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The first experience of livestock guarding dogs preventing large carnivore damages in Finland

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Abstract. Livestock guarding dogs (LGDs) have been for millennia an effective means of protecting rangeland, i.e. cattle or sheep, from predators in Central and Southern Europe and Asia. In contrast, there is no LGD tradition or local breeds in the Nordic countries. The objective of this study was to collect descriptive information about the experiences of LGDs in Finland acquired by early farm adopters through semi-structured interviews, narratives, and on-site visits to farms. The experiences were encouraging: no predation was observed since LGD(s) presence. The presence of LGDs had multifunctional character by increasing the feeling of security. Unlike in Norway the farmers in Finland did not describe high costs or serious difficulties in relationships with guarded animals, herding dogs, other animals, or village neighbourhoods.

Key words: livestock guarding dogs, LGD, predation, wolf, lynx, bear.

INTRODUCTION

In recent decades the populations of wolves (*Canis lupus*), bears (*Ursus arctos*), and lynx (*Lynx lynx*) have increased and expanded towards more inhabited areas throughout Europe (Boitani, 2000). Large carnivore populations estimated by the end of 2005 in Finland included 205–215 wolves, 810–860 bears, 1100–1200 lynxes, and 145–150 wolverines (*Gulo gulo*). Compared to 2004, the numbers represent increases of 11% for wolves, 22% for bears, 24% for lynxes, and 16% for wolverines (Kojola et al., 2006). Return of the carnivores to their original habitats has caused problems. In Finland the number of attacks towards sheep, cattle, hunting-dogs, reindeer, and other domestic animals has increased in recent years. Finnish State covered €190 000 in 2005 as compensation for damages by

large carnivores (Nylander & Ahvonen, 2007). Return of the large carnivores has also caused lots of fear among people, especially towards wolves (Bisi & Kurki, 2008).

Damages caused by large carnivores can not be stopped by the elimination of predators as the management of wolves and other large carnivores (except in the reindeer herding area in northern Finland) is regulated by the EU Nature Directive, Annex IV. Developing and distributing information about damage preventive methods can be a solution to reduce losses and compensation costs. In seeking sustainable coexistence of humans and large carnivores in Finland this far fencing, wolf phone service, and the removal of problematic individuals have been used (Ministry of Agriculture and Forestry, 2005).

Livestock guarding dogs (LGDs) have been for millennia an effective means of protecting rangeland, i.e. cattle or sheep, from predators in Central and Southern Europe as well as in Asia (Rigg, 2001). In the United States, LGDs were introduced as a new method of guarding flocks in the 1970s (Linhart et al., 1979; McGrew & Blakesley, 1982; Coppinger et al., 1983; Green & Woodruff, 1983a, 1983b; Black & Green, 1985). LGDs work by staying with the livestock and driving away intruders with rarely any need for physical conflict because of their impressive size and protective behaviour. Often more than one dog is needed to keep up the necessary level of protection (Rigg, 2004). LGDs should be kept with, brought up with, socialized with, and bonded with the stock they are going to protect (Coppinger, 1992).

There is no LGD tradition or local breeds of LGD in the Nordic countries. In Sweden the testing of LGDs in electric fenced areas has started recently (Levin, 2005). The use of LGDs to protect sheep was evaluated in Norway (Hansen & Smith, 1999; Hansen, 2005). The sheep in Norway tend to graze widely dispersed in small family groups, which makes the use of traditional LGD methods in Norway difficult (Hansen, 2005). A total of four different LGD methods have been evaluated in Norway: LGDs used in combination with herding and night corrals, LGDs on fenced pastures, LGDs alone with sheep on open range, and LGDs loose on patrol together with a range inspector (Hansen & Smith, 1999; Hansen, 2005). LGDs on fenced pastures are the least expensive method and show the second best preventive effect (Nilsen et al., 2003). The use of LGDs has not been a great success in Norway with high costs, widely dispersing sheep, and also strict laws for dog keeping (Hansen, 2005). Finland differs from the areas with long traditions of LGD use in having relatively small rangelands and forest surrounding pastures. In addition, the long winter period with shorter pasturing times and everyman's right to use rangelands and forests are also factors that need to be considered. There would surely be a need for LGDs in Finland if knowledge of the use of dogs and their possibilities were to reach the people who need a trustable guard for their livestock or property (Koljonen, 2002). Thus, it is important to explore the suitability of this method for large carnivore damage prevention.

A few Finnish farms had spontaneously started to acquire LGDs. Therefore, in this study descriptive information about the experiences of the use of LGDs

acquired by these early adopters in Finland was collected. The aim of the study was also to identify the suitability and functionality of LGDs in Finnish conditions with the law of everyman's right, fairly small pastures, half-year grazing period, and several species of livestock to be guarded.

METHODS

The study included a semi-structured questionnaire, interviews, collection of narratives, and on-site visits to farms in the summer of 2006. Farms were recruited to the study via newspaper and web-site announcements. The research populations were by their nature statistically close to total populations as the sample included all known farms using LGDs at the time. Thus the prominent method for gathering information on the phenomenon was through farmers' descriptions and narratives.

The semi-structured interviews included the following question topics: habitats at the farm, children, visitors, neighbours, trespassers; farm size, geographical position, production, pastures; livestock species, numbers, breeds, production, pasturing; and LGDs numbers, breeds, ages, qualities, bonding, behaviour, costs.

A total of 12 farms were found via announcements and responded to the questionnaire: 8 of these were included in the study. The selection criteria required that the farms were actually using or having acquired their LGDs as working livestock guarding dogs, although exclusively full-time working was not necessary. Four farms from 12 kept their LGDs chained or in a dog yard with no access to livestock, and so did not fulfill the selection criteria of the study.

RESULTS AND DISCUSSION

A starting base for collecting descriptive information about the experiences of the LGDs in Finland was the information about reasons for acquiring the LGDs. The main reasons for acquiring the LGDs were to prevent continuing large carnivore damages (three farms) and to conduct continuous daily or weekly large carnivore observations (five farms). Thus, on all farms the residents had perceived the danger of meeting large carnivores in their yard or in the neighbourhood (Table 1).

The total farm area of the eight farms accepted to the study varied between 2 and 77 ha (median 48.5 ha). Geographically, four farms were located in traditional large carnivore areas in the eastern and four in the central parts of Finland. One of the farms was located in the middle of a village, five farther from other inhabitants, and two in isolation in the middle of forest. Distances from the farms to neighbours varied between 0.02 and 6 km (median 0.3 km).

The total number of LGDs in the eight farms was 19, of which 18 were working dogs: 1 to 4 LGDs per farm (median 2). Differently from Norway, where

Table 1. Experiences of large carnivores and associated damage among the participating farms

Farm	Breed of LGD	Number of working LGDs	Number of damages		Prevented attacks witnessed at place	Density of carnivores in surroundings*			Animals under guard
			Before LGDs	During LGDs		Wolves	Bears	Lynxes	
1	Caucasian Ovcharka	1	0	0		0–2	2.1–4	4.1–6	Sheep, poultry, horses, bees
2	Central-Asian Ovcharka	2	1	0	Wolf	2.1–4	0–2	4.1–6	Beef cattle, sheep, horses
3	Maremma Sheepdog	2	1	0	Lynx	0–2	2.1–4	4.1–6	Sheep
4	Komondor	2	0	0		0–2	2.1–4	6.1<	Goats, sheep, donkey
5	Great Pyrenees	2	1	0	Wolf	4.1–6	4.1–6	4.1–6	Sheep, horses, poultry
6	Tibetan Mastiff	4	0	0	Bear	4.1–6	6.1<	0–2	Sheep, poultry
7	Polish Tatra Sheepdog	1	0	0		2.1–4	6.1<	2.1–4	Alpacas, horses, poultry
8	Slovak Cuvac	4	0	0		0–2	0–2	4.1–6	Dairy cattle, sheep

* Density of carnivores per 1000 km^2 in 2006 (RKTL, 2007).

the number of LGD breeds used was three (Hansen, 2005), the number of LGD breeds in Finland was eight (a different LGD breed in each farm). They included Caucasian Ovcharka (farm No. 1, one LGD), Central-Asian Ovcharka (farm No. 2, two LGDs), Maremma Sheepdog (farm No. 3, two LGDs), Komondor (farm No. 4, two LGDs), Great Pyrenees (farm No. 5, two LGDs), Tibetan Mastiff (farm No. 6, four LGDs), Polish Tatra Sheepdog (farm No. 7, one LGD), and Slovak Cuvac (farm No. 8, four LGDs) (Table 1).

Two LGDs only had been imported from abroad: one Komondor from Hungary and one Tibetan Mastiff from the USA, while the rest had been bought from Finnish breeders. None of the LGDs had working dogs as parents. People on all the farms had earlier experience of dogs and four had long-term dog owner experience. At farm No. 8 the first LGD was acquired in 1978 and at farm No. 6, in 1989. Everybody had acquired LGDs on their own initiative with no support from authorities or any subvention. The individual LGDs were chosen on the basis of gender or the recommendation of the breeder, appearance, and estimated character. However, only two puppies had been aptitude tested. The gender distribution of the working LGDs was nine females, eight males, and one sterilized male.

Seven out of the eight farms kept sheep (all except No. 7), four poultry (farms Nos 1, 5, 6, and 7), one dairy cattle (farm No. 8), one beef cattle (farm

No. 2), four horses (farms Nos 1, 2, 5, and 7), and one bees (farm No. 1). The sample also included one horticulture farm, which was only starting to rear alpacas (farm No. 7). Differently from Norwegian experience, where LGDs were mainly used to protect sheep (Hansen & Smith, 1999; Hansen 2005), in Finland early adopters used LGDs to protect various kinds of domestic animals (Table 1).

The total number of residents on the farms was 29, including 14 females and 15 males. The age range was from one to 60 years (median 31). Ten of the residents were children aged 1–12 years (median 4). Visitors or other people simply passing the farm depending on the season were, among others, neighbours, cyclists, mopedists, people driving cars and other vehicles passing via village roads. According to the regulations of everyman's right to pass through the surroundings of the farms visitors could also include those going to pick berries as well as joggers, skiers, snowmobilists, hunters, or tourists.

The areas LGDs were guarding had a variety of fence types (Table 2): electric fences (one farm), a light electric fence combined with a wooden fence (one farm), sheep net (one farm), wolf fences (two farms), and a strong net with wooden frames (one farm). Two farms had no fence at all. The fences did not restrict the free trespassing of LGDs in the surroundings at five farms (Nos 1, 3, 4, 5, and 8).

Minor problems occurred at farms Nos 3 and 5 with one LGD at each wandering too much in the surroundings. This was presumably caused by the need of the LGD to control a larger territory around the pastures and it could possibly have been avoided by better fencing and bonding in the puppyhood. Wandering did not cause any serious problems to the surroundings but was a safety risk for LGDs themselves creating a possibility of being run over by a car. None of the LGDs could be considered as a safety risk for trespassers. All the LGDs were human tolerant except those at farm No. 6, where they guarded a smaller enclosure and because of the strong fence (Table 2) had no possibility of contacting trespassers. Other problems mentioned were chasing and playing with guarded animals (one LGD at farm No. 3 and one LGD at farm No. 7).

Table 2. Variety of fence types at farms

Farm	Breed of LGD	Fence types
1	Caucasian Ovcharka	No fence at all
2	Central-Asian Ovcharka	Wolf fences
3	Maremma Sheepdog	Sheep net; partly no fence at all
4	Komondor	No fence at all
5	Great Pyrenees	Light electric fence combined with wooden fence; partly no fence at all
6	Tibetan Mastiff	Strong net with wooden frames
7	Polish Tatra Sheepdog	Wolf fences
8	Slovak Cuvac	Electric fences; partly no fence at all

Differently from Norwegian experience (Hansen & Smith, 1999; Hansen, 2005), Finnish early adopted LGDs did not cause any lethal threat to the domestic animals guarded or in the neighbourhood.

According to the owners' estimations, the guarding abilities of the dogs first appeared at the age of 4 to 20 months (median 12 months), depending on the breed and on the dog's personality. Bonding the LGDs to the livestock was carried out in all seasons: spring (five LGDs), summer (six LGDs), autumn (one LGD), and winter (six LGDs). The age for starting the bonding process varied from birth to 32 weeks (median eight weeks). Bonding occurred mainly on pastures and partly in the sheep house with four LGDs. The owners reported they wanted to gain further improvements in the behaviour of the dogs in relation to the amount of time or other effort they invested in the socialization process or in human tolerance training. The interviews indicated that the best time for bonding was winter when the guarded animals were kept inside. This helped to keep control over the bonding process more frequently. The descriptions of farmers did not reveal variation of guarding qualities between different breeds (attentiveness, trustworthiness, protectiveness) in this sample. Guarding qualities were influenced by LGDs' individual characteristic traits, working conditions, and bonding to guarded animals. It was previously stressed that successful bonding with the stock the dog is going to protect is needed for successful guarding (Dawydiak & Sims, 2004).

The experiences of early LGD adopters were encouraging: all the farms that responded to the questionnaire had gained from having LGDs and none reported livestock losses (0%) in the areas guarded by LGDs. The dogs had prevented some attacks or other damage. At farms Nos 2 and 5 LGDs were witnessed to prevent wolf attacks, at farm No. 3 to prevent a lynx attack, and at farm No. 6 to prevent a bear attack (Table 1).

Other benefits mentioned were the termination of elk (*Alces alces*) damage to pasture fences at farms Nos 1 and 3 and the termination of white-tailed deer (*Odocoileus virginianus*) damages to horticultural plants at farm No. 1. In addition, the presence of LGDs had a more multifunctional character by increasing personal feelings of security in a comprehensive way. These included issues such as how freely children could be permitted to be outdoors and feelings of companionship.

The price for a LGD pup bred in Finland is approximately €1000 and for an imported one approximately €1500. Taking into consideration all costs for food, vaccinations, maintenance, and for possible insurance and healthcare, yearly costs are approximately €500–1000, depending on the health status of the dog (Ministry of Agriculture and Forestry, 2005).

Unlike in Norway (Hansen & Smith, 1999; Hansen, 2005), the farmers in Finland did not describe high costs or serious difficulties in relationships with guarded animals, other animals, or village neighbourhoods. The descriptive results of suitability and functionality of LGDs in Finnish conditions with fairly small pastures, half-year grazing period, and several species of livestock to be guarded were thus promising.

CONCLUSIONS

The aim of this study, based on a semi-structured questionnaire, interviews, and on-site visits, was to identify possibilities and problems associated with the use of LGDs in Finnish conditions. These preliminary findings showed no direct disadvantages of LGDs. On the contrary, various advantages were mentioned. The experiences of early LGD adopters were encouraging: all farms reported having gained from the dogs. The results of this study indicated that the need for additional fencing does not seem to be essential; various LGD breeds appear suitable, and no obvious constraints seem to exist depending on the species of livestock or other domestic animals to be guarded. The guarding abilities of LGDs could be used in various ways combined with children's and hunting-dogs' safety at farmyards in addition to the traditional full-time guarding on pastures in open landscapes. Using LGDs could also be integrated with wolf fences.

However, the study indicated some possible difficulties: two LGDs were wandering and two LGDs had a suboptimal relationship with guarded animals (playing and chasing); still not on the scale described by Hansen (2005). In the cases of wandering the reasons could be that one LGD was moved from one farm to another at the age of five months and the other LGD to the farm at the age of one year. In the cases of playing and chasing both LGDs were bonded to guarded animals alone with no possibility of playing with other dogs. As noted earlier, successful bonding with the stock the dog is going to protect is vital to successful guarding. It also points out the possible benefit of more than one LGD per farm to create an opportunity to play with the animals from the same species, especially in the puppyhood.

As the number of farms willing to use LGDs in Finland is growing, the necessity of studying the methods of predicting the working abilities of LGD pups is increasing. Minimizing carnivore damage or equally importantly the fears of people is a multidisciplinary study topic. In summary, the themes or factors that emerged from this study were: the welfare of dogs in their guarding job, people on and outside the farms, public opinion on nature relations, cost-effectiveness, and cultural, socio-economic, and stakeholder relations in general. A multifunctional dimension with better understanding of the values, beliefs, and demands of those who are involved or affected seems to be an important and ultimately necessary aspect of preventing carnivore damages (Breitenmoser, 1998; Woodroffe, 2000; Bowman et al., 2004; Mattson et al., 2006).

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Esimene kogemus karjavalvekoerte kasutusest kaitseks suurkiskjate eest Soomes

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Karjavalvekoeri on Euraasias kasutatud aastasadu, et kaitsta kariloomi ja lambaid suurkiskjate eest. Põhjamaades ei ole karjavalvekoerte kasutamise traditsiooni ega ka kohalikke tõuge. Uurimuse eesmärgiks oli koguda infot Soomes kaitseks suurkiskjate eest kasutatud esimestest karjavalvekoertest. Uurimismeetoditeks olid poolstruktureeritud küsitlused, narratiivid ja farmikülastused. Tulemused olid julgustavad: karjavalvekoerte kasutuse ajal suurkiskjad kahjustusi ei tekitanud. Karjavalvekoerad ja karjakoerad said omavahel läbi. Karjavalvekoerad suurendasid ka inimeste turvatunnet. Erinevalt Norra uurimustest ei kirjeldanud Soome talunikud, et karjavalvekoerte kasutamine oleks põhjustanud suuri probleeme koerapidamiskulude, loomadevaheliste suhete või naabrite osas.