Understanding High Nature Value Agriculture in the Romanian Carpathians: a Case Study

Sally HUBAND[1] and David I. McCRACKEN[2]

[1] The Macaulay Land Use Research Institute, Craigiebuckler, Aberdeen, AB15 8QH, UK
slhuband@btinternet.com
[2] The Scottish Agricultural College, J.F. Niven Building, Auchincruive, KA6 5HW, UK
davy.mccracken@sac.ac.uk

KEYWORDS:

HNV farming/agriculture, semi-natural grasslands, hay meadows, biodiversity conservation, agri-environment, smallholdings, shepherds

ABSTRACT

The 2.4 million hectares of semi-natural grasslands in Romania can be classified as High Nature Value (HNV) agricultural lands. Descriptions of HNV agricultural systems will assist the process of evaluating the rural development measures that will be used to target financial support towards them. It will not be feasible to describe every HNV agricultural system in detail given the variety that is likely to exist in Romania but case studies can increase knowledge of the ecological importance of certain agricultural management practices and can also draw attention to other key factors that may influence how semi-natural grasslands are used. This article uses a case study of the village of Moeciu de Sus to describe how the diversity and associated high nature conservation value of hay meadow habitats is a direct factor of subtle variations in the low-intensity management of a large number of meadow parcels. The case study also draws attention to the importance of additional factors, such as the role of seasonal pastures and hired shepherding, in enabling the current HNV agricultural system in the village to function.

INTRODUCTION

Romanian semi-natural grasslands remain relatively widespread with an estimated national area of 2.4 million hectares (ha) (MAFRD, 2009). The extensive occurrence of these habitats is an indication of the continued presence of low-intensity agriculture, which can be characterised by low nutrient inputs and low outputs of products per hectare (Bignal and McCracken, 2006). Low-intensity agricultural practices are typically adapted to and constrained by the natural environment. For this reason, many low-intensity agricultural systems in Europe play a crucial role in conserving biodiversity and can be described as being of 'High Nature Value' (HNV). The HNV farming concept[1] is incorporated into the Romanian National Rural Development Plan (NRDP) (MAFRD, 2009) in which 'biodiversity conservation and preservation of High Nature Value farmland' is identified as a priority. The plan also acknowledges that the 2.4 million ha of semi-natural grasslands in Romania can be 'classified as agricultural lands with high natural value'.

The conservation of Romania's semi-natural grasslands and supporting the continuation of the HNV farming systems that sustain them is a significant task considering the large expanses of these habitats. Concern is being raised that agricultural abandonment is already threatening these habitats (Turnock, 2002; Baur et al., 2006; MAFRD, 2009) although clear data on this trend is hard to obtain. Similarly, concern is also being raised with regards to the potential impact of the intensification of agricultural practices on land where this will be possible. Schmitt and Rákosy (2007) predict that the intensification of semi-natural grassland use in Romania through increased levels of fertilisation and mechanisation 'will have fatal consequences for almost all butterfly species of the habitats concerned'. Research detailing the decline of butterflies in regions of Europe where the intensification and abandonment of HNV agriculture has occurred suggests that these concerns are valid (Balmer and Erhardt, 2000; Asher et al., 2001; van Swaay, 2002; Wallies de Vries et al., 2002; Stefanescu et al., 2005; Öckinger et al., 2006; Wenzel et al., 2006).

The Romanian Government has implemented a High Nature Value Grassland agri-environment measure (AEM) as part of the NRDP in an attempt to limit both agricultural abandonment and intensification (MAFRD, 2009). Farmers can voluntarily enter into a five year agreement and receive payments, currently set at €124 per ha, in return for adhering to a specified set of management requirements which include, for example, a ban on the use of chemical fertilisers. Farmers in this measure can also apply for the Traditional Farming option whereby additional payments can be obtained in return for not using any mechanisation.

There is now a pressing need to provide information on High Nature Value agriculture in Romania, to explain the ecological relationships between management practices and habitats such as hay meadows. This level of detail needs to be set within an understanding of the organisation and functioning of the agricultural system as a whole. This will allow the identification of any additional factors that may determine the conservation of hay meadows but which may not be supported by the HNV Grassland AEM. It will not be possible to describe every HNV agricultural system in Romania in detail given the variety that is likely to exist. However, case studies can illustrate why certain types of agriculture act to sustain semi-natural grasslands and can usefully draw attention to some of the additional factors that will also determine the conservation of these habitats.

CHARACTERISTICS OF HNV AGRICULTURE IN THE ROMANIAN CARPATHIANS

Before going into case study level detail of livestock production in a specific village it is useful to set the context by explaining the characteristics of upland livestock production in Romania. This requires a description of the circumstances of the last century which continue to influence the 'structure' of mountain agriculture today. The communist government's attempt to collectivise mountain areas were hindered by the natural constraints of these environments (steep terrain and nutrient poor and thin soils) and the comparatively remote and sometimes dispersed pattern of settlements (Beck, 1976). For this reason, the ten percent of agricultural land that remained in private ownership during communism was predominantly located in upland zones (Kideckel, 1993). In 1985, 2854 mountain villages remained uncollectivised and at this time, an average mountain holding comprised 2.4 ha of land, one to two cows, three sheep, one pig and 15 chickens (Rey, 1985).

Although mountain communities were not collectivised they were still forced to produce for the state. By setting severe quotas, later superseded by contracts, the government claimed the vast majority of a mountain holding's produce. These quotas also disproportionately disadvantaged larger properties thereby encouraging the persistence of small holding sizes. Household members in mountain villages contributed to the 'peasant-worker' labour pool in the state forestry and agricultural sectors or by travelling daily on extensive public transport networks to the nearest industrial centre. The income accrued through employment was used to meet shortfalls in a household's production quota (Beck, 1976; Muica et al., 1999).

The end of communist governance in 1989 and the subsequent loss of jobs in the state forestry, agricultural and industrial sectors increased the reliance of rural communities on subsistent and semi-subsistent food production. More than twenty years later, smallholding based production remains a key component of livelihoods in the mountain areas of Romania. Income is generated 'off-smallholding' where opportunities exist but is generally insufficient for households to relinquish semi-subsistent forms of livestock production (Huband, 2009).

Nationally, 81.3% of all agricultural holdings keep more than 50% of their produce for home consumption and cannot, therefore, be described as commercial[2]. This figure is likely to be representative of the situation in the mountain regions where 85% (815 813) of households own agricultural land. The average size of a non-commercial holding in Romania in 2005 was 2.14 ha and it is probable that this figure is also applicable to mountain smallholdings. Although holding sizes are small, most have access to common grazing resources which are often complexly organised. In 2001, upland livestock production systems accounted for 2.7 million sheep and 934 000 cattle (Rey et al., 2001).

It is important to draw attention to the characteristically small size of mountain holdings and the semi-subsistent, sometimes fully subsistent, nature of production. Smaller holding sizes have been linked to higher numbers of plant and insect species in semi-natural grasslands as

compared to larger farms (see the following section in this article and Marini et al., 2009). This suggests that additional financial support needs to be directed at maintaining small HNV farms or holdings. But as Bignal and McCracken (1996) take care to point out, support directed at HNV farming must not risk perpetuating rural poverty and low standards of living. In general, land in mountain areas is worked because it is a necessity to provide food for home consumption. This necessity will remain in the short-term but in the long term it is likely to decline and the challenge will be to facilitate a transition towards viable and small-scale production systems which can form an attractive component of rural livelihoods. This may mean an inevitable increase in holding sizes which raises the question of how large holdings can become before unacceptable losses in the diversity and associated nature conservation value of semi-natural grasslands occur? These are difficult questions to answer but a good starting point is an analysis of present day HNV agricultural systems.

CASE STUDY: HNV SMALLHOLDINGS IN MOECIU DE SUS

The information detailed in this case study was gathered during periods of fieldwork undertaken in 2004-2006 and is therefore accurate for this period. Data on livestock production was collected using participant observation over the course of 18 months, key informant interviews with individuals in the village and semi-structured interviews undertaken with 19 households as part of an interdisciplinary doctorate examining the role of smallholders in conserving biodiversity (Huband, 2009).

Study location

Moeciu de Sus (25° 19' 46.89″E, 45° 26' 41.83″N) is one of several villages that lie along the Bran-Rucăr corridor, a pass through the Carpathian Mountains that connects Transylvania in the north with Wallachia in the south. The population of the village in 2005 was approximately 1000 with 230 or so households. The village's location in the foothills of the Bucegi Mountains, which are the most accessible mountains to city dwellers in both the county capital (Braşov) and to Bucharest, means that it has become a popular tourist destination.

'Semi-subsistent' production on smallholdings

Despite the income opportunities generated by tourism, it is still a necessity for the majority of households in the village to combine paid employment with producing food for their own consumption. Of 19 households asked whether they sold their products, three sold them outside of the village on an established commercial basis (directly at a market and to a 'middle-man'), one sold produce on the road-side at a popular tourist spot and 15 kept the majority of their produce for home consumption which includes for use in their own tourist accommodation where relevant. Some of these 15 admitted to selling milk informally within the village in low quantities at a litre or so per time to neighbours on an ad hoc basis[3]. In 2006, 20 households (less than 10% of the households in the village) sold milk to the local collector (also based in the village and supplying a milk processing unit in Braşov) as few had sufficient surplus to warrant this and also because small ad hoc sales are more flexible and generate higher prices per litre. This would suggest that most households produce for their own consumption but is not conclusive as we were unable to survey each household to understand the 'destination' of dairy products.

Smallholdings vary in their size according to the labour capacity of the household[4] but are typically less than three hectares. Cumulatively however, the 230 or so smallholdings in the village sustain approximately 700 hectares of hay meadows. Cattle herd sizes are very small, usually between two and four. Sheep flock sizes, in non-shepherding households, are less than ten if any are kept at all. Sheep numbers may exceed 100 in the minority of households that specialise in sheep production. The smallholding land is dedicated to the production of hay, necessitating the movement of livestock away from the village in the summer months. The number of livestock in Moeciu de Sus (circa 450 cattle and 2000 sheep) exceeds the capacity of the four local mountain pastures (three of which are in public administration and one of which is privately owned) and approximately 100 cows and 1000 sheep are sent (by lorry in the case of cattle or by foot for sheep) to one of several, often privately owned and leased, pastures in the lowlands during the summer months.

Meadow biodiversity

Two studies indicate the HNV of the smallholdings in the village. A study of the village hay meadows and the meadows of a neighbouring village in 1998 using the Braun-Blanquet method of classification identified 11 different plant communities (Tok, 1998). Three of these plant associations are listed as being of European Community interest under the Habitats Directive (including mountain meadows - Natura 2000 code: 6520; acidophilus mountain Nardus pastures - Natura 2000 code: 6230; basiphilous active peats - Natura 2000 code: 7230) (Tok, 1998; Sârbu et al., 2004). The meadows also harbour 12 species of plant listed as rare or vulnerable on the Romanian Red List of Vascular Plants (Tok, 1998; Sârbu et al., 2004). During fieldwork by the lead author in the village in the summers of 2005 and 2006, 46 species of butterflies were recorded on eight transects located in predominantly meadow habitats, three of which are listed as vulnerable on the Romanian Red List of Butterflies (Schmitt and Rákosy, 2007; Huband, 2009).

Land management practices and meadow biodiversity

The species richness of the village meadows results from the variations in the low-intensity management of a large number of small meadow parcels. Dung only is used to fertilise the meadows and there is rarely enough dung to fertilise a whole meadow each year. Nutrient inputs remain relatively low providing the conditions in which a variety of plant species associated with semi-natural grasslands can exist. In general, the lower meadows receive higher inputs of dung and are cut twice per summer whilst higher meadows are less well dunged. Higher meadows are cut only once but may provide an important grazing resource in the spring or autumn. However, this is only a general pattern of meadow use and it is common that two neighbouring meadows may receive differing levels of dung resulting in abrupt changes in vegetation types at meadow boundaries.

In combination with variations in the natural environment, variations in low-intensity meadow management practices (level of dunging, duration of grazing (if any) and the timing and number of hay cuts) results in an intricate mosaic of vegetation types and heights throughout the summer and provides a wide range of niches for plant and invertebrate species with differing ecological requirements. This mosaic is enhanced by the fragmented nature of smallholdings, each of which is divided into several small parcels of meadow that are rarely contiguous in their location (a consequence of inheritance, marriage and straight sale). In Moeciu de Sus there are several hundred separate small parcels of land each managed in subtly different ways but all at a low-intensity.

Pastures

As previously emphasised, pastures free up the smallholding land and labour for the production of winter fodder and, as such, also act to indirectly influence the use of meadows.

On June 1st, or thereabouts, villagers walk their cattle up to the higher pastures in the vicinity of the village or organise transportation by lorry to lowland pastures. The situation for sheep is somewhat different in that they are collected en masse by shepherds in April to be walked to the lowlands where they graze until late May. In June they join the cattle on the summer pastures but are also grazed on lowland arable stubbles from early October until the first fall of snow when they return to the village to be barn kept, with the cattle, on the smallholding.

The three locally administered common grazings are rented on an annual basis by individuals from a small pool of households specialising in professional shepherding and sheep production. However, in the last few years the lease of one of these pastures has been taken by a non-shepherd who is the village milk collector. To rent a common grazing, applicants have to state how much they will charge smallholders in the form of a grazing tax per animal and how much cheese each livestock owner will receive in return for each litre of milk their livestock produce, as measured on a specific day in July. For example, 1 litre of milk may equate to 8 kg of hard cheese (*brânză* – a matured version of *caş*) and 2 kg of soft cheese (*urdă*). If a cow produces 8 litres of milk on the day of measurement, the owner will therefore receive 64 kg of hard cheese and 16 kg of soft cheese for the duration of the grazing period (June 1st to October 1st) for that one animal. The income of the shepherds who lease the pastures comprises the

money that remains from the grazing tax and the sale of surplus cheese, after the payment of hired shepherds.

The tenure of each common grazing can change from year to year should an application not be renewed or, less frequently, if an application is rejected by public vote (villagers vote at a public meeting in the village hall in March to decide which applicant can rent each common pasture). A shepherd may be voted off a pasture if the villagers are displeased with the service they received in a previous year. This has occurred in the past when a pasture has been overstocked (disregarding local regulations) resulting in low returns of cheese. After the tenancies have been secured, the successful shepherd then employs further shepherds for the tasks of herding the livestock and producing the cheese.

The shepherds that secure the lease of pastures, both common grazings and privately owned, report the increasing difficulty of hiring men who are sufficiently skilled. Shepherds can now find better paid work and working conditions either as shepherds in other countries such as Italy or in different sectors such as construction. The difficulty of obtaining skilled labour was felt by one pasture renting shepherd to be *the* factor that will determine the future of livestock production in the village.

Pasture management

In a neighbouring village, smallholders recall a past obligation to contribute time to the management of the common grazings (pulling weeds and saplings) grazed by their livestock (see Netting (1976, 1981 and 1990) for a description of communal pasture management occurring in the Swiss Alps in the 1970s). This practice is reported to have ceased as a consequence of mayoral candidates trying to increase their popularity in pre-electoral propaganda. Few people recall this obligation in Moeciu de Sus indicating that, if it was in place, it was either abandoned many years previously or that it was poorly enforced. At present, monitoring of the condition of the pastures is negligible as is the control of invasive weed and tree species as shepherds have sufficient time for a task which may once have involved the labour of many people. This leads to the question as to whether the pastures are also managed in such a way as to be beneficial for the biodiversity of these exclusively grazed semi-natural grasslands. To a certain extent, pastures must be managed sustainably otherwise returns of milk and cheese would become unacceptably low. Although the examination of the pasture biodiversity was beyond the scope of this work, it is also important to gauge the HNV (or not) of the grazing element of HNV livestock productions systems in which species rich meadows are the focus of conservation efforts.

DISCUSSION

The small size and fragmented nature of holdings, the low-intensity of meadow management practices and the important role of pastures, which are often complexly organised commons, are key factors that sustain the biodiversity of meadows in Moeciu de Sus. Using this knowledge as a starting point, it is possible to discuss the potential of support policies such as the HNV Grassland AEM. Time and funds have not allowed a revisit of the village to assess the uptake and acceptability of this measure and the section that follows has not, therefore, been 'grounded' by interviews with villagers. Nevertheless, it is possible to make some general observations.

With payments of €124 per hectare, entry into the voluntary agri-environment measure is an attractive option and requires little if any change in meadow management practice[5]. The villagers have no spare capital with which to buy chemical fertilisers, for example, and no real need because production is oriented towards home consumption and the current holdings sizes can provide sufficient outputs for a household's requirements. In Moeciu de Sus, the negative experiences of applying nitrates as fertilisers to the land for a brief period in the 1980s would suggest that, in the short term at least, smallholders would not seek to use chemical fertilisers if they became affordable. In 2006, of the 18 smallholders in the village who answered the question 'would they use chemical fertilisers if they could afford to?' four answered maybe or yes. Out of this group, one individual explained that the development of chemical fertilisers has improved since the 1980s. Of those that said no, some asked why this would be necessary when dung works so well, 'we would be spending money pointlessly'.

In the HNV Grassland AEM there is a requirement that the first cut of hay can be taken only after July 1st. Even at the relatively high altitude of 1000m, lower meadows in Moeciu de Sus are cut, weather allowing, before this date. Prohibition of higher levels of fertilisation alone, in many cases, may be sufficient to prevent early cutting of meadows in a mountain setting. The sequential cutting of a smallholding's meadows by altitude and the absence of chemical fertilisation (or high levels of dunging) and mechanisation (therefore lengthening the duration of the hay making process) should be sufficient to ensure that late seeding plants and late flying butterflies will thrive in some locations.

The cutting date requirement is probably more suitable for lowland hay meadows but even here, could act to homogenise spatial and temporal vegetation mosaics, lowering plant and insect species diversity. Ideally, it would be better to tailor management prescriptions to local conditions but incorporating flexibility into the design of AEMs is constrained in Romania by the need to monitor compliance with management prescriptions, a formidable task considering the characteristically small size of holdings. Eligible parcels of land in the HNV Grassland AEM may be as small as 0.3 hectares, as long as the total amount of land entered into the scheme is at least one hectare (MAFRD, 2009).

Nevertheless, the HNV Grassland AEM should provide welcome income to the smallholders in Moeciu de Sus that are able to access this measure for their smallholding land. It is less clear as to how this measure may or may not be supporting the shepherding and pasturing element of the livestock production system. The 'Traditional Farming' add on measure recognises the labour inputs required to mow meadows by hand. But there is no support for the labour required to herd livestock, in contrast to the situation in Bulgaria where this is included as part of an agri-environment measure in certain regions. Supporting the shepherding element of the system, whether through AEMs or other forms of support, is vital for livestock productions systems in which this is a key component.

Similarly, it is difficult to see how the HNV Grassland AEM can address the support of pasture management and commons in particular. No mention is made of commons in the outline of the AEM but is set out in the 'Support for Mountain Areas'[6] measure in the NRDP. This contains the stipulation that the 'financial support granted for common land used by more farmers as pasture could be granted to each farmer pending on the legal right to use the land or could be granted to farmers representatives'. However, there is still a five year tie in which might preclude the average smallholder in Moeciu de Sus from receiving these payments and even the shepherds that rent the commons.

The ability of smallholders to annually determine, by vote, which shepherd rents which common provides them with some leverage if they become dissatisfied with the care of their stock, the management of the pasture or the quality of the cheese produced. It may also act to ensure that the grazing taxes charged by the shepherds remain competitive. Furthermore, unless regulations are in place and enforced to ensure that the places for smallholder's livestock are guaranteed, more security of tenure might encourage shepherds to increase their own herd sizes and profitability. This could result in the 'de facto privatisation' of common land and privately owned pastures also used for communal herding (see Myrvang Brown, 2007 and McKenna et al., 2007). There is therefore an urgent need to undertake an assessment of how both shepherding and the use of commons can be supported, if this is not already occurring, as this will be vital to the viability of many HNV livestock production systems in the Romanian Carpathians.

It is also important to explore and acknowledge the role that socio-cultural factors have to play in sustaining HNV agriculture in Romania. At first glance the communal herding of livestock may be seen to represent a high level of cooperative action amongst villagers in Moeciu de Sus but in reality, examples of cooperative action outside of family networks are few. Neither smallholders nor shepherds in Moeciu de Sus belonged to an association in 2006 and the capacity to feed back into the policy development process or more changes in local administration changes were very limited. The need for a representative association is not recognised as being of relevance by smallholders whose attitudes towards the implementation of policies that will affect their smallholding can appear almost fatalistic. Villagers may recognise that their way of production may be threatened, particularly in terms of the hygiene

elements of the cheese production process on the summer pastures, but see influencing policy as being outside of their control.

Memories of coercive socialist land use policies are still at the forefront of many people's minds even in areas that were not collectivised and can be argued to be at the core of the resistance to cooperative action (Muica and Turnock, 2000). In Moeciu de Sus, a lack of trust is given by some villagers as a reason for not forming small producer groups that could access certain rural development support measures. Compounding the lack of a strong 'civil society' amongst groups of smallholders and shepherds is the ineffectual trickle down of policy and administrative information to the household level. In 2010, some of the householders in Moeciu de Sus accessing the €124 per hectare payment for the HNV Grassland AEM had no understanding of the purpose and rationale underlying the payment. Increasing awareness amongst mountain livestock producers of the many public goods, not just the conservation of biodiversity, that low-intensity agriculture provides could act to increase pride and add cultural value to this type of production.

It is already a matter of pride in Moeciu de Sus to be seen to be managing your hay meadows and livestock well. The term for smallholder, *gospodar* (masculine) and *gospodină* (feminine), can be used as a compliment to describe someone who is a good manager. Kideckel (1993) similarly observed that 'Labour was the major source of regional identity and the prime criterion of respect' and 'all households, regardless of wealth, were respected as long as their members worked hard, cared for their land and resources, and were honest and forthright in economic and social relations'. At present in Moeciu de Sus, this cultural attitude still pervades, and it is common to hear a person without paid employment, and even some with, refer to their smallholding as their job, often with pride.

In Moeciu de Sus, smallholders see themselves as clearly distinct from that of a farmer, a term that is applied to the owners of larger holdings who produce for the market. In this sense, a smallholder's identity is not tied up per se in the yields of hay, milk or cheese that they are producing. It is intertwined with the good management of resources and to a certain extent, self sufficiency and the survival of the household. The symbolic importance, in some cases, of smallholdings as the constant in the lives of villagers, also engenders notions of stewardship. Land must be kept and passed on in good condition to the next generation and to a certain extent this may provide a 'cultural brake' on the abandonment of smallholding based production. On this note, it is also important that policy 'speaks to' *smallholders* and *shepherds* and includes these terms along with that of *farmer*.

At present, being a smallholder, or shepherd, is the norm in the village. These self-identities are generally robust even when villagers are closely exposed to tourists of far greater wealth and leisure time than their own. It is not uncommon for smallholders or shepherds to report with derisive humour, the often derogatory and 'ignorant' comments made by visitors from urban areas. However, it is difficult to imagine that this robustness will remain should the majority of people abandon pastoralism. This is yet another reason for raising the profile and status of this type of production both amongst smallholders and shepherds as well as the wider public.

CONCLUSIONS

There are a variety of HNV agricultural systems in the Romanian mountains and this case study is illustrative of the situation in just one village. Venture into a neighbouring village and the system alters again with commons located in the heart of the village negating the need for the same level of herding. Nevertheless, the case study draws out some useful points. Firstly, it illustrates how the biodiversity of the meadows is a factor of the idiosyncratic low-intensity management of a large number of small meadow parcels in combination with variations in the natural environment. This creates the temporal and spatial heterogeneity in the meadow habitat that is necessary to support a large number of plant and invertebrate species, many of which have contrasting inter (and often also intra) specific ecological requirements.

Secondly, the case study illustrates that hay meadows are just one element of the production system and that it is also important to understand, for example, the importance in this case of pastures, particularly common grazing resources, and hired shepherding, Finally, this case

study urges the consideration of socio-cultural factors that may also impact on the viability of HNV agriculture and calls for the raising of awareness of the many public goods provided by low-intensity forms of production amongst the smallholders, shepherds and farmers themselves as well as the general public.

In the short term, the economic situation in Romania will maintain the pressure for people to continue to produce food for their own table. Large amounts of semi-natural grasslands will continue to be conserved, whether or not they are entered into the HNV Grassland AEM. However, in the medium and long term, this measure alone will be insufficient to maintain the social and economic viability of HNV livestock production in Romania's mountains. Support measures need to be able to facilitate a change from production out of necessity to production which provides a viable and attractive component of livelihoods in mountain areas. Case studies will be an important part of this process and can help to understand HNV agricultural systems and act as a tool with which to evaluate the effectiveness of current and 'in development' support measures.

ACKNOWLEDGMENTS

This research was funded by an ESRC/NERC Interdisciplinary studentship hosted by the Scottish Agricultural College, the University of Edinburgh and the Centre for Mountain Ecology in Romania. The lead author is currently based at the Macaulay Land Use Research Institute and is grateful for being given the time to write this paper. The lead author would also like to thank the European Forum on Nature Conservation and Pastoralism for enabling her attendance at the 'Mountain Hay Meadows: Hotspots of Biodiversity and Traditional Culture' conference. Thanks to the Orleanu and Robu families for their invaluable help during the doctoral research and to the villagers of Moeciu de Sus who helped in this research.

REFERENCES

Asher, J., Warren, M., Fox, R., Harding, P., Jeffcoate, G. & Jeffcoate, S., 2001 - *The Millennium Atlas of Butterflies n Britain and Ireland*. Oxford University Press, Oxford.

Balmer, E. & Erhardt, A., 2000 - Consequences of Succession on Extensively Grazed Grasslands for Central European Butterfly Communities: Rethinking Conservation Practices. *Conservation Biology* 14, 746-757.

Baur, B., Cremene, C., Groza, G., Rakosy, L., Schileyko, A. A., Baur, A., Stoll, P. & Erhardt, A., 2006 - Effects of abandonment of subalpine hay meadows on plant and invertebrate diversity in Transylvania, Romania. *Biological Conservation* 132, 261-273.

Beck, S., 1976 - The emergence of the peasant-worker in a Transylvanian mountain community. *Dialectical Anthropology* 1, 365-375.

Bignal, E.M. & McCracken, D. I., 1996 - Low-intensity farming systems in the conservation of the countryside. *Journal of Applied Ecology* 33, 413-424.

Huband, S., 2009 - The Role of Romanian Pastoralists in Conserving Agricultural Biodiversity. Doctoral Thesis. University of Edinburgh.

Kideckel, D.A., 1993 - *The Solitude of Collectivism*. Cornell University Press, New York.

MAFRD, 2007- Draft National Rural Development Programme 2007-2013 March 2007 version, Romanian Ministry of Agriculture, Forestry and Rural Development, Bucharest

MAFRD, 2007 - Draft National Rural Development Programme 2007-2013 July 2007 version, Romanian Ministry of Agriculture, Forestry and Rural Development, Bucharest

MAFRD, 2009 - National Rural Development Programme 2007-2013, December 2009 Consolidated Version, Romanian Ministry of Forestry Agriculture and Rural Development, Bucharest

Marini, L., Fontana, P., Klimek, S., Battisti, A., Gaston, K., 2009 - Impact of farm size and topography on plant and insect diversity of managed grasslands in the Alps. Biological Conservation. 142, 394-403

McKenna, J., O'Hagan, A. M., Power, J., MacLeod.M. & Cooper, A., 2007 - Coastal dune conservation on an Irish commonage: community-based management or tragedy of the commons? *The Geographical Journal* 173, 157-169.

Muica, N., Roberts, L. & Turnock, D., 1999 - Transformation of a border region: dispersed agricultural communities in Brasov County, Romania. *GeoJournal* 46, 305-317.

Myrvang Brown, K., 2007 - Reconciling moral and legal collective entitlement: Implications for community-based land reform. *Land Use Policy* 24, 633-643.

Netting, R. 1976 - What Alpine Peasants Have in Common: Observations on Communal Tenure in a Swiss Village. *Human Ecology* 4, 135-146.

Netting, R. 1981 - *Balancing on an Alp*. Cambridge University Press, Cambridge.

Netting, R., 1993 - *Smallholders, Householders*. Stanford University Press, Stanford.

Öckinger, E., Hammarstedt, O., Nilsson, S. G. & Smith, H., 2006 - The relationship between local extinctions of grassland butterflies and increased soil nitrogen levels. *Biological Conservation* 128, 564-573.

Rey, R., 1985 - *Civilizatie Montana*. Editura Stiintifica si Enciclopedica, Bucuresti

Rey, R. Vasile,A; Zvoristeanu,A., Stef,T., Agapi,I., Rusu,M., 2001 - *Romanian Carpathians: Summit on Environment and Sustainable Development in the Carpathian and Danube Region*. Ministry of Agriculture, Food and Forests, Bucharest.

Schmitt, T. & Rákosy, L., 2007 - Changes of traditional agrarian landscapes and their conservation implications: a case study of butterflies in Romania. *Diversity and Distributions* 1-7.

Tok, N., 1998 - *Vegetationsökolgische Untersuchung en Montaner Wiesen de Westlichen Ausläufer des Bucegi. Gebirges, Rumänien.* Masters Thesis Universität Münster.

Turnock, D., 2002 - Ecoregion-based conservation in the Carpathians and the land-use implications. *Land Use Policy* 19, 47-63.

Sârbu, A., Gheorghe, C., Gavril, N., Vasile, C., Jenica, H. & Veen, P., 2004 - Grasslands of Romania pp. 1-67. University of Bucharest, Bucharest.

Stefanescu, C., Peñuelas, J. & Filelle, I., 2005 - Butterflies highlight the conservation value of hay meadows highly threatened by land-use changes in a protected Mediterranean area. *Biological Conservation* 126, 234-246.

van Swaay, C.A.M., 2002 - The importance of calcareous grasslands for butterflies in Europe. *Biological Conservation* 104, 315-318.

Wallies de Vries, M.F., Poschlod, P. & Willems, J. H., 2002 - Challenges for the conservation of calcareous grasslands in northwestern Europe: integrating the requirements of flora and fauna. *Biological Conservation* 104, 265-273.

Wenzel, M., Schmitt, T., Weitzel, M. & Seitz, A., 2006 - The severe decline of butterflies on western German calcareous grasslands during the last 30 years: A conservation problem. *Biological Conservation* 128, 542-552.

[1] For a full explanation of the High Nature Value farming concept see the European Forum on Nature Conservation and Pastoralism's 'HNV farming: Explaining the concept and interpreting EU and national policy commitments http://www.efncp.org/download/EFNCP-HNV-farming-concept.pdf (last accessed July 2010).

[2] Unless stated otherwise, cited statistics in this section were obtained from the March 2007 and July 2007 drafts of the National Rural Development Programme for Romania (2007-2013): http://www.maap.ro/pages/page.php?self=03&sub=0302&tz=030202 (last accessed July 2010)

[3] These findings may not be representative of patterns of production in the village as a whole given the small sample size.

[4] The older generation are particularly important in the day-to-day running of smallholdings in Moeciu de Sus. An important point when considering that there are measures in the NADR aimed at encouraging succession of holdings to 'younger farmers', a policy that would be inappropriate in the smallholding setting.

[5] For the list of the management requirements see pages 277 and 278 of the National Rural Development Programme, consolidated version, December 2009 available at: http://www.maap.ro/pages/page.php?self=03&sub=0302&tz=030202 (last accessed July 2010)

[6] See page 268 onwards of the National Rural Development Programme, consolidated version, December 2009 available at: http://www.maap.ro/pages/page.php?self=03&sub=0302&tz=030202 (last accessed July 2010)

Mountain hay meadows: hotspots of biodiversity and traditional culture, Ed. Barbara Knowles, Society of Biology, London. ©Pogány-havas Association 2011.