

# HERD PROTECTION IN THE NORTHWESTERN SWISS PREALPS 2009-2013

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## The wolf and small livestock husbandry in Switzerland

The return of the wolf to the Swiss Alps often leads to conflicts with the resident human population. Especially owners of small livestock are affected, as they summer their animals in the habitat of wolves. Experience shows that wolves can cause considerable losses among unprotected herds. To make the coexistence of wolves and small livestock possible, herd protection by means of livestock guarding dogs becomes of primary importance in the Alpine region. In Switzerland, scepticism and lack of understanding are often prevailing regarding the implementation and efficiency of herd protection. Therefore, the scientific evaluation of herd protection measures is crucial. In a recent study, corresponding analyses were for the first time conducted for a region with continuing wolf presence over five years in Switzerland. The insights gained from the study are summarized in this article.

## Traditional small livestock husbandry and herd protection

Today, small livestock in Switzerland are mainly kept as a part-time job or as a leisure-time activity. Only a minority of farmers pursues small livestock husbandry as a full-time job. The summered herds with an average of 100 to 450 animals are relatively small (Waeber, 2003). After the eradication of large carnivores, the protection of small livestock herds in Switzerland was not important until the end of the 20th century (Mettler, 2005). With the return of the

wolf and the associated losses to unprotected livestock herds the situation has suddenly changed. Therefore, over the last few years the effort to protect sheep and goat herds from large carnivores has increasingly gained importance in Switzerland (Landry et al., 2004; Lüthi and Mettler, 2005).

Nonetheless, the establishment of suitable herd protection measures has only been taking place very slowly. Thus, in many areas protection measures have only recently been implemented. Although there are multiple reasons for the slow implementation process, an argument often put forward by small livestock owners contributing to the present situation is that an effective protection is not feasible in Switzerland. As a consequence, the willingness of small livestock owners to establish herd protection measures on their summering pastures has in the past remained very low.

## Missing information on applicability and preventive effects of herd protection

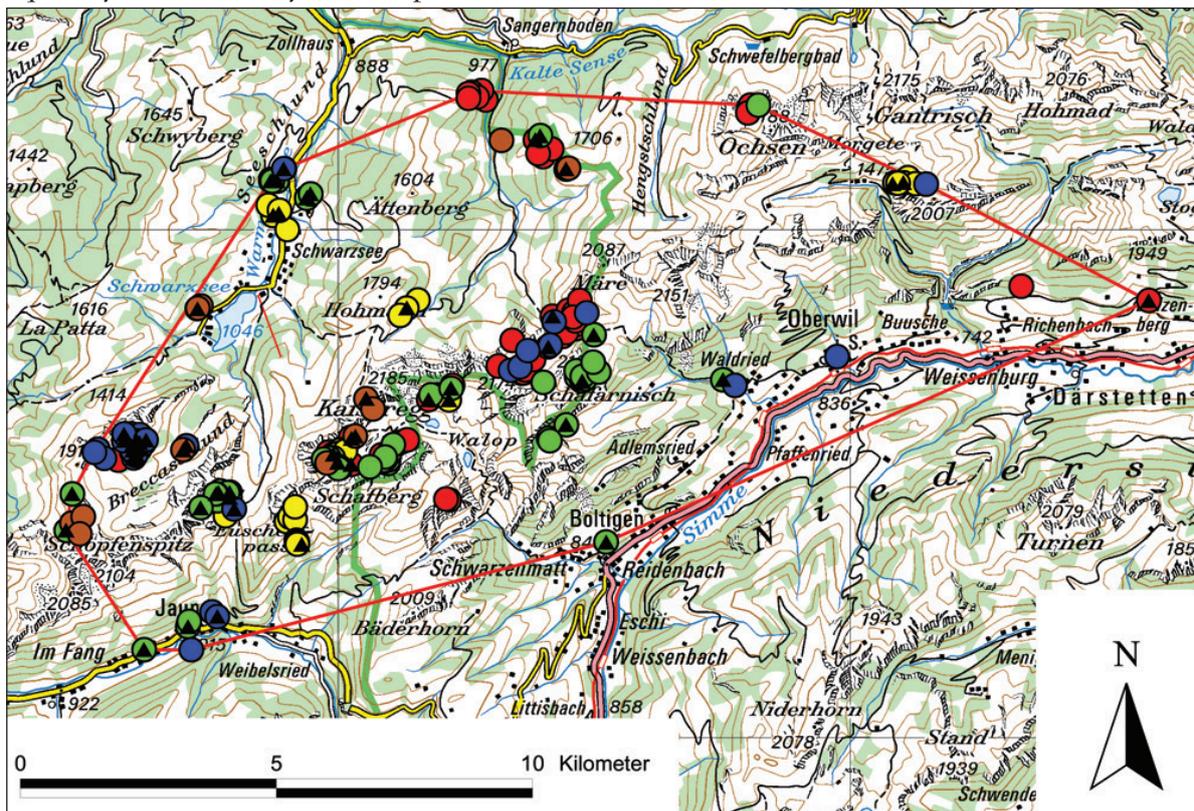
Unfortunately, evidence that locally adapted herd protection – i.e. by the use of livestock guarding dogs – can effectively prevent small livestock herds from wolf attacks in Switzerland has until recently been missing. This lack was mainly due to the fact that appropriate situations necessary for a scientific evaluation of the adopted herd protection measures did not exist for a long time. In order to investigate if herd protection can reduce or prevent wolf attacks in the medium-to-long-term the continuing presence of wolves in areas with protected herds is required.

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## Quantitative evaluation of herd protection – ecological setting

In Switzerland the first opportunity to scientifically evaluate the development and efficiency of herd protection measures arose in 2009 with the arrival of a female wolf (identified as F05) in the north-western Prealps (i.e. the Ganttrisch-Schwarzsee region of the cantons Bern and Fribourg, Fig. 1). During the summering period of 2009, the wolf caused considerable damage to some of the numerous unprotected small livestock herds in the region (see below). As a reaction, responsible authorities enforced the implementation of locally adapted herd protection in the concerned area. Together, the continuing presence of the wolf during the subsequent years and the systematic protection of

small livestock herds, both contributed to the ecological setting that was needed to perform a quantitative investigation of the applied herd protection measures in a whole region in Switzerland. In 2013, an analysis has, finally, been conducted on behalf of the Association for Livestock Guarding Dogs Switzerland (HSH-CH) and the Federal Office for the Environment (FOEN) (Willisch et al., 2013). The following questions have been addressed in the mentioned study: First, do persons in charge of small livestock implement herd protection measures on their pastures? And second to what extent are wolf attacks and the number of killed animals depending on the applied protection measures?



**Fig. 1.** Confirmed wolf attacks (2009: red; 2010: yellow; 2011: green; 2012: blue; 2013: brown) and estimated territory (red polygon) of the female wolf F05 between 2009 and 2013. The black triangles represent wolf attacks where the wolf F05 was genetically identified. Data: KORA 2013; Map: PK200, Swisstopo.

## Characteristics of traditional small livestock husbandry

In the Ganttrisch-Schwarzsee region each year between May and September/October about 4,000–4,300 small livestock (95% sheep, 5% goats) are summered on alpine pastures. The pastures in the region typically

consist of open alpine meadows above the timberline. However, the terrain along the west-to-east running mountain ridge may be rugged with cliffs and extended scree fields. Herd sizes in the area normally vary between 20 and 450 animals (Pfister, 2010). An exception is a single large herd of approximately 1,200 ani-

mals that replaced some smaller herds on six neighbouring pastures in the years 2012–2013. Small livestock in the region are either held on permanent pastures where animals are allowed to roam freely without any range restrictions, or on so called rotational grazing pastures. In the latter case, the pastures are subdivided by fences into several subunits and the animals are held alternately in the different compartments (Boggia and Schneider, 2012). Before the arrival of the wolf no permanent shepherding was conducted in the study area, although owners checked their herds on a more or less regular basis.



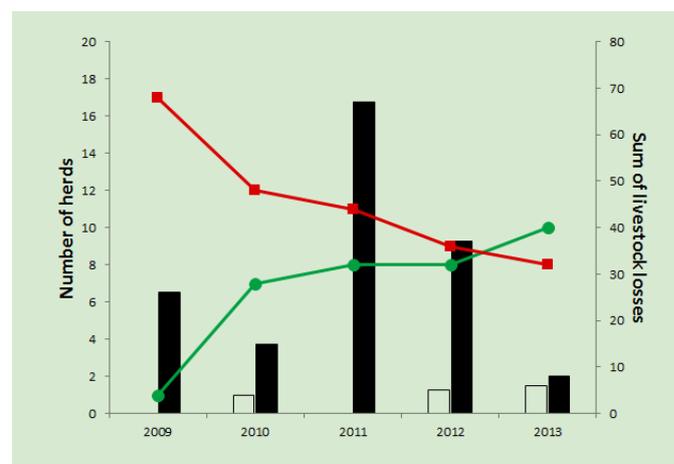
### Locally adapted herd protection

In the study area, herd protection gained rapid importance in 2009 when the first attacks by the newly arrived wolf occurred. As a consequence, the implementation of herd protection measures was intensified during the subsequent years based on the cantonal management plans for wolves. With the aim of having the protection measures accepted by the small livestock owners, pre-existing, local summering structures were maintained as much as possible, and only the absolutely essential changes were made. For the protection of herds, livestock guarding dogs of the breeds Maremma and Abruzzes Shepdog or Pyrenean Mountain Dog were used. Electric fencing was not applied. Where possible, up to four livestock guarding dogs were integrated into the herds. In order to enable the livestock guarding dogs to efficiently protect the herds in some cases structural support measures were taken. Accord-

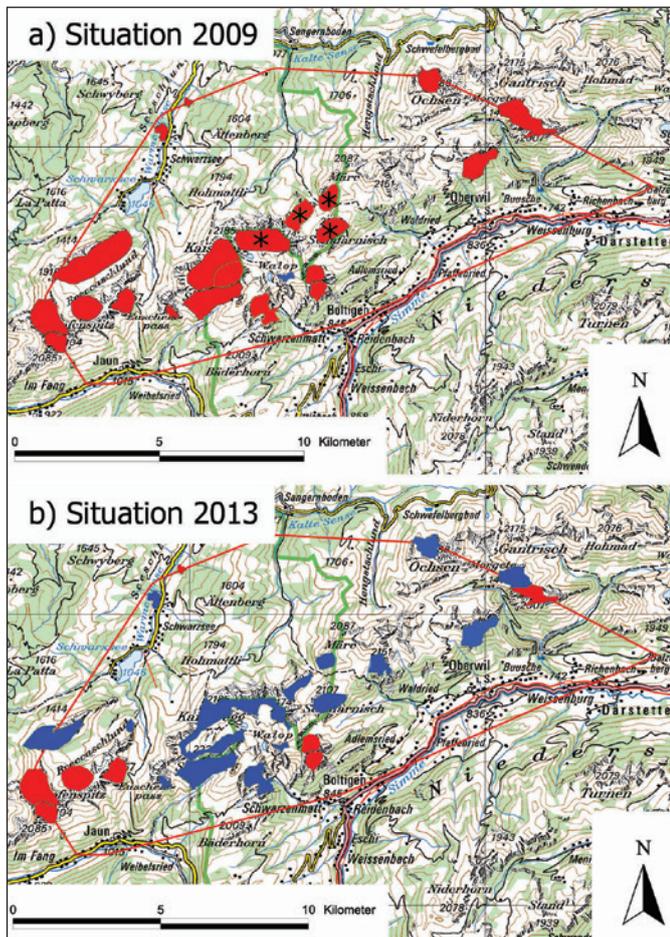
ingly, changes in the grazing systems or the permanent surveillance by shepherds were both considered support measures. Adaptation of the grazing system occurred on one pasture. Here, the permanent pasture system, where the livestock were free to roam, was changed to a rotational grazing system, where animals are summered alternately in different fenced subunits. In two cases, the permanent pasture system was maintained, while the remaining pastures were already managed as rotational grazing systems. Ultimately, permanent surveillance by a professional shepherd was established during the run of the study in one case only (i.e. the herd of 1,200 animals; see above).

### Small livestock summering is adapting

Between 2009 and 2013 for each pasture in the area, the regional protection experts defined the most suitable herd protection measures (i.e. number of livestock guarding dogs) and the required structural support measures (i.e. adaptation of grazing system, fusion of small herds, permanent presence of shepherd) in order to prevent the herds from further wolf attacks. Livestock owners were free to adopt the proposed protection measures on their pastures. The data show that as a result of this systematic protection effort between 2009 and 2013 the number of protected herds increased from initially 1 to finally 10. At the same time the number of unprotected herds decreased from 17 to 8 herds (Fig. 2). It is noteworthy that despite the continuing pres-



**Fig. 2.** Development of the number of protected (green circles) and unprotected herds (red squares) between 2009 and 2013 and the cumulated number of livestock losses in each year within these herds (white bars: losses in protected herds; black bars: losses in unprotected herds).



**Fig. 3.** Mapping of herd protection within the projects' perimeter in the years 2009 and 2013 (red: unprotected pastures; blue: protected pastures; \*: pastures temporarily abandoned or where the summering was aborted from 2009 to 2011). Data: PK200, Swisstopo

ence of the wolf and the on-going attacks in the area none of the managed pastures had to be completely abandoned. Only on a few pastures with unprotected herds was the summering of small livestock terminated temporarily due to losses (Fig. 3). Overall, the area of protected pastures in the region increased between 2009 and 2013 from initially only 0.1 km<sup>2</sup> to 10.0 km<sup>2</sup> while the area of unprotected pastures declined from 15.5 km<sup>2</sup> to 4.2 km<sup>2</sup>.

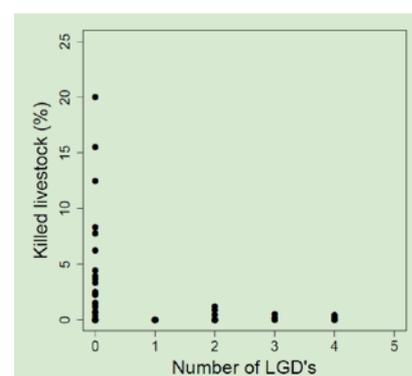
### The efficiency of herd protection

Considering the number of herds which did not change their protection status during the summer, a total of 18 cases could be identified between 2009 and 2013 in which the wolf had caused losses to unprotected herds. In contrast, herds with herd protection only

suffered losses in five cases. Regarding the total amount of killed livestock, 153 animals were killed by wolves in unprotected herds in comparison to 15 killed animals in protected herds. The numbers of killed animals per summering period and pasture amounts to 1-5 animals (mean = 0.6, SD = 1.2) in protected herds, while in unprotected herds livestock losses of 1-35 animals (mean = 3.4, SD = 6.4) were registered. Particularly, the high numbers of losses in unprotected herds were due to multiple surplus killing events. Overall, these numbers show that unprotected herds can suffer very large losses caused by wolves. In comparison, by using suitable prevention measures protected herds suffer only moderate losses, if any.

### Factors affecting wolf attacks and killed livestock

Statistical analyses showed that successful wolf attacks as well as the number of killed livestock during the summering are directly related to the number of livestock guarding dogs in use and the size of the herds. Accordingly, the more livestock guarding dogs were present to protect the herds, the smaller were the numbers of successful wolf attacks and the smaller were the total numbers of killed livestock per herd and season (Fig. 4). On the other hand, the risk of successful wolf attacks and the total amount of killed animals were both increasing with increasing herd sizes. In addition, the analyses revealed that the numbers of successful wolf attacks and livestock losses did not depend on the type of grazing pasture system or the presence of a permanent shepherd. Therefore, it can be concluded that these structural support measures do by themselves not provide any protective effect from wolf attacks. As a consequence, it can further be assumed that successful protection of livestock is not only possible in herds with a rotational grazing system



**Fig. 4.** Percentage of livestock killed per season and herd in relation to the number of livestock guarding dogs in the respective herds for the study area between 2009 and 2013.

or a permanent shepherd, but, if local conditions permit, also in herds on permanent pastures that are not surveyed by a shepherd.

### Significance for herd protection

The presented study is the first one evaluating quantitatively for a whole region in Switzerland the implementation and efficiency of herd protection measures against wolves. As scepticism and lack of understanding for herd protection is widespread among small livestock owners, sound information is of pivotal importance. In this respect the scientific analysis of protection measures and wolf attacks, in regions where a) herd protection is practiced and b) wolf presence is confirmed over multiple years, is invaluable for the future implementation of herd protection. In addition, the systematic evaluation of the applied protection measures provides, of course, detailed insights into the functional relationships between protection measures and wolf attacks. There is no question that this kind of information is important to successfully adapt herd protection to local conditions. For the

Gantrisch-Schwarzsee region, for instance, the exemplary analyses have shown that a successful protection, against a single female wolf, via the use of a sufficient number of livestock guarding dogs can also be achieved with permanent or rotational grazing systems without the need of permanent shepherds – if certain conditions are fulfilled (e.g. sufficient herd cohesion, open habitat). Night-time corralling, as suggested by Espuno et al. (2004) for the successful protection of small livestock in France, is, therefore, not a mandatory measure to reduce wolf attacks to a level tolerable for livestock owners in Switzerland.

No doubt, the protection of small livestock herds in Switzerland against large carnivores is, when compared with other countries, such as Italy or France, still at an early stage. The question if the presented herd protection measures will hold in the long-term, in situations where wolves are building packs, remains open. Similar quantitative assessments of the adopted protection measures will be required in order to ensure an effective herd protection under various, local conditions in the different regions of Switzerland.

## Acknowledgements

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