



Carnivore Damage Prevention News

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Preface

The Large Carnivore Initiative for Europe (LCIE)

GOAL: "To maintain and restore, in coexistence with people, viable populations of large carnivores as an integral part of ecosystems and landscapes across Europe".

Europe, once a broad mosaic of natural habitats ideal for large carnivores, is now left with only scattered tracts of suitable "wildland". Brown bear, wolf, wolverine, Eurasian lynx and Iberian lynx still occur in Europe but they are forced to live in highly fragmented and human-dominated landscapes. Where there was widespread and bitter opposition to large carnivores in the past often today there is increasing public interest in their conservation. However, the predatory behaviour of large carnivores often conflicts with local economic activity, especially livestock farming.

It is clear that the challenge of conserving large carnivores is complex and dynamic, involving ecological, economical, institutional, political, and cultural factors and any attempt to solve this conservation issue must take this into account. Realistically, no single agency, organisation, or institution will be able to solve the carnivore conservation issue alone. No single plan or strategy can be completely comprehensive and correct as a guide for action and continual monitoring is required.

In 1995 recognising these opportunities, and the need to build strong partnerships with land managers, researchers, citizens, government officials and international organisations and Conventions, the World Wide Fund for Nature (WWF), together with partner organisations and experts in 17 European countries, decided to get to grips with the issue so that the future for large carnivores can be substantially improved, while the opportunity still exists. To-date over three dozen partners are present in over 25 countries and the number of interested parties and individuals is growing rapidly still. The aim of this

Initiative is to support and build on existing activities or projects across the continent, avoid duplication of effort and make the most efficient use of the available resources.

The Initiative addresses issues in four important fields of activity:

- 1. Conservation of Large Carnivore populations and their habitats*
- 2. Integration of large carnivore conservation into local development in rural areas*
- 3. Support for large carnivores through appropriate legislation, policies and economic instruments*
- 4. The Human Dimension (Information and public awareness with the aim of obtaining the acceptance of large carnivores by all sectors of society)*

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Notes from the Editors

Large carnivores are recently spreading into areas lost long ago in many parts of Europe. They are in conflict with man, who has forgotten how to coexist with these animals. Concerned is, above all, animal husbandry. The tradition to protect livestock against predator attacks has vanished in most parts of Europe, but has been maintained in others. Modern lifestyle does not encourage livestock owners to manage their animals in the traditional ways, and thus they face increasing losses to predators. Large carnivores can survive in the long term only if the conflicts with local people can be restrained. Doubtless, protecting livestock, beehives, and orchards against predation is a key to large carnivore conservation. Many projects in Europe are dealing with damage prevention. They are, however, often not published in international journals, and exchange of information is difficult. In particular, experiences

with negative results are hardly ever made known, though we can all learn a lot from failures. The Carnivore Damage Prevention Newsletter (CDP News) is intended facilitate the collaboration and to improve the exchange of information among carnivore damage prevention projects. The CDP News is meant to be a forum for scientists, conservationists, wildlife managers, and policy makers.

The CDP News is a project of the Large Carnivore Initiative for Europe (LCIE) and financially supported by WWF International. Please help us with your contributions and suggestions to maintain and improve the CDP News. We would like to encourage everybody to make use of the content, to translate it to your local language, and to spread it among interest groups. We appreciate any comments, critics, and contributions.

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Education of Wildlife Damage Inspectors in Sweden

In Sweden the Swedish National Environmental Protection Agency has the comprehensive responsibility for protected species. Three years ago the right to make decisions regarding compensation for wildlife damage caused by protected species was delegated to the County Administrative Board.

The Wildlife Damage Center develops preventive methods to protect property (such as domestic animals and crops) from species protected from hunting and inform interested groups and the public. The center also functions as a coordinator between the Swedish National Environmental Protection Agency and the County Administrative Boards, inspectors of damaged property, farmers and the public. It also educates groups like the inspectors, persons at the County Administrative Boards in charge of wildlife damage, veterinarians, sheep keepers, teachers and leaders of study circles, among others. The Wildlife Damage Center was initiated and is financed by the Swedish National Environmental Protection Agency. Today two full-time employees are working at the center.

Basically, in Sweden wildlife damage is prevented through hunting management of the populations causing damage and only secondly through grants to preventive actions such as electrical fences etc. As a last resource, damage is settled through compensation. In accordance with the hunting regulations compensation will be paid from government funds. The County Administrative Board compensates for losses only if preventive actions have been taken or if preventive actions are lacking. If an animal is found to be killed by a protected predator (i.e. lynx, wolf, bear, wolverine, and golden eagle) after examination through a commissioned inspector (see below) the owner generally is compensated. The counties are allotted a certain budget from the Swedish National Environmental Protection Agency to use for grants and compensations of wildlife damage. That same budget shall cover educating inspectors and their expenses as well as public information.

Damage on reindeer caused by large predators are compensated through a different system. Domestic animals supposed to have been injured or killed by predators have to be examined through an inspector commissioned by the County Administrative Board. He examines the body and searches the area where the animal was found before he certifies the event. The number of inspectors in each county varies between two and twelve, according to county size and abundance of large carnivores. It is important not to have too many inspectors, in order to allow each of them to gain as much experience as possible.

The inspectors are educated at the Wildlife Damage Center, which is situated at Grimsö Research Station in south central Sweden. A total of 93 inspectors have been educated since January 1997 at six separate courses. They are recruited among people who are interested in the subject, have good field experience from tracking large predators, know how to act in precarious situations, and who are trusted by both, authorities and the public. Some of them are from hunters' associations, others from predator interest groups and others still already work for the County Administrative Board with other assignments.

The basic course runs over three days. It starts with an exposition of the Swedish policy and legislation that regulates wildlife damages and management of large predators held by a representative of the Swedish National Environmental Protection Agency. The inspectors also learn about predator injury on sheep, horses and dogs in theory and practice (examining real predator kills); preventive methods against predators in general and electrical fences in

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 course 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 livetrapped 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 move-

ment 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



Drawing: Dominique Roth

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.

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 en-

tures 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.

References:

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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 alternatives 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 difficulties 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-

ke the bears do not hesitate. Losses are generally well documented by trained personnel, and have steadily increased during the last 10 years. In 1998 compensation was paid for 4265 bear-killed domestic sheep. When the estimated population size is between 25 and 50 (we share a population with Sweden, so the number of bears actually in Norway varies a lot, this means that each bear is on average killing about 100 sheep each summer. This is a world record in terms in the number of livestock killed per individual bear, and is in fact 20 times higher than the nearest competition. It is also a world record that Norway could do without. As a result there is an enormous conflict between sheep farmers and the government which is greatly hindering the process of reestablishing viable bear populations inside Norway.

In order to try and reduce predation, a number of measures have been, and continue to be evaluated.



Drawing: Dominique Roth

Bringing the sheep in from the forest early in August avoids the season with the highest losses, but means that farmers lose up to 30% of their grazing season. Currently an experimental project to test livestock guarding dogs and shepherds is currently in its third year. Guarding dogs were imported from Italy and Poland and so far have proved to be very effective. However, before they could be used to guard a flock, shepherds with herding dogs needed to be included in the husbandry system to prevent the sheep from spreading out. This is a new component in Norwegian sheep husbandry and greatly adds to the cost of the system. However, in two years they have not had a single case of bear predation on the experimental

flocks. Although such efforts can demonstrate that it is possible to farm sheep in bear areas, the extra costs may mean that it is not practical on a large scale. In addition farmers are often slow to accept new methods.

The lessons so far from Norway are the following; (1) There is a difference between good bear habitat being available and bears being allowed to use it. (2) Depredation rates can be enormous if sheep are grazed without supervision in forest habitats. (3) It appears that shepherd / guarding dogs systems prevent most predation, but economics may prevent their widespread application. (4) Long term solutions will probably involve some changes in husbandry and increased zoning of both sheep and bears.

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Large Carnivore Damage in Spain

Three species of large carnivore exist in Spain: the brown bear, the wolf and the Iberian lynx. There are some 80 bears in the Cantabrian Mountains, in the northwest of Spain, slightly decreasing. In addition, there is a remnant population of 5 or 6 bears in the western Pyrenees and maybe 6 other bears in a recently reintroduced population in the Central Pyrenees; most of these bears are on the French side. In the Cantabrian Mountains, bear damage is scarce and it is not a conservation problem. The amount compensated by regional governments in the Cantabrian Mountains is 7 million pesetas (43,750 \$) per year, but only 50% of this is estimated to be actually caused by bears. Bears are perceived as a minor problem by Cantabrian local people for several reasons: sheep are very scarce in bear range, so damage is moderate and surplus killing is rare; wolves are common in the Cantabrian Mountains, and compared to them, bears appear not so bad. In recent years, as bears attract tourists, they are perceived more and more positively by local people. In the Pyrenees, sheep are common, and the very few remaining bears cause much more damage in relation to their numbers than those in the Cantabrian Mountains.

There is an increasing population of 2,000 wolves covering about 100,000 km², living mainly in the northwest of Spain. We can roughly estimate the da-

ages to be 1-2 Mio \$ per year, and maybe 40% is compensated by regional governments. The main factor affecting wolf damage is the management system of livestock. In mountain areas (i.e., Cantabrian Mountains) livestock is free ranging from May to November, and the average damage caused per wolf per year can be 10 times higher than in the plain, where the livestock is always protected by shepherds. Only 20% of the Spanish wolves live in these mountain areas, but they cause 80% of all losses. Surplus killing is common, and the conflicts are very high when wolves expand into sheep areas, as for example, to the Basque Country and the Picos de Europa National Park. In the south of Spain, wolves occur in large, private, fenced states devoted to red deer hunting; they are almost extinct due to the illegal persecution through gamekeepers because of their predation on game. The wolf is by far the most controversial species in Spain, and the social conflicts and the polarization are increasing in recent years, as a consequence of the campaigns of animal right groups.

There are 500 to 1,000 Iberian lynx in sharply decreasing, very fragmented populations in the southwest of Spain. Unlike the European lynx, they almost never attack livestock and they are not perceived by local people as a problem. Hunters sometimes claim that they kill rabbits, but recent awareness campaigns seem to have improved the lynx image even among hunters.

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Testing Livestock Guard Donkeys in the Swiss Alps

Since 1995, Switzerland experiences the immigration of wolves spreading along the western Alps. Genetic studies have revealed that the animals belong to the Italian population (Taberlet *et al.* 1996). As elsewhere, the wolves cause damage in the free ranging sheep herds (Landry 1997a). Livestock husbandry is no longer adapted to the presence of large carnivores, and preventive measures will have to be re-applied in and adopted to the Swiss Alps to prevent losses (Landry 1997b). This is one of the goals of the Swiss Wolf Project by KORA. The most promoted prevention system, is the use of livestock guard dogs. Additionally, other prevention systems such as electric fences (Speeder Pac), fladry and guard donkeys are tested.

In 1995, several farmers in the Valais (southwestern Switzerland) bought donkeys to be placed with their herds. Their integration into the flock did not cause major problems. The sheep took about a week to get accustomed to their presence. It seems that a donkey of any age can be integrated into a herd, unlike with the dogs; it is nevertheless advisable to use very young animals. In the stable, the donkey is placed in a stall near the sheep, especially during lambing. However, the farmers are afraid that a donkey might crush a lamb by accident.

A donkey stallion is much more aggressive than a female or a castrated male, and donkey breeders advised against using such an animal to guard a flock. Farmers who used stallions noted their aggressiveness particularly in autumn. The donkeys ripped wool from the backs of the ewes and lifted 40 kg lambs to walk around with them. The nearby presence of other equids can incite the donkey to attack them, especially the stallion. One of the farmers had to remove his donkey because it prevented the ram to mount the sheep.

A donkey is much simpler to use than a dog and it clearly has a higher ability to adapt (change of owner, climate, activity) than the dog. No specific knowledge is needed to look after a donkey, which daily consumes up to 8 kg of hay, the same amount as 4-5 sheep. In winter (150 days), 1 tonne of hay and one tonne of straw must be reckoned. The stall must measure about 10 m², to allow the donkey to roll on the ground. Donkeys readily eat what sheep do not consume in the pens.

The presence of a donkey in the pen seems to reassure the sheep (they are less nervous). At night, the donkey remains with the sheep. One donkey even

acquired the habit of assembling the sheep every evening. Obviously, a donkey is very vigilant at night. At the least suspicious sound or smell, it starts to bray. Its voice can be so loud that it may be heard over several kilometres – so there may be some problems with the neighbours. Donkeys have shown to be very discouraging to dogs which roam around the pen (tourists' dogs). A donkey is able to recognise dogs from a far distance and to warn the sheep, which then will be less surprised by the sudden coming of a canid.

The donkey is able to run away and at the same time kick with one or both of its hind hoofs, then turn quickly and rush at the dog with its head lowered, and ears flattened on its nape. I know two cases, where a dog (a German shepherd dog and a hunting dog) were killed by a donkey in a mountain pasture when harassing the sheep. The donkey's aversion to canids is so strong that one has to be careful when using a herd dog to tend the sheep. However, in two flocks, we managed to have a donkey together with livestock guard dogs (a St-Bernard and a Great Pyrenees). Even more, the unlike animals are sometimes playing together.

The donkey normally stays with the sheep, but when at a mountain pasture, the slope is too steep, it is not capable of following them everywhere. Especially tall donkeys show this handicap. Several farmers kept their donkeys in lower parts of the pasture because they feared that the animal might fall. If the herd divides into several groups, the donkey visits them by turns, or stays constantly with one group. The use of several donkeys in a herd is not to be recommended because they tend to stay together and neglect the contact with the sheep.

Several farmers had problems with tourists who liked to feed the donkey and hence distracted it from its task. One donkey, however, used to rush at people who approached the enclosure.

From the first results, a donkey appears to be a good solution to protect small flocks of sheep (< 50 heads) in an enclosure. The presence of a donkey in a pen frightens people less than a large dog. Furthermore, it is not necessary to feed the donkey daily, unlike the dog. It is however, too early to conclude about the use of the donkey as a guard animal in the Alps. Its effectiveness against wolves is not yet known. Furthermore, livestock guard dogs remain the only preventive system valid for large herds.

References:

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Should Life condition all co-financing of compensation systems to the use of preventive methods?

I think that we should divide the question "Should LIFE condition all co-financing ...etc." into two separate ones: One regarding Compensation payments through conservation projects (like LIFE projects) and another one regarding Compensation which is paid for damages through National or Regional systems (run by public authorities or other funds).

According to my opinion the answer to the question concerning the conservation projects is that, yes, LIFE should condition all co-financing to the use of preventive methods. My main reasoning for this answer is that compensation is a passive strategy, since it does not create incentives for the reduction of damage and it does not include other educational and policy tools.

However, the same question is differentiated concerning individual farmers who exercise agriculture within a range of different land types or socio-economic and environmental conditions: In some European mountainous and less favoured areas low intensity farming systems may be incompatible with the high cost of implementing some of these measures. In general, in these areas the farmers' income is lower and the cost of production is higher than in others where intensive farming systems are applicable. On the other hand, the small size or the structure of holdings which dominate the low intensity systems of agriculture and pastoralism presents further difficulties to the implementation of such measures. Consequently, a large portion of farmers would be excluded from compensation systems which are conditioned to the use of preventive measures and this,

in turn, would possibly increase the human caused mortality of certain animal species, the large carnivores included.

According to my opinion, the European Commission (and, consequently, LIFE) should politically and financially support the application of both compensation systems and prevention methods concerning large predators and other protected species. In this frame, public authorities should be encouraged and supported to envisage assumption of all or part of the cost of the most appropriate preventive measures, especially for the animals belonging to species which are protected. Clear and explicit discrimination and exception of an endangered species of European interest from the general rules that stands for compensation or prevention of damages caused by other reasons (e.g. damages caused by common game species), handle such an animal as “res omnium” (property of all) not as “res nullius” (property of nobody). Namely, it is the state and the whole society that are responsible for it (including damages) and this could be used as a political and educational tool.

In conclusion, LIFE should not follow a strict policy but rather a more flexible and sensible one compatible with the particularities and differences within the European diverse reality: While preventive measures should be supported and encouraged, the conditions for co-financing compensation to certain farmers should not be limited exclusively to the use of preventive measures but, preferably, should be differentiated according to land-use types, the extent of (intensive or extensive) farming systems, the size and structure of holdings, the farmers income, other socio-economic conditions, as well as the general aims and the specific objectives of nature conservation in the respective regions/areas.

In the frame of this policy, LIFE should support application of a combined use of compensation systems with prevention methods and should encourage public authorities to cover all or part of the cost of the most appropriate preventive measures. To implement such a policy and given that LIFE is the only Community financial instrument for the environment, with a tiny budget compared with other European Commission financial instruments, other sources of subsidy for preventive measures should also be envisaged: The CAP accompanying measures, the Cohesion Fund or the Structural Funds could also be used for such purposes.

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The Recovery of Livestock Guarding Dogs' use and the Iberian Wolf Conservation in Portugal - Promising results

Originally distributed throughout the Iberian Peninsula, the Iberian Wolf (*Canis lupus signatus* Cabrera, 1907) is presently restricted to the North-west regions. In Portugal, where the species is fully protected by law since 1988, its population has been decreasing rapidly, mainly after the 70's. Nowadays the wolf occurs only in less than 25% of its original distribution area, in the most mountainous and less populated areas of the North and Centre of the country, where it can still find refuge and food. The main cause of regression is illegal persecution by man, namely shepherds, motivated by the damages wolves cause to livestock. In fact, the wolf diet is based almost exclusively on domestic animals (mainly sheep and goat), due to the low numbers of natural prey like roe deer and red deer. Thus, by reducing livestock damages caused by wolves, we are effectively contributing to a better acceptance of this predator. The best solution to this problem seems to be the traditional one – the use of Livestock Guarding Dogs (LGD). Although part of the traditional grazing system, the use of LGD is falling out of use, not only in Portugal but all over Eurasia. These dogs, selected by shepherds during hundreds of years, are very effective in livestock protection against predators. Currently, however, the Portuguese LGD breeds are becoming very scarce and most of them are used mainly as pets or show dogs. This situation is of great concern because the selection is based only on morphologic characteristics, disregarding the functional, behavioural and genetic aspects. Being aware of this, Grupo Lobo initiated in 1996 a new line of action which aims to rehabilitate the use of LGD as a measure of wolf conservation. At the same time, Grupo Lobo is also contributing to the recovery of the Portuguese LGD breeds – the Estrela Mountain Dog (Cão da Serra da Estrela), the Castro Laboreiro Watchdog (Cão de Castro Laboreiro) and the Alentejo Shepherd Dog (Rafeiro do Alentejo). The project operates in two different levels: one is concerned with the correct development of the dogs' behaviour and physical condition; the other focuses on the analysis of the inbreeding coefficient for each breed, based on genetic studies. A previous selection of the shepherds was made, according to some criteria as the amount of damages and the interest to participate in the project. The selection of the pups to be

integrated in the flocks was carried out according to the behaviour and morphology of the parents. Whenever possible, descendants of working animals were chosen. The pups were then integrated into flocks at the age of 2 to 3 months, when the establishment of bonds with livestock is possible, and were permanently kept in contact with the flock from then on, with limited contact with people. So far, 15 dogs (8 females and 7 males), ranging from 5 to 25 months of age, have been placed with different flocks of sheep and/or goats. The flocks range in size from 20 to 200 animals, and are managed in different systems and distinct environment conditions - from the high and steppe mountains, with heavy rain and snow in winter, to the lower plains with very hot and dry weather in summer. In the first case the flocks are always shepherded and confined for the night. In the second the animals are sometimes left alone in fenced pastures during the day and kept inside small metal fences, far away from the villages, at night, protected only by the dogs. From the time they were given to the shepherds until they reach maturity, the dogs were continuously monitored (on a monthly basis) in their physical and behaviour development. This has proved essential for the achievement of good working dogs, enabling the immediate correction of behaviour problems that may emerge and the supervision of the conditions where the dogs were raised. For the genetic analysis, the collection of blood samples from dogs of the different breeds was performed. In the laboratory, we have characterised each breed for 7 microsatellites (parts of the nuclear DNA highly polymorphic). Each dog breed shows particular characteristics for the selected molecular markers and so far the breed with higher values for inbreeding is the Castro Laboreiro Watchdog. The analysis of pedigrees has started and soon the most important animals to cross, regarding their inbreeding coefficient and kinship values, will be selected. The results from the genetic analysis will then be crossed with the morphologic and behavioural data.

Although in the beginning shepherds' opinion towards the efficiency of the LGD and of their correct raising may have been of distrust and disbelief, presently, after most of the dogs have reached maturity and started to prove efficient in flock protection, the attitude is changing. Furthermore, with the reduction of the amount of damages caused by wolves on their livestock shepherds began to show some tolerance towards this predator. One factor that has shown to be very important is the establishment of a permanent contact and of continuous support between the elements of the project and the shepherds.

The reduction of the conflict between man and wolf and the evolution towards a bigger tolerance and peaceful coexistence in Portugal seems to be possible, if a correct approach is undertaken.

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Abstract of scientific articles or reports

Linnell, J.D.C, Smith, M.E, Odden, J., Kaczensky, P. and Swenson, J.E. 1996. Carnivores and sheep farming in Norway. 4. Strategies for the reduction of carnivore - livestock conflicts : a review. NINA Oppdragsmelding 443 : 1-118.

This report aims to review individual methods by which the depredation can be reduced, and ways in which these methods can be incorporated into management strategies. An underlying assumption is that joint goals exist of maintaining carnivores, and livestock production.

Data were collected on several related topics including ; (1) Carnivore behaviour and ecology, (2) Animal Husbandry, (3) Depredation studies, (4) Traditional herding practices, (5) Cases studies. A world-wide perspective was taken where possible, although the main emphasis is for Europe, and Scandinavia in particular. Data were gathered from published and unpublished studies and personal communications. A clear effort was made to identify the biological mechanism behind a depredation reduction methods success or failure.

Fourli, M. 1999. Compensation for damage caused by bears and wolves in the European Union. Experiences from the LIFE-Nature projects. EUROPEAN COMMISSION DG XI, Environment, Nuclear Security and Civil Protection, Bruxelles. 68 pp.

The aim of this study is to present the existing compensation mechanisms within the context of LIFE-Nature projects, focusing particularly on two species of large carnivores that have received significant Community support, namely the wolf and the bear.

The study present and compares the compensation systems in the European Union countries that have had or still have LIFE-Nature projects on the wolf and / or on the bear (Austria, France, Greece,

Italy, Portugal and Spain), and attempts to point out what seems to have worked in a particular case and what did not. After a short presentation of the distribution and legal status of the two species, and the presentation of the damage levels and types in the aforementioned countries, the study examines and compares the different elements of a compensation mechanism.

One of the main results is that compensation systems do not vary only between countries but also within countries, particularly in the case of countries whose administration is on regional level. Some general suggestions are proposed for the amelioration of compensation systems, which can be adapted to the particular circumstance.

CDP News on the Web

The CDP News can be downloaded as PDF file on:

- LCIE-homepage on www.large-carnivores-lcie.org/ (**June 2000**)
- KORA-homepage on <http://www.kora.unibe.ch>

A list of addresses and projects will soon be available on:

- KORA-homepage on www.kora.unibe.ch

Damage prevention on the World Wide Web

Flock & Family Guardian Network:

www.flockguard.org

Reports on different breeds of livestock guarding dogs

Working Dog Web:

www.workingdogweb.com/wdbreeds.htm

A lot of information on guarding dogs with links to other webpages

Predator FAQ:

www.members.home.com/18james/rural/predator.html

Reports on several different prevention measurements

Ilamapaedia:

www.llamapaedia.com/uses/guard.html

Provides information about llamas as guarding animal.

The internet Center for Wildlife Damage Management

www.ianr.unl.edu/wildlife/solutions/handbook/index.htm

Predator defense Institute:

<http://www.enviroweb.org/pdi/alternat.htm>

Damage Prevention and Control

www.conservation.state.mo.us/manag/coyotes/control.html

Livestock Guarding Dogs

www.lgd.org/

Meetings of interest

2-4 May 2000

7th Western Bear Workshop

Coos Bay, OR.

Dave Immell, OR Dept. Of Fish and Wildlife, 4192

North Umpqua Highway, Roseburg, OR 97470.

Phone : (541) 440 3353, Fax : (541) 673 0371

Email : dave.a.immel@state.or.us

22-24 June 2000

Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)

Group of Experts on Large Carnivores Meeting

Oslo

Council of Europe, Strasbourg

Please send information about meetings of interest or addresses of Web sites dealing with carnivore damage prevention to:

cdpnews@kora.ch

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