

Short Communication

HOW TO PREVENT DAMAGES FROM BEARS ON BEEHIVES

THE PRACTICE OF THE SWISS SYSTEM

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1. The comeback of the brown bear in Switzerland

In 2005 a brown bear reappeared for the first time in 100 years in the southeast of Switzerland. This bear immigrated from the Trentino population of Italy, where 50 bears live at the moment. In the last 10 years, 10 different individuals from this population have dispersed to Switzerland, where they permanently stayed in the area bordering Italy. Although 3 of these juvenile bears overwintered in Switzerland, no bear stayed longer than 2 years. Two problem bears were preventively shot by the local authorities because of their problematic behaviour closed to villages and humans.

The damages caused by the brown bears concentrated mainly on the small domestic animals (sheep and goats) summering on alpine pastures and on beehives, both in the valley and in the alpine area. An average of 20 domestic animals (mostly sheep) and 10 unprotected apiaries were killed/damaged by bears each year (Fig. 1).

Other conflicts with humans were mostly due to bears being attracted by anthropogenic food sources such as waste bins and compost heaps. However, there were no incidents where people were injured by bears. The preventive killing of two bears was justified by the Swiss management plan to prevent any kind of bear attacks on humans.



Fig. 1. Bear damage on apiary hut during the winter.

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2. Situation of beekeeping in the Canton of Graubünden

Because of the damage situation in the first years after the immigration of the bears, the national prevention program had to focus on sheep and apiaries. In the whole canton of Graubünden, where the bears have migrated during the past 10 years, there are 10,000 beehives, which are managed by about 900 beekeepers. But there were only 3 mainly concerned sections in the south-east to the Italian Border (Fig. 2).

The whole region is divided into 15 sections, where a beekeeper association organizes the keeping and breeding of the bees. Regarding the protection of the apiaries 3 different husbandry systems had to be considered:

1. Apiaries (solid house with built-in beehives) (Fig. 3);
2. Magazine of Styrofoam (individual boxes with different sizes) (Fig. 4);
3. Wooden Magazine (individual boxes with different sizes) (Fig. 5).

In addition the difference between transhumance (migratory) bees that change regularly the location and sedentary bees, which stay in the same place throughout the whole year, had to be taken into account.



Fig. 2. Southeastern project region on Swiss map.



Fig. 3. Protected apiary hut during winter season in the region of Engadin.



Fig. 4. Protected site of bee-breeding station in the region of Unterengadin.



Fig. 5. Protected mobile beehives in the region of Poschiavo.

Fig. 6. Model-fenced apiary hut in the region of Engadin.



3. Fencing of apiaries as priority damage prevention

3.1. Political and organisational approach 2005-2007

The return of bears challenged beekeepers in an entirely new way. Therefore, we took the necessary steps to protect the first apiaries with emergency measures. It was important that the associations of the affected sections participated in the organization and the communication from the beginning, so that they could take the responsibility for the preventive measures as soon as possible. To obtain the fairest possible compensation for the material costs, we conducted a survey among the beekeepers, as well as a material and price evaluation with some suppliers to determine the financial support of the state. With an average financial contribution of SFr. 700/apiary we found a fair solution that would take the different topographical conditions into account.

3.2. Technical aspects

Thanks to the experiences gained from the surrounding bear-regions (Trentino, Abruzzees, Pyrenees) it soon became clear that only a robust electrical

fencing of apiaries could discourage the bears from attacking the beehives. So we tried to recommend the fence material that was adapted to the circumstances. Again, we made sure to give the beekeepers as much responsibility as possible, so original and creative solutions for fencing became possible. The sections coordinated themselves differently, so the fences were either standardized, built with commonly ordered material, or they were built depending on individual assessment (Fig. 6). Our technical guidelines were limited to the following basic guidelines:

1. Height: 1.20 m should be flexibly adjusted to the slope;
2. Solid wooden stakes of 1.60 m should be embedded 2-3 meters apart on of each other;
3. Use of high quality electrical tapes (diameter of 12 mm), that are fixed with insulators from the outside, at intervals of 20-30 cm;
4. Recommended voltage: 5000 V (a standard energizer is sufficient);
5. Regular maintenance of the conductivity and the tension of the wires is necessary.

3.3. Implementation practice 2007-2015

After the first apiaries have been electrified as immediate measures with an emergency budget, both the technical and the financial support could be integrated into our national carnivore damage prevention program from 2007. The implementation during the following years was therefore financially secured and the organization could be realized in a quite simple form. Because the actual costs and the amount of work per apiary were different, all the financial contributions for each site have been paid to the responsible beekeepers association, so that it could manage the contributions of its members in a flexible manner. So the better the beekeepers organized themselves, the smoother was the implementation. With an annual control, we tried to sustainably improve the quality of the fencing and mutual trust. So far 70% of the 1,500 beehives, which is corresponding to 250 apiaries, are protected by electrical fences in the most affected regions. The main concern has increasingly become the maintenance of the fences because there were no more bears in the area. Meanwhile, when a bear appears, we are trying through rapid communication to ask the beekeepers to build respective fences prematurely. The bear monitoring and the communication is organised by the local wildlife-guards and a regular transboundary exchange.

4. Conclusions

After the return of the brown bear to Switzerland no more damages were recorded to properly fenced beehives. It took about 5 years from the beginning of the immediate measures over the test phase until the transition to the “daily business” with secure compensation for the costs of prevention. Since 2013, the state contributions for the protection of bees are guaranteed by law and thus secured over the long-term. The

participatory approach since the first damages until the institutional anchoring at the legislative level has proven to be a successful model. There are a few factors to emphasize that were critical to the successful process:

1. Good networking and organization of beekeepers through beekeepers associations;
2. Evidence of efficiency of the measures for motivation and sustainability;
3. Local and national political will to support the finances and technical support;
4. Willingness of technical support unit to offer simple and non-bureaucratic solutions;
5. Amount of work for any possible maintenance and adjustments to the measures that is reasonable for long term;
6. Appreciation of the engagement and exchange of information between beekeepers and the general public.

Through the interplay of these factors, the bee prevention case could serve as a model for other prevention measures. However, our ability to effectively adapt sheep farming to the presence of bears has been less successful because one or more of the above mentioned factors has not been present.

In Switzerland the immigration of bears can also be expected to continue in the future. The conflicts with beekeeping have been largely mitigated by the prevention concept and its implementation in recent years.

The co-existence between bears and human activities will find its key challenges mainly in the sheep and goat farming, and through direct encounters between bears and humans.