act 2000), written notice of proposed burning must be given at least seven days in advance, to the forest owner, local Garda Sergeant and Fire Service (Chief Fire Officer). This must include a 'burn plan' specifying where burning will take place and how it will be managed. Under law the forest owner has the right to object. If burning is being proposed within an SAC (or nearby), at any time, an 'Appropriate Assessment' (AA) is required under the Habitats Directive to examine its potential impact on ecology. The assessment is prepared by an ecologist and submitted to the relevant authority (NPWS). Immediately before burning is being carried out (on the day) notifications must be sent to the Fire Service, Coillte and Garda Sergeant. Finally when the operation is completed these agencies should be contacted to confirm that all fires are fully out. Other conditions contained in the Forest Service code relate to the need for insurance, training, health and safety of workers and appropriate clothing and equipment. Insurance obligations require that the individual carrying out controlled burning has adequate insurance.

### 3.3.3 Management issues

The implementation of these regulations imposes an almost impossible bureaucratic burden on land managers. No advice is available on the preparation of burning plans or identification of fire sensitive areas.

There is much anecdotal evidence that fewer small patches are being burnt and that there are more large fires. Large fires are more difficult to control and may not achieve good outcomes for farming or biodiversity. Instead of a mosaic of small patches of old and young heather with wet and dry grassland/healthy areas, upland pastures will either fall into the tall-heather category (be unburnt) or have very extensive areas with no mature heather – often with accompanying soil erosion because uncontrolled fires have been too hot. In the latter cases there is also a strong danger of heather being replaced by poor quality mat-grass, bracken or, (less frequently in Wicklow but commonly in western counties) white grass (*Molinia).*

Certain cross compliance obligations impose standards of farm practices which contradict with biodiversity priorities and have the potential to further enhance the requirement to remove heather completely. Under GAEC farmers are obliged to keep their land in good agricultural condition (GAEC). A cover of tall heather/gorse (not useful as forage) threatens these payments. As a result there is an incentive to bring about the complete removal of heather.

As there was no consultation with Upland farmers when the burning period was drastically reduced in 2000 Upland farmers have reluctant to accept the restriction which has reduced by six weeks the period when burning traditionally occurred. The new burning dates create particular difficulties in the Uplands as there are now fewer farmers. Opportunities for burning are very limited due to access and weather. As recreational use of the Uplands has increased there is greater public concern with all burning incidents. The continuation of burning during the traditional burning period (early spring) has resulted in conflicts between the objectives of farmers and the Fire Service, the Forest Service, ecologists and the statutory authorities, particularly NPWS. Nationally no efforts have been made to address this conflict situation.

### 3.3.4 Management opportunities

**Co-operation**
Efforts by statutory agencies have focused on increasing awareness of the regulations and managing the impacts of uncontrolled burning. The date and extent of fires within the SAC are recorded by the NPWS in Wicklow (Enda Mullen, pers. comm.). As a result of countrywide concern with vegetation burning Fire Services in several local authorities are now planning to provide training in fighting 'wildfires' (Chief Fire Officer, Wicklow, pers. comm.). The Forest Service has carried out a training exercise in Kerry to publicise prescribed burning practices (Ciaran Nugent, FS, pers. comm.). Efforts have been made by the Department of Agriculture, Food and the Marine to penalise farmers (through reducing their Single Farm Payment) in areas where burning occurred even in commonages outside official burning dates.

In certain parts of the country locally based projects have promoted the value of an alliance between farmers and other interests to carry out controlled burning thereby reducing the risk of large fires. In the Cooley Mountains an informal network was established between farmers, the local fire service and local NPWS staff. This resulted in meetings, an outline plan and an exercise to carry out controlled burning in an Upland area in 2011. However, due to the limitations of weather, burning was not carried out and the network was dissolved due to lack of institutional support, access to resources and limitations of the burning period (Matthew Mc Greehan, Louth IFA, pers. comm.).

Pilot grouse management projects involving NPWS, environmentalists and the game management sector have been more successful in carrying out controlled burning. On Boleybrack Mountain in Leitrim (an SAC) as part of a grouse management project, controlled burning exercises have been carried out within the legal burning period since 2011 (John Carslake, gamekeeper, pers. comm.). Partners include the local gun club, the National Association of Regional Game Councils (national umbrella organisation for gun clubs), the Golden Eagle Trust, (a national environmental group supported by the NPWS), and local NPWS manager and ranger. Liaison is maintained with farmers, many of whom are also members of the gun club. To facilitate burning, a burn plan was produced involving NPWS and the grouse management group. The Appropriate Assessment was prepared by the NPWS. Burning operations are carried out by the gamekeeper, employed by the project who has experience of managed burning in Scotland. The project in the Cooleys lasted one season and never successfully carried out any burning. The success in Boleybrack suggests the importance of institutional support (particularly NPWS) and resources to employ a specialist / administrator to manage the bureaucracy associated with prescribed burning and its operation.

**Promotion of best practice in burning**

By promoting best practice the benefits of burning for farming and ecology are supported. The characteristics of good heather burning practice are:

- Heather is burnt when plants are about 20-30cm tall and stems are the width of a pencil. At that stage the fuel load is low. Heather readily regrows and provides new soft forage valuable for sheep and young grouse. Therefore a burning rotation should be about once /15-20 years depending on rate of growth.
- Heather should be burnt in several small patches (<0.5ha) rather than one big burn to allow for diversity of age types. Patches of different age interspersed with grass provide suitable habitat for invertebrates and birds.
- Burning should only be carried out during appropriate weather conditions and particular regard taken for public safety.

The characteristics of bad burning practice are:

- Burning more than once/15-20 years as this does not allow a sufficient diversity of age types and may remove heather permanently.

- Burning up the slope or with the wind as this increases the risk of uncontrolled fire.
- Burning an area with little or no heather (blanket bog and wet heath).
- Burning old i.e. tall heather. Old heather plants do not recover as well as younger plants. Their burning may generate too much heat thus increase the risk of burning soil. They may have valuable mosses and lichens associated with them.
- Burning at high temperatures because fuel load too high. This can result in dangerous fires of little value to farming. If the fire is too hot, plant roots can be affected. Soil could be burnt and the heather seed bank could also be lost. Therefore regrowth will not occur and heather cover can be lost, possibly permanently.
- Burning of white grass (Molinia), bracken and tall gorse. Burning of these materials is problematic because the burnt leaves of white grass and bracken are easily blown by the wind, causing fire to spread uncontrollably. Gorse burning can lead to high temperatures and dangerously tall flames. Such burning may not lead to their replacement by more valuable vegetation.

## 3.4 Drain filling and erosion control

Management of Upland habitats could involve restoration of bare areas, caused by animals/ walkers and also infilling of drains associated with drainage works. High quality Upland habitats such as blanket bog and wet heath should not have any artificial drainage channels. Stocking rates and seasonal grazing practices should not cause poaching. Areas of bare peat are of little value for biodiversity or farming. Both speed up soil erosion affecting water quality downstream.

Management works to enhance biodiversity could involve the restoration of natural drainage systems. The Uplands Agri-environmental Scheme in Scotland supports the construction of dams (of varying sizes) to reduce the impact of drains. Support is also offered for bog bridges to manage movement of grazing animals across sensitive areas.

A plan to restore areas affected by erosion would first require an assessment of the cause of erosion. On exposed hill tops, peat erosion is principally caused by environmental conditions. If erosion is due to grazing or recreation, treatment might involve temporary fencing to allow vegetation to recover. Measures would also need to be put in place to prevent the pressures which caused erosion such as a reduction in stocking rate, change in seasonal pattern of grazing or redirection of walkers.

# 3.5 Management of bracken, white-grass (*Molinia*) and tall vegetation

## 3.5.1 Introduction

Management of bracken, white grass and tall vegetation presents challenges for farming and biodiversity. While there is considerable experience of bracken removal in areas of biodiversity value in the UK, less research has been carried out on white grass (*Molinia)* and management of tall unwanted heather and gorse.

## 3.5.2 Value of vegetation types for farming and biodiversity

**Bracken**
Bracken dominated areas are considered poor for biodiversity, for farming and for recreation. They harbor ticks. Bracken is toxic to animals. Spores contain carcinogens. Its presence increases the rate of soil/peat erosion. A reduction in cattle grazing and particularly hot frequent fires can enhance the growth of bracken.

**White grass (*Molinia*)**
This type of vegetation is found in waterlogged areas with nutrient poor acidic soils. It has usually replaced a type of habitat with greater biodiversity**.** Its appearance may be associated with a reduction in cattle grazing or too much burning. Its value for biodiversity depends on the diversity of plants within it, the structure of the vegetation and its potential for improvement. Good examples are rare and will contain other plant species, a habitat for the rare and protected marsh fritillary butterfly or nesting sites for wading birds. Poor examples will have only white grass (*Molinia*).

**Tall heather/gorse**
According to farmers tall heather/gorse is anything >25cm. This confirms experimental work in Scotland which shows that sheep do not readily graze heather >25cm. This height is also the optimum size for burning (20-30cm). Ecologists view tall heather as mature heather and gorse plants >1m <2m in height which is almost a scrub. Scrub is valuable for nesting birds (whinchat and whitethroat) and invertebrates. While of little value to sheep it is possibly grazed by goats and red deer. Sheep particularly dislike moving between tall heather and gorse. Thus patches of grass which may have been grazed become inaccessible and overgrown by these plants.

The retention of some tall heather/gorse is necessary for farming (shelter for sheep) but also biodiversity, as part of the mosaic of habitats within the lower slopes in the hills. Tall heather is more likely to be used as nesting sites for certain birds or be associated with mosses. A compromise is necessary as tall heather /gorse (= no grazing and burning) will lead to the removal of areas of grassland which are important in the Upland mosaic but a certain amount is necessary particularly for nesting birds.

## 3.5.3 Management techniques

**Bracken**
There is considerable expertise in the UK (www.brackencontrol.co.uk) where funds are available for bracken control as part of Agri-environmental Schemes.


**Fig. 3.2** Dense bracken in summer

Bracken control was carried out in the Glen of Imaal by the Army (Comdt Derek Hanley, pers. comm.). Until recently Asulox (the proprietary name of the compound Asulam) was the preferred herbicide of choice and was used in various habitats including designated sites. However following its banning within EU and Ireland this chemical is no longer available. It could be replaced by Dicamba (recommended in NI) which, if used, should be applied from March to early May with repeat applications in subsequent years. Mechanical cutting is also an option but should not be carried out between mid July and August when carcinogenic spores are produced. Research has shown that where it is cut once, in late July, there will be a 50% reduction in bracken cover over 3-6 years, with 10-30% left after 10 years; whereas if it is cut twice in June/July, only 10% will remain after two years (Lowday and Marrs, 1992). Mechanical cutting will be more costly and, if carried out by machine, risks damage to biodiversity and soils, leading to erosion.

**White grass (*Molinia*)**

The location of this habitat in the Uplands means that removal, reclamation or fertilisation is not an option for farmers. Traditionally burning may have been used to improve its forage value. However it is likely that this simply increased the dominance of white grass as it is tolerant of fire. Neither is burning recommended best practice as the long leaves of white grass can spread fire. Management for biodiversity could involve mechanical control i.e. cutting three times /year. This might also attract sheep leading to localised poaching and possible recolonisation by more desirable species. The re-introduction of cattle grazing is being considered in Connemara to break down white grass tussocks (McGurn, 2011). Re-introducing cattle to Upland areas in Wicklow would entail considerable capital expense due to need for temporary fencing, possibly shelter and provision of a water supply. There is also the risk of contracting TB from deer. Fencing has the potential to impact on landscape and recreation. A system suggested for Connemara involves tagging grazing animals and using an electronic signal to confine them within particular areas. This system could also be trialed in Wicklow.

**Fig. 3.3** White grass (Molinia) in winter

**Tall heather/gorse**

As the practice of grazing and burning is focused on low heather/gorse farmers traditionally did not have a role in managing tall heather/gorse. In the past it may have been used as bedding for animals. Its value for biodiversity and farming is maximised when present as a mosaic with grassland. If the age distribution is too skewed in favor of old heather and all grassland areas are invaded then biodiversity value will decline. However, burning of this vegetation may not be option as the fuel load is extremely high and suitable conditions for burning may occur rarely. According to the Draft Prescribed Burning Code (DAFF, 2011) burning of gorse should not occur. Controlling its spread could be arranged through managing grazing pressure. Burning of younger material would restrict its development. Mechanical methods, i.e. swiping or flailing, could be appropriate. They offer more flexibility as far is weather is concerned and timing of operations. In Scotland the heather swiping season is from 1 September to 15 April inclusive**.** They allow for precise treatment leading to more rapid regeneration (Mohamed & Gimingham 1970). However its usefulness in Wicklow needs piloting, to check the extent of the area requiring treatment, limitations of terrain and its cost. As suitable machinery will probably have to be adapted or imported and training will be needed, start up costs will be high. A comparison between mechanical means of cutting heather and burning as part of the Boleybrack Grouse Management Project concluded that

burning was the more cost effective. According to the supplement to the *Muirburn Code* (Anonymous 2001c), heather cutting can be carried out using a chain swipe mounted on a four-wheel drive 80 or 100 HP tractor which can be fitted with double wheels for softer ground. The Scottish agri-environmental scheme provides various financial incentives to remove scrub vegetation where rates depend on the diameter of the material to be removed.

## 3.6 Targeting management works

### 3.6.1 Bracken

No mapping currently exists showing the extent of the areas affected and rate of spread. A decision on treatment will depend on the scale of the problem, its potential to invade valuable habitats and grazing pressure, i.e. requirement for extra forage and capacity for management. An ecological assessment will also be required to ensure clearance is appropriate and its effects can be monitored. Areas suitable for treatment will be likely to have retained some elements of the original diversity of heath or grassland which it will have replaced and not be at risk from uncontrolled fires.

### 3.6.2 White grass/*Molinia*

Similarly no mapping currently exists to identify white grass dominated areas requiring management. Even if mapping existed, further assessment would be needed to discover if management intervention is required. Unlike bracken, which is almost always an indicator of poor biodiversity and bad forage, the presence of white grass may be a natural and desirable component of vegetation. It is undesirable where it has replaced a more diverse type of vegetation (due to excessive burning) and forms a uniform collection of tall tussocks. Fieldwork by an ecologist would be required to determine the significance of its presence, clarify appropriate treatments and design a monitoring protocol. It will require treatment when present in a block isolated from blanket bog or wet heath.

### 3.6.3 Treatment of tall heather/gorse

Habitat mapping in the SAC will show the location and extent of habitats in which tall heather could be found. Fieldwork by an ecologist would assess the value of this type of vegetation (nesting birds, relationship to other habitats), the impact of grazing (if any) and determine the type and scale of intervention required. Depending on the extent and location, it may involve controlled burning or mechanical cutting (followed by grazing) at specific times. An obvious location for treatment is where there is some evidence of its recent appearance, its lack of value to nesting birds and proximity to forestry. The choice of burning versus mechanical treatment will depend on accessibility (to machinery) and potential for controlled burning. It can be assumed that mechanical methods will be the treatment of choice near forestry.

### 3.6.4 Grazing management

Habitat mapping in the SAC will provide information on the presence of habitats from which an approximate estimate can be made of possible grazing/forage value based on guidelines for these habitats developed by ecologists in UK and Ireland. To develop the optimum grazing regime, direct inspection of the vegetation will be needed to assess its current value of forage and its biodiversity value. Calculation of possible stocking rates will need to consider the extent to which grazers access particular habitats. Research in Connemara has confirmed little use of blanket bog and wet heath by mountain sheep.

From the biodiversity perspective, the necessity for management is principally indicated by the physical appearance of the land (degree of poaching, bare ground), presence of indicator species and condition of heather. Indicator characteristics will have to be validated through a farm visit. Over grazing is indicated by the removal or reduction of all heather and limited number of age classes (i.e. no old heather). Under grazing has the opposite effect leading to a uniform cover of tall heather and gorse. While the latter is less undesirable from a biodiversity perspective, the spread of heather/gorse will eventually take over all grasslands, thus reducing the value of the mosaic of Upland habitats. According to research elsewhere, the absence of cattle grazing could account for the spread of white grass (McGurn, 2011) and possibly the increase in the extent of tall heather in certain parts of Wicklow. Clarification of optimum stocking densities on a hill will require general awareness of the types of habitats, but more particularly direct inspection of their condition and determination of desired outcomes resulting from grazing. A desired outcome may require a restriction of winter grazing if little or no forage, i.e. heather, is available. Where heather is present winter grazing will be required following traditional practice. If more grazing is needed over winter it may be necessary for the farmer to use more sheep and hardier sheep.

### 3.6.5 Areas suitable and unsuitable for burning

Areas unsuitable for burning from a farming and biodiversity perspective include habitats such as wet heath and blanket bog as they have little heather cover and cannot easily recover from burning. Bracken dominated areas should not be burnt as burning encourages bracken spread. Similarly vegetation with high fuel load will be problematic. Dry heath on the lower slopes of the hills has potential for burning as it has the greatest cover of heather and, if burnt at the right growth stage, it is likely that heather will recover. Low growing dry heath usually found on the upper reaches of the hill should not be burnt as this vegetation has limited capacity for recovery at this location. Fire in dry heaths at high altitude, particularly on slopes >1:3 can increase the risk of erosion due to the prevalence of high-wind and rain (English Nature 2003).

While the habitat map for the Wicklow Mountains SAC will show areas with these habitats, field inspection will be needed to provide advice on management options. An ecological assessment will be needed to discover the biodiversity status of vegetation to be burnt, assess recover capacity and confirm burning will not cause erosion. Particular precautions may need to be

taken to ensure fire does not spread into sensitive habitats or affect breeding birds (even if fire occurs before nesting takes place).

## 3.7 Management models which would be relevant to the Wicklow Uplands

### 3.7.1 Introduction

To obtain guidelines for a Wicklow scheme, a brief review was carried out on Uplands Agri-environmental Schemes in the UK and NI. The Burren scheme also formed part of this review.

### 3.7.2 Scotland

The scheme is available to all farmers under the Scottish Rural Development Programme however; farmers compete for funding by offering to do a range of works. Packages of work on offer (or measures) could cover destocking, bracken clearance, burning, species-rich grassland, grassland management for waders, shepherding, cattle introduction on small units, grazing management of habitat mosaic. Set payments are offered per ha, or by task or through implementation of a costed plan. While a farmer can apply directly, most employ consultants to carry out the audit and make the application, which has to be done on-line. Government covers c. 20% of the audit/application (generally c. £1,500).

Payment rates are moderately attractive for most small-medium scale farmers. The lack of any cap (so far) on payments means that large estates can receive several hundred thousand pounds. There is an incentive for applications under £30,000 and for young entrants. It provides a regular, guaranteed income for 5 years. One of the best measures is the cattle introduction scheme, whereby a farmer can get £275 per ha for introducing cattle or £185 per ha for continuing to keep cattle if the green land total is <20ha. The scheme also has an extensive suite of payments for measures designed to facilitate access, e.g., stiles, bridges, and gates.

Disadvantages of the scheme are that measures are not attractive to owners of smaller amounts of hill land. The scheme does not recognise regional differences. The scoring system to determine if an application should be accepted is very complicated. Many of the administrators /specialists operating the scheme lack expertise in Upland ecology. There is no inspection until year 4 (unless spot-checked) and there is little flexibility between change measures.

The particular weakness of the scheme is its low take up. This is 20.3% and 16.2% for Land Managers and AE respectively. It is particularly low for farmers with common grazings, i.e. commonage (4.8% and 5.6% for land managers and AE respectively). Reasons for this may be hill (unenclosed) ground is subject to much, much lower rates, even if of high biodiversity value. Feedback from farmers suggests that the scheme has few attractive options, and little support for positive management (too many don'ts). See

(www.scotland.gov.uk/Topics/farmingrural/SRDP/RuralPriorities/Packages).

### 3.7.4 Glastir Wales

This scheme operates at two levels and entry level is open to all farms. Upper tier applies to farms with particular habitats and species. Application is on-line and competitive with farmers needing to reach a 'score', i.e. points to be accepted. Farmers with Upland heath and grassland who are accepted to join the scheme are required to abide by a specified stocking rate and follow code of good practice to minimise impacts of farming on biodiversity. Extra money is available for particular management works such as bracken control, burning and provision of facilities for recreation. Burning is allowed in dry heath if burning regulations are adhered to. No information is available on take up or response by farmers.
See (www.wales.gov.uk/topics/environmentcountryside/schemes/glastir/).

### 3.7.5 Northern Ireland Countryside Management Scheme

The scheme in NI has one level. Farmers apply to join and if their land meets particular criteria, their application is accepted and an advisor visits them to develop a farm plan. A farmer with rough moorland grazing/or heather moorland are obliged to adhere to a code of practice and stocking rates which prevent damage to the environment. Payment rates vary for each farm and are negotiated with each individual based on the principal of income foregone. Winter grazing is prohibited and there are conditions on the type of grazing animal used. Depending on habitat, farmers must either graze sheep only, a combination or cattle only and adhere to one of four stocking rates from 0.075LU/ha to 0.30LU/ha. Specific support is offered for burning (£110/ha) or flailing blocks approximately 0.5 hectares (with costs to be agreed with DARD) as part of a heather regeneration plan. See (http://www.dardni.gov.uk/ruralni/index/environment/countrysidemanagement/schemes.htm).

### 3.7.6 Burren

The Burren Farming for Conservation Programme has been lauded by the EU as an example of best practice. The principles of 1) payment for a measured output acceptable to farmers and ecologists and 2) farmer involvement in planning are being used in experimental Uplands agri-schemes in the UK (Hunt, 2013).
See(www.agriculture.gov.ie/otherfarmersschemes/burrenfarmingforconservationprogramme/ )

Characteristics are:

- Close involvement of relevant farmers in developing agri-environment scheme in contrast with the previous top-down approach whereby the development of proposals for agri-environment occur with little real engagement with farmers and detailed knowledge of farming practices and their potential.

- Outcome oriented vs prescription based. While most schemes emphasise adherence to prescriptions, the Burren scheme places greater emphasis on positive effects of management. Farmers are set quality targets and they have choices on the methods used to achieve these targets (within certain guidelines).
- Objectives and management approach are easily understood. The large number of management packages available under UK schemes (a national scheme) are not always easily matched to biodiversity priorities in particular locations and are always difficult to understand by the applicant.
- Simple administration. The schemes currently operating in UK and Scotland (not NI) require farmer to have access to ecological expertise even at the application stage.
- Burren uptake outstanding. The success of the scheme can also be judged by the level of uptake. Uptake is central to the delivery of a range of policy objectives and the Burren scheme has a long waiting list.

## 3.8 Conclusions

Management works, which are described in this chapter, could almost all be carried out immediately by farmers. A plan could be developed after direct inspection of hill land and consultation with farmer. Targets could be set for farm management which recognizes farmers' skills and maximize their value to biodiversity. While flexibility should be allowed to allow farmers reach these targets, guidelines should be produced on new work practices such as targeted controlled burning and swiping/flailing vegetation. The particular characteristics of Uplands environments and farming suggests that considerable time might be needed to modify stock numbers or introduce new grazing practices as they may involve a complex range of sequential activities in various parts of a farm. The management of hills as commonage implies that particular incentives will be needed to bring about co-ordinated integrated management. These characteristics of Uplands management and community relations have to be recognized by the Sustainable Uplands Agri-environmental Scheme. This implies that individuals managing the scheme should have expertise in Uplands ecology and farm practices. While an Uplands scheme should learn from successful models elsewhere, there is little or no experience of successfully introducing such agri-environmental schemes to farmers in commonages. A review of the impact of such schemes in Scotland (Jones, 2012) suggested that take up among holders of common grazing would be improved if incentives were provided to encourage co-operative management. This may allow for new initiatives such as the transfer of shares. The administration of the scheme has to recognize this type of management situation and that such schemes should have a more positive focus stressing the importance of the role of the farmer.

# Chapter 4 Recommendations

## 4.1 Introduction

The principal recommendations include three practical initiatives to be carried out in Wicklow, studies focused on Upland farming and proposed policy changes at local and national levels.

Principal recommendations are an Uplands Agri-environmental Scheme and the establishment of local groups to carry out controlled burning.

## 4.2 Sustainable Uplands Agri-environment Scheme (SUAS)

### 4.2.1 Key principles

- The priority objective of the scheme is to enhance and improve the condition of upland habitats through hill farming, particularly within designated areas (SAC's/National Park). It will also benefit historic features and upland recreation.
- Eligible land will be unenclosed hill land and associated lowland with which it is farmed. Eligible farmers must be active farmers.
- The scheme's promotion, administration and structure will be tailored to recognise the commonage system of management.
- The scheme will follow the approach used in the Burren (BFCP) with payments on production of biodiversity. This involves the preparation of an easily understood farm plan drawn up by ecologist and agricultural advisor in close consultation with the farmer. Payments are in addition to those available under existing schemes, including AEOS.
- Farmers will be supported by an advisory service which will be available throughout the time period of the plan. Contributions will be required to the preparation of the farm plan.
- Due to the nature of upland ecology a nine year scheme will be operated with a possibility of major revisions every three years.

### 4.2.2 Eligible areas

Eligible land will have at least one of the following habitats: dry heath, wet heath, blanket bog, upland acid grassland, white grass (*Molinia*) flushes, montane heath and rocky slopes present in at least 10% of their land.

### 4.2.3 Objectives of scheme

- To support the development and implementation of focussed farm plans aimed at maintaining and/or enhancing the quality of the environment particular those habitats listed in Annex I of the EU Habitats Directive through farming.
- To support economically, socially and environmentally sustainable farming
- To support the management of recreation and protect cultural heritage.

### 4.2.4 Administration of scheme

While the overall administration of the scheme will be the responsibility of government (Departments of Arts, Heritage and the Gaeltacht and Agriculture, Food and the Marine) it will be administered and promoted locally by specialists with expertise in Upland ecology and agriculture.

The local staff based in two offices (in east and west Wicklow) will carry out the following tasks:

- Promotion of scheme to all farmers with hill grazing, both individual farmers and those who farm in commonages inside and outside designated areas with eligible land.
- Assessment of applications to join the scheme. Preference will be given to land/farmers who manage designated land, who may either farm a hill independently or are members of a commonage.
- Preparation of farm plans. Depending on the uptake of the scheme other suitably qualified people could be trained as farm planners supervised by the core staff.
- Monitoring of progress on farm plans.
- Recommendations for payment to Department of Agriculture, Food and Marine
- Provision of training and free advisory service to farmers.
- Annual reporting.

### 4.2.5 Farm plan

While participation in the scheme will principally be through agreement to farm according to a farm plan it will also be necessary that all farmers meet other statutory requirements under cross-compliance, (Good Agricultural Environmental Condition (GAEC) under council Reg. 73/2009 Annex III).

Preparation of a farm plan will involve an initial audit of habitats, review of existing farm plans and in-depth discussions on management with farmer or farmers. In the case of commonages, meetings will be facilitated between holders of grazing rights and between them and the holders of the fee simple (if relevant). Following discussions a contract will be prepared based on agreement to implement the farm plan either independently or as part of a group.

The farm plan will be a short document that will have colour-coded aerial photographs showing management requirements /year in particular areas. An explanation will be given of the targets which need to be achieved in each area. There will be a possibility of review after year 4 which will consider the achievement of agreed targets and be informed by an audit of habitat condition.

### 4.2.6 Work required

Tasks and fees will be allocated by responsibilities or measures as in REPS.

**Measure 1:** Manage designated land and other areas of Annex I habitat
**Measure 2:** Enhance habitat diversity
**Measure 3:** Enhance particular species
**Measure 4:** Support sustainable upland farming, recreation and manage cultural heritage (including protected monuments)

Following the initial survey of baseline condition, under Measure 1 a payment will be offered to all participants (area basis and sliding scale) depending on the condition of their habitats. The maximum payment will be awarded when land is in best possible condition. A reduced rate will apply if quality is less. Levels of payment will be reviewed after years 2, 5 and 7. Indicators to judge quality will be based on those used in upland habitat condition studies commissioned by NPWS and should be easily examined and understood by the farmer (*www.**npws**.ie/publications/irishwildlife**manuals**/IWM48.pdf*).

Under Measure 2 each farmer will be eligible for additional payments if they want to carry out the following works to benefit habitats. They may include:

- Targeted burning (to an agreed 10-year burning plan).
- Changes to grazing regime. This might include a longer grazing season, grazing to a different (time, spatial) pattern, a reduction or increase in sheep numbers, introduction of new sheep breeds or re-introduction of cattle.
- Removing bracken or gorse.
- Swiping or flailing of tall heather/tall gorse.
- Reducing area covered by white grass.
- Installation of fire breaks (to protect sensitive areas from uncontrolled fires).

Measure 3 works will focus on rare plant species, upland birds and grouse. Works may include:

- Small scale fencing (max 10m x 10m) to protect rare plants from grazing and recreational impacts.
- Targeted management of certain areas to improve habitat for upland birds. This will involve swiping, controlled burning or introduction of cattle to create a mosaic of habitat types and structure, to break up the ground and increase the number of patches with habitat heterogeneity.

- Targeted burning of appropriate vegetation in strips to improve habitat for grouse.

Measure 4 covers support for works to manage impacts of recreation and maximise potential of associated lowland to support grazing animals when not on the hill. Works may include:

- Installation, monitoring and management of small scale infrastructure (i.e. stiles) to facilitate access to robust areas and routes.
- Clearance of encroaching vegetation and drain management in hill access routes.
- Improvement of lowland grasslands (rush control, maintaining drainage) to improve capacity of lowland if new grazing regime or stocking rate requires expansion in sheep numbers.

Agreement on Measures 2-4 will be reached after discussion with farmer or farmers. Thus adequate time will be given to this stage of farm planning particularly as some of the works may require co-operative actions.

### 4.2.7 Payments

The average payment will be similar to the Burren c. €8k/year. These will comprise payment under measure 1 (to reach habitat condition target) and payments for specific tasks. The maximum payment will be €15k/year and minimum €600 based on farming 10ha (minimum area).

**Measure 1**

Under Measure 1, every participant could qualify for a payment (maximum €7,250) depending on the condition of their habitats and area farmed. Payments will be made at the following rates: €60/ha for first 50ha, €25/ha for next 150 and €5 up to 300ha.

**Measure 2**

Payment for changes to grazing regime will incur payments of €250 to cover cost of herding i.e. bringing sheep up and down (to extend the grazing season). Payments of €35 sheep and €200/cattle will be made to increase or decrease stock numbers.

For the removal of bracken and or furze, depending on amount this will offer a payment of between €250 and €500/ha.

The payment for swiping/ flailing will depend on the area and nature of vegetation and will vary between €300 and €500/ha. If this is carried out by a group of farmers in a commonage payment the rate will be 25% higher and the total amount will be shared between members of the group.

A payment will be made for reducing the area covered by white grass (*Molinia*). As the mechanism for this operation will vary depending on local

conditions, each operation will be costed separately to a maximum of €1,000/ha.

A payment for controlled burning will be made at the rate of €350/controlled burn which will be specified on the farm plan. If this is carried out by a group of farmers payment rate will be 25% higher and total amount will be shared between members of the group.

Installation of fire breaks (to protect sensitive areas from uncontrolled fires will be costed at the same rate as swiping/flailing.

**Measure 3**

Fencing to protect sites of rare plants and nesting birds will qualify for payment of €15/metre. If deer fencing is required then payment will be €25/metre.

Improving patch heterogeneity for upland birds will allow for a maximum payment of €1,000/ha. Success will be monitored by carrying out breeding bird surveys, particularly grouse.

**Measure 4**

Payments will cover the total cost covered of buying or/and constructing infrastructure to a maximum of €500 and an annual fee (between €200 and €500) for maintenance works and inspection visits.

Rush control will be paid at the rate of €200/ha and drain maintenance at the rate of €5/metre.

Measures are summarised in the following table 4.1

**Table 4.1** Summary of Scheme and Payment Rates

| **Measures** | **Actions** | **Payments** |
|---|---|---|
| **Measure 1**<br>To manage designated land and other areas of Annex I habitat | Reach particular condition targets for habitats. | Depending on condition. Maximum level €60/ha for first 50ha, €25/ha for next 150ha and €5 up to 300ha |
| **Measure 2**<br>To maintain and improve habitats | Changes to grazing regime. | €250 for extra herding. €35 /sheep and €200 cattle if extra stock needed |
| | Removing bracken and/or furze. | €250-500/ha |
| | Targeted burning according to 10 year plan or for fire breaks. | €350 |
| | Swiping or flailing of tall heather/tall gorse. | €300-500/ha |
| | Reducing area covered by white grass (*Molinia*). | Max €1,000/ha |
| **Measure 3**<br>To improve status of species | Small scale fencing (max 10m x 10m). | €15/m or €25/m (deer fence) |
| | Targeted management to improve habitat for upland birds. | Max €1,000/ha |
| **Measure 4**<br>Support sustainable upland farming, recreation and manage cultural heritage | Rush control in enclosed land associated with Upland farm. | €200 /ha |
| | Drain maintenance in enclosed land | €5 per metre |
| | Inspection and management of hill access routes | Maximum €1,000/year |
| | Installation of styles | Max €500/style |
| | Regular inspection of infrastructure used for recreation | €200-€500 /year |

## 4.3 Parallel study areas

### 4.3.1 Introduction

This project will be carried out in parallel to the Sustainable Agri-environmental Scheme. Its objective is to identify novel, cost effective and practical management techniques to maximise the benefits to biodiversity from upland farming. It will focus on a sample of Upland farms and will be sponsored by a multi-stakeholder group (Project Steering Group) containing representatives of local farming groups and statutory authorities such as NPWS and Teagasc. The project work will be carried out by a team with communication, ecological and farm management skills.

### 4.3.2 Study areas

Study areas (3) include hill land (unenclosed land) which is typical of farming systems and biodiversity in the Uplands. They are likely to be managed by landowners who have been actively involved in the vegetation management study and will probably be within Glenmalure, West Wicklow and East Wicklow. Study areas will comprise management units farmed both individually and as part of a commonage. The final selection of sites will be agreed by the Project Steering Group in co-operation with the project team/manager. Commonage is likely to be the most frequent study area type.

Habitats within the study areas are listed in Table 4.2

**Table 4.2** Habitats

| **Habitat** | **Status** |
|---|---|
| Dry heath/European dry heaths/(4030) | Listed in EU Habitats Directive |
| Wet heath/North Atlantic wet heaths with *Erica tetralix*/(4010) | Listed in EU Habitats Directive |
| Blanket bog/Blanket bogs/(7130)* | Priority habitat listed in EU Habitats Directive |
| Montane heath/Alpine and boreal heaths/(4060) | Listed in EU Habitats Directive |
| Alpine graminoid heaths/Siliceous alpine and boreal grasslands/(6150) | Listed in EU Habitats Directive |
| Species-rich slightly calcareous upland grasslands/Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe)/(6230)* | Priority habitat listed in EU Habitats Directive |

### 4.3.3 Research methodology

**Stage One:** Audit (Months 1-2)

The purpose of the audit is to provide a baseline assessment of biodiversity and its relationship to farming, to assist in quality assessment and clarify management potential for biodiversity and farming. This will also involve an analysis of actual and potential recreational use of farmland.

Both field based and desk research studies will be carried out on all study areas (i.e. hill management units) to determine the current condition of habitats, (including the status of breeding birds, particularly grouse and merlin) their management history and management potential. These studies will look particularly at the condition of designated habitats and areas which could be subject to new management works. Condition assessments will follow the approach used in NPWS upland surveys (NPWS, 2010).

Land use history and burning history will be examined through field based examination, inspection of aerial photography, satellite imagery and local records (particularly NPWS/Fire Service etc).

All farmers will be interviewed to characterise their farming operation, land management practices (recent grazing and other operations) and aspirations. In the case of commonages, meetings will be arranged with all holders of grazing rights and other right holders to clarify common issues of concern and potential for greater co-operation.

**Stage Two:** Preliminary specifications for management operations (Months 3-4)

A participatory planning process will facilitate agreement of a range of preliminary management interventions which will be trialled in the study areas. This will involve land managers and NPWS (as the authority responsible for designated habitats and species and managers of grazing rights in some of the National Park). If a study area is a commonage, further consultations will be needed between farmers. This process will result in a preliminary draft management plan specifying works (including burning plans) which need to be carried out.

**Stage Three:** Management trials (Months 4-24)

Experiments will then be carried out to trial various types of management initiatives such as

- Controlled burning
- Swiping of vegetation
- Changes to grazing regime
- Bracken control
- Control of white grass

Experimental treatments will be carried out in all study areas. Wherever possible their boundaries will relate to existing management units in order to avoid fencing which is expensive, undesirable for aesthetic reasons and unpopular with hill walkers. Monitoring of the impacts of these works will cover impacts on biodiversity as well as animal health and productivity.

Biodiversity monitoring will occur before and after experimental interventions, in years one, three or four in c.20-30 randomly selected plots 2m x 2m for plants. Control plots will also be monitored. The boundary of sample plots within these study areas will be indicated using sub-metre GPS with context photographs, or some form of buried marker. Animal husbandry impacts will be monitored through inspection by the farmer and regular measurements of productivity.

Controlled burning trials will be guided by the trial burning plan and will be carried out by a locally based controlled burning group. The plan will identify the area and type of suitable vegetation targeted for burning on a ten year rotation. If a license is available burning could occur both within and outside the official burning season. Controlled burning trials will focus on 1) identification of areas suitable and unsuitable for burning and 2) monitoring of its impacts on biodiversity and productivity.

Swiping will involve trials of commonly available machinery/tools in varying types of terrain to remove vegetation (small, medium and large materials), which is considered unsuitable for burning due to the sensitivity of the location (for small material) or excessive fuel load.

Changes to grazing regime will include extending or reducing the grazing season, increasing or decreasing flock size or re-introducing cattle. There will be a particular focus on the relative impacts of traditional hill grazing (winter and summer grazing) versus current practice (summer only) over a three year trial period and the role of cattle in the management of areas dominated by white grass. In areas covered by white grass (*Molinia*) experimental treatments will focus on the use of cattle grazing (at different stocking rates, for different lengths of time) to reduce its cover and cause regrowth of heather (possibly present in the seed bank). This will involve fixed point photography in marked plots and measurement of: vegetation heights, percentages of dwarf shrubs, dwarf-shrub species present, browsing % of *Calluna* long shoots (in Feb-May period to catch winter browsing), % bare ground, % grass cover, cover of *Campylopus*/*Polytrichum*/*Funaria* etc mosses (pioneers after severe burns) and dung pellet frequency (the latter in winter). The impacts of these trials on animal productivity will also be monitored.

Experiments with bracken removal will trial the use of Dicamba (recommended for use in NI) and mechanical methods. The latter will involve mechanical crushing of stalks three times/year. Monitoring will measure impacts on biodiversity (% of bracken still present, cover of acrocarpous mosses) and agricultural productivity (graminoid cover/extent of dwarf-shrub (re)colonisation).

**Stage 4:** Expansion of trials in Uplands in Wicklow (Months 24-36)

Following successful completion of trials in defined study areas, the approach and methodology will be applied to upland areas in other parts of Wicklow. This will allow a more thorough testing of the practicality of the approach and the value of management operations in a wider range of farms.

### 4.3.4 Dissemination of the results of parallel project

**(Months 36-40)**

As well as providing a comprehensive baseline on biodiversity and farm management in the Wicklow Uplands, outputs from the parallel project will include:

- Informed assessment of the potential of particular management interventions to support biodiversity and sustainable agriculture. This will support the production of agreed guidelines, specifying where these operations might be required, costs involved and how they should be carried out. These will be of value in other Upland areas.
- An understanding of the impact of these operations on farming practice (sheep and cattle husbandry, stock management practices, and profitability i.e. cost/benefit) will increase understanding between ecologists and agricultural specialists.
- Clarification of the nature of local skills and upskilling which might be required.
- Details of the cost of the operations (capital costs and manpower) to support realistic payments offered in a Sustainable Agri-environmental Scheme.

# 4.4 **Establishment of controlled burning groups**

## 4.4.1 Introduction

A locally based controlled burning group or groups will build on the tradition of controlled burning of vegetation in the Wicklow hills. The operation will have the objective of improving the productivity of the hills, using a traditional management practice which does not damage biodiversity or threaten forestry and public safety. It will enable farmers living and working locally to take advantage of safe burning conditions to burn specified areas. While the system proposed will operate during the official burning season, if this changes, the operational period will be reviewed.

## 4.4.2 Who should be involved?

**Role of farmers**

The most important representatives are the farmers currently involved in burning and the local Fire Service. The work on the hills in Wicklow will be carried out by one, two or three burning groups comprising farmers who want to carry out burning in their locality. Burning will be guided by a burning plan which will be agreed with the authorities, and an upland ecologist. Training will be provided. When taking part in burning it is likely that one person will be needed to start the fire, and three to four others to manage it. Resources will be available to provide necessary equipment and administrative back-up.

**Other organisations**

Other organisations with a role in authorising or planning controlled burns are: Wicklow County Council (Fire Service and Heritage Officer), the National Parks and Wildlife Service (upland ecologists and managers of the National Park), An Garda Siochana, the Forest Service and Coillte.

Representatives of all these organisations together with local farmers would assist in the development of a co-ordinated burning plan for an area and training programme for local burning groups.

The role of NPWS ecologists is vital to identify areas which are suitable for burning to manage biodiversity. Final agreement on burning should result from a direct inspection of the area(s) by farmers who will be carrying out burning and NPWS ecologists (who should also monitor impacts).

The Fire Service could assist with training the local group to carry out controlled burning in association with an upland ecologist. It could appoint a liaison person to liaise with burning groups.

### 4.4.3 Training

Training (one day/week over two weeks) will be provided to prospective members of local burning groups to provide them with relevant background information and skills. It will include indoor and outdoor sessions including viewing of different vegetation types, discussion of the impacts of fire (on biodiversity and public safety) and experience of a fire event. Suitable equipment (fire proof clothing, beaters, water pumps, foam sprays etc) will be demonstrated. It should enable participants to carry out a controlled burning exercise and operate as part of a controlled burning group.

### 4.4.4 Burning plan

Once agreement is reached on the burning plan it is expected that the controlled burning group could be given a derogation from some of the notification requirements i.e. that notification could specify a general timescale for burning and not particular days.

### 4.4.5 Role of part-time seasonal co-ordinator

The scheme requires the support of a part–time co-ordinator based locally.

Their responsibilities will include:

- Promoting the scheme within the community.
- Identifying participants interested in being involved.
- Organising training (trainees, venue) for local burning groups in association with Fire Service, Forest Service or other suitable training organisation.
- Provision, maintenance, storage and distribution of essential equipment (including protective clothing and shovels) available to participants.
- Liaising with authorities to support the production of burning plans for particular areas. Preparation of burning plans.
- On-going support to burning groups to enable them to meet requirements of the regulatory bodies.
- Compilation of annual report to include records of the extent of controlled burning and impact on vegetation recovery. Monitoring of vegetation recovery will be undertaken by a consultant ecologist after years one, five and ten.
- General awareness raising about fire aimed at farmers, the general public and recreational users, including development of a 'community fire watch' . Members of a 'community fire watch' would pass on information to the Fire Service about a fire in their locality and thus assist them in determining the location of the fire and scale of response needed.

## 4.5 Research needs

### 4.5.1 Introduction

Research on biodiversity and farming is needed to complement and inform the action oriented projects previously outlined.

### 4.5.2 Biodiversity

Biodiversity research should focus on all unenclosed hill land within Wicklow designated and undesignated lands, within and outside the National Park to provide a comprehensive baseline of biodiversity and management practices. Research should involve:

- Habitat condition survey following methodology in NPWS sponsored upland surveys elsewhere (*www.**npws**.ie/publications/irishwildlife**manuals**/IWM48.pdf)*.
- Grazing survey (focussing on unenclosed land above 200m) including interviewing all graziers to determine usage of their hill land, stocking level, pattern of use of hills, where, other forms of management, and their aspirations.
- Five year census of deer supported by annual helicopter based survey.
- Socio-economic research focussed on hill sheep farming to identify its future prospects.
- Establishment of monitoring programme to describe management and status of biodiversity.

The research will require the involvement of farmers and ecologists. Results will provide a baseline and context for action oriented research projects.

### 4.5.3 Farming and land management

Research should also be carried out on the following management issues:

- History of fire as a management tool. Historical (estate and folklore) sources and field inspection should be used to characterise the history of fire, its management and impacts. Field inspection could be linked to the condition survey above.
- Analysis of the impacts of recent fire events recorded by NPWS in the Wicklow Mountains SAC.
- Nutritional preferences of sheep and cattle in the Uplands to support stocking practices which benefit biodiversity.
- Grouse management. The characterisation of grouse ecology and management could be linked to measures to enhance other features of upland biodiversity, particularly upland breeding birds.

The results will inform the approach to managing hills through burning and identify measures required to improve habitats for breeding birds.

### 4.5.4 National level research

At a national level there is an urgent need to research:

- Socio-economics of Upland (particularly hill sheep) farming taking into account the value of public goods produced (cultural values and recreational opportunities) and need for opportunities to obtain greater financial return from alternative markets for wool, breeding stock and hill lamb.
- Grazing regimes to maximise productivity and benefit biodiversity in upland habitats. This project will examine role of cattle and various breeds of sheep.
- Characteristics of management within commonages, to examine prospects for co-operation to improve biodiversity and productivity.

### 4.5.5 Applied research

Applied research is needed to produce:

- Revised code of practice for controlled burning to make it more farmer friendly and incorporate greater consideration of ecological issues.
- Advisory guidelines for farming in the hills covering grazing, burning/swiping and the treatment of bracken and white grass (*Molinia*)

## 4.6 Policy changes

### 4.6.1 Introduction

The Wicklow experience of setting up partnerships between local stakeholders to promote community based sustainable development has had considerable success. Efforts to develop partnership between local interests and the statutory authorities (to apply for a LIFE project and review burning dates) to promote biodiversity related projects have had less success. Major policy changes are needed to encourage this type of partnership.

### 4.6.2 Incentives for partnership

**Rationale**

Partnership is essential to achieve sustainable development. None of the initiatives outlined above can take place without the active involvement and support of several sectors and statutory authorities. The type of partnership required varies between projects but all essentially require support for initiatives which focus on learning with farmers how to improve the management of the hills for biodiversity.

Conflicts have arisen due to the lack of a partnership approach to key land management issues and lack of understanding of the impact of upland farming management practices on biodiversity. A traditional protectionist approach to biodiversity management led to the shortening of the burning season by six weeks in 2000 without scientific justification. This has increased

the potential for conflict between the farming sector, organisations concerned with biodiversity and services involved in fire management.

Partnership did not characterise the process which led to the decision to significantly change the burning dates in the Uplands as partnership requires sustained investment in shared learning and experience. Few statutory organisations dedicate adequate resources to this activity and therefore miss valuable opportunities for shared learning. The proposed Wicklow LIFE project provided a unique opportunity to carry out research with a well organised group of upland farmers networked into farming organisations in Wicklow. Concern with the impact of burning dates could have been seen to strengthen the value of the project. The rejection of this offer suggested that while statutory authorities may aspire to becoming involved in partnership, institutional structures do not support this aspiration. The Burren project based on a partnership approach to land management is lauded for its success, yet there appears to be a reluctance by some to learn the lessons from the project and emulate this model elsewhere.

**Actions**

- NPWS policies should give priority to research projects which are strongly supported by groups which control important biodiversity resources. A relevant policy should be developed, implemented and monitored. Responsibility should be assigned to a senior staff member and a budget line allocated to this activity (research and action projects).

- A budget should be allocated to the Wicklow National Park to enable its managers to actively engage in projects piloting a partnership approach to management with the farmers holding grazing rights in the National Park.

- The NPWS should immediately introduce a licensing system to allow for burning outside the official burning dates. The system introduced should be farmer friendly. Technical assistance should be provided if ecological expertise is needed to support any form of licensing application.

- Drafting should commence on an amendment to Section 46 of the Wildlife (Amendment) Act to return the burning dates to those which prevailed until 2000. This would bring them into line with Northern Ireland. The revised dates could be trialled in association with the establishment of controlled burning groups. Support should be offered to the Pilot Burning Project by the NPWS.

- The Fire Service at national and local levels should offer support for the Pilot Burning Project and together with NPWS become involved in the revision of the Forest Service Code of Practice for Prescribed Burning.

- County Wicklow Partnership, the local development organisation, should consider allocating LEADER funding to support the Pilot Burning Project.

**Results**

Policy changes listed above will support implementation of the projects outlined in this report. The reversal of the decision on burning dates and the introduction of a farmer friendly licensing system would improve relations between the farming community and statutory bodies and enable the legal burning of upland vegetation during the time when this traditionally occurred. Active support of the Fire Service for the Pilot Burning Project would improve relations with the Uplands community, with the potential benefit of establishing a 'community fire watch service' which would enable more efficient use of fire fighting resources.

### 4.6.3 Recognition of values, challenges and opportunities associated with the Uplands

## Rationale

The Uplands need to be valued and managed as a unique area covering large parts of Ireland featuring land of particular value for farming, high quality biodiversity, landscape and recreation. Compared to other farmed lands its particular environment is characterised by difficult topography and climate conditions which result in farmers and local populations that are economically disadvantaged.

The traditional economic activity of hill sheep farming is in decline. The sector features below average farm incomes and is principally dependent on direct farm payments which are seriously depleted due to the withdrawal of REPS. The decline of hill sheep farming will have a significant negative impact on biodiversity and increase the risk of catastrophic fire.

## Actions

- In the next Rural Development Plan the Department of Agriculture, Food and the Marine should make provision for an Upland Agri-environment Scheme for all the unenclosed land in the country following the template developed for Wicklow.

- Teagasc should be requested to carry out research projects specified in this report on commonage management, sheep husbandry and socio-economic aspects of upland sheep farming.

- NPWS in the Department of Arts, Heritage and the Gaeltacht should initiate a research programme examining the relationship between habitat condition and land management in the hills.

## Results

The operation of a Sustainable Upland Agri-environment Scheme would allow for a targeted scheme offering payment by results. It would help to maintain and improve biodiversity and support farming. It would support the objectives of the National Park. Research on sheep husbandry and socio-economics of hill farming will improve prospects for the maintenance of this vulnerable farm sector.

### 4.6.4 Interdepartmental co-operation

**Rationale**

Interdepartmental co-operation must be strengthened for the following reasons:

Uplands are valuable for many features only some of which are traded. Non traded 'public goods' include recreation, biodiversity, landscape, water holding and carbon storage. These valuable features are of interest across many government departments and could be used to support the maintenance of a traditional economic activity, hill sheep farming, which is in decline. There is a relationship between biodiversity, agriculture and the management of fire risk. This implies interdepartmental co-operation between the Department of Agriculture, Food and the Marine and the Department of the Arts, Heritage and the Gaeltacht.

The lack of co-operation has led to conflicts concerning cross compliance. This has united environmental groups with farmers through concern with the retention of non-productive features in farmland. Currently farmers can be penalised for allowing semi-natural vegetation of value to biodiversity to appear on their farms. The Department of Agriculture, Food and the Marine has attempted to penalise farmers whose hill land was burnt outside the legal burning dates. These issues are not unique to Wicklow.

Greater co-operation would support the prospects for sustainable development. It would build on and strengthen a partnership approach such as that facilitated by Comhairle na Tuaithe and strengthen submissions to international bodies such as the EU which recognise the special value and challenges of mountain environments.

## Actions

The Department of Arts, Heritage and the Gaeltacht (through NPWS) and the Department of Agriculture, Food and the Marine should work together to initiate the process of developing a Sustainable Uplands Agri-environmental Scheme.

The government should combine with other European groups to lobby for a change in cross compliance obligations concerning scrub.

Actions resulting from non-compliance due to burning practices should be informed by accurate information on damaging incidents. Penalties should only be applied when the involvement of a non-compliant farmer can be proven.

A national policy should be developed for Upland areas giving priority to the maintenance of the hill farming and associated communities. This should be informed by an understanding of the commonage system of management, the socio-economics of hill sheep farming and the potential of additional income streams arising from payment for biodiversity and other ecosystem services (recreation, carbon sequestration and water management). This should involve engagement with five departments: 1) Environment, Community and Local Government 2) Agriculture, Fisheries and the Marine 3) Arts, Heritage and the Gaeltacht, 4) Health and 5) Transport, Tourism and Sport.

## Results

The production of a national policy will highlight the unique resources of the Uplands and lead to more sustainable policies and programmes. The Sustainable Agri-environmental Scheme will be more effective if promoted and managed jointly by the authorities responsible for biodiversity and agricultural development. Obligations under cross compliance will be more acceptable to farming and biodiversity interests.

# Chapter 5 Action Plan

## 5.1 Introduction

This section elaborates on the recommendations. It provides indicative costs and lists key organisations/individuals that need to be involved. The final section suggests priority actions for the Wicklow Uplands Council.

## 5.2 Partners in project implementation

The table below summarises the partners and policy changes which are required to implement projects described in previous chapter.

**Table 5.1** Organisations, policy changes and resources

| Project | Organisations/individuals who need to be involved | Policy Implications | Sources of Support |
|---|---|---|---|
| Sustainable Agri-environmental Scheme for the Wicklow Uplands | Dept of Agriculture, Food and Marine, NPWS (National Park and other specialists), Teagasc, Hill farmers (through their representative local and national bodies, WUC, IFA and Sheep Owners' Associations) | Irish government to agree to use Pillar 2 funding of revised CAP to fund Sustainable Uplands Agri-environmental Scheme. | CAP. Article 28 of the European Agricultural Fund for Rural Development. Irish government resources (administrators and Teagasc specialists). Farmers who participate. |
| Parallel study areas | NPWS, Teagasc (local and other specialists in Johnstown Castle for agri environment and Athenry for sheep husbandry) Wicklow Sheep Cheviot Sheep Owners' Association, IFA | NPWS to prioritise research projects which involve active participation by groups who control important biodiversity assets. | NPWS, Teagasc Hill sheep farmers. |
| Establishment of controlled burning groups | WUC, groups of hill farmers, local gun clubs, County Wicklow Fire Service, Coillte, NPWS/Forest Service | Fire Service to support controlled burning practices. NPWS to assist in training and carrying out of controlled burning. | Leader funds for rural development (CWP). Support in kind from Wicklow Fire Service, Coillte/Forest Service/NPWS. |

## 5.3 Project costs and sources of funding

### 5.3.1 Sustainable Agri–environmental Scheme

Cost breakdown is based on the following assumptions:

- Eligible farmers number between 350-400 (divided between those who own their own hill land and those on commonages).
- Measure 1 payments average €4,250/ farmer (farmer has c80ha of hill land in good condition) and total payments are between €1.5m and €1.7m.
- Measure 2-4 payments average €4k/farmer, spread over several years and total payments are between €1.4 and €1.6m.
- Administration costs are similar to those in the Burren Farming for Conservation Programme of c €140,000/year.
- Farmers pay a proportion of the costs of their own farm plan and thus contribute between €0.7m and €0.8m.

Total annual costs are between c €3.7m and €4.2m depending on numbers of farmers involved (either 350 or 400) and farmers pay c.20% of the cost.

Finance for this scheme could be negotiated under Pillar 2 of the Cap as its objectives are compatible with Rural Development Policy. Up to 100% funding is available. However government support is needed.

### 5.3.2 Parallel study areas

The table below summarises associated costs.

**Table 5. 2** Cost of parallel study areas project

| **Stage** | **Timescale (months)** | **Costs** | |
|---|---|---|---|
| | | Personnel | Expenses |
| Project set up | Months 1-2 | €10,000 | €2,000 |
| Audit | 2-3 | €15,000 | €2,000 |
| Development of plans for study areas | 3-4 | €10,000 | €2,000 |
| Management trials | 4-24 | €90,000 | €20,000 |
| Expansion in Wicklow | 24-36 | €30,000 | €10,000 |
| Dissemination of results locally and nationally | 36-40 | €5,000 | €5,000 |
| Total | | €160,000 | €41,000 |
| **OVERALL** | | **€201,000** | |

Personnel include ecological and agricultural specialists with upland experience. Sub-contractors are needed to carry out swiping, scrub clearance or controlled burning or stock management. Expenses cover a fee paid to landowners who agree to let their hill be used as a study area and assist with trials as well as basic services to enable the project to function, i.e. office etc.

As efforts to secure funding from EU sources through LIFE were unsuccessful due to the difficulty of obtaining matching funding, alternative sources should be pursued. These include Leader and Interreg. NPWS should be asked to support the project by commissioning a baseline analysis, similar to

that carried out in Upland areas in other parts of the country as part of an Upland Habitats Monitoring Project.

### 5.3.3 Controlled burning groups

Annual cost includes:

- Recruitment of a part-time administrator who has experience of controlled burning, providing practical training and report writing. Estimatated cost, €20k
- Provision of specialist ecological services to prepare burn plan and carry out monitoring. Estimatated cost, €5k.
- Hire of meeting rooms for training and transport of trainees to field sites (associated with three training courses). Estimatated cost, €5k.
- Purchase of training materials, and essential equipment (phone to provide an accurate wind/weather forecast, basic fire management equipment). Estimatated cost, €5k.

Therefore the estimated total cost of this project is c €35,000/year.

LEADER funding should be sought from County Wicklow Partnership for a demonstration/training project. Relevant agencies should be requested to contribute. The Forest Service also has a small training budget (Ciaran Nugent, pers. comm.). If NPWS is actively involved in this project, costs would be less than €5k as a consultant ecologist would not be required.

## 5.4 Priorities

### 5.4.1 Burning

Burning management should be a priority issue for WUC. In the short term contact should be established with like-minded organisations to agree a common approach to the authorities. Following the establishment of this network, relevant government departments should be contacted. A short summary document containing background information about the issue should be prepared as briefing material. DOAHG and DECLG should be requested to 1) draft an amendment to the Wildlife Act which would legalise burning during the period allowed under the original Wildlife Act and 2) instruct County Fire Services to co-operate with controlled burning groups. NPWS in DOAHG should be requested to support the establishment of controlled burning groups in Wicklow and to carry out studies on bird nesting seasons in the Uplands. WUC should prepare an application to CWP for LEADER funding to support the development of controlled burning groups. Wicklow Fire Service/ Coillte and the Forest Service should be consulted and asked to contribute to this initiative.

### 5.4.2 Sustainable Uplands Agri–environmental Scheme

The proposal for a Sustainable Uplands Agri-environmental Scheme should be progressed through closer contacts with the recently established National Uplands Working Group and wider Consultation Forum c/o Mountaineering Ireland which has been responsible for a detailed submission to the DAFM on

this issue. WUC should ensure that further submissions would refer to the specification outlined in this report, that a national scheme would recognise differences between Uplands in the east and west and that burning management is given a high priority in any agreed scheme. WUC should continue to co-ordinate efforts of local farming and sheep farming representative organisations to progress this issue locally and nationally.

### 5.4.3 Research

Best practice needs to be supported by research and survey work. WUC should lobby Teagasc to carry out socio-economic research on traditional hill farming. Research should examine the values associated with this sector (economic, cultural and biodiversity related). It should investigate the factors responsible for its decline and suggest policy initiatives to restore it to sustainability. As management of the Glen of Imaal is very well documented (sheep numbers, bracken control) and appears to be associated with high biodiversity values, WUC/NPWS and Wicklow County Council Heritage Office should encourage the army to sponsor a study examining this area as an example of best practice. WUC should continue to seek support for the parallel study areas research project. It could suggest that the National Park expand its monitoring activities to engage in active research on Upland management issues. Potential exists to use ecological expertise available within NPWS to plan and manage small scale grazing, burning and swiping trials. To initiate this programme an agreed management plan should be drawn up for a defined area. Recording should include farming and financial impacts together with biodiversity.

# References

AFCon Management Consultants with Jim Dorgan Associates, (2006), *Rural Development Programme 2007-13 Ex Ante Evaluation.*

Armstrong, H., (1996), *The Grazing Behaviour of Large Herbivores in the Uplands*, Adapted from Scottish Natural Heritage Information and Advice Note, No. **47**.

Bowler, M. and Bradshaw, R., (1985), Recent Accumulation and Erosion of Blanket Peat in the Wicklow Mountains, Ireland. *New Phytologist*, 101, 543-550.

Burke, F., (2001), The Role of Satellite Imagery for Production of a Broad Category Habitats Map of Wicklow Mountains National Park, University College Dublin.

Bowler, M. and Bradshaw, R., (1985), Recent Accumulation and Erosion of Blanket Peat in the Wicklow Mountains, Ireland, *New Phytologist*, 101, 543-550.

Buckley C., van Rensburg, T., M., & Hynes S. (2008) *"Farming on commonage is it a constraint to recreational access"* (Working Paper No. 0130) Department of Economics, National University of Ireland, Galway.

Byrne, D., (2002), *A Study Of Granamore Commonage In County Wicklow*, Project submitted in partial fulfillment of the requirements for the Higher Diploma in Rural Environmental Conservation and Management, University College Dublin, Ireland.

Central Statistics Office, (1997), Farming Since the Famine: Irish Farm Statistics 1847-1996. CSO.

Central Statistics Office. (2000) Census of Agriculture, Cork.

Central Statistics Office, (2012), Census of Agriculture 2010 - Preliminary Results, pp. 66. Stationary Office, Dublin.

Cooper, A. and Loftus, M. (1998), The Application of Multivariate Land Classification to Vegetation Survey in the Wicklow Mountains, Ireland. *Plant Ecology*, 135, 229-241,

Curtis, T. G. F. and F. Wilson. (2008), A Survey of the Rare, Scarce and Threatened Vascular Plants of County Wicklow, Unpublished report, National Parks and Wildlife Service.

Department of Agriculture, Fisheries and Food, (2007), *Ireland Rural Development: National Strategy Plan 2007-2013*, DAFF.

Department of Agriculture, Fisheries and Food, (2009), *Cross Compliance Farm Advisory Service Training*, Good Agricultural Environmental Condition (GAEC).

Department of Agriculture, Fisheries and Food, (2011), *Code of Practice for*

*Prescribed Burning*, The Irish Government.

Department of Arts, Heritage and the Gaeltacht, (2011), Action for Biodiversity: Ireland's National Biodiversity Action Plan, DAHG.

European Commission, (1996), *Interpretation Manual of European Union Habitats*, *Version 15*, European Commission DGX1

European Commission, (2009), *New Insights into Mountain Farming in the European Union,* Directorate-General For Agriculture And Rural Development, European Commission, Brussels.

European Commission, (2003), *Community Policies and Mountain Areas,* European Community, Brussels.

European Commission, (2011), *The Costs of Not Implementing the Environmental Acquis,* European Commission Directorate-General Environment.

European Commission, (2009), Establishing Common Rules for Direct Support Schemes for Farmers under the Common Agricultural Policy and Establishing Certain Support Schemes for Farmers, amending Regulations (EC) No 1290/2005, (EC) No 247/2006, (EC) No 378/2007 and repealing Regulation (EC) No 1782/2003, *Council Regulation (EC),* No. 73/ 2009.

EU, (2011), Laying Down Detailed Rules for the Implementation of Council Regulation (EC) No 1698/2005, As Regards The Implementation of Control Procedures as well as Cross-Compliance In Respect Of Rural Development Support Measures, *Commission Regulation (EU), No. 65/ 2011.*

European Commission, (2004), *Mountain Areas in Europe: Analysis of Mountain Areas in EU Member States, Acceding and other European Countries.*

European Network for Rural Development, (2009), *Mountain Areas / Mountain farming NSP and RDP Screening Results*. Draft working paper, Revised draft submitted to DG AGRI on 18/11/09.

Fossitt, J., (2000), *A Guide to Habitats in Ireland*, The Heritage Council, Ireland.

Gurrin, B., F., (206), *A Social History of the Wicklow Uplands*, DOEHLG.

Hunt, J., (2013), *Agri-environment schemes working for the upland farmer*
Farmer's Weekly, Monday 14 January.

Indecon International Economic Consultants, (2010), *Mid-Term Evaluation of the Rural Development Programme Ireland (2007-2013),* Department of Agriculture, Fisheries and Food and the European Commission.

Jones, G., (2012), *Supporting Common Grazing Through agri- environment – Lessons from an ex post Evaluation*, European Forum for Nature and Pastoralism.

La Canada, (2012), *Greening the CAP for permanent pastures – why the Commission's proposals need an urgent review,* European Forum on Nature Conservation and Pastoralism.

Leonardo Da Vinci Vetpro, (2012), *Capacity Building for Irish Commonages,* Leargas, Ireland.

McElheron, A., (2005), *Merlins of the Wicklow Mountains*. Currach Press, Dublin.

McGurn, P. & Moran, J., (2010), *A Draft High Nature Value Programme for the Aran Islands based on the Burren Farming and Conservation Programme,* The Heritage Council and European Forum for Nature and Pastoralism.

McGurn, P., (2011), *Developing a Targeted-based Programme for HNV Farmland in the North Connemara Area,* The Heritage Council and European Forum for Nature and Pastoralism.

McGurn, P., (2012), *Co-operation on an Irish Commonage – the Boleybrack Approach,* La Cañada No. **29**

Matthews, A., (2013), *Greening the CAP, A Missed Opportunity?* The Institute of International and European Affairs, Dublin.

Mitchell, F., and Conboy P., (1993), Early Blanket Peat Bog Development in the Wicklow Mountains. *Irish Naturalists' Journal*, 24, 229.

Mohamed, B.F., and Gimingham, C., H., (1970), The Morphology of Vegetative Regeneration in Calluna vulgaris, New Phytol, 69, 743-750.

Moore, J.J., (1960), *Resurvey of the Vegetation of the District Lying South of Dublin* (*1905-1956*), Proceedings of the Royal Irish Academy B, 61, 1-36.

National Association of Regional Game Councils, (2011), *Heather Management within an SAC by Burning – The First Steps,* (http://www.nargc.ie/habitat-conservation/heather-management-within-an-sac-by-burning---the-first-steps.aspx.)

National Parks and Wildlife Service, (2005), *Management Plan for Wicklow Mountains National Park 2005-2009,* The National Parks & Wildlife Service Department of the Environment, Heritage & Local Government, Ireland.

National Parks and Wildlife Service, (2007), *The Status of EU Protected Habitats and Species in Ireland,* Vols 1-3, Unpublished Report, NPWS, Dublin.

O'Donovan, G., (2007 in prep), *Vegetation and Habitat Survey of Wicklow Uplands cSAC*. Unpublished draft report commissioned by the NPWS.

O' Rourke, E., (2010). High nature value farmlands: Case study reports: Iveragh Peninsula, Co Kerry. Unpublished report prepared by the European Forum for Nature Conservation and Pastoralism in association with the Heritage Council.

Purser, P., Wilson, F. & Carden, R., (2009), *Deer And Forestry In Ireland: A Review Of Current Status And Management Requirements,* Woodlands of Ireland, Wicklow.

Pethybridge, G.H. and Praeger, R.L., (1905), The Vegetation of the District Lying South of Dublin. *Proceedings of the Royal Irish Academy*, 25B, 124-180.

Rural Development Programme, (2008), *Countryside Management Scheme – Rates of Payment,* Department of Agriculture and Rural Development (NI).

Rural Development Programme, (2008), *Countryside Management Scheme 2007 – 2013 Information Booklet,* Department of Agriculture and Rural Development (NI).

Scottish Executive, (2008), *Prescribed Burning of Moorland; Supplement to The Muirburn Code,* The Scottish Government, Scotland.

Smith, G. F., Bligh J., Delaney E., Egan, M., O'Donovan G., O'Donoghue, P. & O'Hora K., (2010), *Case Studies On High Nature Value Farming In Ireland,* The Heritage Council.

Smith, G. F., Cronin, R., Delaney, E., Merkle A. O., Connell B. and O' Hora K., (2010), *Landscape Study of the Great and Little Sugar Loaf Mountains, Co. Wicklow,* Report prepared for Wicklow County Council.

Teagasc (Rural Economy Research Centre), (2008), *Baseline 2008 Outlook for EU and Irish Agriculture.* Report produced as part of FAPRI-Ireland Partnership, Teagasc.

Wicklow Uplands Council & Wicklow Dublin Mountains Board, (2007), *Initiative to increase bio-diversity by reintroducing best vegetation management practice in the Wicklow uplands,* Wicklow – Dublin Mountain Board.

Williams, B., Wall, S., Walsh, M. and Gormally, M., (2012), Habitat selection by grazing animals in heterogeneous environments: The case of hill sheep in western Ireland, *Biology and the Environment: Proceedings of the Royal Irish Academy* 2012. D01:10.3318/BIOE.2012.16

Wilson F. and Curtis, T. (2008), *The Montane Flora of County Wicklow*, Unpublished report supported by the Heritage Council (Wildlife Grant Scheme) and Heritage Officer, Wicklow County Council.

Wilson, F., Curtis, T.G.F., and Duff, K., (2007), *Conservation Status Assessments for Heath (4060), Siliceous Scree of the Montane to Snow Levels (8110), Calcareous Rocky Slopes with Chasmophytic Vegetation (8210), Calcareous and Calcshist Screes of the Montane to Alpine Levels (8120) Siliceous Rocky slopes with Chasmophytic Vegetation (8220).* Unpublished Report. National Parks and Wildlife Service.

# Bibliography and websites

Brunner, A.& Lauder, A., (2013), *Nature creates prosperity,* Bird Life International & BirdWatch Ireland.

Cross, J., (2006), *The Potential Natural Vegetation of Ireland*, Biology and Environment: Proceedings of the Royal Irish Academy, Biology, Botany, Zoology and Environmental Studies, Vol 106, Number 2

Cummins, S., Bleasdale, A., Douglas, C., Newton, S., O'Halloran, J. & Wilson, H.J., (2010), *The Status of Red Grouse in Ireland and the effects of Land Use, Habitat and Habitat Quality on their Distribution.* Irish Wildlife Manuals, No. 50. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.

Department of Agriculture and Rural Development (NI), (2011), *Heather Moorland,* Country Management Publications

Department of Agriculture, Fisheries and Food, (2011), *Specifications for the Agri – Environment Options Scheme,* European Agricultural Fund.

Donnelly, R. R., (2008), *Land Managers Options Guidance 2008, Notes for Guidance,* The Scottish Government, Edinburgh.

Doogue, D., (1987), *Flora and Fauna of the Dublin Mountain, An Environmental Guide,* Dublin County Council.

English Nature (2001), *The Upland Management Handbook*,

Environment & Heritage Service, (2008), *Northern Ireland Species Action Plan: Red Grouse,* Environment & Heritage Service.

European Forum on Nature and Pastoralism, (2010), *High Nature Value Farmlands Case Study Report, Iveragh Peninsula, Kerry.*

Gallett, S. and Roze, F., (2001), *Conservation of Heathland by Sheep Grazing in Brittany (France): Importance of Grazing Period on Dry and Misophilous Heathland,* Ecological Engineering, Vol 17, pp333-344.

Gimmingham, C. M., (1975), *An Introduction to Heathland Ecology*, Oliver and Boyd, Edinburgh.

Glanville, E., (1997), *The Compilation of a Land Cover map of the Lough Dan, Lough Tay catchment, and its use in Assessing Future Land Management.* Environmental Science Unit, Trinity College Dublin.

Gray, C. et. al. (2003), *The Status and Distribution of Choughs (Pyrrhocorax pyrrocorax) in Ireland, 2002/2003,* Irish Birds Vol 7 (2), pp 147-156

Goodwillie, R., (1975), *Physical Features and Habitats. In: Hutchinson, C.D., The Birds of Dublin and Wicklow.* Irish Wildbird Conservancy.

Hill Farming Act 1946, England, Scotland and Wales.

Hulme, P.D., Merrell, B.G. Torvell, L., Fisher, J.M., Small, J.L. and Pakeman, R.J. (2002), *Rehabilitation of Degraded Calluna vulgaris (L.) Hull-dominated Wet Heath by Controlled Sheep Grazing*, Biological Conservation Vol 107, pp351-363.

Newton, A., Bullock, J.M. & Pullin, A.S. (2005) *How does the impact of grazing on heathland compare with other management methods?* Systematic Review Protocol No. 14. Available at: http://www.cebc.bham.ac.uk

Hamell, M., (2012), *Environmental Sustainability in Agriculture: Challenges in the Agri-environmental relationship to 2030,* EU Commission, Dublin.

Hanley, N., (?), Likely Impacts of Future Agricultural Change on Upland Farming and Biodiversity, Stirling

High Nature Value Farming Project Advisory Group Meeting (2011), *Advisory Group Minutes*

High Nature Value Farming Project Advisory Group Meeting, (2011), *Discussion Notes*

Holland, J. P., Morgan-Davies, C., Waterhouse, T., Thomson, S., Midgley, A. & Barnes, A. (2011), *An Analysis of the Impact on the Natural Heritage of the Decline in Hill Farming in Scotland.* Scottish Natural Heritage Commissioned Report, No. 454.

Inter-Agency Deer Policy Group, (2012), *Draft Deer Management Policy Vision Draft Discussion Document, ?*

MacDonald, A., Stevens, P., Armstrong, H., Immirzi, P., Reynolds, P., (1998), *A Guide to Upland Habitats: Surveying Land Management Impacts,* Scottish Natural Heritage.

McEvoy, P., Vyse, S., Roos, S., Preston, J. & Reid, N. (2008) *Belfast Hills Upland Heath Survey 2008.* Report prepared by Quercus for the Belfast Hills Partnership, Northern Ireland, UK.

McGrath, B., (1995), *A Guide to the Comeragh Mountains*, The Adventure Club, Waterford Regional Technical College.

Millinga, A.L., Putwain, P.D., Cox, E.S. Ghorbani, J., Le Duc M.G. and Marrs, R.H.,(2004), *Developing an Integrated Land Management Strategy for the Restoration of Moorland Vegetation on Molinia caerulea Dominated Vegetation for conservation purposes in Upland Britain*, Biological Conservation Voll. 119 , pp371-385.

Newton, A., (nd), How Does the Impact of grazing of Heathland Compare with other Management Methods, (Outline of) Systematic Review No. 14 Centre for Evidence Based Conservation, Bournemouth University, UK.

Pakeman, R. J.,Hulme, P.D., Torville, L. and Fisher, J. M. (2003), *Rehabilitation of Degraded Dry Heather (Calluna vulgaris (L.) Hull) Moorland by Controlled Sheep Grazing*, Biological Conservation, Vol, 114, pp 389-400.

Ross, S., Adamson, H. and Moon, A. (2003), *Evaluating Management Techniques for Controlling Molinia caerulea and Enhancing Calluna vulgaris on Upland Wet Heathland in Northern England, UK,* Agriculture, Ecosystems and Environment Vol 97, pp39-49

Scottish Natural Heritage, (2004), *Forth and Borders Moorland Management Scheme.*

SEARS, (2008), *Bracken Control, A Guide to Best Practice*, Aberdeen

Servant, G., (2006), *Assessment of Surface Fuel Loads in relation to Wildfire and Prescribed Burning,* East Glen Derry and Glen Quoich Mar Lodge Estate.

Smith D., & Bird J., (2005), *Restoration of Degraded Molinia caerulea Dominated Moorland in the Peak District National Park Eastern Moorlands, Derbyshire, England*, Conservation Evidence, no. 2, p. 101-102.

Stewart, F. E., Eno, S. G., (1998), *Grazing Management Planning for Upland Natura 2000 Sites: A Practical Manual,* The National Trust for Scotland, Aberdeen.

The Commission for Rural Communities, (2009), *High Ground, High Potential – A Future For England's Upland Communities,* Gloucestershire.

The National Trust For Scotland, (2010), *Moorland Management Guidelines*, Scotland.

The Scottish Government, (2008), *The Muirburn Code: A Guide to Best Practice*, The Scottish Government, Scotland.

Tucker, G., (2003), *Review of the impacts of heather and grassland burning in the uplands on soils, hydrology and biodiversity,* English Nature Research, Report 550.

Walsh, P., & McGrath, D., (2009), *The Waterford Breeding Bird Atlas 2006-2011: Report to the Heritage Council, 2009 Season,* The Heritage Council, Waterford.

Wicklow Mountains National Park, (2013), *Events 2013,* Department of Arts, Heritage and the Gaeltacht.

Woodhouse, S.P., Good, J.E.G., Lovett, A.A., Fuller, R.J. and Dolman, P.M., (2005), *Effects of Land-use and Agricultural Management on Birds of Marginal Farmland: A Case Study in the Llyn Peninsula, Wales*, Agriculture, Ecosystems and Environment Vol 107, pp331-340.

Young, P., (2012), *Commonage Grazing Plans Explained,* Irish Farmer's Journal, p. 19-23.

**Websites**

http://www.valuing-nature.net/news/2012/restoring-peatlands-payments-ecosystem-services (consulted March 20th 2013)
www.ipcc.ie
www.npws.ie
www.heathertrust.co.uk
www.dardni.co.uk
www.ukbap.org.uk
www.wicklowmountainsnationalpark.ie

# Appendix 1 Meetings (Public Meetings, Working Group Meetings and Consultation Meetings)

**2011**
March 10th
Public Meeting
Vegetation Management, Glendalough
Attendance 48

May 5th
Public Meeting
Developing an Agri-environmental Scheme for the Wicklow Uplands, Glendalough
Attendance 35

May 30th
First meeting of members (15) of Heather Management Working Group, Roundwood

July 6th
Heather Management Working Group Site Visit, Glendasan and Glenmalure

September 15th
Heather Management Working Group Meeting, Roundwood

October 5th
Heather Management Working Group Site Visit, Djouce

November 13th
Heather Management Working Group Meeting, Roundwood

December 20th
Vegetation Management Working Group Meeting, Roundwood

**2012**
January 12th
Vegetation Management Steering Group Meeting, Roundwood

January 26th
Consultations with NPWS (Andy Bleasedale, Caitriona Douglas, Wesley Atkinson) and Forest Service (Pat Farrington and Tom Mc Donald)

January 27th
Informal consultations with farmers from Cooleys and Comeraghs in Dundalk and Kilrossanty, Waterford

February 8th
Heather Management Working Group meeting, Roundwood

February 21st
Meeting of technical group (Ciara O' Mahoney, Declan Byrne, Brendan O' Hanrahan and Mary Tubridy), Park Offices, Laragh

March 14th
Heather Management Working Group Meeting, Roundwood

March 29th
Vegetation Management Steering Group Meeting, Roundwood

April 5th
Upland Vegetation Management Steering Group, Roundwood

April 17th
Vegetation Management Steering Group Meeting, Roundwood

April 29th
Upland Vegetation Management Group Meeting, Roundwood

May 29th
Upland Vegetation Management Steering Group, Roundwood

June 8th
Attendance at LIFE workshop, Custom House, Dublin

June 12th
Public Meeting on Upland Vegetation Managment, Glendalough
Attendance 70

June 18th
Vegetation Management Steering Group Meeting, Roundwood

August 13th
Consultations with NPWS (Ciaran O'Keeffe Gerry Leckey and Wesley Atkinson), Ely Place, Dublin

October 9th
Workshop on Management of Upland Vegetation in Wicklow, Glenview Hotel, Glen o' the Downs, Wicklow

September 19th
Heather Management Working Group Meeting, Roundwood