

Research Article

FROM FREE GRAZING TO FLOCK MANAGEMENT: A CASE STUDY FROM SWITZERLAND

Daniel Mettler*, Daniela Hilfiker *AGRIDEA, Avenue des Jordils 1, CH-1006 Lausanne, Switzerland.*

1. Introduction

In a world of constant evolution, changes in agricultural practice are influenced by various factors. Environmental, socio-economic and psychological aspects all play a role. In regions where eradicated predators are now returning thanks to more stringent protection provisions, livestock owners are once more faced with change processes¹. Shaping and guiding such processes represents a challenging task for administrators and

advisory service providers. This task is subject to political decisions, and decision-makers may adopt either a sceptical or a positive approach. The canton of Valais in Switzerland provides an example of how wolf management and agricultural policy can impact practices in the area of small livestock farming as part of such long-term processes. It also demonstrates the relationships between various factors which can influence change processes.

*Corresponding author: daniel.mettler@agridea.ch

¹ In an agricultural context, the term “change processes” refers to the evolution of agricultural practice influenced by a complex setting of various economic, environmental and social aspects.

2. The impact of the wolf on sheep farming

Individual wolves have dispersed to Valais from France and northern Italy since 1995. They first arrived in French-speaking Lower Valais (Fig. 1), but later also spread to the German-speaking eastern region of the canton.

During the period from 2003 to 2012, the number of wolves was within the range from 3 to 12 individuals. Since the establishment of the first wolf pack in 2012, however, the number increased rapidly (Fig. 2) (KORA, 2016).

The traditional system of free grazing on Alpine meadows in summer with livestock checked at least once a week is an important part of the grazing and production cycle in Valais. This system of low control, which had been practiced for decades, was suddenly confronted with the “wolf factor”. Before the wolf returned, sheep numbers had increased in Switzerland and by the mid-1990s exceeded 400,000: a level that had not been seen since the 19th century. Agricultural policy as well as the process of industrialisation, which made it economically possible to continue sheep farming as a side-line enterprise, had contributed to this development. However, it soon became clear that this system of grazing was not compatible with the presence of large carnivores. The following key questions have thus been posed from the moment the wolf returned to Switzerland: How can sheep farmers adapt to the new situation and are they willing to do so?



Fig. 1. Cantons of Switzerland. The designation of the lower cantons, where wolves have arrived and established, is as follows: BE – Bern, FR – Fribourg, GR – Graubünden, LU – Luzern, TI – Tessin, VD – Vaud, VS – Valais. (Source: BFS – Federal Office of Statistics).

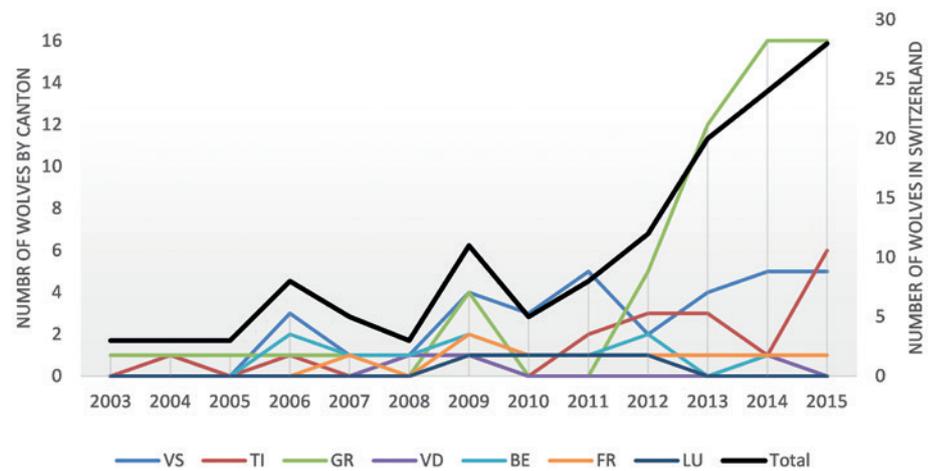


Fig. 2. The number of wolves in Switzerland between 2003 and 2015. Each canton is represented by a different colour and the total number of wolves in Switzerland is shown in black (VS – Valais, TI – Tessin, GR – Graubünden, VD – Vaud, BE – Bern, FR – Fribourg, LU – Luzern) (Source: KORA, 2016).

This article outlines four key factors that have had an impact on change processes in Alpine sheep meadow management since the return of the wolf to the canton of Valais and shows how these changes can be positively influenced and guided. A comparison is then made between national and regional developments in the canton of Valais between 2003 and 2015.

3. Factors affecting change processes

3.1. Psychological: dealing with risk and uncertainty

All operational changes are underpinned by decisions that are triggered by several motivating factors. The presence of the wolf, the experience of having wolf attacks and the perceived risk of losing livestock provide the impetus both for taking short-term preventive measures and implementing long-term changes in farming practices. Economic, cultural and environmental factors play different roles in the case of full-time livestock farmers versus small livestock farmers operating their businesses as a side-line enterprise. This leads to different strategies that may include giving up the business completely, expanding and professionalising the enterprise, changing the livestock kept, adjusting the division of labour or adopting different production methods. The willingness to respond flexibly to a new threat or challenge is decisive. The exchange of advice, provision of support and transfer of knowledge between scientists, administrators and those working on the ground are also important for shaping sustainable changes (Tanner, 2006).

3.2. Socio-economic: structural changes in agriculture

Continuous structural change has affected farm size as well as the economic, environmental and symbolic significance of sheep farming in family businesses for the last 20 years. In addition, the agricultural sector is undergoing a generation change, with a slow shift in values influencing underlying motivating factors and attitudes towards agriculture and nature. These phenomena affect both large, full-time enterprises and small-scale operations. The economisation of everyday

farming activities, different demands from consumers and tourists, increased levels of mobility and the intensive use of rural areas by an increasingly urbanised society have changed how farms operate on a daily basis. The importance of landscape conservation and the cultural value of local breeding traditions have also increased relative to the significance given to agricultural production. Symbolic, cultural and identity-forming factors thus remain important even though it is becoming increasingly difficult to maintain work-intensive small livestock farming activities with the younger generation. A long-term trend can be observed in sheep farming: the number of small farms is in decline, while the number of large enterprises is slightly increasing thanks to agricultural policies that aim to support more efficient and professional production.

3.3. Environmental: biodiversity and grazing management

As a result of structural changes in agriculture, there has been an increase in woodland cover in areas no longer farmed. In southern Alpine regions, in particular, there has thus been an expansion of habitats suitable for wildlife. The level of vegetation encroachment has increased at lower and medium altitudes, whereas above the tree line sheep flocks have become more concentrated during summer months. In Switzerland in the 1990s, sensitive vegetation zones in high mountains were subject to local overgrazing due to a lack of herd management. This triggered a debate about the environmental significance of sheep grazing on alpine pastures. At the same time, a gradual 'greening' of the agricultural sector also saw an increase in the significance of aspects relating to biodiversity.

It was for these reasons that a new Ordinance on Summer Pasturing Subsidies was introduced in 2000, which differentiates between three grazing systems: 1) free grazing²; 2) rotational grazing³; and 3) permanent shepherding⁴. These three systems are now supported with different levels of subsidy with the objective of promoting rotational grazing and permanent shepherding in order to improve the quality of sheep production and biodiversity. When the Ordinance was introduced, the financial incentives were 100, 250 and 350 Euros per livestock unit (LU) put to summer pas-

² No flock management and at least one check of sheep flock once a week.

³ Sectoral grazing with fences or natural barriers and pasture change every two weeks.

⁴ Management by shepherd with controlled grazing and overnight places.

ture, respectively. Within the framework of the new agricultural policy for 2014–2017, the amounts for controlled grazing have been increased to CHF 320 (350 euros) for rotational grazing and CHF 400 (440 euros) for shepherded and protected Alpine pastures.

3.4. Political: wolf management and flock protection

For several years, agricultural policy prevented changes towards the liberalisation and greening of the agricultural sector. Against the backdrop of this rather conservative context, a cautious wolf policy emerged that, in adopting both a pragmatic and sceptical stance towards the return of the wolf, has shaped the framework for the management of wolves and protection of flocks. Thanks to legislation on compensation payments, flock protection and wolf regulation, financial support for livestock farmers has been secured over the long term. While this means that changes can be implemented on a sustainable basis, it will nevertheless not be enough if other factors do not have a positive impact on developments.

Where change processes are perceived to represent progress, even conservative rural areas have shown themselves willing to actively push forward with changes. However, if changes are viewed as a backwards step, and this is often the case in connection with the return of the wolf, very little willingness is shown at the beginning of the process in terms of adopting behavioural changes. In rural areas, a negative attitude towards economic pressure and additional work is linked to the general tendency in agriculture to increase farm size and profitability (Mack and Flury, 2014). Within this context, resistance to changes can develop at any time.

Despite such inhibiting factors, a gradual change has been observed over the past 15 years. This has been strongly shaped by financial incentives as part of national policy as well as changes at an operational level such as generation changes or new owners.

4. Participatory management: Alpine sheep meadow planning in Valais

In 2012, the canton of Valais and the Federal Office for the Environment commissioned an analysis of sheep summering in the Valais region. The objective

was to clarify questions relating to management and protection of flocks within the framework of a comprehensive Alpine sheep meadow plan. A conscious decision was taken to select a participatory approach in order to incorporate the key players in the area of Alpine farming. This mandate was performed between 2012 and 2014 by Agridea – Swiss Association for the Development of Agriculture and Rural Areas, supported by a steering committee comprising representatives from the spheres of agriculture, wildlife management and forestry. The adopted approach was viewed as pioneering in Switzerland and has helped the canton to implement longer-term flock protection measures. The exemplary character of this project also illustrates how the aforementioned factors can impact individual behavioural changes and collective processes.

In applying a participatory approach, the objective was to work together with Alpine farmers and shepherds to establish the basis for optimising farming activities and conditions for flock protection. This included recording the grazing perimeters, drawing up a rough grazing plan, calculating the forage yield, documenting existing infrastructure and identifying ownership and herd structures (Fig. 3). The results, summarized below, should serve to help make structural improvements and create the framework for facilitating flock protection measures and optimizing grassland management. Responsibility for the implementation of the recommendations lies with the cantonal Department for Agriculture, which together with the regional advisory services will work with farmers to flesh out the recommended measures and implement these over the coming years (Mettler et al., 2014).

4.1. Summered sheep

Half the 50,000 sheep summered in Valais graze freely (continuous grazing), while 14% graze on a rotational basis and 37% are shepherded on Alpine meadows. The vast majority of the 155 Alpine meadows provide summer pasture for between 150 and 450 animals. On 35 Alpine meadows (23%), the number of animals exceeds 450. This is the minimal size to hire a shepherd with an appropriate salary. Most Alpine meadows are owned by public communities or alliances (cooperatives in Upper Valais). Almost one third of Alpine meadows are farmed by a single farmer, with a further third utilised by more than five. In Upper Valais, primarily white Alpine and Black Nose sheep

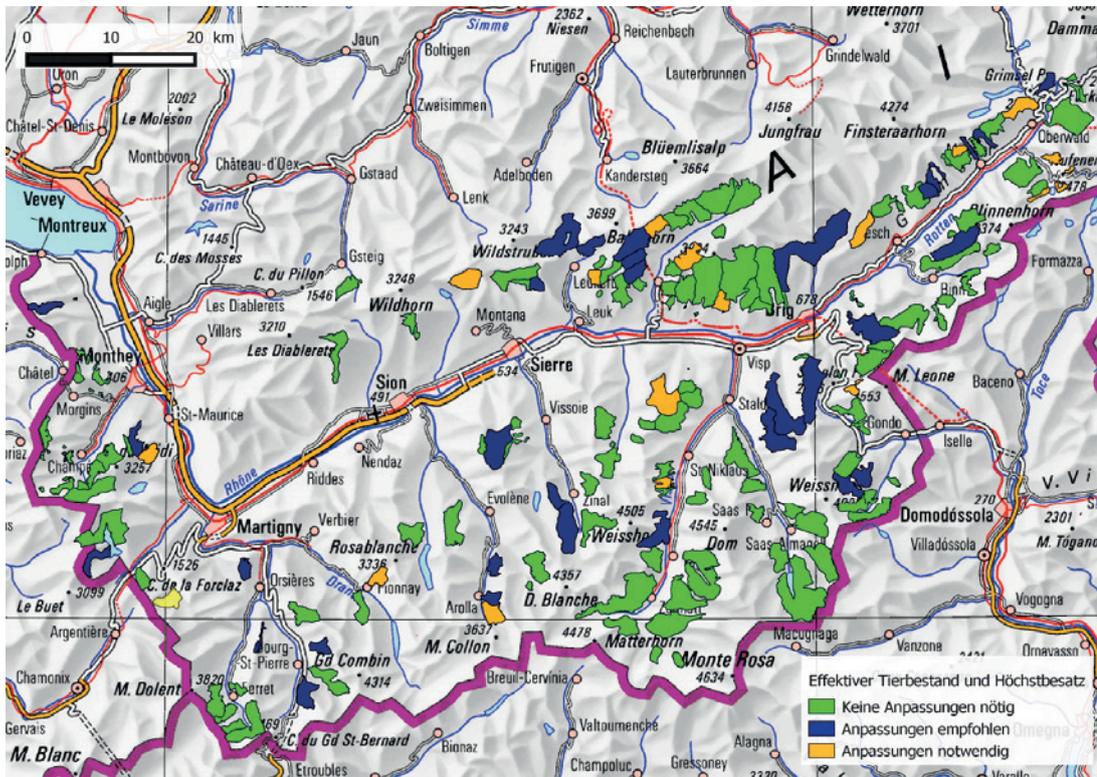


Fig. 3. Alpine sheep meadow plan (Source: Agridea). Alpine perimeters have been defined and classified in three different categories of flock management (green – no change of herd size recommended; blue – change of herd size and management recommended; orange – obligation for change of herd size and management).

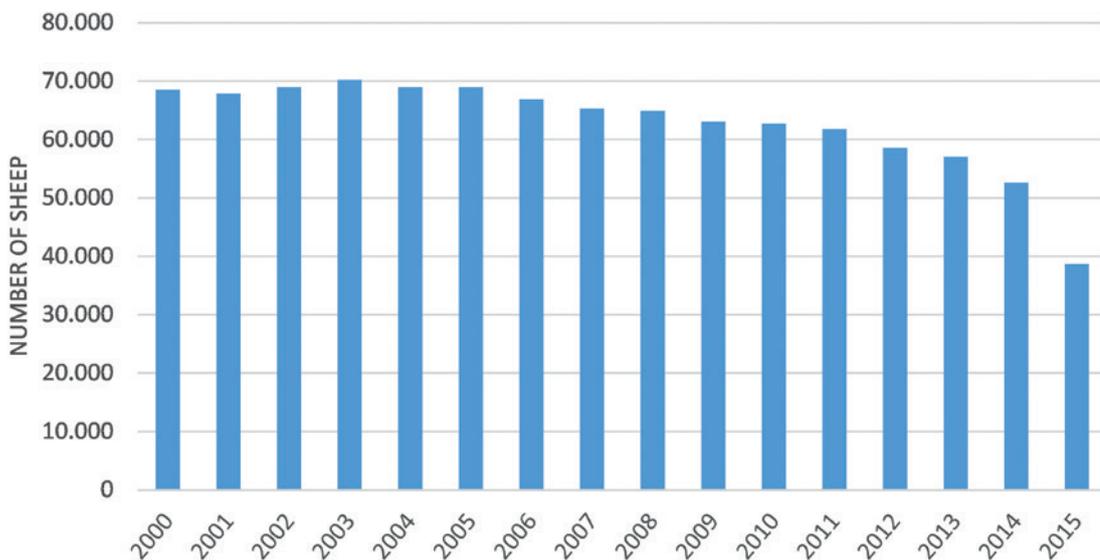


Fig. 4. The total number of sheep kept in the canton of Valais between 2000 and 2015. The decrease between 2014 and 2015 is partly due to changing the date of data collection from June to January (Source: Swiss Federal Office of Statistics).

are put to summer pasture, while in Lower Valais there are predominantly white Alpine sheep and a variety of fattening stock. The summer grazing period lasts between 70 and 150 days. Despite regional differences, the number of animals put to summer pasture has been on the decline for several years (Fig. 4).

4.2. Cultural differences

Sheep farming in Valais is characterised by cultural differences which manifest themselves along the language frontier between the French and German-speak-

ing regions. There are significant differences in terms of sheep breeds and husbandry systems. This is reflected in the infrastructure and tradition of shepherding as well as in the breeding criteria. While in Upper Valais high socio-cultural and environmental significance is attached to the farming of Black Nose sheep, in Lower Valais greater importance is assigned to economic criteria when rearing sheep. Although this cultural divide is evident in the areas of agriculture and livestock farming, the wolf debate represents a common denominator.

Since the rise of industrialisation in Upper Valais,



traditional subsistence farming has been replaced by the “working farmer” approach, leading to a change in the importance of agriculture. A living income is now guaranteed by jobs in the industrial sector, while work in agricultural enterprises has more socio-cultural significance. Breeding criteria relating to an animal’s outward appearance became more important than considerations of productivity. Traditional sheep markets and shepherd events have thus increased in significance.

These traditions are unique in Switzerland in terms of their form and the frequency with which they occur. Within this seasonal rhythm, the work of shepherds is thus geared towards the traditional sheep market, which usually takes place during autumn. At this time, a village and its surrounding region come together to celebrate at a livestock show and subsequent convivial gathering. It is for this reason that the Black Nose sheep is one of the most important symbols of the Upper Valais iden-



Black Nose sheep, typical breed of Valais.
Photo: Agridea.

tity. The enormous effort put into breeding these animals is driven by competition as well as social prestige.

In Lower Valais, even larger farms (more than 150 ewes) can be found at which lamb meat production still represents an important source of income. In some cases shepherds are employed, while in others the flock owners themselves go to the Alpine pastures. The summer grazing period tends to be longer as meadows are at lower elevations. Lower-lying Alpine pastures are

used more intensively and have relatively good access. Alpine lodgings can be found at most locations. Sheep farming is less tied to the major industrial enterprises than in Upper Valais. Furthermore, sheep farming only plays a marginal role in the agricultural sector, as viticulture and fruit growing assume a more important position due to the topographical and climatic conditions. Sheep farming is more greatly shaped by French culture and thus is also strongly oriented towards France, in regard to both shepherd culture and the value chain of sheep products.

4.3. Differences between valley communities

The regions also differ greatly in terms of their grazing systems and stocking densities. For this reason, 19 different valley communities are distinguished in the Alpine sheep meadow plan. In some cases, sheep play virtually no role, while in others they are the dominant livestock species. The significance of sheep is also dependent on the role played by large livestock. While the mixed use of different species is still practiced in some areas, in others dairy cattle have almost disappeared. Regional differences provide the context for adapting the Alpine sheep pastures plan to local requirements and regional events. This also includes taking account of Alpine cattle meadows that are no longer used or have a low stocking density. Tourism also differs considerably between the regions, as the canton contains both unknown, poorly accessible valleys, as well as world famous destinations such as Zermatt and the Aletsch Arena.

4.4. From continuous grazing to shepherding

The extraordinary topographical and climatic conditions of Valais provide a suitable environment for extensive farming with sheep. In order to have a positive impact on the landscape and biodiversity, however, systematic grazing management is required. This needs to take account of both sensitive areas at high altitudes as well as areas at medium altitudes situated close to the shrub and tree line and subject to gradual encroachment. Recommendations from the investigation thus aim to ensure grazing management that incorporates

rotational grazing or shepherding, thus allowing for optimal use of vegetation. For one third of the Alpine pastures adjustments are recommended to prevent over-use or under-use at a local level. For the remaining two thirds, there is currently no need to change stocking densities because the environmental framework is respected by current grazing practices and grazing areas are used in a sustainable manner. With improved grazing management, additional livestock could be put out to pasture on many Alpine meadows. Due to falling animal numbers and increasing pressure from scrub encroachment, it is worthwhile to carefully assess the prioritisation of areas earmarked for continued use.

4.5. Conditions for flock protection

Requirements for working with livestock guarding dogs (LGDs) are met on 15% of Alpine pastures. In around 60% of cases, changes are recommended that are deemed to be both necessary and feasible, while for the remaining quarter of Alpine meadows measures required for flock protection would involve a disproportionate amount of effort. There are major differences between Upper and Lower Valais. In the latter, the basic conditions of flock management such as shepherds, dogs and fences are already in place on around one

third of Alpine meadows. In Upper Valais, on the other hand, this figure stands at just 10%. When one considers the size and grazing potential of Alpine meadows, it can be said that all sheep currently put to summer pasture could be summered on protectable pastures. This would mean, however, that those areas that are difficult to protect with LGDs and shepherds need to be abandoned.

In order to lay the foundations for the use of LGDs, the grazing system in Upper Valais would first and foremost have to be changed and the infrastructure for shepherds would need to be improved (see below). In Lower Valais, the use of LGDs should be implemented in a manner that is as conflict-free as possible. Due to very intensive tourism in some areas, the potential for conflict and objections from the tourism sector about the use of LGDs represents the biggest challenge. It is essential that this issue is clarified in a targeted manner and that advisory services are provided. For both flock protection and management of meadows, flocks in areas of difficult topographical terrain should not be too large (600-800 animals). In order to optimise both these factors, it appears that a mix of shepherding and rotational grazing often represents the best solution.



Night corral
under Alpine conditions
(Canton Graubünden).

4.6. Shepherding

In order to allow for sheep summering to play a positive role in landscape conservation, biodiversity and animal welfare as well as in the production of high quality products, the appointment of expert shepherds is key. For this to be possible, the necessary framework needs to be in place. This includes the provision of training opportunities as well as proper accommodation, wages and appreciation of this work. The shepherd training scheme in Visp, which was introduced four years ago, as well as a French training programme in Châteauneuf, which has been offered since 2013, should contribute to ensuring a high quality of work. Nevertheless, accommodation for shepherds is often lacking, particularly in Upper Valais, and is inadequate or poorly located in Lower Valais. Despite the summering contributions, wages are in many areas insufficient to provide appropriate compensation for the work and to prevent a high level of fluctuation. There is also the fact that the seasonal nature of the appointments represents a difficult hurdle on the labour market. The policy adopted by the Confederation is attempting to create improved incentives by providing greater financial support for summering.

4.7. Vegetation encroachment

The expansion of forested areas as well as dwarf shrub⁵ and scrub areas in locations at medium altitudes of between 1,600 and 2,200 metres above sea level is a widespread phenomenon. There are, however, major regional differences. The canton of Valais is more greatly affected as a result of the decline in the number of livestock on summer pastures and its difficult topographical terrain. Inspections have clearly shown that many areas located in the lower parts of Alpine sheep pastures and former Alpine cattle pastures are greatly underused. In some cases, plant succession is now at such an advanced stage that large areas of potential grazing have already been lost. As grazing areas on most Alpine sheep meadows are located above the tree line, they are mostly found at the vegetation level inhabited by dwarf shrub communities, which can in some cases be encountered at altitudes of up to 3,000 m.

As underuse is observed in the majority of Alpine sheep meadows, the impact that sheep have on these

dwarf shrub areas is limited. Due to their specific eating habits and avoidance of woody species the sheep, with the exception of a few breeds, are able to make little impact where succession is at an advanced stage. Only with the intensification of meadow management through systematic fencing or the consistent use of permanent shepherding is it possible to stop or purposefully influence scrub encroachment processes (Chatelain and Troxler, 2005).

Even if the landscape conservation role played by sheep is rather marginal above the tree line, in the canton of Valais sheep remain an important factor in maintaining areas in lowland regions and at medium altitudes up to the tree line. The use of spring and autumn meadows for fodder and the mowing of high-yielding areas for stable feed means that Valais sheep farming plays a key role in the use and preservation of areas subject to significant scrub encroachment.

4.8. Implementing the Alpine sheep meadow plan

The recommendations for farming and flock protection as well the grazing plan should support the cantonal advisory services in implementing the Alpine sheep meadow plan on a sustainable basis. Based on the national and cantonal consulting network, it will be seen how quickly suitable measures can be implemented in order to make the required structural adjustments to allow for the use of shepherds and livestock guarding dogs. By adopting a regional approach, the objective is to implement the plan on a step-by-step basis over the next three to six years. If the trend towards declining livestock numbers further increases, it will not be possible to manage all the areas currently used on a sustainable basis. For this reason, early planning could identify prospects for continuing to shape sheep summering in a sustainable manner through the use of suitable investments and forms of cooperation. This will require appropriate policy decisions as well as the resources of farmers, who are confronted with the challenges of generational change and economic uncertainty. It is to be hoped that the living and deep-rooted tradition of sheep farming in Valais can meet these upcoming challenges and that the changes underway can be actively shaped by sheep and Alpine meadow owners (Werder and Bamert, 2015).

⁵ Species such as *Rhododendron ferrugineum* L., *Ericacea*, *Junniperus communis*.

5. National incentives and regional differences

When looking at the development of grazing systems in the canton of Valais between 2003 and 2015 (Fig. 5), it is striking that the trend towards shepherding first intensified during the phase of participatory planning. A national comparison shows that these changes started in other regions as early as 2003 (Fig. 6) even though the presence of wolves was less pronounced or non-existent there. It is to be assumed that financial incentives had a decisive impact on these changes. Nevertheless, in both cases it can be seen that the trend towards shepherding has increased since 2011. Furthermore, a decreasing trend in livestock numbers can be observed at both national and regional levels. It is therefore apparent that the change in grazing systems has primarily taken place thanks to financial incentives, with the wolf playing only a secondary role.

When looking at trends in the use of LGDs, a stagnation can be observed in the canton of Valais (Fig. 7). In the other cantons, however, the number of LGDs has developed in line with the presence of wolves or the probability of wolf attacks. This important difference can be explained by the fact that damage pre-

vention measures have become a highly politicised issue. The use of LGDs is viewed as an acceptance of the wolf's presence, whereas the latter is still being contested by most agricultural associations (Werder and Bamert, 2015). In contrast to the changes related to grazing practices, the use of LGDs can primarily be attributed directly to permanent wolf presence. In cantons where wolf numbers have not increased, the use of LGDs has declined. Nevertheless, it must be noted that the lynx is also playing a role in developments, albeit only in the pre-Alpine cantons of Vaud, Bern and Fribourg.

6. Summary and conclusions for flock management and flock protection

The return of the wolf has added new momentum to national policy, which together with other factors has resulted in changes in the farming of small livestock. National incentives for changes in flock management can improve the resilience of sheep farming in the face of wolf presence. During the last 15 years the national flock protection strategy has had the following key impacts:

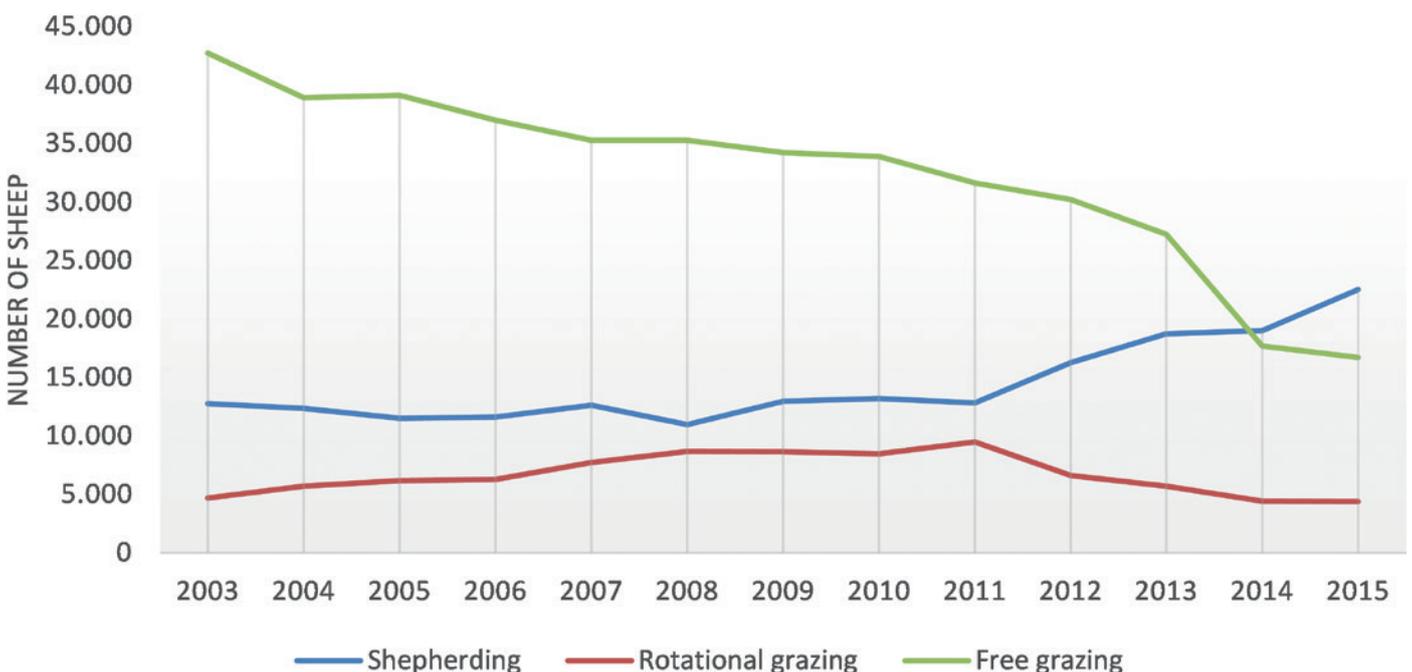


Fig. 5. Prevalence of three flock management systems from 2003 to 2015 in the Canton of Valais (Source: FOAG).

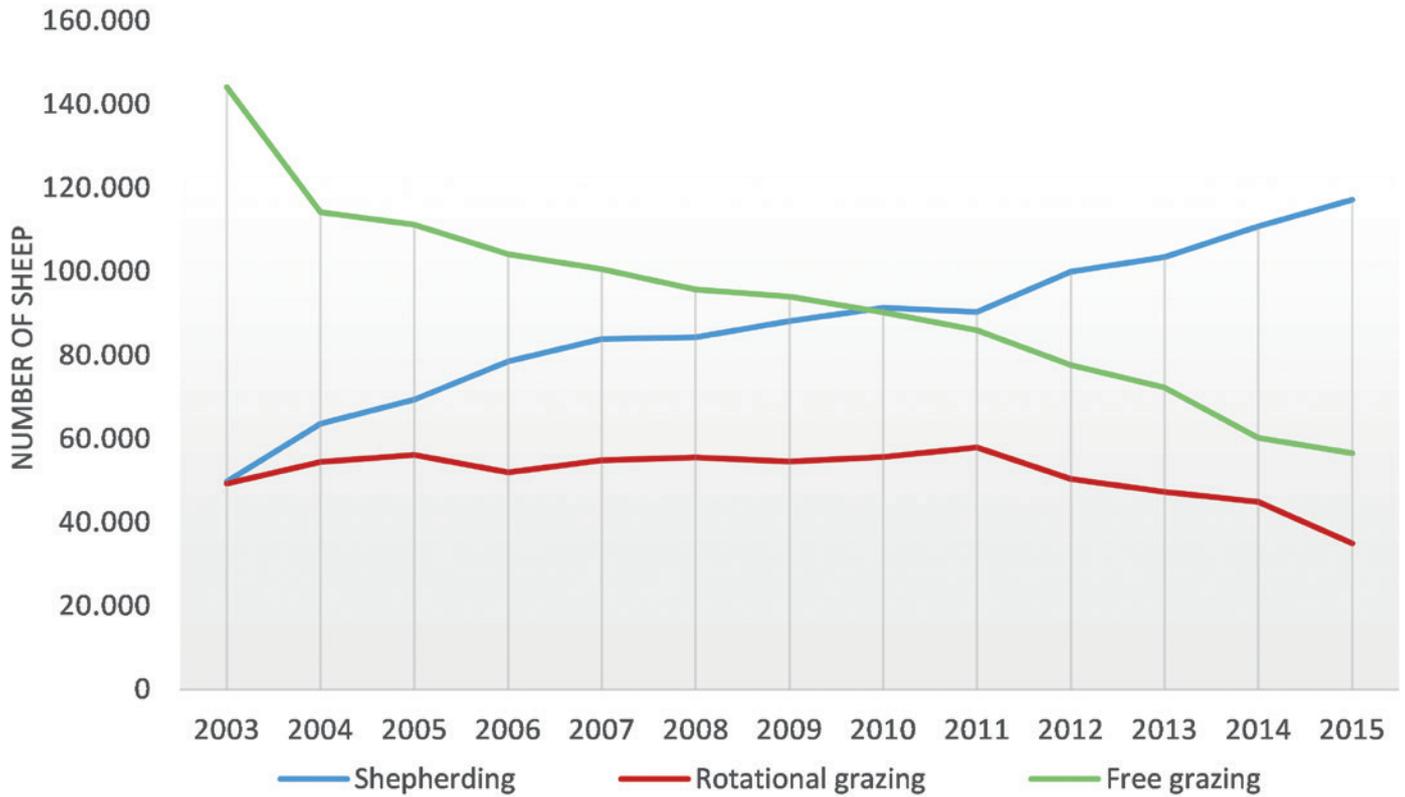


Fig. 6. Prevalence of different flock management systems in Switzerland from 2003 to 2015 (Source: FOAG).

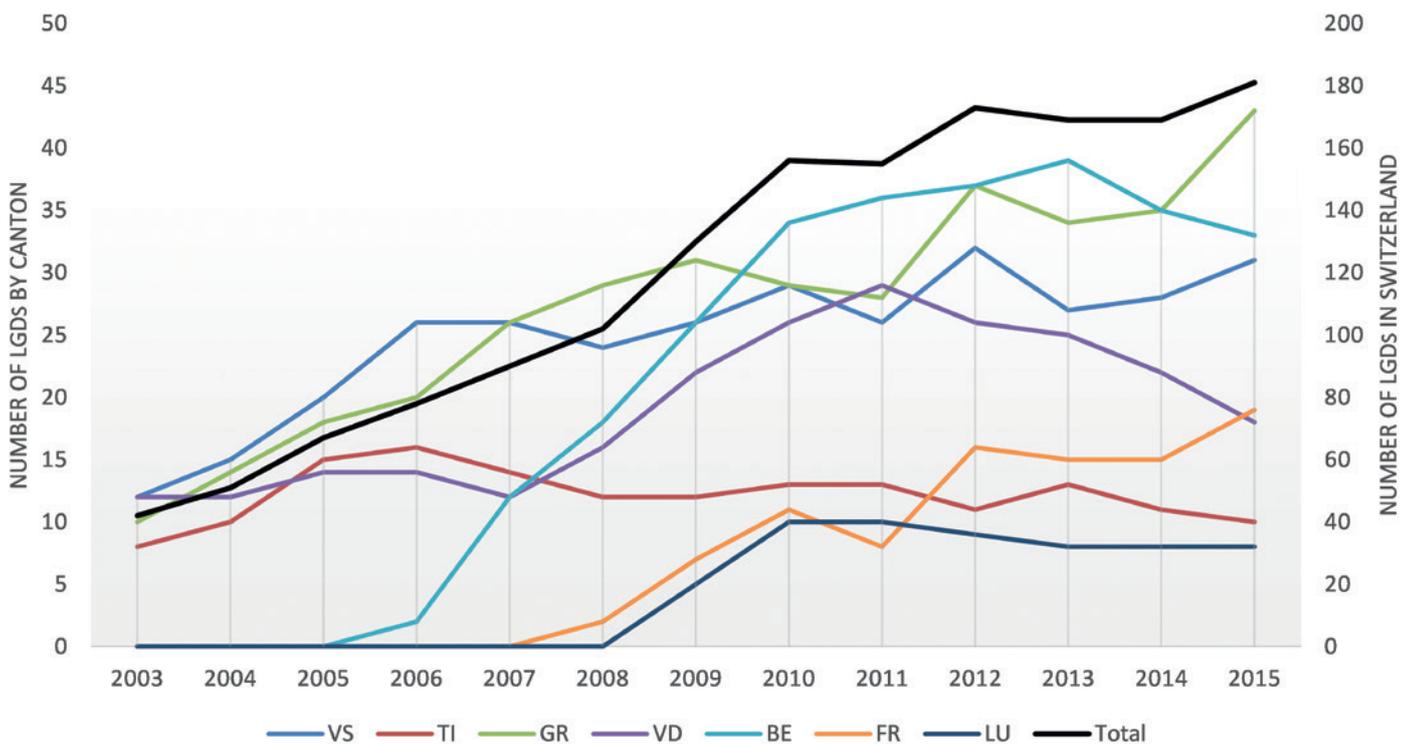


Fig. 7. The number of livestock guarding dogs (LGDs) in cantons of Switzerland with wolf presence from 2003 to 2015 (VS – Valais, TI – Tessin, GR – Graubünden, VD – Vaud, BE – Bern, FR – Fribourg, LU – Luzern). The total number of LGDs in Switzerland is shown by the black line (right axis).



1. The Ordinance on Summer Pasturing Subsidies, with differing incentives for the three grazing systems, drove a change from free grazing practice to shepherding and flock-management (from 2000);
 2. Increased use of livestock guarding dogs in summer pasture holdings with shepherding (from 1999), in fenced valley meadows (from 2002) and in summer pasture holdings with small flocks without shepherds (from 2005);
 3. Structural changes through the amalgamation of flocks (from 2006);
 4. Development of a flock protection advisory system by the Ministry of the Environment (from 2006);
 5. Establishment of a legal framework for working dogs in the agricultural sector (from 2008);
 6. Development of a flock protection advisory system by the Canton (from 2009);
 7. Legislation on flock protection in the national Hunting Ordinance (from 2013);
 8. Increased use of electric fences for flock protection in valley meadows (from 2013).
- The specific trigger for initial changes to flock management was usually wolf attacks, which were immediately followed by emergency measures such as spotlights, shepherd assistance or emergency LGDs. Changes to farming operations were then made in the following year. Public funds for flock protection

measures and the direct payment system in the agricultural sector generated financial incentives relatively quickly in order to establish these measures over the longer term. Further institutional and legal changes were made after a few years. An advisory network developed in parallel to these developments, with the systematic training of dog breeders and shepherds. Regions without wolf presence were able to benefit from experience in areas that suffered wolf damage, anticipating certain developments and initiating learning processes in advance.

The impact of wolf numbers on changing practices in pastoralism has not been systematically analysed. However, comparing the trend in the use of LGDs (Fig. 7) with that of wolf numbers (Fig. 2), it seems likely that the increasing number of LGDs in some cantons is directly related to the presence of wolves. In contrast, Valais is the only canton where a change from free grazing to flock management seems to be in direct relation with wolf presence. In the other cantons, changes in pastoralism were mainly influenced by the subsidies policy with the aim of improving mountain pastures.

A survey of small livestock farmers could prove informative in identifying key motives and factors behind shifts in grazing practices. The wolf is very often named as the decisive factor behind such changes. It seems evident that flock management depends largely on the availability of subsidies (Lauber et al., 2014) whereas the use of LGDs is more directly linked to the number of wolves in the region. However, this is not confirmed by data from Valais. This could be linked to the fact that there are many other issues which can play just as big a role in influencing farming decisions as the probability of damage caused by wolves.

The results from the Valais Alpine sheep meadow plan and changes in flock protection seen to date have shown that continuity in the provision of advisory services and the establishment of a planning basis provide a trust-building springboard for finding and implementing individual and collective strategies for dealing with a phenomenon such as the return of the wolf. In its role as a stimulus for change processes, however, the wolf remains a conflict-generating, political and tension-fraught flagship issue in connection with the future of shepherds and sheep flocks.

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Further information

National network for LGDs and protection of flocks: Agridea: www.herdenschutzschweiz.ch
 Monitoring and management of large carnivores: www.kora.ch
 Subsidies for summer grazing, Federal Office of Agriculture: www.blw.ch
 Legal framework for protection of flocks, Federal Office of Environment: www.bafu.ch
 Swiss Federal Office of Statistics: www.bfs.ch