An Assessment of Farming Prescriptions Under the Rural Environment Protection Scheme in the Uplands of the Burren Karstic Region, Co. Clare

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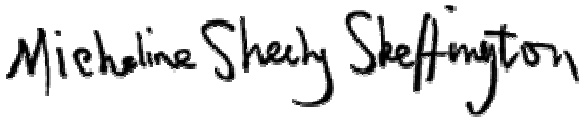
Foreword

One of the Heritage Council's functions is to propose policies and priorities for the national heritage. The farming community plays a major role in maintaining the Irish landscape including areas of conservation value. The Council has recognised this and has recently published a policy document on the impacts of agricultural schemes on the national heritage. Subsequently, it was felt that further case studies specifically concerning the efficacy of schemes such as the Rural Environment Protection Scheme were required. In view of its international significance for its landscape, flora, fauna and geomorphology, the Burren was selected as a key site. The Wildlife Committee of the Heritage Council, in conjunction with the Irish Farmers' Association, therefore commissioned this independent study.

This assessment, though preliminary in nature, is therefore important as it highlights not only some advantages of the REP Scheme for farmers and wildlife, but also addresses points that highlight difficulties both for participants and for conservation.It is our hope that this study will make a useful contribution to the debate on farming and conservation and that it can form the basis for future policy recommendations.



Micheline Sheehy Skeffington

Chairperson
Wildlife Committee,
The Heritage Council

October 1999

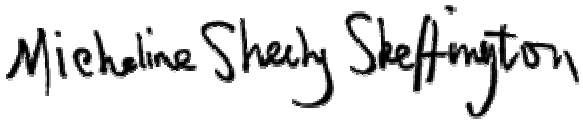
Brollach

Is í ceann d'fheidhmeanna na Comhairle Oidhreachta polasaithe agus tosaíochtaí don oidhreacht náisiúnta a mholadh. Glacann an pobal feirmeoireachta mór-ról i gcothabháil tírdhreach na hÉireann lena n-áirítear ceantair a bhfuil luach caomhnúcháin leo. Tá sé sin aitheanta ag an gComhairle agus tá doiciméad polasaí foilsithe aici le déanaí ar thionchair scéimeanna talmhaíochta ar an oidhreacht náisiúnta.

Braitheadh, ina dhiaidh sin, go raibh gá le breis cás-staidéar a bhaineann go háirithe le héifeachtúlacht na scéimeanna ar nós na Scéime Caomhnaithe Chomhshaoil faoin Tuath. Ag cuimhneamh ar a tábhacht idirnáisiúnta dá tírdhreach, flora, fauna agus geomoirfeolaíocht, roghnaíodh Buirinn mar phríomhláthair. Mar sin, choimisiúnaigh an Coiste Fiadhúlra den Chomhairle Oidhreachta, i gcomhar le Cumann Feirmeoirí na hÉireann, staidéar neamhspleách.

Tá an measúnú seo, cé gur cineál réamh-mheasúnaithe é, tábhachtach mar sin mar go gcuireann sé béim ní hamháin ar bhuntáistí áirithe den Scéim Caomhnaithe Chomhshaoil faoin Tuath d'fheirmeoirí agus don fhiadhúlra, ach tugann sé chomh maith aghaidh ar phointí a chuireann béim ar dheacrachtaí do rannpháirtithe agus don chaomhnúchán araon.

Tá súil againn go mbeidh an staidéar seo úsáideach maidir le cur leis an díospóireacht ar fheirmeoireacht agus caomhnúchán agus gur féidir leis bheith mar bhonn do mholtaí polasaí amach anseo.



Micheline Sheehy Skeffington

Cathaoirleach
An Coiste Fiadhúlra
An Chomhairle Oidhreachta

Deireadh Fómhair 1999

Abbreviations Used in the Text

CAP Common Agricultural Policy (of the EU)

DAF Department of Agriculture and Food

DED District Electoral Division

FDS Farm Development Service (of the Department of Agriculture)

ha Hectare

LU Livestock Unit

NHA Natural Heritage Area

NPWS National Parks and Wildlife Service (now part of Dúchas - The Heritage Service)

pCSAC proposed Candidate Special Area of Conservation

pNHA proposed Natural Heritage Area

SAC Special Area of Conservation

SM Supplementary Measure (of the REPS)

Summary

The study examines farming prescriptions under the Rural Environment Protection Scheme in the Burren karstic region with a focus on grassland management in the upland areas which are designated almost in their entirety as both proposed Natural Heritage Areas (pNHA) and as proposed Candidate Special Areas of Conservation (pCSAC) under the European Communities (Natural Habitats) Regulations, 1997. The Burren is a cultural landscape and internationally renowned for its floristic, geomorphological and archaeological interest and diversity. Sustainable agricultural management is the key to the preservation of the designated sites.

Agricultural production structures in the region have undergone considerable change, particularly since Ireland's entry into the EU, including a drastic decline in the number of farms, larger farm sizes, and a degree of intensification and specialisation of production, primarily in the lowland areas, but with repercussions for the upland habitats. These changes have imbalanced the agriculture-environment relationship in the region.

The main policy response has been the promotion of the Rural Environment Protection Scheme (REPS) to ensure minimum environmental standards and to secure additional environmental benefits, with a special, compulsory management tier applying in NHAs/SACs. The scheme is administered by the Department of Agriculture and Food.

The current management objectives and farming prescriptions of the REPS measure 'Conservation of Natural Habitats' do not adequately reflect the specific legal obligations for the conservation of listed habitats and species in the proposed Candidate Special Areas of Conservation. There is a lack of baseline information relating to the current conservation status of these habitats and species. Without this information it will be impossible to determine the effectiveness of the REPS in maintaining or restoring their favourable conservation status. There is also a lack of monitoring and evaluation procedures providing information on the environmental, agricultural and socio-economic impacts of the scheme. Also, there is no clear and coherent conservation strategy for the Burren region which could serve to provide guidelines for management decisions.

Observations from ten farms participating in the agri-environmental scheme indicate that from the ecological point of view the key adjustments made would generally appear to have arrested adverse changes, apart from scrub invasion on limestone habitats, and also to have reversed some of the negative impacts of the past intensification of farming operations. The prescriptions are, however, unlikely to be sufficiently strict, specific and proactive to achieve the objectives of the Habitats Directive in the designated areas.

There is a need for improved communication and cooperation between farmers, agricultural planners, ecologists, Dúchas and the Department of Agriculture and Food in the implementation, administration, monitoring and review of the agri-environmental scheme. The role of Dúchas in relation to the REPS Supplementary Measure 'Conservation of Natural Heritage' and the role of environmentalists in the drawing up of REPS plans must be more clearly defined and enforced.

Further recommendations include improved conservation management planning, increased research efforts, the implementation of legally required monitoring and review programmes, the review of REPS specifications to take account of the specific requirements of the Habitats Directive, a more direct system of reimbursement for positive management activities in the context of the REPS, stricter scrutiny of REPS plans, the provision of independent agri-environmental advice, and the investigation of cost-effective and ecologically acceptable approaches to scrub control in limestone habitats.

Acknowledgements

The consultants wish to sincerely thank the farmers involved in the study, who generously gave of their time and knowledge, but who - for reasons of confidentiality - cannot be named here.

We would also like to thank those individuals who helped by providing important information for this study

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Congella McGuire, Burren National Park

Adrian Browne, Farm Development Service, Ennis

Jim Lenehan, Central Statistics Office, Cork

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Finally, thanks are due to the initiators of this study - the Irish Farmers Association and the Heritage Council - for making yet another step in reconciling the interests of farming and conservation in a very precious landscape.

Section 1 - Introduction

1.1. Opening Statement

In September 1998 the Heritage Council commissioned the consultants to undertake a study of farming under the prescriptions of the Rural Environment Protection Scheme (REPS) in the Burren, Co. Clare, based on a sample of ten to twelve farms. While taking the whole farm situations into account, the study was to concentrate on issues relating to grassland and scrub management in the Burren uplands which are designated almost in their entirety as both proposed Natural Heritage Areas (pNHA) and as proposed Candidate Special Areas of Conservation (pCSAC) under the European Communities (Natural Habitats) Regulations, 1997 (implementing Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora).

1.2. Aim and Scope of the Study

The aim of this study is

- to assess how the relevant conservation measures have been incorporated into the REPS plans;
- to identify the issues the farmers feel important to address in the context of farming under REPS prescriptions, particularly in relation to the NHA and SAC conditions;
- to identify whether the prescriptions are practical or workable or whether they place unnecessary restrictions on the farmers;
- to identify the extent of flexibility in modifying the guidelines at the local level;
- to assess whether the prescriptions are likely to benefit wildlife;
- to assess the likely consequences of farming in the manner prescribed.

Based on these analyses and considering background information on conservation management of limestone grassland/heathland and scrub vegetation as well as general changes in farming practices in the Burren, recommendations are made on how the REPS Burren package could be improved to benefit both farming and nature conservation. Some further possibilities outside the context of the REPS are also briefly explored.

The information contained in this report is derived from three principal sources:

REPS plans and on-site farm examinations - The consultants visited ten REPS farms during October 1998 and held informal discussions with the farmers about the issues to be addressed in this study. Other sites (not involved in REPS) were also visited with these farmers as reference areas.

Literature review - A limited literature review on limestone grassland / heathland and scrub vegetation and management both in the Burren and elsewhere in Europe was undertaken.

Agricultural statistics - Office Abstracts of CSO Agricultural Statistics dating back to 1930 were obtained for eight North Clare DEDs and analysed with respect to land use, livestock categories and numbers.

The study is limited in that it was conducted over a short period of time and involved only a small, subjectively selected, sample of farms. Also, it was conducted in the autumn period which leads to some difficulties in relation to the identification of the botanical value of sites. As the study focuses on upland and winter grazing areas it would have been of interest to visit the sites subsequent to the winter grazing and feeding periods.

Section 2 - Description of the Case Study Area

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Section 3 - Operation of the Rural Environment Protection Scheme in Conjunction with NHA and SAC Designations

3.1. Development of the REPS in the Burren

The uptake of the REPS in the Burren was initially relatively slow due in part to uncertainties which existed with regard to management prescriptions to be applied in the NHAs. Following agreement with the EU Commission regarding payments in NHAs, farmers who wished to participate in the REPS had to sign a form of undertaking in which they declared that they would "abide by the conditions set down by the National Parks and Wildlife Service (NPWS) for the proposed NHA on your land" (DAF 1995a). Since these conditions were not actually agreed before November 1995 many farmers were hesitant to join the scheme before this date.

3.1.1. Management Prescriptions in NHAs

Following intensive negotiations between the NPWS, farming organisations, REPS planners and the Department of Agriculture and Food, conditions for the conservation of the Burren NHAs under the REPS were agreed, with separate prescriptions for the "high Burren", i.e. the rocky limestone areas and shallow Rendzina soils, and the lowland areas on deeper soils (DAF 1995b). These prescriptions are additional to and in some instances stricter than the prescriptions of the basic REPS.

The conditions for the "high Burren", defined as those areas mapped as "Burren Series Soils" by Finch (1971)

include:

- no summer grazing (May to October inclusive) on areas defined as winterage;
- sustainable stocking densities, to be set by the planner, to prevent both overgrazing and undergrazing;
- no introduction of sheep into new areas;
- supplementary feeding only in areas where it is currently practised and no further increase of numbers of animals fed and amount of feed;
- an upper limit on the amount of feed and a maximum period of 9 weeks of supplementary feeding between 15 January and 12 April;
- supplementary feedstuff to be supplied in movable feeders in agreed locations where the impact on groundwater as well as on flora is minimised;
- no land improvement without the consent of the NPWS except for scrub control with appropriate tools;
- no organic or artificial fertiliser and pesticide use (except for spot treatments of noxious weeds);
- no field storage of farmyard manure and accumulations of manure at feeding points to be removed after the winter;
- silage storage in identified "safe" areas with respect to groundwater protection.

In the Burren lowland areas on deeper soils, defined as the Kinvarra Brown Earths and Rendzinas of the Kilcolgan Series as mapped by Finch (1971), the following conditions apply:

- nitrogen and potassium applications based on general REPS prescriptions and intensive soil sampling;
- no phosphate applications where soils are above P index 2;
- no slurry and manure spreading within 50 m of lakes or winter-flooded areas and a maximum quantity of 25m3 per hectare per application, with 50-75% to be spread before July and the remainder to be spread before the end of October;
- no field storage of farmyard manure and removal of accumulations of manure at feeding points after the winter;
- no importing of farmyard manure.

3.1.2. Management Prescriptions in SACs

Farmers who have some or all of their lands in SACs are being supplied with a map of the area being proposed for designation, a description of the site indicating the reason for its inclusion, an outline list of damaging activities, and information on procedures for objections and appeals as well as on compensation.

The damaging activities are outlined for each habitat type and each species which is covered by the EU Habitats Directive in a "Notice of Notifiable Actions". These notifiable actions are not be undertaken without the consent of the Minister for Arts, Heritage, Gaeltacht and the Islands. In some instances the notifiable actions go beyond the NHA prescriptions under REPS. Dry limestone grasslands, for example, may not be mown before 30 June and hay-meadows on these grasslands must not be converted to silage production or pasture.

Land owners who do not join REPS will be required to manage their SAC lands in accordance with a plan drawn up by Dúchas. A financial package which will compensate for potential losses of income is currently under negotiation with the EU Commission. To date the Deputy Regional Wildlife Manager has not been approached by any farmers requesting this option.

Where a farmer has a current approved plan under the REPS she/he is required to notify the Minister of activities not covered in the plan. The nutrient management regime, stocking densities, grazing periods, and the supplementary feeding regime etc. are to be implemented as defined in the REPS agri-environmental plan.

3.1.3. REPS Payments in NHAs and SACs

Until 31 December 1999 the payment rate for REPS farms with lands covered by NHA designations was ECU 155/ha irrespective of the area of the farm contained in the NHAs. Additional top-up payments for SAC lands had been envisaged but were not accepted by the EU Commission in the form in which they were proposed. Instead, on April 29 1998, revised REPS specifications were approved by the EU which will apply in the NHAs/SACs from 1 January 1999 (DAF 1998a,b; DAF 1999). Under the new supplementary measure, termed 'Conservation of Natural Heritage' (Supplementary Measure A) and replacing SM1 and SM2 of the original REPS, the payment rates for proposed or designated NHAs, designated farmland-based SACs and commonages are as follows:

1. £190.59/ha for the first 40 hectares;

2. £18.90/ha between for areas over 40 hectares and up to and including 80 hectares;
3. £14.18/ha between for areas over 80 hectares and up to and including 120 hectares max.

REPS farmers in these areas have the option of either completing their five year plans or revising their plans in order to opt for the new package (DAF 1999). Supplementary Measure A payments can only be accumulated with payments under SM 3 (Rearing Animals of Local Breeds in Danger of Extinction). This may make the uptake of the 'Rare Breeds' measure more attractive in the Burren. However the top-up payments for NHAs/SACs and SM 6 'Organic Farming' remain exclusive of each other. As the SM A and SM 6 (full-symbol) payments will now be equal at 190.59/ha, this will essentially mean that the continuation of organic farming methods on full-symbol holdings with all lands proposed or designated as NHAs will lose the financial incentive previously provided under REPS. The incentive for conversion to organic farming will remain attractive with £261.47/ha (paid for a maximum of two years).

3.1.4. Uptake of the REPS

According to the FDS, approximately 375 farmers in the Burren had joined the REPS as of January 1998, and 232 of these were claiming supplementary payments under the NHA measure. The number of REPS farms with lands in NHAs, however, is higher than this figure indicates as registered organic farmers with lands in NHAs are unlikely to draw the NHA supplementary payment. There are approximately 60 registered organic farms in the Burren of which some, however, may not have land in NHAs and/or participate in REPS.

3.2. Conservation Objectives and Management Planning in the Burren

Agricultural management in the Burren uplands is being drawn into a framework of three sets of objectives. These are:

- **the general objectives of the REPS, i.e.,**
- to establish farming practices and controlled production methods which reflect the increasing concern for conservation, landscape protection and wider environmental problems;
- to protect wildlife habitats and endangered species of flora and fauna;
- to produce quality food in an extensive and environmentally friendly manner.
- **the basic objective of the Burren NHA conditions, i.e.,**
- to avoid farming practices causing environmental damage to the sites;
- **the objectives of the SAC designation, i.e.,**
- to ensure the restoration or maintenance of natural habitats and species of Community interest at a favourable conservation status;
- to create a coherent European ecological network (NATURA 2000).

However, the formulation of objectives or goals is only one aspect of management. "The processes of management are analysis of the situation, formulation of goals, administration of a regime to attain goals, and monitoring and review" (Jeffrey, 1995). Without a proper analysis of specific situations it is impossible to formulate objectives and prescriptions which can secure the precise changes required to achieve these objectives.

The following sections explore in how far the four stages of the management process outlined above have been implemented with respect to the Burren.

3.2.1. Management Planning - Analysis of the Situation

Despite the fact that much biological research has been conducted in the region, many questions remain unanswered. Why are certain flowering plants present in the region but nowhere else in Ireland or Britain? Are the limestone grasslands and heathlands advancing or retreating and exactly what role does grazing pressure play in these processes? How important are the cattle, sheep and goats to the maintenance of the openness of the vegetation and its species richness? Why does sheep grazing in the Burren appear to lead to a loss of species richness while the species-rich calcareous grasslands on the continent are dependent on sheep rather than cattle grazing for the maintenance of their richness? What stocking levels at what time in the summer can limestone grasslands sustain without a loss of species of flora and fauna of special conservation concern? What type of stock would be required at what time of year to combat the spreading of hazel scrub? What is the restoration potential of limestone grassland sites which have been reclaimed and subjected to more intensive management?

Clearly more research is needed to answer these questions. To this end Jeffrey (1995) advocates a

'Domesday Book' approach, a field-by-field survey of the Burren grasslands "with the objective of recording vegetation, precise soil origin and characteristics, and management history." Detailed ecological baseline data are a prerequisite for the development of any meaningful conservation strategy. In a cultural landscape such as the Burren this must be supplemented by a clear understanding of the past and present agricultural management. Collectively such data provide a definitive statement on the condition of an area. But as with all survey data, they remain valid for a relatively short period. However, they form a crucial baseline against which the effectiveness of any subsequent management can be measured. While there are gaps in our knowledge, it is clear that, at a minimum, such baseline data should include a statement of the nature, present condition and extent of the various features of interest for which sites have been designated.

Much of the existing data are held in the offices of the Burren National Park but these are not made accessible in a manner which would allow information to be easily retrieved by those directly and indirectly concerned with agricultural management, i.e., the farmers and REPS planners, including associated environmentalists/ecologists. Nor has the available data been collated in such a way that renders them easily useful in analysing the current situation or in identifying or prioritising research needs.

In conclusion it can be said that there is inadequate data to allow for a structured evaluation and formulation of detailed management objectives, or for the creation of a baseline description of the area against which the effectiveness of current and future management can be measured. The data that is available has not been collated in a way which contributes to these ends.

3.2.2. Management Planning - Formulation of Goals

A management strategy must state objectives which identify clearly and unequivocally the required condition of all features of interest in the area concerned and must allow for future assessments of whether or not the set objectives have been achieved. Such a management strategy does not yet exist for the region or for individual NHAs/SACs.
Following the adoption in 1992 of the 'Habitats Directive', Ireland is under an international obligation "to ensure the restoration or maintenance of natural habitats and species of Community interest at a favourable conservation status". The natural habitat types, plant and animal species of Community interest are identified in the Annexes to the Directive. Ireland is also obliged "to designate special areas of conservation in order to create a coherent European ecological network according to a specified timetable" (Council Directive 92/43/EEC). The definition of 'conservation' and 'favourable conservation status' in Article 1 of the Directive provides guidelines for objectives to be achieved in the areas proposed for designation as SACs in the Burren:

Conservation "means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status" as defined below.

The conservation status of a natural habitat, i.e., "the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species" within the EU Member States, "is taken as 'favourable' when:

its natural range and areas it covers within that range are stable or increasing, and the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable" (Art. 1). The conservation status of a species, i.e., "the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations" within the EU Member States "will be taken as 'favourable' when:

population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis" (Art. 1).

This legislation (the Habitats Directive and implementing Regulations) imposes a duty to maintain or restore at a favourable conservation status the habitats and species of Community interest for which the various pCSACs in the Burren have been designated. The importance of the quality of baseline data must again be highlighted as it is an essential prerequisite to determining whether the various features are at a favourable conservation status. Note also the importance of the temporal element because it must be possible to determine, for example, whether a habitat's range is "stable or increasing". If it is determined that a listed habitat or species is at a favourable conservation status, then the goal is clearly to maintain this status. If the habitat or species is not at a favourable conservation status, then the goal must be to restore it to such a state.

The objectives to be achieved must be set out using measurable parameters appropriate to each situation. The parameters selected for use will obviously depend on the nature of the feature of interest. For example, for limestone pavement a measure of total area may suffice. For limestone grasslands hosting important

orchid populations, measures of diversity or abundance of relevant species may be appropriate. The approach taken should be as simple as possible while capable of extracting the necessary information and should be easily repeatable in order to allow effective monitoring.

Currently the actual management of farmland-based pCSACs in the Burren is applied through the general REPS prescriptions and the REPS/NHA prescriptions. These were drawn up prior to the transposition of the Habitats Directive into Irish law and thus do not take the strict protection requirements of the Directive into account. These prescriptions are largely restrictive in nature and do not provide a positive impetus or incentive to reverse adverse changes, i.e., to restore habitats or populations of species of Community interest to a favourable conservation status as defined previously.
There has been no general assessment of the conservation status of the various relevant habitats and species, hence it is difficult to determine whether the REPS, as currently applied, makes a contribution towards their maintenance at, or restoration to, a favourable conservation status.

In conclusion, it can be said that the current management objectives and the resultant prescriptions do not adequately reflect the specific legal obligations for the conservation of the sites of Community interest in the Burren.

3.2.3. Management Planning - Administration of a Regime to Attain Goals

The two government services involved in the administration of farming and conservation policy with respect to farmland-based NHAs and SACs, which in the Burren essentially cover identical areas, are the Farm Development Service (FDS) of the Department of Agriculture and Food (DAF) and Dúchas - The Heritage Service of the Department of Arts, Heritage, Gaeltacht and the Islands.

The REPS including the Supplementary Measure containing the REPS prescriptions for the management of NHAs on REPS farms are administered by the DAF. While Dúchas was involved in developing the Burren NHA prescriptions, it has no defined statutory role in supervising their implementation and appears to have minimal involvement in the preparation of REPS plans with respect to designated lands (cf. Section 4.5).

Pending the amendment of the 1976 Wildlife Act the proposed NHAs have no statutory protection and have not formally been designated while activities in the proposed SACs are regulated by the European Communities (Natural Habitats) Regulations, 1997. The Minister for Arts, Heritage, Gaeltacht and the Islands has used her powers to require landowners to seek written consent for potentially damaging operations or activities listed in 'Notices of Notifiable Actions'. However, where the landowner has a current approved plan under the REPS, s/he need only notify the Minister of operations or activities not covered in the plan. Landowners who cannot or do not wish to join REPS will be required to manage their SAC lands in accordance with a management plan drawn up by Dúchas. This option had not been taken up by any farmer as of the end of 1998.

In essence this means that current agricultural and conservation management of most of the Burren sites of high conservation importance in private ownership hinges on the quality of the REPS plans drawn up in respect of these sites and on the quality of the plans' implementation by the farmers, as controlled by the DAF, as well as on the enforcement of the requirement to either enter the REPS, or have a management plan drawn up by Dúchas in respect of SAC lands. Currently Dúchas' role is de facto limited to educational functions, policing functions and marginal involvement and advisory functions in the drawing up of REPS plans. It may be possible to achieve specified conservation objectives through the administration of appropriately designed agri-environmental schemes. However, specific conservation objectives in the Burren have not been adequately laid out nor do the relevant baseline data exist in a form which would allow for such objectives to be specified.

3.2.4. Management Planning - Monitoring and Review

Monitoring and review are essential to the effectiveness of any management strategy. Clearly the only way to determine whether objectives are being met is through the application of a monitoring programme. The review, based on the results from the monitoring programme, determines what modifications to the administration of management are necessary to allow set objectives to be met. It can also identify areas where further research is needed and modify objectives as required.

With respect to the REPS, the DAF is under an obligation to monitor and evaluate the programme in terms of its impact on the environment, its impact on agricultural production, and its socio-economic impact and to communicate the findings to the Commission (CEC 1997, 17). Monitoring shall facilitate, if necessary, the adjustment of the scheme on the basis of the needs that come to light during implementation (Commission Regulation (EC) No 746/96, Article 16). The REPS has been amended a number of times, most recently with

effect of 1 January, 1999. In their Working Document on the Evaluation of the Agri-Environmental Programmes in Europe the Commission comments that "initially in Ireland there appears to have been a considerable lack of commitment to evaluation. Ireland had argued that evaluation and monitoring was an expensive undertaking and that a Community contribution should be provided. This issue was raised in the Report on application. At the occasion of a recent amendment the Commission approval decision included the condition that a full evaluation of REPS must be provided in 1999 and that any funding for REPS after this date must be the subject of a further approval decision by the Commission. Evaluation has now commenced and a series of 3-year evaluations are underway." (DGVI 1998, 106). A draft report on the REPS was submitted by the DAF in 1998 with the final report being due in 1999 (DGVI 1998, 138). The evaluations are carried out by the DAF and Teagasc.

With regard to the Burren, the authors of this report and the Heritage Council are unaware of any structured monitoring efforts which could demonstrate the effectiveness or otherwise of the scheme and its impact on the natural resources, agricultural production and the socio-economic situation in the region, even though the need for research and monitoring of the REPS in the Burren was highlighted in the "Conditions for the Conservation of the Burren to be applied under the Rural Environment Protection Scheme" in 1995.

The Habitats Directive stipulates in Article 11 that "Member States shall undertake surveillance of the conservation status of the natural habitats and species" of wild fauna and flora of Community interest, "with particular regard to priority natural habitat types and priority species." The main results of this surveillance are to be reported to the Commission and are also to be published. The first such report is due in 2000 but is likely to be substantially delayed as the notification of the list of proposed Candidate Special Areas of Conservation is already three and a half years behind schedule.

3.3. Summary and Conclusions

The Rural Environment Protection Scheme came into operation in May 1994 on a nationwide basis, containing inter alia a mandatory Supplementary Measure 1 'Natural Heritage Areas'. The proposed Burren NHAs were notified during 1995 and the actual management guidelines for these areas in the REPS were finalised in late 1995. Since then an estimated 400 farmers in the Burren have joined the scheme. In the meantime the identification of Sites of Community Interest under the European Habitats Directive had begun. The proposed Candidate Special Areas of Conservation (pCSACs) were notified in 1997 and lists of damaging activities that may not be carried out on these lands without the consent of the Minister were sent out to landowners. Where a landowner has a current approved REPS plan the Minister only needs to be notified of activities not covered in the scheme. Payments at a higher level than the basic REPS area payment and above the 40 ha limit of the basic REPS are made in respect of NHAs and farmland-based pCSACs provided the relevant guidelines are complied with. Alternatively landowners in pCSACs are required to have a management plan drawn up by Dúchas and receive compensation through the Ministry of Arts, Heritage, Gaeltacht and the Islands. Current management objectives (as set out in REPS and in the NHA guidelines) and the resultant prescriptions do not adequately reflect the specific legal obligations for the conservation of the sites of Community interest in the Burren. In particular they do not provide for the restoration to a favourable conservation status of habitats and species of Community importance which have negatively been impacted upon through agricultural management or other operations in the past.

In essence REPS is being used as one instrument in attempting to fulfil the legal obligations imposed by the Habitats Directive for the conservation of sites and species of Community interest on privately owned, farmland-based lands in the Burren. Given the above considerations, the marginal involvement of Dúchas in the preparation and control of REPS plans, and the inadequacies of a number of agri-environmental plans in terms of their environmental input which were examined during this survey (cf. Section 4), it is questionable whether it is possible to meet the objectives of the Habitats Directive in respect of these sites.

A baseline description of the area, against which the effectiveness of current and future management can be measured, has not been compiled and monitoring and evaluation procedures providing information on the environmental, agricultural and socio-economic impacts of the agri-environmental scheme do not appear to be in place in the region.

An integrated and agreed approach will have to be taken at the regional level to formulate clear management plans that satisfy both the concerns of sustainable agricultural production and nature conservation in this internationally important area.

Section 4 - Farm Surveys

This section provides an overview of the ten farms surveyed in the course of the study. Each farm is profiled,

giving key data on the farming system with particular reference to the upland winterage areas. For each farm the key issues which form the brief for this study are briefly described based on the on-farm observations, the discussions with the farmers and the data contained within the REPS plans. The findings are summarised in the following subsection and these are supplemented by some general observations on the REPS plans examined.

4.1. Overview of the Farms Surveyed

The selection of farms for the survey was neither random nor based on defined criteria but is considered reasonably representative of the spectrum of farm situations and livestock systems found in the area. A number of farmers who were aware of the study being carried out volunteered to participate and others were approached by the consultants to broaden the sample. The small size of the sample implies that no statistic significance must be attached to the figures given below.

The sample includes three farms with dairy and suckler herds, five farms with suckler herds plus (mostly small) sheep flocks, one farm with sheep only and one farm with a suckler herd combined with granivores. Farm sizes in the sample vary from less than 18 to over 140 hectares of which between 48% and 100% of lands are in proposed NHAs. The stocking rates averaged over the whole farm vary from less than 0.1 LU/ha to 1.01 LU/ha.

Winterage areas as specified in the REPS plans vary between 23% and 100% of the entire farms. The stocking rates on the winterage lands, averaged over the prescribed six months period, were found to vary between 0.27 LU/ha and 0.83 LU/ha with one very low value of 0.08 LU/ha. Three of the ten farms did not provide any supplementary feeding on the winterage, with the remainder feeding hay, silage, concentrates and grain, alone or in combination. On all farms, the nitrogen quantities deposited by livestock on the winterage, which are a measure of stocking densities, were lower than the maximum potential of the areas "to take animal and other wastes having regard to the environmental sensitivity of each area" specified in the REPS plan by the respective REPS planner. However, the consultants felt this potential of the winterage areas was somewhat overvalued on two farms and undervalued on one farm which indicates that there is no real consistency of approach with regard to determining optimum stock levels.

On eight out of the ten farms some winterage-type lands (not designated in the plans as winterage) were also grazed during the summer. On four of the farms grazing on these lands was sporadic or of a planned, short duration as prescribed by the REPS planner. On the other four farms substantial areas were grazed during the summer. These are farms which are wholly or predominantly located in the 'High Burren' and which do not have sufficient alternative good grassland areas for summer grazing.

The listing of Great Soil Groups (after Finch 1971) for each farm gives an indication of the nature of the lands, which determines farm management to a large extent. All farms are dominated by Rendzinas of the Burren Series which characterise the areas falling under the "NHA Conditions for the Conservation of the High Burren" under REPS (Heritage Service 1996). These are very shallow, well to excessively drained soils over bedrock with large amounts of exposed rock. Their use-range is very limited but because of their strong structure and good drainage they are very suitable for outwintering stock (Finch 1971, 35). Most of the farms also contain areas of Rendzinas of the Kilcolgan Series. These are relatively shallow, well-drained soils of a clay loam texture and a moderately strong structure. They have a wide use-range, being well suited to both tillage and grass production. Despite their shallowness they have a very high potential with increased fertiliser use but they can be susceptible to drought in very dry weather (Finch 1971, 36). Grasslands on these soils are typical good summer grazing areas and are also used for fodder conservation.

Other soil types found on the farms surveyed include Brown Earths of the Kinvarra Series giving rise to excellent grassland (Finch 1971, 12), well-drained Grey-brown Podzolics with a high potential for grass production (Finch 1971, 15) and various types of Gleys which are generally characterised by poor drainage, retarding grass growth in the spring, and by susceptibility to poaching by grazing stock (Finch 1971, 27).

The Kilcolgan Series Rendzinas and the Kinvarra Brown Earths characterise the areas falling under the "Conditions for the Conservation of NHAs in the Burren Foothills" (Heritage Service 1996).

4.2. Farm Profiles

Farm Profile No. 1	
Total Agricultural Area of which NHA/SAC	142 ha 48%
Area of winterage specified in REPS plan	102 ha

of which NHA/SAC	67%
Is summer grazing permitted on other winterage-type land ?	Yes (very light summer grazing)
Great Soil Groups present on farm	Rendzinas (Burren Series 50% rock) Rendzinas (shallow clay loam) Brown Earths (well drained gravelly loam)
Type of stock kept	Suckler cows, all calves to 1 year, 1/3 of calves to 1.5 years, 1/6 of calves to 2 years Lowland ewes
Stocking rate (12 months average over the whole farm)	0.85 LU/ha
Type of stock kept on winterage	Suckler cows, stores, sheep
Stocking rate on winterage (over six months)	0.83 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	35-40 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	20-33 kg N/ha and year
Type of supplementary feed on winterage	Hay, silage

Incorporation of NHA/SAC Prescriptions into the REPS Plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	X
Feeding points on winterage are clearly marked on REPS map(s)	3
Environmentalist was involved in the drawing up of the plan	X
Dúchas was consulted in the drawing up of the plan	3

Main management changes made to accommodate participation in REPS

- More distinct separation of summer and winter grazing
- Watercourse protection
- Discontinuing practice of spreading farmyard manure on rocky limestone ground
- Liming and reduction of fertiliser inputs on good grassland areas

Practicality of REPS plan specifications

- Because of late spring growth on summer grazing areas an application was made to Dúchas to extend the feeding period on the winterage without exceeding supplementary feed volumes or the total feeding period as stated in NHA winterage conditions. Allegedly no reply was received, which poses potentially unnecessary restrictions on the farmer.

Likely benefit to wildlife

- Farming under the REPS/NHA prescriptions has led to the discontinuation of some farming practices which may have had a negative influence on the composition of the limestone grassland and wetland flora in the

past and has also achieved more effective protection of watercourses on the farm.

Flexibility - Evidence of the modification of REPS/NHA guidelines

There are some winterage-type areas on the farm which are not designated NHAs. The plan allows for earlier winter grazing on these lands, i.e. from September onwards and for very light summer grazing.

A request for an extension of the supplementary feeding period allegedly has not been dealt with by Dúchas.

Likely future consequence of farming in the manner prescribed

No fundamental changes are expected on the NHA/SAC lands. The spreading of scrub is not a major issue on this farm.

Farm Profile No. 2	
Total Agricultural Area of which NHA/SAC	132 ha 100%
Area of winterage specified in REPS plan of which NHA/SAC	37 ha 100%
Is summer grazing permitted on other winterage-type land ?	Yes
Great Soil Groups present on farm	Rendzinas (Burren Series 50% rock) Rendzinas (Burren Series 75% rock) Rendzinas (shallow clay loam) Brown Earths (well drained gravelly loam) Gleys (poorly drained loam/clay loam)
Type of stock kept	Suckler cows, all calves to 1 year, 50% of calves to 2 years Horses Granivores
Stocking rate (12 months average over the whole farm)	0.68 LU/ha
Type of stock kept on winterage	Suckler cows
Stocking rate on winterage (over six months)	0.53 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	54 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	17 kg N/ha and year
Type of supplementary feed on winterage	Hay, silage

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X

Relevant NHA conditions are fully listed in the plan	X
Farmer is being referred to NHA conditions under REPS	X
Feeding points on winterage are clearly marked on REPS map(s)	X
Environmentalist was involved in the drawing up of the plan	X
Dúchas was consulted in the drawing up of the plan	3

Note: The plan was drawn up in consultation with Dúchas before the REPS/NHA conditions were agreed. However, it has not been updated since.

Main management changes made to accommodate participation in REPS

- Restrictions on grazing of turlough.
- Removal of scrub is prescribed for an area of winterage-type land on which summer grazing is permitted in order to take grazing pressure off wetlands and to increase the area of floristically rich limestone grassland.
- Housing constructed in order to take pressure off the winterage.

Practicality of REPS plan specifications

- The plan prescribes the removal of scrub which has invaded an area of limestone grassland, however, it does not outline the methods to be employed. The control of scrub by chain saw or other brush cutting tools as permitted under the REPS/NHA conditions is not regarded as being practical by the farmer because of rapid re-growth from the base and because of prohibitive labour costs.

Likely benefit to wildlife

- The prescriptions contained in the plan would appear to maintain the conservation value of the wetland and the winterage lands.
- Due to a shortage in good summer grassland summer grazing was permitted on substantial areas of winterage-type vegetation which may prevent the full development of the typical winterage-type vegetation of high conservation value.
- The issue of scrub control needs to be addressed in order to prevent the loss of valuable limestone grassland.

Flexibility - Evidence of the modification of REPS/NHA guidelines

The entire farm is designated as an NHA/SAC and contains only about 20% reasonably good grassland. Hence, in the interest of farm viability allowances were made for the summer grazing of certain winterage type lands.

Likely future consequence of farming in the manner prescribed

Generally farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation but not necessarily the more stringent objectives of the pending SAC designation.

Despite a relatively high stocking rate for the type of land on the farm the present farming regime is not controlling the spread of scrub and this will have to be dealt with in order preserve valuable wildlife habitats and to prevent the loss of grazing areas. The recommended methods of scrub control are considered by the farmer to be prohibitively expensive.

Farm Profile No. 3	
Total Agricultural Area of which NHA/SAC	128 ha 93%
Area of winterage specified in REPS plan of which NHA/SAC	66 ha 100%
Is summer grazing permitted on other winterage-type land ?	Yes
Great Soil Groups present on farm	Rendzinas (Burren Series 25% rock) Rendzinas (Burren Series 50%

	rock) Rendzinas (Burren Series 75% rock) Rendzinas (shallow clay loam) Brown Earths (well drained gravelly loam)
Type of stock kept	Suckler cows, most calves sold as weanlings, c. 10% kept on to 2 years Lowland ewes.
Stocking rate (12 months average over the whole farm)	0.48 LU/ha
Type of stock kept on winterage	Suckler cows, weanlings, stores, sheep.
Stocking rate on winterage (over six months)	0.73 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	30-40 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	20 kg N/ha and year
Type of supplementary feed on winterage	Silage

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	X
Feeding points on winterage are clearly marked on REPS map(s)	3
Environmentalist was involved in the drawing up of the plan	X
Dúchas was consulted in the drawing up of the plan	3

Main management changes made to accommodate participation in REPS

- Reduction of stock numbers
- Reduction of fertiliser inputs on NHA/SAC lands
- Fencing off of watercourses and ceasing to feed near watercourse which had caused some pollution in the past
- Stone wall maintenance

Practicality of REPS plan specifications

The farmer has difficulties with grazing his stock within the strict dates on the winterage. He has lost the flexibility to switch freely between summer and winter grazing areas in response to seasonal and annual variations in weather. Almost the entire farm is in a proposed NHA/SAC and there is little good grassland. This has a significant impact on farm management.

Likely benefit to wildlife

- Farming under the REPS/NHA prescriptions has led to the discontinuation of some farming practices which may have had a negative influence on the composition of the limestone grassland in the past. Fertiliser applications had to be reduced and on some lands they had to seize altogether which may aid in restoring species-richness on some sites. More effective protection of watercourses on the farm from point-source pollution is also being achieved.
- Scrub encroachment was noted on some lands which had been cleared in the past and it is unlikely that current grazing management will keep the scrub in check. This may lead to a loss of valuable limestone grassland and pavement sites.

Flexibility - Evidence of the modification of REPS/NHA guidelines

The entire farm is in a proposed NHA and contains a relatively small area of good grassland. Hence, allowances were made for the summer grazing of certain winterage type lands.

Likely future consequence of farming in the manner prescribed

Generally farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation but not necessarily the more stringent objectives of the pending SAC designation. Scrub encroachment is likely to increase in certain areas of the farm. Restrictions on fertiliser inputs are likely to impact on farm profitability and stocking rates may have to be restricted further in the coming years.

Farm Profile No. 4	
Total Agricultural Area of which NHA/SAC	128 ha 93%
Area of winterage specified in REPS plan of which NHA/SAC	51 ha 100%
Is summer grazing permitted on other winterage-type land ?	No
Great Soil Groups present on farm	Rendzinas (Burren Series 25% rock) Rendzinas (Burren Series 50% rock) Rendzinas (Burren Series 75% rock) Rendzinas (shallow clay loam) Brown Earths (well drained gravelly loam) Gleys (poorly drained loam/clay) Grey-brown Podzolics (well drained gravelly loam) Gleys (poorly drained clay)
Type of stock kept	Suckler cows, all calves to 1 year, c. 40% of calves to 2 years. Lowland sheep
Stocking rate (12 months average over the whole farm)	0.93 LU/ha
Type of stock kept on winterage	Suckler cows, weanlings
Stocking rate on winterage (over six months)	0.75 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	60 kg N/ha and year

Actual Nitrogen from livestock on winterage as specified in REPS plan	50 kg N/ha and year
Type of supplementary feed on winterage	Silage

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	3
Feeding points on winterage are clearly marked on REPS map(s)	3
Environmentalist was involved in the drawing up of the plan	?
Dúchas was consulted in the drawing up of the plan	?

Main management changes made to accommodate participation in REPS

- Provision of additional housing and slurry storage
- Increased silage production to feed cattle indoors
- Reduction of fertiliser inputs
- More distinct separation of summer and winter grazing
- Stone wall maintenance

Practicality of REPS plan specifications

- The farmer has lost the flexibility to release some stock early onto the winterage, i.e. during October or to leave limited numbers of animals, e.g. late calving cows on the winterage beyond April 30, as would have been customary.
- Overall, the cost of implementing the REPS and NHA specifications on this farm, particularly the cost of constructing additional housing and the maintenance of boundary walls, greatly exceeds the payments received under the scheme.

Likely benefit to wildlife

- The more distinct separation of summer and winter grazing is likely to have maintained or increased the conservation value of the winterage lands. The reduction of phosphorous applications will aid in protecting karst water resources and associated wetland habitats.
- Interesting observations on this farm included (a) the apparent good conservation value of a site which was very tightly grazed during the spring-time and where meal is fed instead of hay or silage and (b) the good recovery - in floristic terms - of a site where silage had been fed for 15 years the practice of which ceased 10 years ago.
- Scrub encroachment was noted on some lands which had been cleared of scrub in the past and it is unlikely that current grazing management will keep the scrub in check.

Flexibility - Evidence of the modification of REPS/NHA guidelines

The Farm Development Service, following consultation with Dúchas, gave permission to extend the supplementary feeding period to the end of April.

Likely future consequence of farming in the manner prescribed

Generally, farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation but not necessarily those of the more stringent SAC designation since current management does not allow for the rehabilitation of the more intensively managed grassland on deeper soil within the

NHA/SAC site. Also, the present farming regime is not controlling the spread of scrub and this will have to be dealt with in order to preserve valuable wildlife habitats and to prevent the loss of grazing areas. The recommended methods of scrub control are considered by the farmer to be prohibitively expensive.

According to the farmer, the loss of flexibility in terms of winter grazing dates might require a reduction in stocking rates with repercussions for farm viability.

Farm Profile No. 5	
Total Agricultural Area of which NHA/SAC	85 ha 81%
Area of winterage specified in REPS plan of which NHA/SAC	30 ha 100%
Is summer grazing permitted on other winterage-type land ?	Yes
Great Soil Groups present on farm	Rendzinas (Burren Series 25% rock) Rendzinas (Burren Series 50% rock) Gleys (poorly drained silty soil)
Type of stock kept	Dairy Cows, Suckler cows, all calves to 1 year, 60% of calves to 1.5 years and 20% to 2 years.
Stocking rate (12 months average over the whole farm)	0.93 LU/ha
Type of stock kept on winterage	Suckler cows, weanlings
Stocking rate on winterage (over six months)	0.75 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	60 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	50 kg N/ha and year
Type of supplementary feed on winterage	Silage

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	X
Farmer is being referred to NHA conditions under REPS	3
Feeding points on winterage are clearly marked on REPS map(s)	n/a
Environmentalist was involved in the drawing up of the plan	?
Dúchas was consulted in the drawing up of the plan	?

Main management changes made to accommodate participation in REPS

No major changes had to be made.

Practicality of REPS plan specifications

- Cattle are kept on the winterage from early November to 25th January. Since much of the farm land is on poorly-drained gley soil, in very wet weather (e.g. in 1998) it would have been advantageous to be able to move the animals to the winterage at an earlier date in order to reduce poaching. Additionally, the animals generally could be kept longer on the winterage in order to reduce the housing period and hence slurry production but no stipulation is made in the plan in this regard.

Likely benefit to wildlife

- Generally, the prescriptions contained in the plan would appear to maintain the existing conservation value of the upland habitats.
- However, limestone grassland on somewhat deeper soils in the NHA/SAC, that had been reclaimed in the past, continues to be more intensively managed with medium chemical fertiliser applications which is likely to prevent the regeneration of more species-rich grassland flora. Due to a shortage in good grassland, summer grazing was permitted on a large area of winterage-type vegetation. This may prevent the full development of the typical winterage-type vegetation of high conservation value.
- The winterage on this farm was found to be of excellent fodder value and would appear to be somewhat undervalued in the REPS plan in terms of its potential stocking rate, i.e. it may become undergrazed which would reduce its conservation value.
- Scrub (predominantly hawthorn) is spreading on the unimproved winterage-type land that is used for summer grazing together with some of the improved and fertilised ground. It appears that the stock does not venture into the scrubby area because of the rich grazing on the adjacent improved land.
- Careful management of slurry should have been made a key requirement of the REPS plan in order to protect freshwater resources.

Flexibility - Evidence of the modification of REPS/NHA guidelines

- In 1998 the farmer wished to move cattle onto the winterage at an earlier date than is permitted under the NHA conditions in order to reduce poaching on the poorly-drained lowland gley soils. No permission was, however, sought.

Likely future consequence of farming in the manner prescribed

Generally, farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation but not necessarily the more stringent objectives of the pending SAC designation. The negative environmental impacts of previous intensification of some of the upland farmland (reclamation, use of chemical fertilisers) are not being reversed.

Scrub encroachment will increasingly present a problem on the winterage-type land used as summer grazing in conjunction with improved land.

Farm Profile No. 6	
Total Agricultural Area of which NHA/SAC	77 ha 100%
Area of winterage specified in REPS plan of which NHA/SAC	37 ha 100%
Is summer grazing permitted on other winterage-type land ?	Yes
Great Soil Groups present on farm	Rendzinas (Burren Series 25% rock) Rendzinas (Burren Series 75% rock) Rendzinas (shallow clay loam)
Type of stock kept	Dairy Cows, 1/3 of sold at birth, 33.3% of calves to 1 year and 33.3% to 2 years.

Stocking rate (12 months average over the whole farm)	0.81 LU/ha
Type of stock kept on winterage	Dairy cows (dry)
Stocking rate on winterage (over six months)	0.27 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	10.5/50 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	7.73/36.81 kg N/ha and year
Type of supplementary feed on winterage	none

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	3
Feeding points on winterage are clearly marked on REPS map(s)	n/a
Environmentalist was involved in the drawing up of the plan	?
Dúchas was consulted in the drawing up of the plan	?

Main management changes made to accommodate participation in REPS

- Reduction in stock (selling 50% of calves at birth)
- Ceasing use of silage clamp and feeding at a limestone grassland site
- Pollution control work
- Reduction of fertiliser inputs

Practicality of REPS plan specifications

- A substantial amount of reclamation work and scrub clearance had been carried out about ten years ago and the remaining sites of conservation interest are of limited economic value to the farm enterprise. Hence there are no major restrictions or impracticalities.

Likely benefit to wildlife

- Generally, farming under the REPS/NHA prescriptions would appear to maintain the conservation value of those NHA lands which have not been reclaimed in the past. Parts of the winterage were found to be somewhat overvalued in the REPS plan in terms of their potential to carry stock. They, however, were not overstocked.
- Scrub encroachment was noted on all the limestone pavement sites. This may lead to a loss of conservation interest in the future.
- Animals had year-round access to one area listed as winterage as the site was not fully fenced off. However, since there are adjacent good grassland areas, the cattle probably do not venture much into that area.
- The specified fertiliser use for one site of limestone grassland on very shallow soil was found to be excessive and is likely to lead to a loss of floristic diversity over time.

Flexibility - Evidence of the modification of REPS/NHA guidelines

No issues were noted on this farm.

Likely future consequence of farming in the manner prescribed

Generally, farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation except for the limestone grassland site mentioned earlier which is receiving too much chemical fertiliser. Scrub encroachment is also a problem on the limestone pavement areas and may lead to a loss of conservation value in the future.

While management has been somewhat extensified under REPS, the current management prescriptions maintain the sharp division of the farm into improved lands of relatively high productivity, and marginal unimproved lands, such as limestone pavement sites with patchy grassland. It is unlikely that the more stringent objectives of the pending SAC designation are going to be met, as with the current management guidelines no restoration of previously reclaimed limestone grassland sites will be achieved.

Farm Profile No. 7	
Total Agricultural Area of which NHA/SAC	76 ha 100%
Area of winterage specified in REPS plan of which NHA/SAC	41 ha 100%
Is summer grazing permitted on other winterage-type land ?	Yes
Great Soil Groups present on farm	Rendzinas (Burren Series 25% rock) Rendzinas (shallow clay loam)
Type of stock kept	Suckler cows, calves Lowland hoggets
Stocking rate (12 months average over the whole farm)	0.44 LU/ha
Type of stock kept on winterage	Suckler cows
Stocking rate on winterage (over six months)	0.51 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	0 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	15/30 kg N/ha and year
Type of supplementary feed on winterage	none

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	X
Feeding points on winterage are clearly marked on REPS map(s)	n/a
Environmentalist was involved in the drawing up of the plan	X
Dúchas was consulted in the drawing up of the plan	X

Note: The plan was drawn up before the REPS/NHA conditions were agreed but complies basically with the conditions.

Main management changes made to accommodate participation in REPS

- Change from letting some grazing to using whole farm for own stock
- Fertiliser reductions to protect freshwater sources

Practicality of REPS plan specifications

- Major reclamation work and scrub clearance had been carried out in the 1980s of what appears to have been rocky limestone grassland with an extensive small-scale field system. Hence there are now no major restrictions or impracticalities.

Likely benefit to wildlife

- Generally, the prescriptions contained in the plan would appear to maintain the existing conservation value of the upland habitats. These, however, had been diminished in the past through extensive reclamation work.
- Scrub encroachment was noted on all the limestone pavement sites. This may lead to a loss of conservation interest in the future.
- Following reclamation some pockets of winterage-type land remained to which animals have access year-round. However, since there are adjacent good grassland areas the cattle probably do not venture much into those areas during the summer period.
- Scrub encroachment was noted on the area designated as winterage in the plan. This site is unusual because of its rather damp, loamy soils. Some scrub had been cleared in this area along tracks but it is clearly expanding again which may lead to a loss of conservation value.
- Management decisions have, as yet, not been made for a wetland site on the farm. Such decisions should be based on an assessment of its floristic and faunal value and habitat structure.

Flexibility - Evidence of the modification of REPS/NHA guidelines

No issues were noted.

Likely future consequence of farming in the manner prescribed

Generally, farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation on those land which have not been damaged in the past. However, as scrub encroachment, predominantly hazel, is gaining momentum on the site, management decisions need to be taken to avoid a loss of grazing land and conservation value.

It is unlikely that the more stringent objectives of the pending SAC designation are going to be met, as with the current management guidelines no restoration of the previously reclaimed limestone grassland sites will be achieved.

Farm Profile No. 8	
Total Agricultural Area of which NHA/SAC	62 ha 94%
Area of winterage specified in REPS plan of which NHA/SAC	55 ha 100%
Is summer grazing permitted on other winterage-type land ?	Yes
Great Soil Groups present on farm	Rendzinas (Burren Series 25% rock) Rendzinas (Burren Series 50% rock) Rendzinas (shallow clay loam)
Type of stock kept	Suckler cows, calves to 1 year, Extra calves for 3 months Lowland ewes and extra hoggets
Stocking rate (12 months average over the whole farm)	0.68 LU/ha
Type of stock kept on winterage	Suckler cows, weanlings, ewes and hoggets

Stocking rate on winterage (over six months)	0.73 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	45 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	36 kg N/ha and year
Type of supplementary feed on winterage	Hay, concentrates

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	3
Feeding points on winterage are clearly marked on REPS map(s)	3
Environmentalist was involved in the drawing up of the plan	X
Dúchas was consulted in the drawing up of the plan	X

Main management changes made to accommodate participation in REPS

- More distinct separation of summer and winter grazing
- Renting of extra land for summer grazing in order to take pressure off the winterage
- Purchasing fodder rather than producing it in order to make available more summer grazing
- Reduction of fertiliser inputs

Practicality of REPS plan specifications

- Generally, there are no major restrictions or impracticalities.
- However, scrub encroachment is a major issue on this farm. The control of scrub by chain saw or other brush cutting tools as permitted under the REPS/NHA conditions is not regarded by the farmer as being practical because of rapid re-growth from the base and because of prohibitive labour costs.

Likely benefit to wildlife

- The more distinct separation of summer and winter grazing, aided by fodder purchases and the renting of extra summer grazing, is likely to have maintained or increased the conservation value of the winterage lands.
- Severe scrub encroachment may lead to a loss of conservation value of the limestone grassland/heathland areas. The plan prescribes an increase in winter stocking density to combat the spread of hazel scrub.

Flexibility - Evidence of the modification of REPS/NHA guidelines

- Dúchas gave permission to carry out limited scrub control with prescribed methods along a roadside.
- Limited summer grazing has been permitted on some on richer winterage.

Likely future consequence of farming in the manner prescribed

Generally, farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation but not necessarily the more stringent objectives of the pending SAC designation. If no feasible management solution is found to deal with the issue of scrub encroachment, a large area of the farm will be taken over by hazel scrub, leading to a loss of valuable limestone grassland/heathland and pavement.

Farm Profile No. 9	
Total Agricultural Area of which NHA/SAC	61 ha 91%
Area of winterage specified in REPS plan of which NHA/SAC	14 ha 100%
Is summer grazing permitted on other winterage-type land ?	No
Great Soil Groups present on farm	Rendzinas (Burren Series 25% rock) Rendzinas (Burren Series 50% rock) Brown Earths (well drained gravelly loam) Gleys (poorly drained silty soil)
Type of stock kept	Dairy cows, Suckler cows, all calves to 1 year, 80% of calves to 2 years.
Stocking rate (12 months average over the whole farm)	1.01 LU/ha
Type of stock kept on winterage	Suckler cows
Stocking rate on winterage (over six months)	0.71 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	35 kg N/ha and year
Actual Nitrogen from livestock on winterage as specified in REPS plan	23.2 kg N/ha and year
Type of supplementary feed on winterage	none

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	3
Feeding points on winterage are clearly marked on REPS map(s)	n/a
Environmentalist was involved in the drawing up of the plan	?
Dúchas was consulted in the drawing up of the plan	?

Main management changes made to accommodate participation in REPS

- Ceasing feeding on an unsuitable site on the winterage
- Construction of additional housing near the winterage
- Fencing off of wetlands

Practicality of REPS plan specifications

- Scrub encroachment is a problem on this farm. Some areas were cleared around 1980 but scrub is spreading back into these lands. The control of scrub by chain saw or other brush cutting tools, as permitted under the REPS/NHA conditions, is not regarded by the farmer as being practical because of rapid re-growth from the base and because of prohibitive labour costs. Some of the new growth was topped when soils were trafficable; this was not the case in 1998.
- Since much of the lowland section of the farm is on poorly-drained gley soil, in very wet weather, such as in 1998, it would have been advantageous to be able to move the animals to the winterage at an earlier date in order to reduce poaching. Also, the farmer would occasionally require leeway to extend the winterage period beyond the end of April as specified in the REPS/NHA conditions, e.g. for late calving cows.
- On the section of the farm on poorly drained gley soils a planned track for moving dairy cattle cannot now be built as it would traverse an NHA.
- The required maintenance of stone walls is a problem where feral goats regularly break into grassland areas.

Likely benefit to wildlife

- Farming under the REPS/NHA prescriptions is likely to contribute to maintaining the conservation value of those NHA lands which have not been previously reclaimed. On the remainder of the upland sites nutrient management has become more efficient. There is sufficient suitable ground for the spreading of slurry.
- The vegetation on the former feeding site - now disused - has recovered well.
- No management prescriptions are made in the plan for an area of the winterage that has become covered in dense scrub.

Flexibility - Evidence of the modification of REPS/NHA guidelines

No evidence.

Likely future consequence of farming in the manner prescribed

Generally, farming under the set prescriptions would appear to achieve the objectives of the REPS and the NHA designation but not necessarily those of the more stringent SAC designation since current management does not allow for the rehabilitation of the more intensively managed grassland on deeper soil within the NHA/SAC site. Also, the present farming regime is not controlling the spread of scrub and this will have to be dealt with in order to preserve valuable wildlife habitats and to prevent the loss of grazing areas. The recommended methods of scrub control are considered by the farmer to be prohibitively expensive.

Farm Profile No. 10	
Total Agricultural Area of which NHA/SAC	18 ha 100%
Area of winterage specified in REPS plan of which NHA/SAC	18 ha 100%
Is summer grazing permitted on other winterage-type land ?	n/a
Great Soil Groups present on farm	Rendzinas (Burren Series 50% rock)
Type of stock kept	Lowland ewes
Stocking rate (12 months average over the whole farm)	0.08 LU/ha
Type of stock kept on winterage	Sheep
Stocking rate on winterage (over six months)	0.08 LU/ha
Specified maximum potential of winterage areas to take animal waste having regard to the environmental sensitivity of each area (in REPS plan)	50 kg N/ha and year

Actual Nitrogen from livestock on winterage as specified in REPS plan	9 kg N/ha and year
Type of supplementary feed on winterage	Organic grain (very occasionally)

Incorporation of NHA/SAC prescriptions into the REPS plan (3 Yes, X No)

Reference is made to proposed SAC designation and notifiable actions	X
Relevant NHA conditions are fully listed in the plan	3
Farmer is being referred to NHA conditions under REPS	3
Feeding points on winterage are clearly marked on REPS map(s)	3
Environmentalist was involved in the drawing up of the plan	?
Dúchas was consulted in the drawing up of the plan	?

Main management changes made to accommodate participation in REPS

No changes had to be made apart from stock-proofing and changing to organic feedstuff.

Practicality of REPS plan specifications

A very low stocking rate (sheep) is specified in the plan which the farmer would like to see increased. This would not appear to be a problem from the conservation point of view as the site is grazed only during the winter period. In fact under the new REPS regulations as of 1 January 1999 a minimum stocking level of 0.3 LU/ha is required for organic REPS farms.

Likely benefit to wildlife

The site is limestone pavement area with limited grass cover. Hazel scrub is spreading on the site. This winterage land was found to be somewhat overvalued in terms of its potential to carry stock, but it is rather understocked. An increase in stocking rates may aid in controlling the scrub.

Flexibility - Evidence of the modification of REPS/NHA guidelines

No issues have arisen on this farm.

Likely future consequence of farming in the manner prescribed

Generally, the farming system (low stocking density, winter grazing only) on this farm which consists of only winterage-type land would appear to achieve the objectives of the REPS and the NHA designation.

However, as scrub encroachment, predominantly hazel, is gaining momentum on the site management decisions need to be taken to avoid a loss of grazing land and conservation value.

4.3. Summary of Farm Observations

4.3.1. Incorporation of NHA/SAC prescriptions into the REPS plan

In the Burren the proposed NHA and SAC designations cover largely the same area. The Notices of Notifiable Actions for SACs issued under Statutory Instrument 94 of 1997 state that "Where a landowner has a current approved plan under the REPS s/he need only notify the Minister of activities not covered in the plan." This

would imply that the REPS scheme is envisaged as being used to achieve certain objectives of the EU Habitats Directive under which the SAC designations will be made, i.e. to take measures "designed to maintain or restore, at a favourable conservation status, natural habitats and species of wild fauna and flora of Community interest" (cf. Section 3.2). However, no instructions have been issued to planners that they mention proposed SAC designations or refer to the notifiable actions issued to landowners. As a consequence none of the plans make any mention of the proposed SACs.

Different approaches were taken by the planners as to the incorporation of the NHA prescriptions into the plans. While some planners listed fully the conditions relevant to each site, others simply referred to the NHA conditions and attached a copy of these to the plan.

One of the most contentious issues in the process of negotiating the REPS/NHA conditions for the Burren was the siting of 'feeding points' on the winterages. It was made a condition of the scheme that round feeders or hay racks must be located at appropriate 'feeding points' described and specified in the farm plan, i.e. they should be marked on the maps accompanying the REPS plan. One plan failed to mention the location of these points on the map. The issue was also raised as to the appropriateness of using round feeders or hay racks where small, square bales of hay are fed on farms with relatively few animals. In such situations, feeding points could be rotated daily, thus avoiding poaching and any substantial accumulation of dung at these points.

It is a requirement of the REPS that all "plans in respect of proposed NHAs, designated SACs/SPAs must have an environmental input and must be approved and signed by the Agricultural Planner and an Environmentalist" (DAF 1998a). Environmentalists were definitely involved in the drawing up of two of the ten plans; for five of the plans, there was no clear evidence in the plan and documentation that an environmentalist had participated; for three plans there had been no environmental input.

An advisory leaflet published by the NPWS in 1996 outlined how optimum stock levels should be set for farms in the Burren and other limestone areas and it is stated that "all [REPS] plans should be referred to NPWS for comment on this and other points" (Heritage Service, 1996). Of the ten plans examined, three had been referred to Dúchas for comment and field staff visited the sites in question. Two of the plans had not been referred to Dúchas and for the remainder there was no evidence in the REPS plan and documentation of any communication between Dúchas and the planner. A case study in the Burren carried out earlier this year (The Heritage Council, 1999) showed that the Regional Deputy Wildlife Officer in charge has only been consulted about a small minority of the plans drawn up with respect to Burren NHAs.

Plate 5 Species-rich winterage vegetation in the central uplands in October. This site had been tightly grazed until about mid-April and supplementary feeding consisted of meal.

Plate 6 Winterage-type vegetation in the central uplands that has been summer-grazed for some years. Much of the botanical value has been lost as the 'typical' Burren flora does not get sufficient opportunity to flower and set seed during the summer. These lands have been omitted from the pNHA/pCSAC designations.

Plate 7 Typical limestone pavement winterage with intensively managed grassland in the background on a mixed dairy and drystock farm in the eastern Burren.

Plate 8 Large-scale reclamation was carried out on this site in the 1980s including the removal of a small-scale field system. The site is included in the pNHA/pCSAC designations. Under REPS the land is lightly grazed in the summer and receives relatively small amounts of chemical fertiliser.

4.3.2 Main management changes made to accommodate participation in REPS

The key adjustments made to the farming systems to ensure compliance with the scheme vary substantially (see the individual farm profiles), and are largely dependent on the intensity of the systems prior to entry into REPS. In addition to the general pollution control work, fencing off of watercourses, stock-proofing and stone-wall maintenance, which are issues on most farms, the most notable changes include:

- the more distinct separation of summer and winter grazing (3 farms);
- the provision of additional housing to take pressure off winterage areas (3 farms);
- reduction in stock numbers (2 farms);
- reduction of fertiliser inputs (6 farms);
- more appropriate siting of feeding points (2 farms).

One REPS plan was unusual in that it prescribed the removal of scrub for an area of winterage-type land, on which summer grazing is permitted, in order to take grazing pressure off a wetland site and to increase the area of floristically rich limestone grassland.

4.3.3 Practicality of REPS plan specifications

Four main issues were raised by the farmers participating in this study which they feel must be urgently addressed in order to ensure the continued success of the scheme and the viability of their farms.

Scrub encroachment: The spreading of scrub - predominantly hazel, but also hawthorn, sloe and bramble - onto both summer and winter grazing areas is evident on most farms. Farms near the western seaboard appear to be less severely affected than those in the central and eastern Burren. The control of scrub by chain saw or other brush cutting tools as permitted under the REPS/NHA conditions is not regarded as being practical because of rapid re-growth from the base and because of prohibitive labour costs. The view was expressed by some of the farmers interviewed that a limited period of summer grazing of the winterages may aid in reducing scrub encroachment.

Winterage dates: Grazing is prohibited in areas identified as winterage on the REPS map from May to October inclusive. While it was considered reasonable to specify grazing periods, most farmers felt that they had lost the flexibility to react to weather conditions and rates of grass-growth on summer pasture. Farmers with substantial areas of poorly-drained pasture in the lowlands would have liked to release stock early onto the winterage in 1998 because of the high amounts of rainfall which rendered the lowlands very susceptible to poaching. A similar situation can arise in a cold spring where lowland grass growths may not have been sufficient to allow animals to be taken off the winterage at the prescribed date.

Short-term management decisions: While there may be a certain amount of leeway and flexibility in the application of the REPS/NHA scheme some farmers experienced that their ability to make short-term management decisions, e.g. in response to adverse weather conditions was being curtailed. This relates predominantly to grazing dates and supplementary feeding regimes. The response time of the chain 'Farmer - Planner - DAF - Dúchas - DAF - Planner - Farmer', as the most extreme scenario, is too long to accommodate short-term management decisions that may need to be taken in a complex farm situation.

Costs: Depending on the individual farm situation the cost of complying with the Burren REPS and NHA specifications can be substantial and on certain farms exceeds the return in payments made under the scheme. Particularly high costs are incurred for pollution control and waste management on the more intensive farms as well as for boundary stone wall maintenance on very large farms. Of the ten farms surveyed nine had more than 60 hectares of land and four farms were larger than 100 hectares but payments had been capped at 40 hectares until 31 December 1998. The new payments under the proposed 'Supplementary Measure A' will be advantageous to the farms involved in this survey (see Section 3.1.3.). However, two of the farms are participating in SM 6 'Organic Farming' and only qualify for either the organic top-up payments or the SMA payments, whichever the highest, while still being restricted in their management by the NHA conditions. It was further highlighted by the farmers that while the cost of compliance with the REPS/NHA conditions is rising from year to year, e.g. for stone wall maintenance, fencing or construction work, the payments under the scheme have lost in value every year as they were based on Ireland's Agricultural Conversion Rate (ACR) of January 1 of each year. The basic REPS payment has thus fallen from c. £122/ha in 1994 to just over £95/ha in 1998 and is now fixed at c. £119/ha per year.

4.3.4 Likely benefit to wildlife

It must be borne in mind that the observations are based on once-off visits and that a proper assessment would require the establishment of baseline data and long-term monitoring of sites being managed under particular regimes in order to detect long-term changes in inter alia habitat parameters, species diversity and the development of populations of species of flora and fauna that are of particular conservation concern.

A change of the vegetation in the vicinity of feeding sites was noted. This change is a result of the concentration of nutrients from both feedstuff and animal wastes at these points as well as of treading and poaching. Typical plants at such sites included thistles (cirsium), dock (rumex), silverweed (potentilla anserina), plantain (plantago major) and creeping buttercup (ranunculus repens) with the 'typical' noteworthy Burren flora being virtually eliminated at these sites. This impact was local extending from about 1 metre to approximately 20 metres from the feeding point. It was interesting to note the good recovery - in floristic terms - of a site where silage had been fed for 15 years and where no feeding has taken place in the past 10 years. Another observation which merits further investigation is that at sites where concentrates, instead of silage or hay are fed, the animals spend much less time around feeders, thus reducing the impact of poaching and deposition of dung usually concentrated at such sites.

Slurry spreading on Burren grasslands as a result of the upsurge in the construction of slatted houses has given much rise to concern and debate in recent years. This is because many farms would not appear to have sufficient areas of land capable of receiving slurry applications without the risk of polluting the karst aquifer. The farms visited for this survey which had slatted houses did also have sufficient areas of suitable lands for spreading the slurry. This does not, however, rule out the possibility that there are other farms in the area which do not have suitable areas at their disposal.

It has been noted earlier that the spreading of scrub presents a problem on many sites, particularly in the

central and eastern Burren, and it may lead to a loss of species diversity on a number of sites. The consultants feel that the REPS/NHA conditions do not deal adequately with this issue. The permitted methods for scrub control would appear to be cost-prohibitive and mimic coppicing which leads to rapid re-sprouting from the base in the case of hazel (corylus avellana) or to increased suckering and spread in the case of sloe (prunus spinosa).

The consultants felt - within the limitations outlined at the beginning of this subsection - that the REPS/NHA prescriptions were in general adequate to maintain the existing conservation value of the limestone grassland/heathland and pavement sites on the farms visited as adverse changes have been arrested (i.e. no further intensive reclamation and intensification of management) and partly reversed (e.g. reduced fertiliser inputs, separation of summer/winter grazing). Further improvements could be made if the amount of summer grazing or year-round grazing on winterage-type land was reduced but it must be borne in mind that these derogations may represent a necessary compromise between ideal conservation management and farm viability, particularly on 'All-High-Burren farms', i.e. where there is little good grassland available for summer grazing.

With regard to the pCSACs, the REPS/NHA prescriptions are unlikely to be sufficiently strict, specific and proactive to achieve the objectives of the designations of these sites, including the restoration of sites and populations of species of Community interest to a favourable conservation status as defined in the Habitats Directive (cf. Section 3.2). The REPS/NHA guidelines essentially cap the intensification level on most farms but do not preclude the maintenance of certain levels of intensification previously achieved on the farms, such as chemical fertiliser and slurry applications on reclaimed lands, higher stocking rates, housing and/or winter feeding regimes to accommodate higher stocking rates. Again, this is indicative of attempts at compromise between conservation objectives and socio-economic objectives but it may not be sufficient to meet the strict legal requirements under the European Habitats Directive.

4.3.5 Flexibility - Evidence of the modification of REPS/NHA guidelines

Flexibility in the interpretation of the scheme guidelines in the drawing up of the plans was evident particularly with regard to the division of summer and winter grazing on 'All-High-Burren farms', i.e. where there is little good grassland available for summer grazing and permission is given to graze winterage-type areas in the summer. Permission was also given in some instances to graze winterage sites for a short period during the summer.

Of the ten farms visited two requested an extension or modification of the supplementary feeding period. In one case this was granted by the DAF, following consultation with Dúchas; in the other case the planner sent a request to Dúchas but a reply was allegedly never received.

In the context of supplementary feeding regimes, it was also noted that the NHA conditions do not make any allowance for variations in the dry matter (DM) content of silage fed on the winterages, since only the maximum weight of silage to be fed per livestock unit is specified in the conditions. In any event, this aspect of the scheme is virtually impossible to police and it may be more appropriate to assess the visual appearance of the winterages and the feeding sites during compliance checks, rather than working with fixed figures which cannot be checked 'on the ground'.

A number of farmers wished to release animals early, i.e. during October, onto the winterage but felt they could not do so under the regulations. According to the Farm Development Service, Ennis only one such request was received by the DAF on the 27th of October and in a difficult year such as 1998 serious consideration would have been given to dealing with requests of this nature en gros (A. Browne pers. comm. Nov. 1998), and would have probably resulted in a blanket permission being granted.

Apparently there is a need for more information - for both REPS planners and farmers - as to the circumstancess under which derogations from the guidelines can be negotiated. An information booklet on environmentally friendly farming in the Burren (Heritage Service, 1996) clearly states that the guidelines "may be superseded by specific recommendations for individual farms" and that farmers should contact the NPWS if they think that the situation on their farm warrants an exception to general rules.

4.3.6 Likely future consequence of farming in the manner prescribed

The predominant issue that arose on most of the farms surveyed, was that of scrub encroachment on limestone grassland/heathland and pavement, as well as on better grassland sites, even where these have been cleared of scrub in the past. This issue has already been addressed above.

On two of the farms, there may be the need for a further downward adjustment of stock numbers. In one instance, this arises as a consequence of a reduction in fertiliser use and resultant lowered grass production.

In the other case, this may arise as a result of difficulties of working within strict dates on the winterage. There would obviously be a negative impact on farm profitability for the farms involved.

The general picture that presented itself, particularly in the central and eastern Burren, both on some of the REPS farms and in reference areas visited, was that management and resources were concentrated on the better grassland areas, i.e. the deeper Rendzinas of the Kilcolgan Series and the Brown Earths of the Kinvarra Series (see Section 4.1.) - many of which were reclaimed in the past 10-20 years - while the limestone grassland/heathland sites became increasingly covered in scrub and in some instances lost all their grazing value and were abandoned. Where there was a gradient, or mosaic, of lowland grassland, limestone grassland, limestone heathland, pavement, scattered scrub and occasional woodland, there is now often a sharp division between improved grasslands and dense scrub. It is this gradient, or mosaic, however, that is of particularly great conservation value.

It has already been outlined earlier that within certain limitations the REPS/NHA scheme has arrested, and partly reversed, a number of adverse changes from the conservation point of view.

It has been stated that there is obvious room for further improvements but that compromises between ideal conservation management and farm viability are inevitable. The basic REPS and REPS/NHA guidelines are generally of a restrictive nature. While they may be sufficient to prevent further intensification and/or the loss of features for which the areas were designated, they lack incentives and a proactive approach to extensification, and to the restoration of important habitats and species to a favourable conservation status as required by the Habitats Directive.

4.4. General Observations on the REPS Plans

The agri-environmental plans drawn up for each farm participating in REPS are the principal instrument by which the guidelines of the Rural Environment Protection Scheme are transposed to the level of the individual farm and they form part of a binding contract between

Plate 9 A mosaic type structure of limestone grassland/heathland, thermophilous saum communities and scrub/woodland. Such complex structures are of particularly high conservation value.

Plate 10 An example of the concentration of agricultural management on the better grassland areas, creating a sharp division between improved grassland and dense scrub instead of a gradient of different habitat types.

The individual farmer(s) and the Department of Agriculture and Food. In order to guarantee the success of the scheme it is, therefore, of utmost importance that the information and the prescriptions contained in the plan are correct and unambiguous.

While great care had generally been taken by the REPS planners in committing rather complex farming situations to paper, the consultants noted some shortcomings in individual plans in the course of assessing the REPS plans of the farms surveyed for this report. The plans had been prepared by four different private planning agencies (7 plans) and Teagasc planners (3 plans). The types of deficiencies noted were as follows:

- no updates to include changes in stock numbers;
- incorrect area sizes or adjustments;
- inconsistencies in stock numbers;
- inconsistencies in nitrogen/stock allocations;
- faulty mapping;
- failure to make prescriptions for leased lands;
- winterage areas not clearly specified;
- winterage period not correctly stated;
- failure to list certain habitats under Measure 4 (non-NHA);
- incorrect listing of lands as NHAs which are not in fact designated;
- no update to include detailed NHA prescriptions;
- failure to show designated NHA lands on map where not all of the lands are designated;
- tables listing projected organic and chemical fertiliser nitrogen applications written in an unclear manner;
- duration of short-term summer grazing on winterage area not clearly specified;
- failure to specify housing/outwintering periods.

While in many cases these deficiencies may be inconsequential for the management of the REPS farms, in other cases they may lead to misunderstandings, adverse management decisions from both the farming and the conservation point of view, heavy penalties for the farmers and avoidable appeals procedures, e.g. in case of faulty mapping. There appears to be a need to urge planners to exercise yet greater care in the drawing up of the agri-environmental plans.

4.5. Conclusions from the Farm Surveys

Within the limitations of a small-scale study such as the one reported on here, some general conclusions can be drawn from the farm visits, interviews with the farmers, and the examination of the REPS plans.

Farm plans are more easily interpreted by the farmer if the relevant NHA conditions are clearly and correctly spelled out in the appropriate sections of the agri-environmental plan as opposed to the REPS/NHA conditions being simply appended to the plan.

The requirement to involve an environmentalist/ecologist in the drawing up and in the reviewing of agri-environmental plans in respect of proposed NHAs and SACs is not being sufficiently enforced. Also, the question must be asked, what constitutes an environmentalist? The DAF reserves the right to admit REPS planners onto their national list and holds a register of environmentalists/ecologists associated with or constituting REPS planning agencies but it has not published the criteria environmentalists have to fulfil in terms of their educational background. Management decisions for important habitats and particularly for internationally important areas such as much of the Burren region must be based on sound ecological, botanical and faunistic expertise together with a good understanding of farm management issues. The educational background of the environmentalists employed in the scheme should reflect these requirements.

Only a minority of plans are being to be referred to Dúchas for comment. However, it is questionable whether Dúchas would have sufficient resources and manpower to deal with all the plans prepared in respect of NHAs/SACs in the Burren.

The spreading of scrub is a major issue on many sites, presenting problems both from the farm management and the conservation point of view. The consultants feel that the REPS/NHA conditions do not adequately deal with this issue. Ways must be found to control scrub in a manner which is both cost-effective and does not pose a threat to the habitats and species for which the lands have been designated.

From the ecological point of view, the key adjustments made on the farms participating in the REPS would generally appear to have arrested adverse changes, apart from scrub invasion, and also to have reversed some of the negative impacts of the past intensification of farming operations on some farms. However, the prescriptions are unlikely to be sufficiently strict, specific and proactive to achieve the objectives of the designations of the designated pCSACs, including the restoration of sites and populations of species of Community interest to a favourable conservation status as defined in the Habitats Directive.

Blanket prescriptions for grazing periods and feeding regimes in the Burren uplands do not take sufficient account of the wide diversity of farming situations on the Burren. However, some scope for flexibility exists within the general guidelines, but farmers often seem to be unaware of this. In addition, the long response

time to requests for short-term modifications to the plan can be viewed as an impediment. The farmers expressed the need for an independent agent to whom they could turn when adverse conditions or specific farm situations give rise to the need for a derogation from the general guidelines.

The fact that NHA payments and the top-up payments for organic farming under REPS are mutually exclusive can be viewed as a disincentive to the encouragement of organic farming in the Burren.

Section 5 - Conservation Management of Burren Grasslands

Despite the fact that there is a considerable body of research available on the Burren grasslands, many questions about their management, both past and present, remain unanswered.

This section will briefly outline the different types of grassland and the associated scrub vegetation of concern to this study, their conservation importance, and certain aspects of their management in relation to the behaviour of the principal large herbivores present in the region.

5.1. Vegetation Types and Their Conservation Importance

5.1.1. Limestone grassland/heathland

This vegetation type consists of a number of different and often interspersed plant communities with many local variants, but for the purposes of this report, it is considered as one continuous habitat type. This semi-natural vegetation is unusual in character in that it contains a combination of arctic-alpine and Mediterranean plant species found nowhere else in the world, as well as a number of species with a very limited distribution within Ireland and Britain (Webb and Scannell 1983). It is widespread in the Burren and represents the 'typical' winterage of the Burren Hills. Being of very high conservation value, it contains many plant species of special concern, amongst them, the most well-known plants giving the Burren its botanical fame, such as the mountain avens (dryas octopetala), the dense-flowered orchid (neotinea maculata), the hoary rock-rose (helianthemum canum) and the spring gentian (gentiana verna). The limestone grassland is also remarkable for its profusion of orchids. This habitat type is very rich in invertebrates and harbours many of the most notable Lepidoptera (moths and butterflies) for which the Burren is renowned. A mosaic-type structure of these grasslands/heathlands, limestone pavement, scattered scrub, thermophilous saum communities together with woodland, springs and waterbodies is of particularly great conservation value, especially for invertebrates. The main threats to limestone grasslands/heathlands would be overgrazing or undergrazing, addition of fertilisers, reclamation and scrub invasion.

5.1.2. Well-drained lowland grassland

The characteristic plant community of this habitat type is the centaureo-cynosuretum, a plant community which is characterised by the presence of crested dogs-tail (cynosurus cristatus) and black knapweed (centaurea nigra) and which is dominated by comparatively productive species including the crested dogs-tail, cock's foot (dactylis glomerata), red fescue (festuca rubra), perennial rye-grass (lolium perenne) and ribwort plantain (plantago lanceolata). From the floristic point of view the transitions between this type of vegetation and the limestone grasslands are of interest. This grassland type has been, and will remain, the focus of productive agriculture but it is not without interest from the conservation point of view, being relatively species-rich (Jeffrey 1995, 272). This vegetation is often invaded by hazel (corylus), bracken (pteridium) and bramble (rubus).

5.1.3. Woodland edges and saum communities

The boundary between woodland or scrub and open habitats such as grassland is often more diverse and species-rich than the habitats it separates. Of the 'famous' Burren plants squinancywort (asperula cyanchica), bloody cranesbill (geranium sanguineum) and dropwort (filipendula vulgaris) can be found in these linear habitats. Also, a number of the particularly important lepidopterous species are typical of this boundary between scrub/woodland and open country. Hazel (corylus), hawthorn (crataegus), sloe (prunus spinosa) and bramble (rubus spec.) are associated with the vegetation.

5.1.4. Hazel scrub and hazel-ash woodland

The development of hazel scrub appears to be dependent on edaphic and climatic factors as well as on

grazing or browsing pressure and the type of herbivores present. In exposed areas of the western Burren, hazel does not normally reach a height over 1.5 m. The height of the canopy increases with increasing shelter and can reach up to 8 m in hollows, sheltered valleys and at cliff bases (Kelly & Kirby 1982, 184). In sheltered locations in the eastern Burren, scattered stands of low deciduous forest over limestone can be found including species such as ash, oak and birch.

Scrub and woodland habitats are of importance to some of the Burren's mammals. Woodland and scrub on shallow soils over calcareous rock generally harbour a rich invertebrate fauna and a number of the most notable butterflies and moths in the Burren are typical woodland species.

Few of the vascular plant species that are of special concern in the Burren have been recorded in the stands of scrub and woodland (i.e. blue moor-grass (sesleria albicans), stone bramble (rubus saxatilis), dense-flowered orchid (neotinea maculata). For this reason, the invasion of limestone grasslands/heathlands with hazel scrub gives rise to concern from the conservation point of view.

5.2. Limestone Grassland, Scrub Invasion and the Large Herbivores

It is beyond the scope of this study to detail the ecological aspects of scrub invasion into grassland and the subsequent succession. However, since scrub invasion has been identified as a major issue from both the farming and the conservation point of view, some aspects of the livestock systems in the Burren and the behaviour of large herbivores will be summarised here.

Important variables in grazing management are (i) the time of year at which grazing takes place, (ii) the intensity of grazing (i.e. the number of animals and the duration of grazing) and (iii) the type, breed and age of stock used. It is also important to bear in mind that mixed grazing, i.e. the bringing together of two or more types of livestock can have distinct advantages and often may actually remove disadvantages resulting from single-species grazing (Bacon 1995, 124). A good example in this context would be the tradition to include one or more goats with a flock of sheep or a herd of cattle in order to keep scrub invasion onto grassland at bay (cf. Maertens et al. 1990, 125).

5.2.1. Cattle

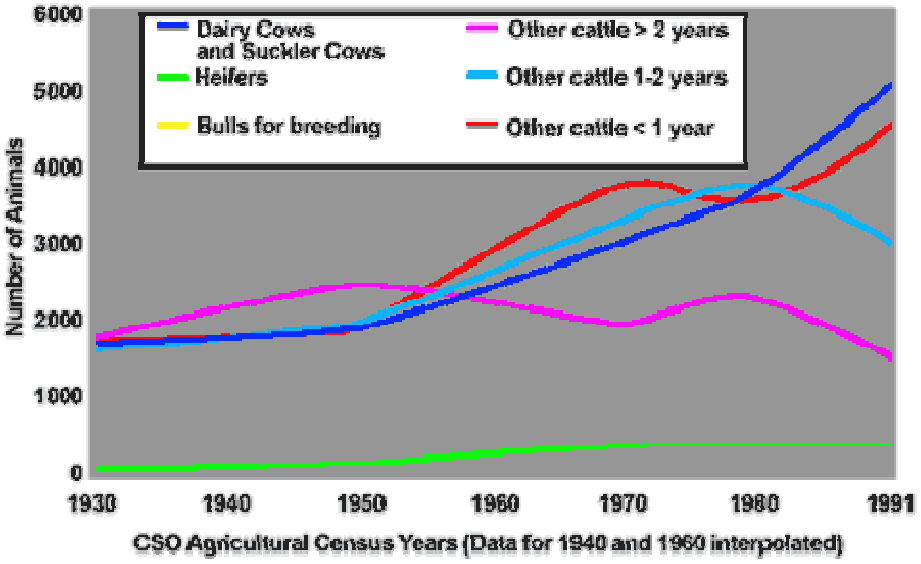
The type of cattle breed kept in the Burren has changed. According to O'Donaghue (pers. comm. 1990) mainly Shorthorns (dual use) were kept up to the 1940s . A subsequent shift to dairying established Holstein Friesians in the region. Aberdeen Angus, Herefords and their crosses became important breeds as beef cattle. A consumer preference for less fatty meat appears to have encouraged the replacement of these breeds by heavier continental breeds, which are not as well suited to the winterage regime as the breeds which were previously common. The latter were kept on the winterage with little or no supplementary feeding and, by the spring, were browsing on buds and young shoots of the scrub. However, they would have lost much condition by the time they were taken from the winterage and had to be fattened up again during the summer on the lowlands. It would have taken them another full year after that to reach slaughter weight. In the present economic climate, with the breeds which currently dominate, farmers would, in most circumstances, incur a loss in achieving a situation where the animals actually control the scrub. The gap between a situation where scrub control is achieved and a situation which is economically viable may be too large to be monetarily compensated for by the REPS. Breeds such as Herefords or Aberdeen Angus and, particularly, crosses of these breeds with a small proportion of continental blood, may offer advantages in this respect as they don't lose condition on the winterage as easily, fatten up again quicker and finish earlier than the continental breeds. Hardy breeds, such as Angus, Hereford, Angus/Hereford crosses, Welsh Black and West Highland are listed by Bacon (1995, 124) as being most suitable for the grazing of calcareous grassland.

Another factor that has changed is the age of cattle kept on the winterage. According to M. O'Donaghue (pers. comm. 1990) the traditional winterage involved cattle at the age of two years, when teeth are fully developed, and the animals could cope with the rough fodder. Meat factories, however, are more interested in younger, fast-maturing stock which provide more tender meat. It can reasonably be assumed that these younger animals exert less pressure on invading scrub than the older animals.

The change in the types of cattle and the age structure of the regional herd between 1930 and 1991 is demonstrated in Figure 3 for eight North Clare DEDs (June Enumerations). Again, it has to be emphasised that these data are not necessarily representative of the stock kept on the winterages. The data do, however, support the statements by O'Donaghue above. There has been an obvious shift towards the keeping of suckler and dairy cows (the census does not differentiate) and towards beef cattle of younger age, with the most pronounced changes occurring between 1980 and 1991.

Figure 3 Cattle Numbers by type of animal and age groups for 8 North Clare DEDs (Carran, Castletown, Derreen,

Gleninagh, Noughaval, Corofin, Glenroe, Kilnaboy) 1930-1991 June Enumerations



Source: CSO Office Abstracts of Livestock (various years)

According to Bacon (1995, 124) the preferred animals for grazing calcareous grassland (not considering the issue of scrub invasion) are beef cattle of the hardy breeds listed above, and light weight bullock calves of 15-18 months in particular. He states that "single sucklers (= cow and calf) of the lightweight beef breeds can be successful if the land is not too steep. Dairy herd cows are not suitable due to their heavy weight and requirement and requirement for a high nutrient intake in order to maintain production of milk and foetus." Studies in the limestone grassland vegetation in the Burren National Park indicate that cattle grazing keeps the sward open, and that the animals help to maintain species diversity in the larger grassland patches scattered within the predominantly bare limestone, and also that "goat grazing may be instrumental in preventing dominance" in these larger patches (O'Donovan & Moles 1997, 325).

With regard to the summer grazing of calcareous grasslands, Bacon (1995, 124) notes that "cattle can be ideal on high-productivity sites requiring summer grazing as they are unselective and do not preferentially eat flowers and herbs as is the tendency for sheep".

An observation in the Burren that merits further investigation is that the use of concentrates, rather than hay or silage as supplementary feed on the winterage, means that the cattle spend less time around feeding points, reducing the risk of poaching and point-source pollution, and also that the animals might browse the scrub to a greater extent since they have to forage for roughage.

5.2.2. Goats

It has already been noted in Section 2.1.2. that the numbers of domestic goats have declined considerably in the region during this century. Many farms would have kept small flocks of goats for milk and kid-meat.

Plates 11 & 12 Feral goat herds in the Burren venture onto good grassland areas but if confined, their browsing behaviour can successfully be employed for clearing sites of invading scrub vegetation, usually in conjunction with initial or subsequent manual clearance.

Goats are probably the most appropriate herbivores for the prevention or reduction of scrub growths since they are natural browsers (Maertens et al. 1990, 123; Rahmann, 1998a, 77). Their successful use to this end depends on the degree of grazing intensity, and undergrazing with goats can, in fact, increase scrub invasion in that thorny plants such as hawthorn are neglected by the animals at the expense of more palatable scrub vegetation. This effect can be pre-empted by generating a relative fodder shortage through the confinement of the animals (Maertens et al. 1990, 124) using mobile electric wire fencing (Rahmann 1995). According to Nitsche & Nitsche (1994, 137) goats have been shown to be very effective in reducing scrub cover on calcareous grassland when they were confined by mobile electric fencing on the sites for about five to ten days. The goats browse buds and defoliate the scrub to a height of about 1.80m which weakens the plants and reduces their cover. Ring-barking is more effective and can kill off the trees or shrubs but the bark of sloe is hardly ever eaten. If goats are regularly moved into areas affected by scrub invasion, they can eliminate almost all scrub. Sloe will first have to be cut down to the base. It will respond by suckering and fresh growth will have to be topped or browsed immediately in order to weaken the plants. Such treatments probably have to be repeated every few years (Nitsche & Nitsche 1994, 137). Goats have been shown to provide a cost-effective alternative to manual clearance on calcareous grasslands which have strongly been invaded by scrub up to a scrub cover of about 70% (Rahmann 1998a, 79; 1998b).

It has been argued that, while the numbers of domestic goats kept in the area have declined substantially, the numbers of feral goats have increased to the extent that they are being regarded as a pest rather than as a resource. Feral goat herds knock walls and venture onto good grassland areas, particularly during the spring when they are feeding their young and have a higher protein requirement. It has been estimated that there are presently about 1000 feral goats in the Burren region (C. McGuire, pers. comm. Nov. 98). However, the feral goats roam the area in large flocks and it would appear that their browsing pressure is too sporadic for any one site and not sufficiently dispersed. Once the scrub has reached a certain height and density, buds and foliage are out of reach of the animals.

While goats have probably played a greater role in the prevention of scrub invasion into grassland in the past, the herding and confinement of goats over large areas of the Burren cannot be considered practical within the farming structures now prevalent in the Burren. It is only suitable in individual situations if a market for milk or cheese and kidmeat can be developed and/or if the "indirect product", i.e. the performance of conservation management tasks is adequately reimbursed (cf. Anon., 1998).

5.2.3. Sheep

Sheep are generally regarded as the traditional grazing animal of chalk grasslands in Britain (Bacon 1995, 123) and on various types of calcareous grasslands in central Europe (Briemle et al. 1991, 106,116; Willmanns 1984, 191).

In the Burren region sheep numbers have fluctuated significantly throughout the past two centuries (see Section 2.1.2.) but in terms of overall livestock units, as an expression of herbage intake, they have played a minor role compared to cattle at least during the past 150 years.

Sheep are selective grazers and, if used constantly, they can produce distinct botanical communities (Wells 1967 cited in Bacon 1995, 123). Anecdotal evidence from the Burren suggests that sheep grazing on the limestone grassland/heathland vegetation has a detrimental effect on the species composition of the grassland flora. It is also known that dryas (mountain avens) heaths can quickly be eliminated by intensive sheep grazing, giving rise to herb-rich grassland (McVean & Ratcliffe, 1962, cited in Elkington, 1971) and in Teesdale (Northern England) heavy sheep grazing was found to have a negative impact on the reproduction of the spring gentian (gentiana verna) (Elkington, 1963). According to D. Jeffrey, (pers. comm. Nov. 98) allowing sheep access to the relatively species-poor unit of limestone grassland, which is dominated by blue moorgrass (sesleria albicans) and contains large quantities of mountain avens (dryas), would need to be accompanied by detailed monitoring including exclosure experiments, particularly on the upper slopes of the Gleninagh Mountain, Cappanawalla and Black Head which harbour a most unusual variant of this community with arctic-alpine affinities. Sheep grazing on the well-drained lowland grassland type described in Section 5.1.2. "will probably not have a marked deleterious effect if stocking rates are not excessive" in his opinion.

The potential of using sheep to limit regrowth of cut scrub, following mechanical clearance during the winter

months, merits investigation in the Burren situation since sheep (as well as goats) have successfully been used to this end on calcareous grassland on the continent (Schumacher et al. 1995, 46). Early grazing in the first half of the vegetation period is advantageous for scrub control but it is usually considered undesirable due to its adverse impact on the herbage layer (Scholaut 1987 cited in Maertens et al. 1995, 116). It is likely that sheep grazing alone can only slow down scrub encroachment but not necessarily prevent it, and grazing management may have to be accompanied by mechanical clearance (Knapp and Reichhoff 1973 cited in Maertens et al. 1995, 116). Generally, for conservation management, the timing of sheep grazing should be determined with respect to the flowering and fruiting times of the species for which the sites are being managed.

5.3. Conclusions

Much of the recent scrub invasion would appear to result as a consequence of changes in farm structures (size and distribution of holdings) and grazing patterns (type and age of stock, timing of grazing and intensity of grazing as influenced by the availability of richer forage on neighbouring improved lands) (cf. Sections 2 and 4 of this report).

From his observations in the Burren, Jeffrey (1995, 272) concludes that where woodland already exists, the impact of the herbivores present in the area seems to be too low to have an important impact on their dynamics, density or extent. This observation was borne out by the farm visits conducted for this study. The same was found to be true with regard to dense scrub.

In terms of the prevention of scrub encroachment on the Burren limestone grassland sites, and the maintenance of floral species diversity, cattle and goats appear to be the most important herbivores in the Burren. The exact impact of sheep grazing on these grasslands is unclear and merits further study.

The type and age of stock kept on the winterage is strongly influenced by market demands. It can therefore be assumed that if market demands could be influenced, it might be possible to encourage farmers to keep stock on the winterage that is more suited to the regime, and that is more effective in combating scrub invasion. Direct marketing schemes to catering outlets, Community Supported Agriculture (CSA) schemes and/or a Burren brand for animals produced in the context of conservation management may offer a suitable framework for such an endeavour. Schemes of this nature have successfully been used on the continent, e.g. the 'Pastured Steers from the Rhön' scheme, the 'Pastured Heifers From St. Englmar' scheme or the 'Rhön Lamb' scheme (Jasper et al. 1997, Rahmann, 1997).

Section 6 - Final Conclusions and Recommendations

6.1. On the issue of management strategies and the benefit to wildlife

1. A fundamental problem in the discussion of whether the REPS/NHA prescriptions are of benefit to wildlife is the fact that no clear conservation strategy exists for the Burren region as a whole which outlines clear and measurable objectives in terms of the desirable extent, quality and distribution of the different habitat types present. Such a strategy would require clear guidelines as to how exactly agricultural management is to achieve these specific objectives.

2. Within the limitations of the above statements, from the ecological point of view, the key adjustments made on the farms participating in the REPS would appear generally to have arrested adverse changes. On some farms they seem also to have reversed some negative impacts of the past intensification of farming operations on some farms. However, current management objectives (as set out in the REPS and in the NHA guidelines) and the resultant prescriptions do not adequately reflect the specific legal obligations for the conservation of the sites and species of Community interest in the Burren. In particular, they do not provide for the restoration to a favourable conservation status of habitats and species of Community importance which have negatively been impacted upon through agricultural management in the past.

3. Ideally, the management prescriptions for REPS farms should be based on a detailed ecological assessment of each farm so that farm management could be based on clear objectives regarding the habitats and species for which the sites are being managed. The results of management could be measured later on against baseline data gathered in this assessment. In the context of the REPS such an approach would

require improved communication between farmers, agricultural planners, ecologists, Dúchas, the Department of Agriculture and Food, and independent researchers. In the meantime, the requirement to involve a qualified environmentalist/ecologist in the drawing up and in the reviewing of agri-environmental plans in respect of proposed NHAs and SACs, as well as the referral of plans to Dúchas for comment, should be enforced more strictly. This would require increased resources and staff to be allocated to the Regional Wildlife Officer.

4. In order to avoid misinterpretations, the NHA conditions to be applied under the REPS should be interpreted by the planner for each site. All relevant conditions should be clearly and correctly spelled out in the appropriate sections of the agri-environmental plan instead of just appending the NHA conditions to the plan.

5. The spreading of scrub was identified as a major issue on many sites, presenting problems both from the conservation and the farm management points of view (cf. Section 6.2.). From the point of view of the farmers, scrub is viewed in a neutral sense (in that some invaded areas have already been abandoned agriculturally) or in a negative sense (in that it reduces the area available for grazing and/or fodder production). From the conservation point of view, there is no clear guidance available as to what constitutes a desirable balance between the area of scrub and the area of grassland/heathland in the Burren as a whole. Nor is there any guidance as to the desirable qualities and spatial distribution of the habitat types concerned. In the absence of such guidelines, we are attempting to manage these habitats in a piecemeal fashion on a farm-by-farm basis with no clear and measurable overall objectives. There is an urgent need to compile and integrate existing research and traditional agricultural knowledge on the Burren's habitats and their management, and to plan a coherent programme of future research in order to generate clear policy objectives.

6. An observation that merits further investigation is the use of concentrates, rather than hay or silage, as supplementary feed on the winterage. This means that the cattle spend less time around feeding points, reducing the risk of poaching and point-source pollution, and also that the animals might browse the scrub to a greater extent since they have to forage for roughage.

7. The potential for the development of direct marketing initiatives, Community Supported Agriculture (CSA) Schemes and/or a Burren brand for animals produced in the context of conservation management should be explored. Such schemes can aid in improving the economic situation of participating farms, in giving agri-environmental programmes a more positive and proactive image and impetus, and in communicating the 'conservation message' to the wider public including tourists visiting the region.

6.2. On the issue of practicality and flexibility

1. Blanket prescriptions for grazing periods and feeding regimes in the Burren uplands do not take sufficient account of the wide diversity of farming situations on the Burren. However, some scope for flexibility exists within the general guidelines, but farmers and planners often appear to be unaware of this. In addition, the long response time to requests for short-term modifications to the plan can be viewed as an impediment. There is a need for greater communication and cooperation between farmers, REPS planners, Dúchas and the Department of Agriculture and Food in order to accommodate the flexible application of the guidelines in the interest of both farm management and conservation.

2. Since the Burren is a unique and complex area in agricultural management terms, and since there is a tremendous variety of farm situations, there was unanimous agreement among the farmers that an independent advisor or advisory body was required for the Burren region. This body would incorporate detailed knowledge of the farming systems and the ecology of the area, in order to aid decision-making on a day-to-day basis within the framework of the REPS/NHA conditions, while not being involved simultaneously in the 'policing' of the scheme.

Plate 13 Hazel scrub has encroached upon this area of limestone grassland over thin Rendzina soil

Plate 14 In the course of wall maintenance a mature hazel bush was cut down to the ground in April. The photo shows the regrowth by October of the same year.

3. The spreading of scrub was identified as a major issue on many sites, presenting problems from the farm management and the conservation points of view. The consultants feel that the REPS/NHA conditions do not adequately address this issue. Ways must be found to control scrub in a manner which is cost-effective and does not pose a threat to the habitats and species for which the lands have been designated.

4. There is little information available relating to grazing regimes which might be used to prevent the spreading of scrub or to eradicate scrub in areas where light infestation has already occurred. To this end a research programme is urgently required to provide hard information on which type of grazing regime might meet this end. This information could be used by the REPS planners and by Dúchas to develop appropriate, farm-specific grazing solutions in the context of an overall management strategy for the region.

5. Where it is necessary to clear dense scrub, problems are encountered as a consequence of the large amount of labour and cost required when using the control methods permitted in the NHA conditions. It may be necessary to develop some form of mechanical means for the clearance of dense scrub. Different approaches were discussed with the farmers involved in this study. One suggestion was to use machinery that would pull the scrub out by the roots. Depending on the situation on individual sites it is possible that this approach would give rise to similar damage to the ecological, as well as archaeological features, as bulldozing has in the past. There is a need to investigate the exact consequences of this type of approach under different site conditions.

6. The other suggestion is to cut (i.e. coppice) the scrub using small-scale forestry type machinery, but as with clearance with hand tools, there would be rapid regeneration from the base (hazel, hawthorn) or increased spread through suckering (sloe). There is a need to investige grazing regimes on the cleared areas to determine which regime (type and age of animal, duration and season, intensity and frequency) might be most effective in preventing regrowth under the particular conditions of the Burren habitats (see also Section 5.2.) Investigation of the type of machinery which might be acceptable (if any) in the Burren environment would be necessary. Research is needed to establish the appropriate time of year to carry out such works in order to avoid irreversible damage to important species and habitats which have given rise to the sites' designation as NHAs and SACs.

7. The consultants suggest that experimental plots be set up in which to test the different types of approaches to scrub clearance and grazing regimes in terms of their ecological as well as their economic implications. Whether funding under the EU LIFE (Nature) programme could be made available for such a project should be investigated.

8. The possibility and the effectiveness of using some form of voluntary labour for manual scrub clearance, such as Conservation Volunteer Groups or Youth Work Camps should be investigated.

6.3. On the issue of the future consequences of farming in the manner prescribed

1. Within the limitations of the considerations set out in Section 6.1. the consultants felt that farming under the set prescriptions would appear generally to achieve the objectives of the REPS and the NHA designation. This may be sufficient to prevent further intensification and/or the loss of features for which the areas were designated but there is a lack of incentives and a proactive approach to extensification and to the restoration of important habitats and species to a favourable conservation status as required by the Habitats Directive.

2. On the majority of farms, the present farming regimes are not controlling the spread of scrub and this will have to be dealt with in order preserve valuable wildlife habitats and loss of grazing areas. This issue has been discussed in the previous section.

3. It is essential that a research and monitoring programme be put in place in the Burren in order to allow the assessment of the environmental, agricultural and socio-economic effects of the Rural Environment Protection Scheme.

6.4. On the issue of payments

1. It is a stated objective of the REPS SM 6 'Organic Farming' "to encourage producers in REPS to respond to the market demand for organically produced foods" (DAF 1996, 62) and evaluation reports on the implementation of the EU agri-environmental measures in other Member States have highlighted the proven environmental benefits of organic farming on soil and water quality and on biodiversity (CEC 1997, 19). As REPS organic farms with lands in proposed NHAs/pCSACs are - in addition to the regulations on organic farming - subject to the same conditions and restrictions as other REPS farms with designated lands, top-up payments for the 'Conservation of Natural Heritage' and the Organic SMs should not be mutually exclusive as they achieve the same end mutually exclusive.

2. It appeared from the farm surveys that there is no clear relationship between the amount of labour and capital required for the implementation of individual agri-environmental plans and the actual payments received. Since there is no requirement to restore features or habitats (if at all possible) that may have been destroyed in the past, farms which have carried out large-scale land reclamation, removal of stonewalls etc. may in fact be subject to fewer constraints and management obligations, i.e. ultimately costs, than farms which have retained these features. Consideration should be given, therefore, in future revisions of the REPS provisions to the possibility of paying on a per-unit basis for the satisfactory completion of certain required or desirable works (such as fencing, stone wall maintenance or the maintenance of certain habitat features, including the manual removal of scrub from areas where this has been determined to be of benefit to achieving defined conservation objectives), and of adjusting the basic payments accordingly. Such an approach would be more proactive than the current scheme as payments would linked more clearly to positive management and to achieving quantifiable results.

6.5. Summary of recommendations

1. Development of a conservation strategy for the Burren region which sets out clear and measurable objectives in terms of the desirable extent, quality and distribution of the different habitat types present in the area, and the drawing up of clear guidelines as to how exactly agricultural management could achieve these objectives.

2. Compilation of existing research and traditional agricultural knowledge on the Burren's habitats and their management, with a view to integrating existing knowledge and to planning a coherent programme of future research, in order to generate clear policy objectives.

3. Establishment of a research and monitoring programme in the Burren in order to allow the assessment of the environmental, agricultural and socio-economic effects of the Rural Environment Protection Scheme.

4. Review of the "Conditions for the Conservation of the Burren to be applied under the Rural Environment Protection Scheme" to take account of the specific legal obligations of the Habitats Directive, and implementing Regulations, for the conservation of the sites and species of Community importance in the Burren, including provisions for their restoration to a favourable conservation status.

5. Improved communication between farmers, agricultural planners, ecologists, Dúchas, the Department of Agriculture and Food and independent researchers, possibly within the framework of a regional forum, in order to accommodate the flexible application of the guidelines in the interest of both farm management and conservation.

6. Stricter enforcement of the requirement to involve a qualified environmentalist/ecologist in the drawing up and in the reviewing of agri-environmental plans in respect of proposed NHAs and SACs and of the obligation to refer such plans to Dúchas for comment. This is likely to require increased resources and more staff being allocated to the Regional Wildlife Officer.

7. NHA conditions to be applied under the REPS should be interpreted by the planner for each site and all relevant conditions should be clearly and correctly spelled out in the appropriate sections of the agri-environmental plan.

8. Establishment of an independent advisor or advisory body for the Burren region - incorporating detailed knowledge of the farming systems and the ecology of the area - in order to aid decision-making on a day-to-day basis within the framework of the REPS/NHA conditions.

9. Investigation of approaches to control scrub in a manner which is both cost-effective and does not pose a threat to the habitats and species for which the lands have been designated.

10. Establishment of experimental plots in which to test the different types of approaches to scrub clearance and grazing regimes in terms of their ecological as well as their economic implications.

11. Exploration of the potential for the development of direct marketing initiatives, Community Supported Agriculture (CSA) Schemes and/or a Burren brand for animals produced in the context of conservation management.

12. Removal of the clause of non-additionality of Supplementary Measure A (NHA) and Supplementary Measure 6 (Organic) top-up payments.

13. Consideration to be given, in future reviews of the REPS provisions, to the possibility of paying on a per-unit basis for certain quantifiable required or desirable works with appropriate adjustments of basic payments.

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Appendices

Appendix 1

Conversion Table for Livestock Units

Horse = 1

Cow = 1

Heifer in Calf = 1

Bulls for Breeding = 1

Other Cattle >2yrs = 1

Cattle 1-<2 Yrs = 0.6

Cattle < 1 Yr = 0.4

Sheep = 0.15

Goats = 0.15

Gilts In Pig = 0.3

Sows In Pig = 0.3

Other Gilts & Boars = 0.3

Other Pigs >=80kg = 0.16

Other Pigs 50-80kg = 0.16

Other Pigs 20-50kg = 0.06

Other Pigs <20kg = 0.02

Poultry = 0.004