particular; statistics on compensation and grants; media and how to deal with them, etc. In addition, they learn about "natural" causes of death among sheep from a veterinarian. He also lectures about risks of infections when examining carcasses. Other topics on the programme are basic biology and ecology of the large predators and reports from the ongoing research projects on wolf, lynx and bear. After the coarse the County Administrative Board announce the names of the inspectors in farmers´magazines and newsletters.

The inspectors are requested to document their examinations with cameras so that other people can study the photos afterwards. After the introductory course the inspectors are assembled once a year in order to be brought up to date, learn from others´ experiences and discuss difficult cases.

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Preventing Wolf Predation on Livestock with Light-Mobile Barriers.

The technique known as *fladry*, traditionally used for hunting wolves in Eastern Europe and Russia, consists of driving them into a bottleneck formed by 50 x 10 cm red flags hanging from ropes stretched over the ground. The animals are shot at a narrow gap that is left in the ropes. Henryk Okarma and Wlodek Jedrzejewski (1997) have employed an adaptation of this technique to livetrap wild wolves. I have worked with Henryk and Wlodek, and have witnessed that this capture method allows for a sudden intervention and sedation of captured wolves. We have never caused injuries to the animals. Surprisingly, other species (e. g., ungulates) don't seem to be afraid of *fladry* and can not be captured using this method. Therefore, possible injuries of non-target species are also avoided. In 1997-1998, together with Elisabetta Visalberghi (Italian National Research Council) and Luigi Boitani (Rome University), I have conducted a study on the avoidance of *fladry* and other types of light-mobile barriers by wolves. The aim of this study was to see whether captive wolves living in two enclosures of the Rome Zoo were responsive. In particular, we explored the effectiveness of certain *fladry* characteristics (i. e., between-flag distance; rope height; scent; flag movement and color), their ability to constrain wolf movement and, most important, their ability to prevent wolves from accessing food.

We found that avoidance was maximal when the flags were 50 cm apart and their bottom was at ground level. In this conditions wolves never crossed red flags (nor gray of the same brightness) intersecting their usual routes. Flags were not crossed even when the daily food ration was placed on the other side of them. In contrast, crossings took place when the flag distances were 75 cm, or the rope heights were 25 cm or 75 cm.

Drawing: Dominique Roth

In his article on the role of behavioral studies in conservation biology, Sutherland (1998) has stressed the importance of adopting non-lethal means to reduce predation. He also mentioned the possibility of creating barriers of habitat that predators dislike crossing or that makes predation difficult. Our study concerns a possible application of this approach to wolf management. Our behavioral observations indicate the features necessary for *fladry* effectiveness, and that the occasional use of *fladry* can constrain captive wolves' movements or exclude wolves from food sources. Therefore, this technique may be shown to protect, at least temporarily, livestock from wolf predation.

During the next months, we will carry out experiments that will further investigate the use of *fladry* for livestock protection in a more "natural" environment than a zoo. The Agriculture Ministry of Italy has already accepted a research project that will be conducted in Popoli, Abruzzo. In Popoli there are 10 adult wolves and 4 pups that are held in large enclosures in a forest area where public access is restricted. This research will use *fladry* barriers to surround food sources. Experiments will be carried out both during day and night. The results on *fladry* effectiveness by night will be particularly important, because shepherds may use barriers such as *fladry* for further protecting livestock that are kept in enclo-

sures overnight. In the meanwhile, we will also test possible habituation of wolves to such barriers, because we do not want to recommend implementation of a technique that will only work temporarily. Specifically, wolf researchers should avoid public opinion over-reactions to unexpected livestock losses due to wild wolves habituating to such barriers!

We believe that the *fladry* technique has great potential for wolf management. The use of *fladry* for wolf capture is currently being implemented. Further research is needed as soon as possible in order to evaluate the use of *fladry* to protect livestock in areas where conflicts between wolves and shepherds are arising.

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Electric Fences and Fladries in Romania

The *Carpathian* Large Carnivore Project is an international joint initiative of the Munich Wildlife Society and the Romanian State Forest Administration. Goal of the project is to establish a community-based conservation of large carnivores and their habitat in a model region in the southern Carpathians through an integrated management approach. Mitigation of conflicts between large carnivores and livestock breeders is an important part of our management and conservation concept.

In the Romanian Carpathians, flocks are traditionally *guarded* with shepherds and guarding dogs. This method is very effective and only about 2% of all sheep are taken annually by wolves and bears. Still, many livestock owners consider large carnivores a pest. Social and economic conditions are changing in Romania, and it is likely that this intensive guarding system will not be economically feasible anymore, once salaries are rising.

To *counteract* this, our project initiated a programme to improve the livestock guarding system and to find altrnatives to the intensive guarding. Electric fences and fladry seem to be two possible solutions. During fall and winter 1999, we equipped two shepherd camps with 12 V powered electric fences in order to test the difficulites in running the camps under the specific Romanian conditions (e.g. no access to electric current or little technical understanding of shepherds). Starting from May 2000, we will equip 10 shepherd camps during the summer grazing season with electric fences, to test their effectiveness against wolves and bears. Based on the experiences of Musiani, we further plan to equip 5 camps with fladry equipment. We will monitor all equipped shepherd camps and 15 control camps without additional protection and compare the results with data from shepherd camps monitored in 1998 and 1999.

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Norwegian Brown Bears: Holders of an Unwanted World Record

When flying over Norway, it appears that the forests and mountains are endless. Compared to a similar flight over other areas of western Europe the signs of human occupation are minimal. Surely if there is anywhere for brown bears to have a chance to survive and thrive in Europe it must be here? Unfortunately the answer is not necessarily yes. The forests of Norway represent superb brown bear habitat. There are plenty of moose, ants and blueberries and other things that bears like to eat. It is no problem to find good denning sites under anthills or spruce trees. Even though the forestry industry is intensive, this appears to have no negative effects on brown bears, as the population in neighbouring Sweden is thriving where forestry is even more intensive. So, what's the problem ?

The problem is that bears do not confine themselves to eating moose, blueberries and ants. Every summer, over 2 million domestic sheep are released into the forests and mountains of Norway. These graze freely without any supervision in the form of shepherds or dogs for up to 3 months. During these three months there is nothing to prevent bears (and other large carnivores like lynx, wolverine and wolves) from helping themselves ad libitum. Unfortunately for farmers, managers, and conservationists ali-