Short Communication

PILOT PROJECT ON WASTE MANAGEMENT AND BROWN BEAR DAMAGE PREVENTION IN THE VAL MÜSTAIR BIOSPHERE NATURAL PARK

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1. Introduction

After more than 100 years, the bears came back to Switzerland. Since 2005, young male bears repeatedly immigrated from northern Italy to Graubünden, in the southeast of Switzerland (Fig. 1). Until now there is no stable population and the bear is strictly protected. Except for two of them, they emigrated again after several months. The other two, so named JJ3 and M13, had to be culled by local authorities because they were classified as dangerous for the public. This classification was based on the Swiss Management plan for the conservation of brown bears. Since these two bears did not fear people, they came too close to them, especially while foraging. In addition to other food sources near settlements that are interesting for bears they raided garbage containers.

Fig. 1. The project region Val Müstair Biosphere Natural Park.

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2. A pilot project for waste management

The immigrant bears have shown that adequate habitat for bears is present in Switzerland, but that there is still a lot of work to do to allow a low-conflict coexistence with them. Among other things, this relates to waste management. The Federal Office for the Environment (FOEN) has recognized this, and initiated the elaboration of a specific strategy plan (Molinari and Theus, 2008). The Biosfera Val Müstair Natural Park subsequently started to implement this concept with a pilot project. An inventory was conducted recording potential food sources that are interesting for bears and have a connection to humans. This survey concluded that a high number of such sources exists (Rempfler et al., 2011).

After a detailed analysis this number could be restricted taking only the geographically important areas and the most attractive food sources into account. In this context it should be noted that those bears, which raided waste containers in Graubünden, always first raided the containers along the streets. Thus already a lot would have been achieved if these containers were made bear-safe. Thanks to the responsible authorities of the Canton of Graubünden this first step of waste management has been realized in the project area since 2010 (Fig. 2). Another step relates to potential food sources in the areas of responsibilities of the municipalities. And a third category relates to the food sources for which private people are responsible. It became obvious during the project period that the pressure to act in each type of property must be high until a community is actually active, not least due to the high costs of adaptation.

Fig. 2. Container test. Photo: Mario Theus.

3. The challenge of implementation

To implement a practical and effective waste management, it should be sufficient if only the most important of the theoretically available food sources are made inaccessible to bears, provided one chooses the locations with the highest potential for conflicts. Such a waste management concept should also be feasible in larger areas than the one of the pilot project. Nevertheless if problem bears, which previously sought their food in garbage, immigrate, a significant additional effort is necessary. Depending on the degree of habituation of a bear, prevention measures can get very costly or just impossible for a sustainable implementation. The concept in the described form with relatively limited prevention resources is therefore promising for the presence of discreet, shy bears. If bears that already have often conspicuously appeared close to settlement areas, immigrate, the prevention measures reach their limit, because the costs become disproportionately large to change the bad habits of bears.

4. Conclusion

In the project area a total of 2304 anthropogenic food sources were registered (Table 1). This large number in an area of about 200 km² gives the impression that waste management in the context of bears is challenging. However, if one limits the food sources due to its location and its attractiveness, the situation can be rationalized. Since the project intends to prevent shy bears from becoming problem bears, and since 2005 the regional experience showed, that it is impossible to make all the sources inaccessible to bears, a prioritization of the sites as well as the type of food sources is crucial for the implementation of such a waste management.

So, regarding the implementation, it was decided to limit the 35 registered potential food sources to 16 (see potential food sources priority 1 and 2 in Table 1, based on the experiences made in Switzerland and the Province of Trento, Italy, Groff et al., 2014). The categories "bees" and "livestock" were not integrated in this project because they were treated in another two different projects.

Table 1. Potentially interesting anthropogenic food sources for bears (Extract from Rempfler et al., 2009).

Human caused potential food sources		
Group	Priority 1	Priority 2
Waste	Waste container	Recycling
	Waste bin	
	Garbage can	
	Open waste	
	Other waste	
Human food		Leftover food
		Food
		Vegetables/fruits
		Drink residues
Organic waste	Compost	Manure heap
	Organic landfill	
	Green waste	
Animal food	Deposited fish feed	Animal feed
	Bowl for dogs or cats	Animal keeping
Grill	Barbecue fireplace	
	Barbecue area	
	Mobile grill	
Miscellaneous	Bio-oil tank	Bait
		Bird food
		Toiletry
		Seeds
		Others
Others	Camp site	Silo
	Bait station	
Livestock, domestic animals and pets		
Bee keeping		Bee house
		Beehive
		Honey/honeycombs
Animals		Pets
		Small domestic animals
		Cattle and horses

Fig. 3. Region of the pilot project Val Mustair with protected food sources. Photo: AJF Graubünden.

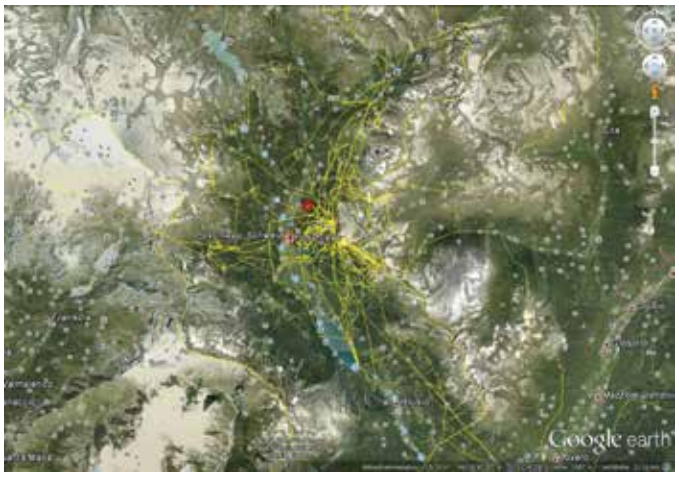

Fig. 4. Region of Val Poschiavo without any protected food sources. Photo: AJF Graubünden.

Locations within settlements have not been dealt with as bears that enter populated areas are usually already problem bears. That's why the food sources in the villages were not included in the project. Therefore, the focus was on the sites along the transport routes and hiking trails, as well as on buildings and infrastructures outside of densely populated areas.

Since the concept was implemented in 2012, the pressure of bears was very low in the chosen region for the prevention measures. So only some sporadic visits of bears happened and a systematic evaluation about the efficiency of the measures could not be realized. But the comparison of the behaviour of one immigrant individual (M13) gives us quite obvious signs that the protection of potential food sources could influence the spatial behaviour of bears and their potential for conflict and future survival.

The following two maps (Figs. 3, 4) show the two regions of comparison where the bear M13 was GPS-tracked. In Figure 1 there is the region with protected food sources along the main roads and hiking tracks. In Figure 2 there is the region where no prevention measures where implemented. There is no statistical value in this comparison, but it shows, that the offer of human-caused food sources could influence the spatial behaviour and the acquisition of bad habits by bears. In the Region of Val Mustair there weren't any damages during 2012 meanwhile in the region of Val Posciavo the individual was causing damages and was eventually shot as a problematic individual after coming closer to humans and getting used to anthropogenic food sources.

References

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