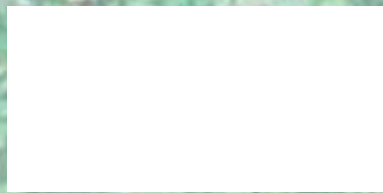




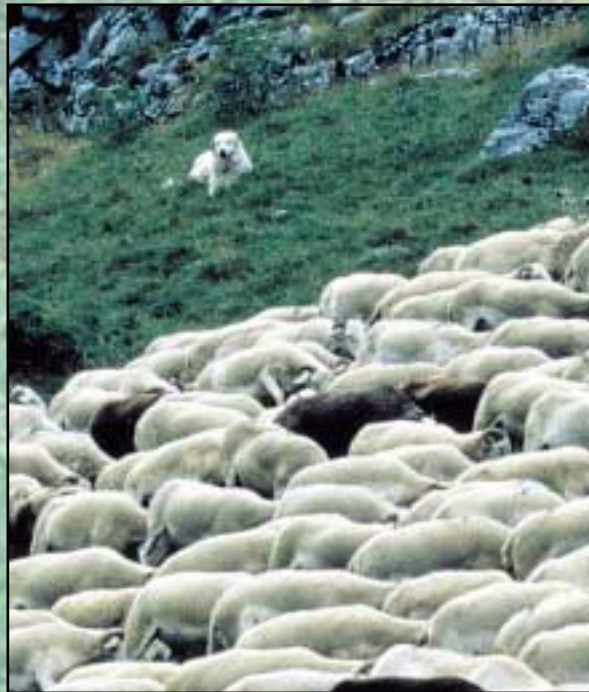
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# **COMPENSATION FOR DAMAGE CAUSED BY BEARS AND WOLVES IN THE EUROPEAN UNION**



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# **COMPENSATION FOR DAMAGE CAUSED BY BEARS AND WOLVES IN THE EUROPEAN UNION**

**Experiences from  
LIFE-Nature projects**

**Mariella FOURLI (Mecomat/Ecosphère)**

service contract n° B4-3200/98/000410/MAR/D2

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# Summary

The large carnivores' predatory behaviour and the resulting damage induced on livestock have always created conflicts with human populations; such conflicts have had and still have a significant negative impact on their public image. Despite the fact that large carnivores are protected by national and/or European law, their elimination (whether it is legal or illegal) is one of the main means used for the decrease of conflicts with humans. Various measures, such as prevention, removal of problematic individuals, and compensation have been used in the last few years in order to increase human tolerance of these species, which is negatively affected by the damage caused. Compensation is used in order to make up or at least alleviate the economic and social disequilibria caused to one group which was caused by the desire of another group to conserve the wolf and the bear.

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 presents and compares the compensation systems in the European Union countries that have had or still have LIFE-Nature projects on the wolf and/or the (namely Austria, France, Greece, Italy, Portugal and Spain), and attempts to point out what seems to have worked in a particular case and what not. A significant part of the information presented was collected through a questionnaire that was compiled specifically for the purposes of the present study and addressed to all LIFE beneficiaries with projects on wolves and/or bears.

Given the difficulty of determining the efficiency of a compensation system, the present study did not attempt to determine which compensation systems are more efficient than others. Instead, there was an effort to identify individual elements of the compensation systems that seem to be working better than others. 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: nature of structures responsible for compensation, the compensation procedure, the types of damage covered, the prerequisites for compensation, and the calculation of the compensation amount.

One of the main results is that compensation systems do not vary only between countries, which is quite logical, but also within countries, particularly in the case of countries whose administration is on a regional level. Evidently, there is no uniform mechanism that is adequate for all countries and all regions. However, some general suggestions are proposed for the amelioration of compensation systems, which can be adapted to the particular circumstances.

# Résumé

La nature prédatrice des grands carnivores et les dommages produits aux animaux domestiques ont toujours engendré des conflits avec les populations humaines, discréditant ainsi ces prédateurs et rendant difficile leur cohabitation avec l'homme. Bien que ces espèces soient protégées par la loi (nationale et/ou européenne), leur élimination légale ou illégale est toujours une des méthodes pratiquées pour réduire les conflits. Plusieurs mesures, telles que la prévention, la capture ou l'élimination des individus à problèmes et l'indemnisation ont été récemment employées afin d'améliorer l'acceptation par l'homme de ces espèces discréditées. L'indemnisation est utilisée afin de pallier ou au moins diminuer les déséquilibres économiques et sociaux infligés à un groupe dû au désir d'un autre groupe de protéger ces espèces.

L'objectif de cette étude est de présenter les mécanismes d'indemnisation existants dans le cadre des projets LIFE-Nature. Elle se focalise sur les deux espèces de grands carnivores qui ont reçu un appui communautaire financier important jusqu'à cette date : l'ours et le loup. Cette étude présente et compare les systèmes d'indemnisation mis en place dans les pays de l'Union européenne bénéficiant des projets LIFE-Nature concernant l'ours ou le loup (Autriche, France, Grèce, Italie, Portugal, Espagne). L'objectif de cette étude consiste également à montrer les succès et les dysfonctionnements de ces systèmes. Une partie importante de l'information présentée a été recueillie avec l'aide d'un questionnaire qui a été adressé à tous les bénéficiaires des projets LIFE sur l'ours et/ou le loup.

Compte tenu de la difficulté à estimer l'efficacité d'un système d'indemnisation, cette étude n'a pas eu pour but de déterminer les systèmes d'indemnisation les plus efficaces. Cependant, les éléments individuels des systèmes d'indemnisation les plus performants ont été identifiés. Après une présentation rapide de la distribution et du statut légal des deux espèces, ainsi que du niveau de dommages atteint dans les différents pays, l'étude examine et compare les divers éléments d'un système d'indemnisation : nature des structures responsables, les procédures, les types de dommages indemnisés, les conditions requises et le calcul du montant d'indemnisation.

Un des résultats majeurs mis en évidence est la divergence des systèmes, non seulement entre les différents pays, mais aussi au sein d'un même pays, plus particulièrement lorsque son administration est gérée à l'échelle régionale. Il n'existe évidemment pas de mécanisme uniforme adapté à tous les pays. Cependant, quelques recommandations générales pouvant être adaptées aux conditions locales sont proposées afin d'améliorer les systèmes d'indemnisation.



# Compensation for damage caused by bears and wolves in the European Union

## Experiences from LIFE-Nature projects

### INTRODUCTION

The predatory behaviour of large carnivores has always produced conflicts with human populations; such conflicts have had and still have a significant negative impact on the large carnivores' public image. For a long time, the means used by humans to resolve the problem of predation and damage has been the elimination of the large carnivores, which is even nowadays one of the most important threats to their conservation in Europe.

Many of the large carnivores whose elimination was legitimate in the past are now fully or partially protected by law. The necessity for their legal protection arose from the alarming decline in their populations in most European countries. The minimisation of damage risks to human activities through the elimination of the species responsible is therefore nowadays difficult because the conservation of biological diversity has become an important objective enshrined in treaties such as the Bern Convention, the Convention on Biological Diversity, and the Habitats Directive (De Klemm, 1996). However, the legal protection of endangered species does not necessarily imply their real protection. Given the modernisation of rural lifestyles, the tolerance limits of rural people for damage caused by the large carnivores have lowered. Tolerance limits are particularly low in areas where predators, like the wolf, have been absent for a few decades and are now coming back. Poaching is still a serious threat present in Europe, especially for predators who create significant damage.

In most countries, wild animals are *res nullius*, which means that they have no owner. Since they have no owner, no one can be held legally liable for damage caused by them. Damage by wild ani-

mals has thus always been considered as a natural risk for which none was liable. However, since certain species have become protected and are since *res omnium*, common heritage, self-defence measures are not applicable anymore, and the State may be considered to be liable for the adverse consequences of legislation which it adopted itself.

Given the obligations and limitations posed by national and European laws, and given that the coexistence of large carnivores and livestock without depredation is probably impossible (LCIE, 1998) the approach towards the problem of damage is gradually shifting towards the implementation of measures that attempt to make the co-existence of humans with large carnivores less conflictual. Various measures, such as prevention, removal of problematic individuals, and compensation have been used in the last few years in order to increase human tolerance of the two species, which is negatively affected by the damage caused. The objectives of such measures are to (Portillo, 1996):

- decrease the negative impact of the conservation of species on human populations located in large carnivore areas, and to
- decrease the hostile attitude and avoid revenge of the local populations against large carnivores.

These measures are divided in three general categories which are complimentary: preventive (e.g. use of guard dogs and electric fences), supportive (e.g. transportation of material to remote shepherd cabins) and compensatory (i.e. payment of damage). The compensation for damage to livestock, crops or other types of property caused by large carnivores is probably the most debatable measure used. It is considered by some as an indispensable

tool, by others as a secondary measure, and by others as a non-sustainable tool which can only be applied on a small scale.

No explicit answer to this issue will be found in this study, since its purpose is not to criticise or praise the notion of compensation. Its aim is to present the existing compensation mechanisms within the context of LIFE-Nature<sup>(1)</sup> projects, focusing particularly on two species of large carnivores that have received significant Community support, namely the wolf and the bear. Other large carnivores (such as lynxes and the wolverine) are not treated in this study since very little has been invested in them through LIFE-Nature. The study presents and compares the compensation systems in the European Union (EU) countries that have had or still have LIFE-Nature pro-

jects on the wolf and/or the bear (namely Austria, France, Greece, Italy, Portugal and Spain), and attempts to point out what seems to have worked in a particular case and what not. In the case of countries where compensation systems vary by region (namely in Spain and particularly in Italy) only those regions where LIFE-Nature projects are undertaking their activities are examined. A significant part of the information presented was collected through a questionnaire that was compiled specifically for the purposes of the present study and addressed to all LIFE-Nature beneficiaries with projects on wolves and/or bears (see Annex I). Most information (unless explicitly stated) refers to the period 1992-1997, the year of the beginning of the LIFE programme and the last year with complete annual information respectively. □



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<sup>(1)</sup> LIFE stands for “L’Instrument Financier pour l’Environnement”, that is, the European Financial Instrument for the Environment. Its objective is to promote the implementation of Community policy and legislation in the field of environment. There are three principal areas of action within LIFE: LIFE-Nature, which focuses on nature conservation, LIFE-Environment, which focuses on other types of environmental actions, and LIFE-Third countries, which focuses on nature conservation and other environmental actions in countries bordering the Mediterranean and the Baltic Sea. As far as LIFE-Nature is concerned, all actions financed under this instrument must contribute to the implementation of Council Directive 79/409/EEC on the conservation of wild birds (known as the “Birds Directive”) and of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (known as the “Habitats Directive”). The ultimate goal of LIFE-Nature is the creation of the Natura 2000 Network, a coherent ecological network of protected areas across the EU.

# 1

## Background



### COMPENSATION: A TOOL FOR EQUILIBRIUM

The conservation of protected species is considered to be a responsibility that must be shared by the entire society, since it is theoretically the entire society that benefits from conservation. At the same time, however, the conservation of large carnivores is likely to have a negative impact on the economy of particular target groups, usually belonging to marginal agricultural communities, which are, nevertheless, heavily subsidised. This means that the conservation of large carnivores implies a cost, which tends to fall on the shoulders of those specific populations that share a territory with protected species (Portillo, 1996). If it does fall on such populations, the system is not only inequitable from a social perspective, but also unsustainable from a conservation perspective. In other words, if a certain group of people has to bear the cost of conservation, then it should be compensated for it, since the conservation of predatory species can be in danger of losing all legitimacy without compensation (De Klemm, 1996). In order for a species to be efficiently protected in the long-term, both socio-economic and environmental parameters must be taken into account. European countries wishing to protect the bear and the wolf have therefore adopted compensation systems for damage, so that farmers and livestock raisers do not have to support economically the cost of protection of the two species (Nedelec, 1995). Compensation is therefore used in order to make up or at least alleviate the economic and social disequilibria caused to one group which was caused by the desire of another group to conserve large carnivores.

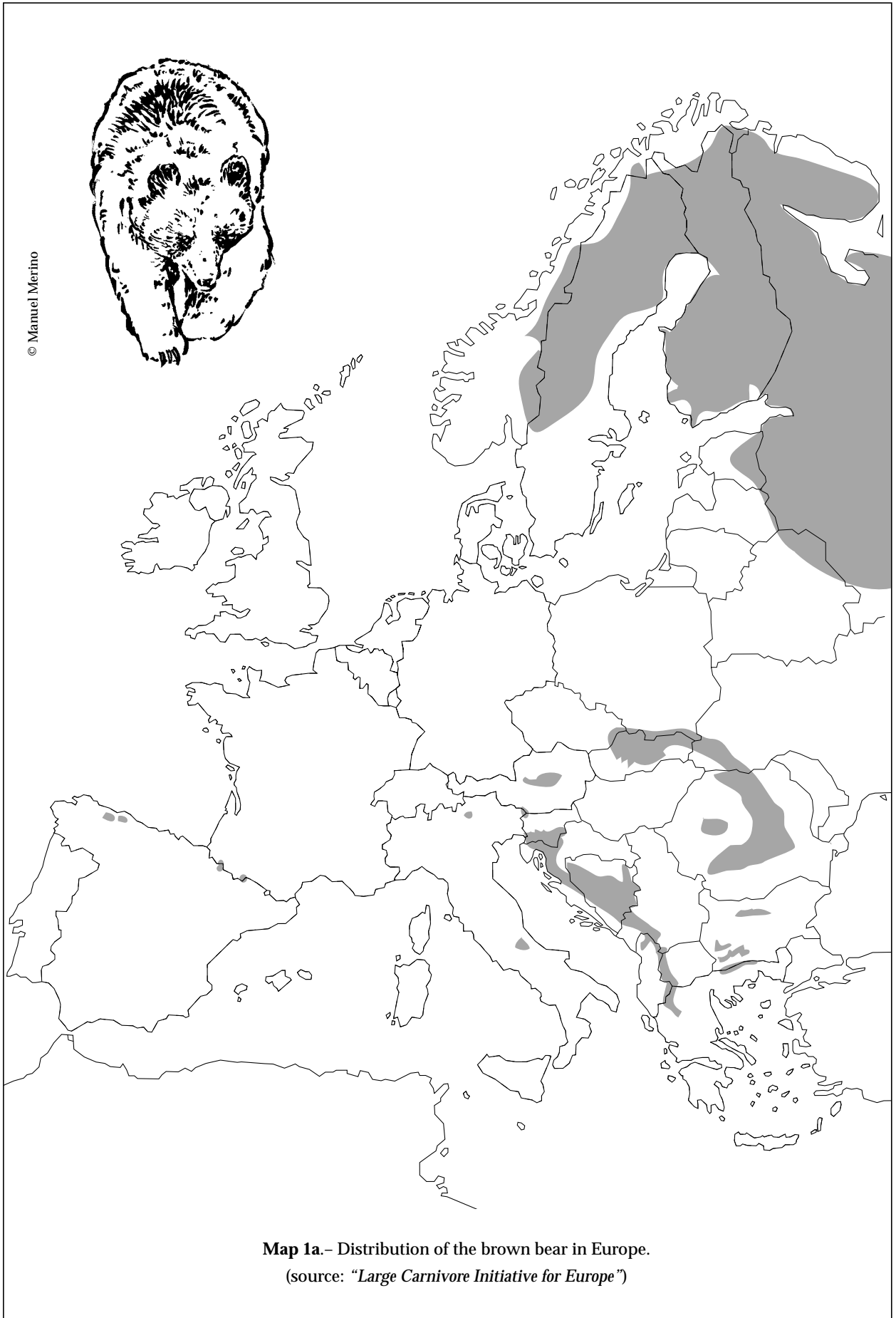
Compensation is part of the integrated management of risk that is generated by the presence of large carnivores such as the wolf and the bear in

areas with human activities. As aforementioned, compensation is a measure that complements preventive and supportive measures. Compensation is a passive strategy, in the sense that it does not create incentives for the reduction of damage, while preventive measures are an active strategy since they aim directly at the reduction of damage. Given that the aim of the conservation efforts is to maintain or increase populations of bears and wolves (wolf populations have already started increasing in many regions), the co-existence of bears and wolves with humans can create some conflicts. Such conflicts are likely to increase with the increase in predator populations, unless preventive measures are used for the minimisation of damage. In order for compensation to be efficient, it should be used only when damage cannot be avoided through the use of preventive measures, and without harming the conservation status of the species concerned (De Klemm, 1996). In addition, great care should be taken in order for compensation to be used as a means for ensuring the peaceful coexistence between humans and large carnivores and not as yet another tool for agricultural subsidies in marginal agricultural communities (Cozza *et al.*, 1996). Through an integrated and balanced use of prevention and complementary compensation, social conflicts resulting from the presence of large carnivores can be eventually minimised and the cost of the presence of large carnivores can become acceptable and manageable in the long run (Dahier et Lequette, 1997).

### DISTRIBUTION OF THE SPECIES

#### Distribution of the brown bear

The drastic geographical decline of the brown bear in the last few centuries has left only small



nuclei of isolated populations in the most inaccessible areas of western and southern Europe (refer to Map 1a). The present populations in the EU countries where the bear is considered to be a priority species (i.e., Austria, France, Greece, Italy, Portugal and Spain) are the scarce remnants of the populations that existed a few centuries ago. The largest part of the European population is found nowadays primarily in the Carpathians and the Balkans, and also in Scandinavia. (Nedelec, 1995)

**AUSTRIA:** In the Alps, the brown bear was exterminated by the end of the last century, with some individual bears coming in from Slovenia. However, since 1992 the number of bears moving back to the Austrian Alps has increased due to the reduced hunting pressure in Slovenia. The present bear population is estimated to be around 20-30 bears, but with only 2 to 5 adult females (N. Gerstl, pers. comm.).

**FRANCE:** Bears disappeared from the French Alps around 1940, and there is only a small nucleus of 5 to 6 bears left in the western Pyrenees (Bearn). The central nucleus of brown bears in the central Pyrenees became extinct in the 1990s, but the reintroduction of three bears from Slovenia (two of which were pregnant) in 1996 and 1997 is aiming at the re-establishment of a new brown bear population (Patrimonio, 1997), composed presently of 6 individuals.

**GREECE:** The bear population is divided in two independent nuclei: one in the mountains of Pindos which hosts 75% of the total Greek population, and another in the mountains of Rhodopi. These two populations are probably in contact with the populations of Albania, F.Y.R.O.M and Bulgaria. The total minimum population, which is the largest one in southern Europe, is estimated to be around 110 and 130 individuals.

**ITALY:** There are three independent bear populations; one population of about 50 to 100 individuals in the Abruzzo region and one population of 3 individuals in the Trentino region in the Alps, which has not reproduced since 1989, and is beyond the point of natural recovery. A reintroduction of individuals from Slovenia has been foreseen in this area. The population in the eastern

Alps is enhanced through a natural recolonisation with bears coming in from Slovenia, which however, are not in contact with the bears in the Trentino region.

**PORTUGAL:** There are no bears.

**SPAIN:** The population in the Cantabrian mountains is divided into two independent nuclei with a total population of 70 to 90 bears, two thirds of which are found in the eastern area of the mountains, in the regions of Asturias, Castilla y León, and Galicia (Portillo, 1996). The bears initially located on the French side of the Pyrenees are more and more often on the Spanish side; we could therefore talk about a mobile population of about 12-13 individuals, which is shared with France.

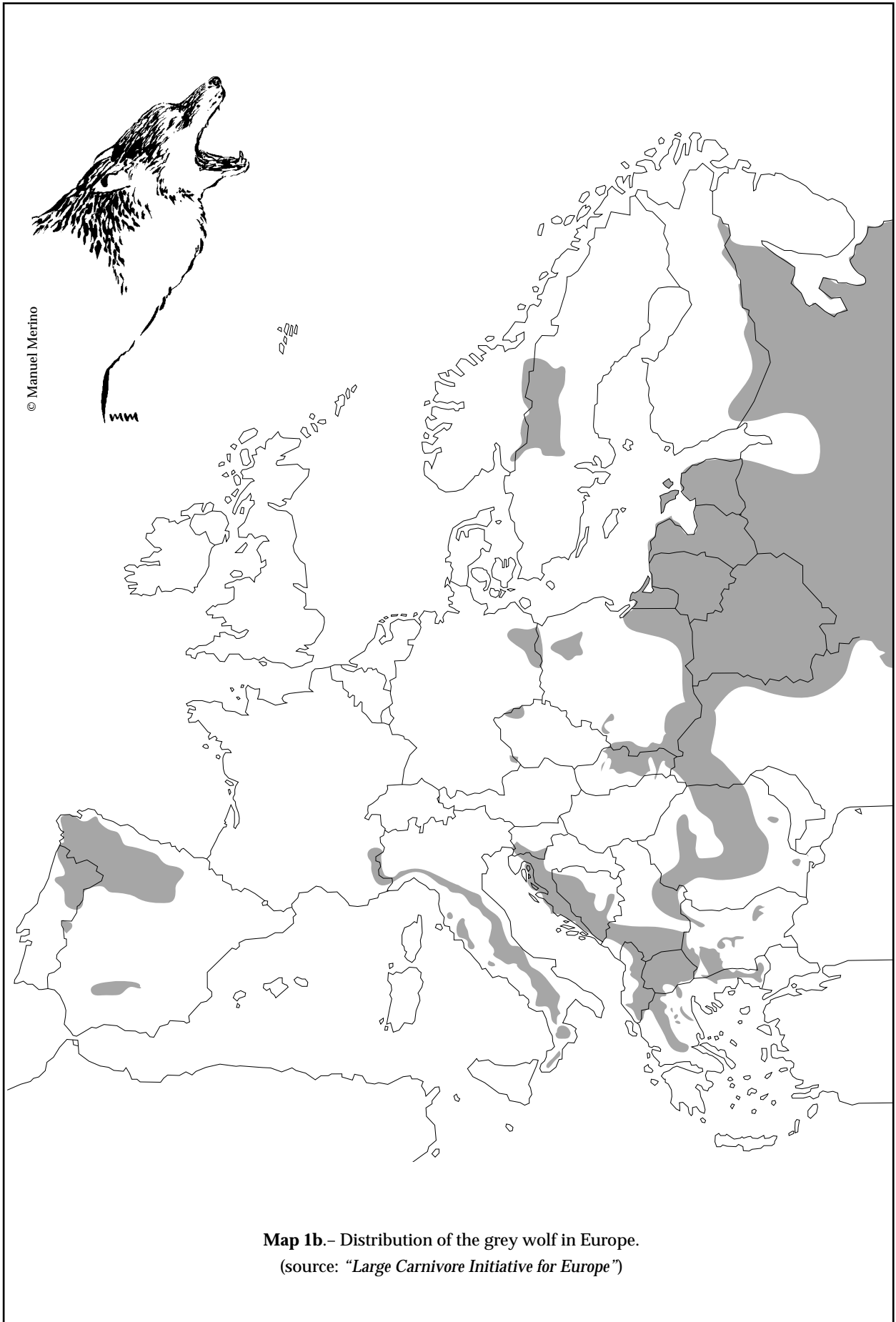
**OTHER EU COUNTRIES:** In Sweden, despite the extinction of the bear below the 600 parallel at the end of the 19th century, the population recovered due to specific protection measures, and was estimated to be between 685 and 770 individuals. In Finland, the estimated population is about 400 individuals and is connected with the Russian population of Carelia. The bear does not seem to be threatened in these two countries.

### Distribution of the wolf

Originally found in the entire Europe, wolves were exterminated from all central and north European countries by the 1950s. Some populations can still be found in Finland, Portugal, Spain, Italy and Greece while much healthier populations can be found in eastern Europe (see Map 1b). Through a natural recolonisation, small wolf populations can also be found nowadays in France, Germany, Norway and Sweden (LCIE, 1998) and occasionally in Switzerland. Presently, positive population trends within the EU are observed in Italy, Spain and France.

**AUSTRIA:** Wolves were exterminated by the end of the last century, but some individual wolves that had moved in from Slovakia or Slovenia had been observed until 1996. A natural recolonisation is considered to be possible (Kazcensky, 1996).

**FRANCE:** Wolves were once present in the entire French territory in the 18th century, but were



exterminated by the early 1930s. After an absence of more than fifty years, a few individuals coming from the Apennines in Italy were observed for the first time in 1992 in the Mercantour area (Houard et Lequette, 1993). There is currently a stable population of 20-30 wolves in this area, whereas there have also been wolf observations in the areas of Alpes de Haute Provence, Hautes Alpes, Savoie, and Isère, thus increasing the entire French wolf population to a maximum of 50 individuals (M. L. Poulle, pers. communication).

**GREECE:** The distribution range of the wolf includes the central and northern mountainous and semi-mountainous part of continental Greece. The wolf became extinct from southern Greece in the late 1930s and has lost 30% of its former range in the last 20 years. The total population is estimated to be around 200 to 300 individuals, the largest part of which is concentrated in northern Greece.

**ITALY:** The present population, which is estimated to be around 400-500 individuals, is distributed throughout the Apennines (Boitani e Ciucci, 1997). The wolf can be found nowadays, with varying degrees of density, in the regions of (going from the North to the South) Piemonte, Liguria, Lombardia, Emilia Romagna, Toscana, Umbria, Marche, Abruzzo, Lazio, Molise, Campania, Basilicata and all the way down to Calabria. The largest part of the wolf population is found in central Italy, in the Abruzzo region. Wolves had been heavily persecuted until the 1970s and their population had declined significantly, until a hunting ban was introduced by the Ministry of Agriculture (Kazcensky, 1996).

**PORTUGAL:** The wolf is present in almost the entire region north of the Duero river as well as in some mountainous areas south of the river. The estimated population of the wolf is about 300 to 400 individuals which are in contact with the Spanish populations.

**SPAIN:** This country hosts the most significant wolf population in the European Union. The present population is estimated to be around 1.500 to 2.000 individuals, the largest part of which can be found in the north-west of the country. The populations south of the Duero river are

extremely endangered, while those north of the river are relatively healthy.

**OTHER EU COUNTRIES:** A small population of about 100 wolves still remains in Finland. In the last twenty years, wolves have recolonised certain areas of Germany and Sweden.

## LEGAL STATUS OF THE SPECIES

### Legal status of the brown bear

The brown bear is legally protected by the Bern convention (cited in Appendix II "Strictly protected fauna species") and the CITES convention (cited in Appendix II "Potentially endangered species"). It is also included in the Annex II of the Habitats Directive (92/43/CEE) which lists all animal and plant species of community interest, whose conservation requires the designation of Special Areas of Conservation. This implies that Member States must undertake the protection of the species' habitats. It is also considered by the same Annex as a priority species, which implies that the Commission has a particular responsibility given the importance of the species' distribution area. The only EU populations that are not included in Annex II are the Finnish and Swedish populations. The brown bear is also included in Annex IV of the Habitats Directive, which lists all animal species that require strict protection. The Finnish and Swedish populations are included in the Annex IV.

On a national level, the species is completely protected by legislation in France, Greece, Spain and Italy (refer to Table 1). In Austria the bear does not have the status of a fully protected species but is considered to be a game species whose hunting is prohibited all year long (and therefore, in real terms is fully protected). Despite the fact that wildlife issues are the competence of the regional authorities in some countries (like in Austria, Spain and Italy), it is always national legislation that decrees the protection of the bear.

In all five countries, the elimination of problematic individuals is theoretically possible. In most cases, competent authorities have the right to chose the elimination of such animals, after con-

sultation with higher authorities. However, this right has never been exercised in any of these countries in the last years, with the exception of Austria, where two problematic bears were eliminated in 1994. The right to eliminate problematic individuals corresponds with Article 16 of the Habitats Directive. According to this article, Member States may derogate from the provisions of Article 12 which, among else, prohibits the deliberate killing of strictly protected species in the wild, in case there is a need to “prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property.” This may be done if no alternative solutions (such as, for example, relocation of problem individuals) are feasible.

**Table 1.**— Legal protection of the brown bear on a national level.

	Estimated population	Protected since	Management Level
AUSTRIA	20-30	1971	Regional
FRANCE	12	1958	National
GREECE	110-130	1969	National
ITALY	50-100	1939	Regional
SPAIN	70-90	1967	Regional

**Legal status of the wolf**

The European populations of the wolf are classified as “vulnerable” in the 1996 IUCN Red List, as “potentially endangered” in the CITES Appendix II, and as “strictly protected species” (Appendix II) according to the Bern Convention. The wolf is a priority species of community interest according to the Habitats Directive (included in Annexes II and IV), the only exceptions being the Spanish populations north of the Duero river, and the Greek populations north of the 39° parallel, which are not included in these two Annexes. Another exception is the entire wolf population in Finland, which is not included in Annex II, while only the Finnish wolf populations in reindeer areas are excluded from Annex IV. All afore-

mentioned populations in the three countries are nevertheless included in Annex V of the Habitats Directive, which concerns animal and plant species of community interest whose extraction from the natural environment and exploitation may be regulated with management measures.

As in the case of the bear, national legislation foresees the protection of the species in all six countries, even in Italy, Spain and theoretically in Austria where regional authorities are responsible for wildlife management (refer to Table 2). In Spain however, the wolf is considered to be a game species according to national legislation, even though its hunting is strictly regulated. The wolf can be hunted north of the Duero river depending on regional legislation, according to a National Decree issued in 1989. It is therefore considered to be a game species in northern Spain, whose hunting is regulated by the regional authorities. So far, the wolf is fully protected only in the regions of Extremadura, Andalucia and Castilla-La Mancha. According to national legislation, the wolf is fully protected in France, Greece, Italy and Portugal. The Greek populations north of the 39° parallel, even though not considered by the Habitats Directive, are protected by national law, and their hunting is therefore strictly prohibited. However, since 1991 (the year when the species was removed from the list of “nuisance” animals), the elimination of two packs of wolves causing high damage has been ordered (one in 1993 and one in 1996) by regional authorities.

**Table 2.**— Legal protection of the wolf on a national level.

	Estimated population	Protected since	Management Level
FRANCE	Less than 50	1993	National
GREECE	200-300	1991	National
ITALY	400-500	1976	Regional
PORTUGAL	300-400	1988	National
SPAIN	1500-2000	-	Regional

## LIFE-NATURE PROJECTS ON THE BROWN BEAR AND THE WOLF

The present study focuses on the compensation systems used by ongoing and completed LIFE projects (between 1992 and 1998) in the European countries where the wolf and the bear are priority species according to the Habitats Directive 92/43/EEC.

The bear and wolf projects whose compensation systems were studied are listed in Tables 3 and 4. Those projects that target both the bear and the wolf are included in both tables, and the information presented throughout this paper in each table refers specifically to the bear or the wolf. Tables 3 and 4 present also some basic information for each project, such as the code used in this study, the area of the project, the duration and the beneficiary.

Maps 2a and 2b indicate the location of each project. A code has been assigned to each project, which will be used throughout this paper. Each code has at most three parts, separated by a backslash: the first part indicates the target species of the project ("B" stands for "bear" and "W" stands for "wolf"), the second part indicates the country ("AT" for "Austria", "FR" for "France", "GR" for "Greece", "IT" for "Italy", "PT" for "Portugal" and "ES" for "Spain), and the third part (if there is one), indicates the region or area of the country where the project is taking place. The third category is used only in the case of countries that have more than one projects on one of the two species. The only exception are the Greek projects on bear, which both cover the entire bear range, and are considered as two phases of a continuous project. In this case, the third part of the code was substituted by a "1" or "2", numbers which refer to the first and second phase respectively. □



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Table 3.– LIFE-Nature projects on bears.

COUNTRY	TITLE	PROJECT CODE	AREA	DURATION	BENEFICIARY
AUSTRIA	Programme for the protection of the bear	B/AT	Eastern Austria <sup>(1)</sup>	04/95-03/98	WWF (NGO)
FRANCE	Conservation of threatened vertebrates in the Pyrenees <sup>(2)</sup>	B/FR/PYREN	Pyrenees <sup>(1)</sup>	09/93-06/98	Ministry of Environment
	Conservation of large carnivores: bears in central Pyrenees	B/FR/PYREN.CENT	Central Pyrenees	01/97-12/99	Ministry of Environment
GREECE	Protection and management of the brown bear and its habitats	B/GR/1	Pindos Rodopi <sup>(1)</sup>	01/94-12/95	Ministry of Agriculture Arcturos (NGO)
	Conservation of <i>Ursus arctos</i> and its habitats	B/GR/2	Pindos Rodopi <sup>(1)</sup>	01/97-12/99	Arcturos (NGO)
ITALY	Mammal conservation in the Alps and Apennines	BW/IT/ALP&APEN	Friuli-Venezia-Giulia Region Trento Province Abruzzo Region <sup>(1)</sup>	09/92-07/97	Ministry of Agriculture Abruzzo National Park WWF (NGO)
	Mountain gorge habitats in the Sirente Velino Regional Park	BW/IT/SIRENTE	Abruzzo Region	01/95-12/96	Sirente Velino Regional Park
	Project URSUS: protection of the brown bear in Brenta	B/IT/BRENTA	Trento Province	04/96-09/98	Adamello-Brenta Park
	Bears and wolves in the central Apennines	BW/IT/APEN	Abruzzo Region Marche Region Umbria Region	01/98-12/01	Legambiente (NGO)
	Conservation of large carnivores in the Alps	BW/IT/ALPS	Friuli-Venezia-Giulia Region Trento Province	01/98-12/00	WWF (NGO)
	Actions for the brown bear in the Sirente Velino Regional Park <sup>(3)</sup>	B/IT/SIRENTE	Abruzzo Region	09/98-09/01	Sirente Velino Regional Park
	Actions for the protection of 2 Natura 2000 sites in Tarvisiano <sup>(3)</sup>	BW/IT/TARV	Friuli-Venezia-Giulia Region	01/99-12/01	University of Udine
SPAIN	Conservation of the brown bear in the Cantabrian mountains	B/ES/CANT1	Cantabrian Mountains	09/92-12/98	Fundación Oso Pardo (NGO) Region of Cantabria Region of Asturias Region of Castilla y León Region of Galicia
	Conservation of threatened vertebrates in the Pyrenees <sup>(2)</sup>	B/ES/PYREN	Pyrenees	09/93-12/98	Ministry of Environment Region of Aragón Region of Navarra Region of Cataluña
	Conservation of the brown bear in Asturias <sup>(3)</sup>	B/ES/ASTUR	Cantabrian Mountains	07/98-06/01	F.A.P.A.S. (NGO)
	Conservation of reproductive nuclei of the Cantabrian brown bear <sup>(3)</sup>	B/ES/CANT2	Cantabrian Mountains	09/98-09/01	Fundación Oso Pardo (NGO)

<sup>(1)</sup> Entire species distribution range in the country

<sup>(2)</sup> This project was accepted as one single project, with various sub-projects; however, given the radically different compensation systems used in France and in Spain, it is treated as two independent projects for the purposes of this study.

<sup>(3)</sup> These projects were selected in 1998, and have either just started or will be starting in the near future. Only the activities foreseen are presented for these projects, since no data have been collected so far, and no or few activities have been realised.



Table 4.- LIFE-Nature projects on wolves.



COUNTRY	TITLE	PROJECT CODE	AREA	DURATION	BENEFICIARY
FRANCE	Conservation of large carnivores: the wolf in France	W/FR	French Alps <sup>(1)</sup>	01/97-12/99	Ministry of Environment
GREECE	Conservation of <i>Canis lupus</i> in Greece	W/GR	Central Greece	01/98-12/00	Arcturos (NGO)
ITALY	Mammal conservation in the Alps and Apennines	BW/IT/ ALP&APEN	Abruzzo Region <sup>(1)</sup>	09/92-07/97	Ministry of Agriculture Abruzzo National Park WWF (NGO)
	Mountain gorge habitats in the Sirente Velino Regional Park	BW/IT/SIRENTE	Abruzzo Region	01/95-12/96	Sirente Velino Regional Park
	Conservation actions for the wolf in the northern Apennines	W/IT/APEN	Emilia Romagna Region	01/97-12/99	Gigante Regional Park
	Bears and wolves in the central Apennines	BW/IT/APEN	Abruzzo Region Marche Region Umbria Region	01/98-12/01	Legambiente (NGO)
	Conservation of large carnivores in the Alps	BW/IT/ALPS	Piemonte Region	01/98-12/00	WWF (NGO)
	Actions for the protection of 2 Natura 2000 sites in Tarvisiano <sup>(2)</sup>	BW/IT/TARV	Friuli-Venezia- Giulia Region	01/99-12/01	University of Udine
PORTUGAL	Conservation of the wolf	W/PT	Northern Portugal <sup>(1)</sup>	01/95-12/96	Institute for Nature Conservation
SPAIN	Conservation of <i>Lynx pardinus</i> and <i>Canis lupus</i> in Extremadura <sup>(2, 3)</sup>	W/ES/EXTREM	Extremadura	09/98-08/02	Region of Extremadura

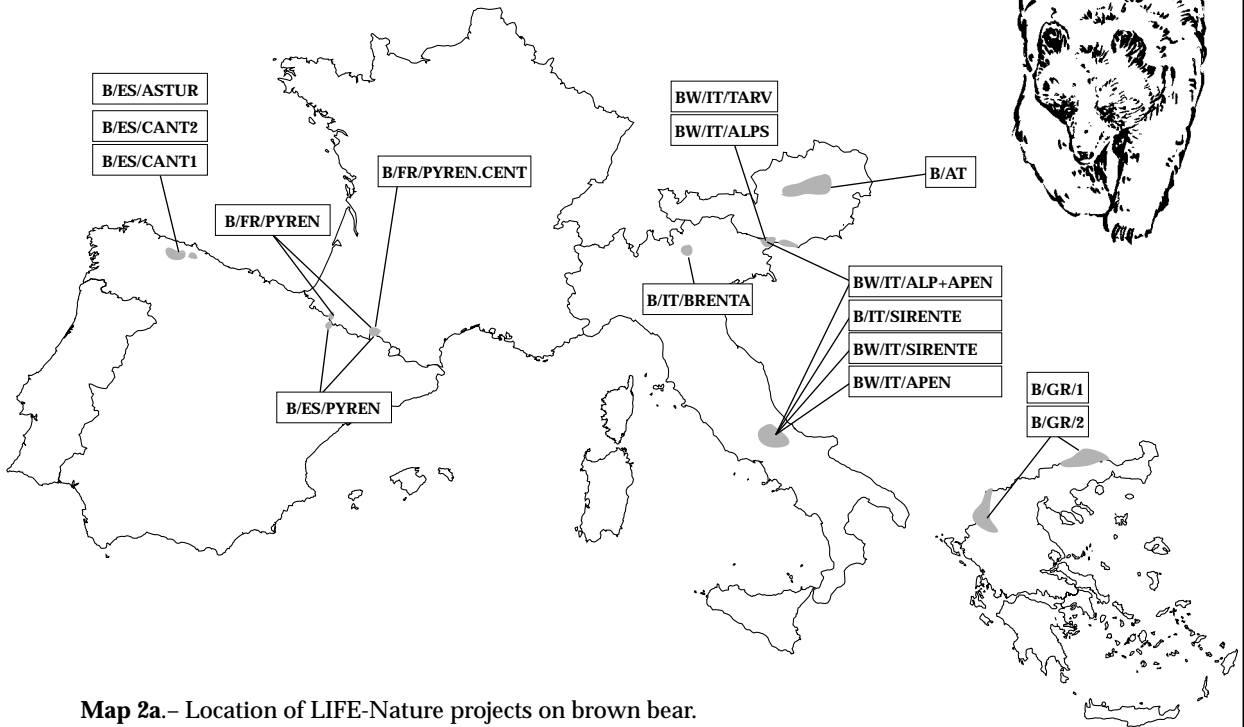
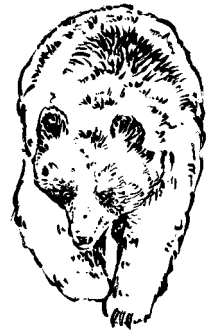
<sup>(1)</sup> Entire species distribution range in the country

<sup>(2)</sup> This project was selected in 1998, and just started. Only the activities foreseen will be presented, since very few activities have been realised.

<sup>(3)</sup> Only a small part of the activities of the project focuses on the wolf.

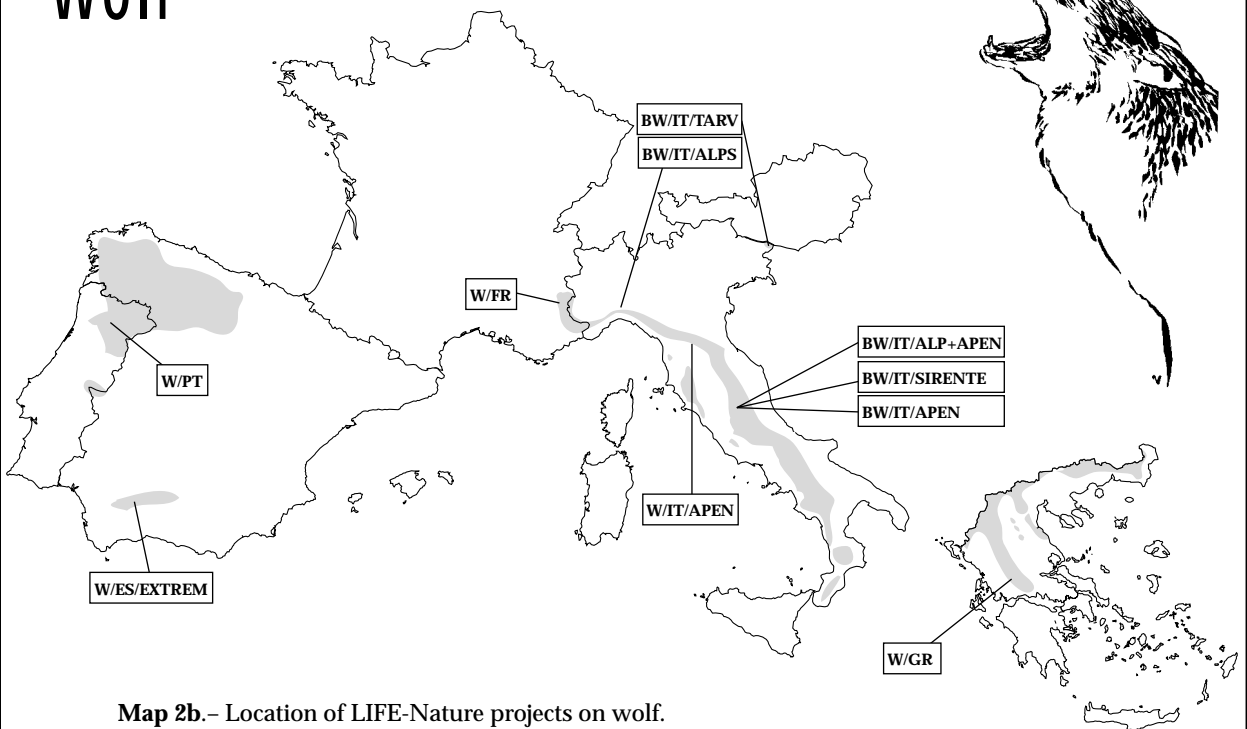


# Bear



Map 2a.- Location of LIFE-Nature projects on brown bear.

# Wolf



Map 2b.- Location of LIFE-Nature projects on wolf.

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## 2 Damage caused by the brown bear and the wolf



Other than the factors related to the population size of the large carnivores and the geographic location of “target” areas, damage is greatly affected by one main factor, which has boosted the levels of predation and other types of damage caused by the wolf and the bear. Pastoral practices are rapidly changing; flocks become larger and larger in order to minimise costs. Consequently, the traditional ways of guarding, such as the use of shepherds and guard dogs, are gradually disappearing in many regions. Free-ranging animals are often left unattended for long periods of time. According to the large carnivore experts, this is probably the most significant cause of high predation levels. The importance of the type of pastoral practices and its relation to damage levels becomes evident when considering that attacks tend to be recurrent on the same flocks and farms (LCIE, 1998).

A secondary factor that influences the level of damage caused by carnivores is that the distribution and density of the natural prey of the wolf and the bear has been significantly modified in many regions as a result of human activities. These modifications in distribution and density, combined with the easier access of large carnivores to domestic animals, have led to an increase in damage levels. In many regions, however, natural prey populations have increased in the last years, due to a stricter hunting control. Nevertheless, this increase of natural prey does not necessarily lead to a decrease in damage on domestic animals, since as long as the latter constitute an easily accessible source of food, carnivores prefer this source.

Another factor that could indirectly influence carnivore damage levels is that humans have

changed some characteristics of certain domestic animals through a procedure of forced selection that has been used for generations, in order to reinforce favoured characteristics of the domestic animals, like milk and meat production capacity. However, the forced selection may be to the detriment of other natural characteristics once possessed by domestic animals, such as resistance to adverse climate and anti-predator instinct (Nedelec, 1995, LCIE, 1998, Savelli *et al.*, 1998). In addition, the market very often forces stock farmers to prefer certain types of animals, which may not be well-adapted to local conditions. For example, the more productive Dutch cows that have replaced native cows in many regions of Greece are much heavier and slower, and are therefore less capable of driving away an attacking predator.

### TYPES OF DAMAGE

The bear’s usual domestic prey is goats and sheep, and less often cattle and horses. The opposite is however true in certain cases, as in Greece and in Asturias in Spain, where most damage is on equine and bovine. The bear is an opportunistic predator, so it may also attack pigs and poultry. It is also very interested in beehives, and lately Austrian bears have also developed a taste for rape seed oil, thus damaging equipment that contains this type of oil, such as chainsaws and road rollers. Invasions to fields containing crops like corn or fruit trees are also frequent in some areas. As can be seen in Table 5 (where percentages are with respect to total bear damage expressed in euro), the type and proportion of damage to livestock, crops, beehives and infrastructure varies greatly between countries and regions.

**Table 5.**– Types and percentage of bear damage costs.

COUNTRY	AREA	LIVESTOCK %	CROPS %	BEEHIVES %	INFRASTRUCTURE & EQUIPMENT %
AUSTRIA	Eastern Austria	29.7	0	51.4	18.9
FRANCE	Pyrenees	100	0	0	0
GREECE	Pindos & Rodopi	58.5	11.4	29.9	0.2
ITALY	Apennines	94.7	0	5.3	0
	Alps	94.8	0	5.2	0
SPAIN	Cantabrian Mountains	66.0	13.8	20.2	0
	Pyrenees	100	0	0	0

Wolves inflict damage almost exclusively on livestock. They attack mainly sheep and goats, which are more vulnerable than horses and cattle. With the exception of some minor damage to agricultural infrastructure, such as fences (which may be destroyed during the wolves' attacks on livestock), no cases of other kinds of damage have been observed. (For a more detailed discussion on types of damage per country, please refer to the individual paragraphs of the following section).

### LEVELS OF DAMAGE

An important methodological problem related to the estimation of levels of damage is how to record and compare them when dealing with different types of damage. If they are recorded in terms of animals killed, then comparisons are highly unrealistic when dealing with attacks on different kinds of animals (Is an attack on a cow equal to an attack on a chicken?), and impossible when comparing with damage in agriculture or beehives. For this reason, the present study is comparing damage in monetary terms, and issues raised are related not to the question “How many animals are killed in region A?” but rather “What is the cost of damage in region A?”.

Charts 1 and 3 present the comparative data per country on the cost of bear and wolf damage (the exact figures used for these Charts can be found in Annex II). An increase in the cost of damage can be observed in some cases (i.e. bear damage costs in Austria, France and Greece, and wolf damage costs in Portugal and France). Such increases may be due to three reasons:

- First, they may be related to increases in the prices of animals or in the other fees included

in the compensation, since damage is estimated in monetary terms. This is one of the main drawbacks of expressing damage in monetary terms, and one of the arguments for expressing them in animal units.

- Second, they can be due to an increase in the damage declared, which may for instance be related to the operation of projects dealing with the improvement of compensation systems. Actual damage by bears and wolves are impossible to estimate in most cases. The data on damage come mainly from damage declarations. It is impossible to know the real level of damage caused by the wolf and the bear, since



*Bee-hive cabin invaded by a bear in Carinthia, Austria.*

© WWF-Austria

usually not all damage is declared. This occurs when farmers or livestock raisers know that the damage they have suffered cannot be compensated, due to specific regulations. In this case, they have no financial interest in declaring damage.

□ Third, they may be due to increases in real damage resulting either from a change in the population or distribution of large carnivores, or from the presence of isolated “problematic” individuals, i.e., individuals with abnormal behaviour causing excessive damage.

Given that it is very difficult to determine which of the three aforementioned reasons could be responsible for an observed increase in declared damage, information and, particularly, quantitative data should be treated with care.

When comparing damage costs between countries, two factors have to be considered in order for the comparisons to be valid. First, declared damage levels expressed in monetary terms are based on the compensation paid in each country. This implies that damage costs are superior in countries where the prices of the animals are higher, and where the responsible bodies pay more for each damage, *ceteris paribus*. This does not imply how-

Chart 1.- Cost of total bear damage.

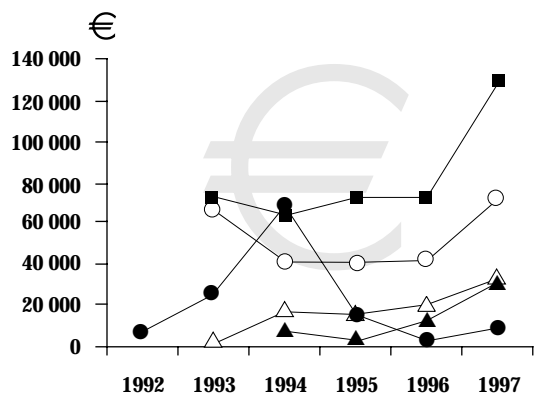


Chart 2.- Cost of damage per bear.

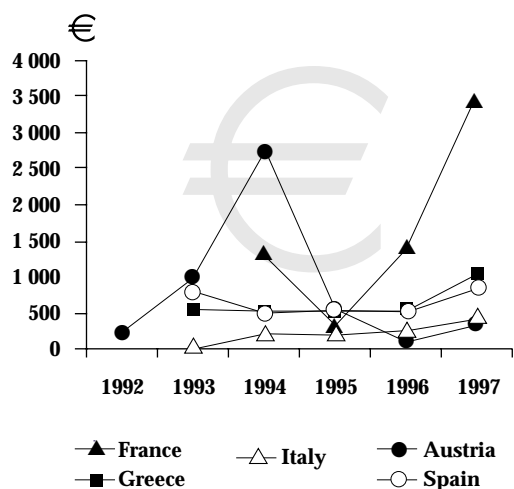


Chart 3.- Cost of total wolf damage.

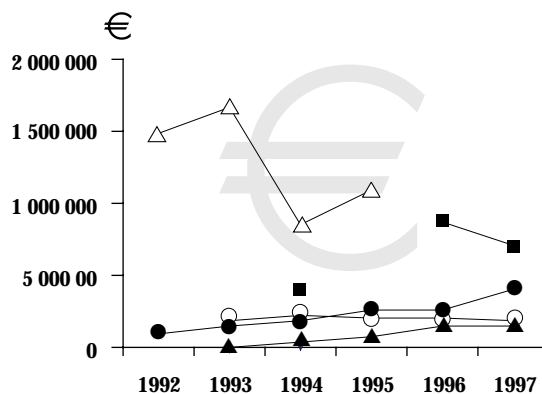
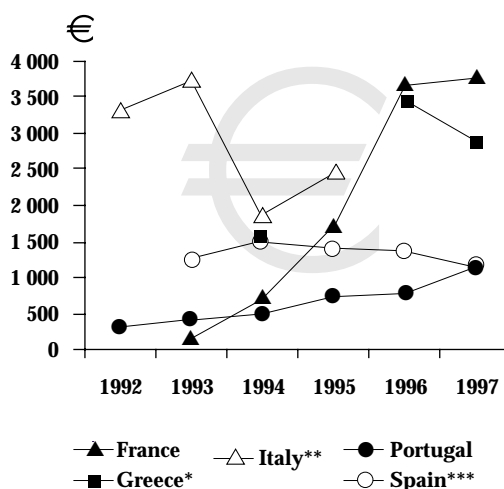


Chart 4.- Cost of damage per wolf.



(\*) The figures for Greece are very approximative since there is no data exclusively for damage caused by the wolf. Wolf damage is included in the category of damage caused by wild animals other than the bear, and wolf damage has been inferred. No data are available for 1995.

(\*\*) Ciucci *et al.*, 1997

(\*\*\*) The figures for Spain refer only to the regions of Asturias and Cantabria, two of the four regions compensating damage, and the only two for which damage compensation data are available on a regional level.

ever that physical damage is necessarily higher in these countries than in countries where damage cost is lower. A second parameter that must be taken into consideration when comparing damage not only between countries but also between regions is the bear or wolf population. In order to be able to compare, damage should be relative to the estimated population of the species causing the damage. The problem is that, only in few cases where populations are very small, do we have a good approximation of the population. In cases of large populations, such attempts are based on approximations with very wide ranges. Charts 2 and 4 present the levels of damage relative to the population in each country caused per bear or per wolf in the six countries, taking into account the average estimated population of each of the two species (the exact figures used for these Charts can be found in Annex II). The data derived on damage per bear or per wolf are based on the assumption of a stable population, with the exception of bear damage in France, since a new population was created in 1996, through the reintroduction of three bears, two of which were pregnant (which increased the French bear population by 50%). It is important to note that these data are highly speculative, but offer a comparative measure of how much wolf and bear damage cost to the society in each country.

One important point to be kept in mind, while considering the levels of damage caused by the wolf and the bear, is the difference between actual and perceived damage. Actual damage is in general much lower than perceived damage, particularly in the case of the wolf, where damage caused by stray dogs is often attributed to the wolf. However, it is perceived damage that influences public opinion, and not real damage. The emotional factor plays an important role in the perception of damage. This becomes evident when considering that even though damage to livestock caused by wolves and bears is low compared to other causes of livestock mortality, it is often perceived as excessively important (LCIE, 1998). In fact, damage caused by wild ungulates, and particularly the wild boar, is by far higher than damage caused by large carnivores (see Chart 5). For instance, damage caused by wild ungulates in agriculture in the region of Umbria in Italy between 1991 and 1995

were 6 times higher than predator damage to livestock during the same period (Ciucci *et al.*, 1997).

Such discrepancies are not found only in Italy; in France, damage from wild ungulates in 1993 was 18.000.000 euro while wolf damage was 5.540 euro, and in 1994 wild ungulate damage was 14.000.000 euro while wolf damage was 28.900 euro (Vassant, 1997). The lowest level of wild ungulate damage costs in the last 20 years in France was observed in 1978. It amounted to approximately 4.923.000 euro, an amount 32 times higher than wolf damage in France in 1997, the year with the highest level of wolf damage costs.

In Asturias in Spain, compensation for damage caused by wild boar in 1993 was 14 times higher than compensation for bear damage and 1,5 times higher than compensation for wolf damage. Interestingly, even though damage may be of a significant level to the farmer who suffered it (which is often the case, especially within the context of marginal agricultural economies), the overall damage from wolves as a percentage of the livestock industry is usually negligible, that is, less than 0.5% of all types of livestock losses (LCIE, 1998), and even less in the case of bears.

Even though bears have a larger variety of “targets”, wolf attacks cause many more casualties. For example, the number of sheep usually killed by a bear in an attack is one or two animals, while the average number killed by a wolf is higher. In addition, wolves usually attack in packs, thus creating accumulated damages. Another element that increases the average number of animals killed per wolf attack is that the phenomenon of surplus killing is quite frequent in wolf attacks. In addition, both in the case of wolf and bear attacks, there are some exceptional cases of “mass murder” which may occur when attacked animals panic and either suffocate, drown or fall in ravines.

**AUSTRIA:** Bear damage has been moderate so far. However, in 1994 two bears caused a sharp increase in damage: in that year, damage increased 2.7 times with respect to the previous year. After the elimination of these two bears, damage went back to its prior levels. More than half of the damage occurs in beehives, while one third of the damage occurs in livestock. Austria has by far the

highest rate of damage in infrastructure (chain saws, road rollers, etc.), which constitutes approximately 19 percent of total damage (see Table 5). This type of damage is a new trend of the last one year and a half (N. Gerstl, pers. comm.).

**FRANCE:** Livestock losses due to bear attacks are generally small in the western and central Pyrenees and concern exclusively livestock (sheep and goats). However, the Slovenian bears reintroduced in the central Pyrenees tend to cause more damage than “native” bears. This is due to the different pastoral systems in the two areas (mainly guarded pasture of milk sheep in the western Pyrenees and unguarded pasture of meat sheep in central Pyrenees). It could also be due to the different inherent character and habits of the Slovenian bears. Nevertheless, bear damage relative to the bear population, is the highest among the countries compared (see Chart 2). Wolf damage to livestock has increased abruptly and is currently by far the highest among the five countries studied when considering the small size of the wolf population. There are about 60.000 sheep each summer grazing in wolf areas in the Mercantour; some flocks are guarded throughout the day and night by shepherds and dogs, while others are inspected only occasionally (Dahier et Lequette, 1997, M.L. Poulle, pers. comm.). Flocks can vary between 300 and 2,500

animals. Given the very lax guarding practices, it is not surprising that damage in relation to the wolf population is by far the highest among the five countries with LIFE projects on wolves, with an increasing tendency, which, however, was stabilised in 1998. The lax practices are very likely to be related to the absence of the wolves from the area for about 50 years. This absence implies that rural people are very likely to have forgotten how to cope with the predator through the use of traditional practices.

**GREECE:** Bear damage in absolute terms is high in comparison to the other EU countries. However, damage relative to the size of the bear population tends to be much lower. The abrupt increase of declared bear damage in 1996 coincides with the beginning of the second phase of the B/GR/2 project, which set in place the second phase for the improvement of the compensation system of ELGA (for more details refer to Box 1). The actual levels of wolf damage are not known with accuracy. ELGA, the Greek organisation of agricultural insurances, which is the official body recording all this relevant information, has data for two large categories of damage: damage from bears and damage from wild animals other than the bears. The second category includes damage from wolves, feral dogs, foxes, jackals, wild boars and other smaller wild animals. The data on wolf dam-

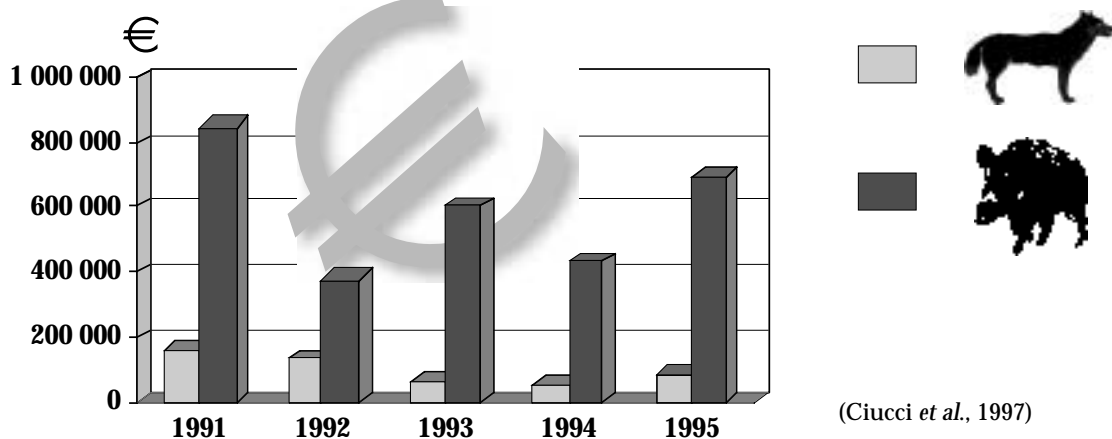


Chart 5.- Comparison of predator and wild ungulate damage levels in the region of Umbria, Italy.

**Box 1.**— The contribution of the Greek bear and wolf LIFE-Nature projects to the official compensation system.

The three Greek projects (B/GR/1 and its continuation B/GR/2, and W/GR) run by the same beneficiary, ARCTUROS, have foreseen as a project objective the amelioration of the compensation mechanism, which is the responsibility of ELGA, the Greek organisation of agricultural insurances. Through their lobbying and continued presence, the projects have managed to achieve certain changes in the procedures of the compensation system. These changes have significantly increased the type and level of damage covered by ELGA, as well as the efficiency of the compensation procedure, in terms of time needed for payment.

The first improvement of the compensation mechanism occurred in 1994, the year when the activities of the B/GR/1 project started: compensation for bear damage became a priority, which meant that the payment delay decreased from 1-1½ years to 1-6 months, with an average of about 2½ months. The project had originally foreseen to create a revolving fund (i.e. the project would compensate the farmer, and then ELGA would reimburse the project) in order to speed up the procedure. However, this system was not put into place finally due to certain legal regulations of

ELGA, according to which ELGA can give compensations only to the person that has suffered the damage and not to third parties.

The second achievement occurred in 1995, just one year after the beginning of the B/GR/1 project; ELGA changed its minimum requirement of damage of 1 Insurance Unit to damage of 0.5 Insurance Unit. The Insurance Unit depends on the size and age of the animal. For instance, an adult cow of at least two years of age is equal to one Insurance Unit, a sheep or a goat between one and six years old is equal to 0.15 Insurance Units. This change implied the coverage of a larger part of damage to livestock.

The third achievement took place in 1996: for the first time, ELGA started compensating bear damage to agricultural production and on beehives (swarms were already being compensated). This increased even more the coverage of damage. For instance, at the beginning of the B/GR/1 project, ELGA regulations covered only 55% of the total value of damage caused by bears in agriculture, while at the end of the project, this percentage had increased to 62%. At present, almost two years after the beginning of the second bear project, B/GR/2, this percentage has increased to 91% of agricultural damage value.

(S. Psaroudas, pers. comm.)

The wolf project, W/GR, is planning to ameliorate even more the official compensation system, and has two specific objectives: first, to decrease the minimum Insurance Unit requirement for compensation from 0.5 Insurance Units to 0.14 Insurance Units, so as to cover even the damage on one goat or sheep (each animal being equal to 0.15 Insurance Units). The second aim is to increase the percentage of the livestock value covered by ELGA for wolf damage, which is currently 80%. The results of such an achievement would be twofold: first, increase the coverage of compensation of wolf damage, and second, remove the wolf from the “other wild animals” category. This category includes also animals such as the wildboar, the jackal, the fox, and feral dogs. Presently, the value of livestock damage from all wild animals covered, with the exception of the bear, is 80%. Even a slight increase in the percentage of damage covered in the case of wolf damage, would imply that the wolf would become a separate category, and this would permit a significantly better knowledge concerning the type and particularly the level of damage caused by this species (the confusion with wild dog damage would, however, persist due to technical reasons).

age has been therefore deduced by comparing damage from wild animals in wolf areas and damage from wild animals in other areas with no wolf presence (S. Psaroudas, pers. communication).

**ITALY:** In comparison to wolves, predation by bears is low throughout Italy. In the Abruzzo region, bears are responsible for only about 7.8% of total predator damage (Fico *et al.*, 1993). The

small remnant population of Trentino causes hardly any damage at all (Kazcensky, 1996). Wolf predation on livestock is high in the Abruzzo region, where approximately 92% of predator damage is attributed to the wolf (Fico *et al.*, 1993). Average annual wolf damage has varied in the last years between a minimum of 2.560 euro in the region of Liguria, and a maximum of 709.360 euro in the region of Lazio in central Italy

(Ciucci *et al.*, 1997). However, overall wolf damage is probably greatly overestimated, mainly due to the existence of a large stray and feral dog population (estimated to be around 13,000 dogs). It is important to note that the collection of information on the cost of damage is extremely difficult in Italy, since very often the information is not available even on a regional or provincial level. In addition, the information is highly biased, given that the percentages of compensation coverage often vary according to fund availability. For instance, the sharp drop in the cost in wolf damage observed in 1994, is not due to an actual decrease in damage, but to the fact that damage in the region of Lazio (which accounted for approximately 54% of total damage in 1992 and 1993 in wolf areas in Italy) did not pay any compensation at all in 1994 or 1995.

**PORTUGAL:** The cost of wolf damage has steadily been increasing in the last six years, from approximately 93,500 euro to 407,010 euro, an increase of 4.4 times. This positive trend in wolf damage is due to a significant increase in animal prices in Portugal, which inflates the levels of damage. It is also due to the fact that the number of declared damage has increased with the improvement of the compensation system and the increasing awareness of its existence (P. Carmo, pers. comm.).

**SPAIN:** Damage from bears is moderate. In general, the relative importance of crop damage has decreased whereas the amount of livestock damage has increased in the last years (Portillo, 1996). Damage in the Spanish Pyrenees concerns mainly sheep, while in the Cantabrian mountains it concerns the entire range of domestic animals as well

as beehives and crops (Patrimonio, 1996). Evidently, given the significantly different bear population sizes in the Spanish Pyrenees (3-4 bears, which were introduced in 1996 in the French Pyrenees) and the Cantabrian mountains (70-90 bears), national averages on bear damage costs are largely biased. Bear damage in the Cantabrian mountains accounts for about 98% of total cost damage in Spain. On the other hand, the cost of livestock losses from wolf attacks is very high, particularly when compared to bear damages. For instance, even in a region where bears are abundant, as is the case of Asturias which hosts about 70% of the Cantabrian population, compensation for wolf damage is, on average, about 10 times higher than compensation for bear damage (C. Olmeda, pers. comm.). Most wolf damage occurs in Asturias, Castilla y León and Galicia, in the Cantabrian mountains, where livestock is free-ranging. Given the pastoral practices used, it is not surprising that this area suffers 77% of livestock losses, while supporting only 21% of the wolf population (Blanco *et al.*, 1992). South of the Duero river, where the species is far less numerous, damage costs are negligible due to the very small wolf populations and/or to the fact that the regions do not compensate wolf damage. Out of all the Spanish regions with wolf population, only the regions of Asturias, Cantabria, Castilla y León and Galicia compensate damages totally or partly, and only the first 2 regions have readily available data concerning the cost of compensation for wolf damages. The data on Spain indicated in Charts 3 and 4 are therefore highly biased, more biased than in any of the other countries studied. □



# 3

## Compensation mechanisms

### BODY RESPONSIBLE FOR COMPENSATION

The national legislation in the six countries foresees different bodies responsible for the management of natural resources, and consequently for the organisation and implementation of the respective compensation systems (see Table 6). However, there are a few cases in which no compensation is given at all for bear or wolf damages. In addition to the official bodies responsible for compensation, some LIFE projects contribute financially to the compensation for damage (see Tables 7 and 8). The compensation paid through these projects is used in general in order to take care either of the absence of an official compensation system, or of certain shortcomings, such as

the non payment of certain types of damage or delays in the payment of compensation.

**AUSTRIA:** Wildlife management is the responsibility of the regional authorities. The compensation system became homogeneous in the four bear regions only at the beginning of 1998 (refer to Box 2 for details on the evolution of the compensation system). Bears are protected in a rather particular way: even though they are considered to be a game species, their hunting is prohibited between January 1<sup>st</sup> and December 31<sup>st</sup>. Since the bear is a game species, at least theoretically, the structures held liable for damage are the hunters' associations. According to the present system, all hunters in the four regions must be members of a hunting association, and part of the membership

**Table 6.**– Bodies involved in compensation.

COUNTRY	RESPONSIBLE BODY	STATUS	SECONDARY BODY	STATUS
AUSTRIA	Insurance Companies	Private	WWF-Austria <sup>(1)</sup>	NGO
FRANCE	Departmental Direction of Agriculture and Forests (DDAF) <sup>(2)</sup>	Public	—	—
GREECE	Agricultural insurance organisation (ELGA)	Semi-public	ARCTUROS <sup>(1)</sup>	NGO
ITALY	Regions National parks	Public Public	WWF-Italy <sup>(3)</sup> Gigante Reg. Park <sup>(3)</sup>	NGO Public
PORTUGAL	Institute for the Conservation of Nature (ICN)	Public	—	—
SPAIN	Regions	Public	—	—

<sup>(1)</sup> Involved in damage compensation mechanism on nation-wide level.

<sup>(2)</sup> Some NGOs and local authorities participate as well.

<sup>(3)</sup> Involved in damage compensation mechanism in certain areas of the species distribution in the country.

**Box 2.**– Harmonisation of the compensation system in Austria.

Until 1989, compensation systems existed only in the regions of Styria and Carinthia. Back then there were still a few wolves, and their damage was also compensated, along with damage from bears and some game species. The system was (and still is) as follows: the hunters' associations cover the premia paid to the insurance companies that compensate wild animal damage. Since each hunter must belong to an association and pay a membership, almost half of this money is used as a contribution to the insurance premia. The main objective of the hunters' insurance is to cover damage resulting from hunting accidents, such as injuries, destruction of property, etc. The compensation of wild animal damage (mainly lynx and bear) constitutes only a small part of the insurance fund.

In 1989 WWF-Austria started its work on bears; given the lack of a compensation mechanism in Lower Austria, WWF paid the insurance premia to the companies. In 1994 a fund was created

among the government of the region of Upper Austria, the hunters' associations, and WWF to cover new bear damage. Each party contributed financially to this fund, which was used for the compensation of damage between 1994 and 1996. In 1995 and 1996, the B/AT project covered the insurance premia in Lower Austria, and the part of the fund in Upper Austria corresponding to WWF. In 1997, the fund was dissolved since the region of Upper Austria adopted the compensation system used in the regions of Styria and Carinthia, which is based on the payment of damage by insurance companies who receive premia from the hunters' associations. The same system was also adopted by the region of Lower Austria in the beginning of 1998, and since then the system is homogeneous in the four regions.

The development of management plans for the conservation of the bear and its habitats undertaken by the B/AT project implied for the first time in the regions of Upper and Lower Austria a close collaboration between the project,

the regional authorities, and the hunting associations. This fruitful collaboration revealed to the hunting associations that they were considered as an important stakeholder in the conservation of the species, and set the path for the creation of the fund in Upper Austria, and the later harmonisation of the compensation system in the four regions. Austria is nowadays the only country among the five EU countries with LIFE projects on the bear, where compensation for bear damage is based on premia given by hunters.

An interesting additional contribution of the B/AT project is that it managed in 1996 to make death from bear predation to be legally considered as "Höhere Gewalt", that is "force majeure". When a subsidised domestic animal dies, the owner must return the subsidies corresponding to the animal, unless the animal died from a "Höhere Gewalt". This implies that farmers are not obliged anymore to return to the EU or to the national government subsidies corresponding to animals killed by bears.

(about 50%) is used to pay the premia to the private insurance companies that cover financially the compensation of game species, including bears.

The World Wildlife Fund (WWF) contributed to the compensation payments from 1989 until 1997 in Lower Austria, and from 1994 to 1997 in Upper Austria. In 1995 and 1996, WWF participated in the compensation for damage with LIFE funds, through the B/AT project. The funds allocated for bear damage through the project, amounted to approximately 4.700 euro, that is, 17.6% of total compensation payments, even though the budget that had been foreseen for damage compensation was much higher (57.300 euro). Nowadays, even if WWF is not financially involved in damage compensation, it is involved in the compensation

procedure through the services provided by its bear damage experts.

**FRANCE:** The French State is not liable for damage caused by protected animals, according to the Nature Protection Act of 1976, which affirms that the protection of wild animals is of general interest (De Klemm, 1996). Nevertheless the State has made compensation arrangements for damage caused by bears, wolves and lynxes. The decision for the compensation payment is always taken by the Departmental Direction of Agriculture and Forests (DDAF), the departmental representative of the Ministry of Agriculture. The DDAF relies on three types of structures for the control and payment of damage, depending on the geographic sector: NGOs (like the French Foundation for Nature and the Environment (FFNE)), hunt-



Table 7.- Involvement of LIFE projects in compensation of bear damage.



COUNTRY	PROJECT CODE	IMPROVEMENT OF COMPENSATION SYSTEM AS GOAL	AVAILABLE LIFE BUDGET <sup>(1)</sup> FOR COMPENSATION IN EURO (% OF TOTAL LIFE BUDGET <sup>(2)</sup> )	% OF TOTAL BEAR DAMAGE COVERED BY PROJECT TILL PRESENT
AUSTRIA	B/AT	✓	57.300 (5,3)	17,6
FRANCE	B/FR/PYREN		59.280 <sup>(3)</sup> (2,8)	100
	B/FR/PYREN.CENT		116.840 (6,7)	100
GREECE	B/GR/1	✓	50.000 (2,8)	21,0
	B/GR/2	✓	73.620 (2,4)	6,7
ITALY	BW/IT/ALP & APEN		0 (0)	0
	BW/IT/SIRENTE		0 (0)	0
	B/IT/BRENTA		0 (0)	0
	BW/IT/APEN		0 (0)	0
	BW/IT/ALPS		11.285 (1,7)	NA
	B/IT/SIRENTE		0 (0)	0
	BW/IT/TARV		0 (0)	0
SPAIN	B/ES/CANT1		272.210 (3,2)	71,5
	B/ES/PYREN		31.240 <sup>(3)</sup> (1,6)	100
	B/ES/ASTUR		0 (0)	0
	B/ES/CANT2		0 (0)	0

<sup>(1)</sup> As indicated in the decision/contract with DGXI.

<sup>(2)</sup> In the case of projects that also have activities on species other than the bear (B/FR/PYREN, BW/IT/ALP&APEN, BW/IT/ALPS, BW/IT/TARV, B/ES/PYREN), the total budget refers to the part covering activities focusing only on the bear.

<sup>(3)</sup> The original budget allocated was for compensation and accompanying measures. This figure has been derived based on later data on actual expenses.

NA : The project has just started and damage has been zero, not registered or not compensated yet.



**Table 8.**– Involvement of LIFE projects in compensation of wolf damage.



COUNTRY	PROJECT CODE	IMPROVEMENT OF COMPENSATION SYSTEM AS GOAL	AVAILABLE LIFE BUDGET <sup>(1)</sup> FOR COMPENSATION IN EURO (% OF TOTAL LIFE BUDGET <sup>(2)</sup> )	% OF TOTAL WOLF DAMAGE COVERED BY PROJECT TILL PRESENT
FRANCE	W/FR	✓	178.205 (14,6)	100
GREECE	W/GR	✓	44.850 (4,3)	NA
ITALY	BW/IT/ALP & APEN		0 (0)	0
	BW/IT/SIRENTE		0 (0)	0
	W/IT/APEN		5.130 (1,6)	100
	BW/IT/APEN		0 (0)	0
	BW/IT/ALPS		11.285 (1,7)	NA
	BW/IT/TARV		0 (0)	0
PORTUGAL	W/PT		0 (0)	0
SPAIN	B/ES/CANT1 <sup>(3)</sup>		463.490 (6,3)	91,7
	W/ES/EXTREM		12.000 (12,2)	NA

<sup>(1)</sup> As indicated in the decision/contract with DGXI.

<sup>(2)</sup> In the case of projects that also have activities on species other than the wolf (BW/IT/ALP&APEN, BW/IT/ALPS, BW/IT/TARV, W/ES/EXTREM), the total budget refers to the part covering activities focusing only on the wolf.

<sup>(3)</sup> This project focuses on the bear, but compensates also wolf damage.

NA : The project has just started and damage has been zero, not registered or not compensated yet.

ing associations, and inter-communal groups (like the Economic and Tourist Development Association (ADET), the Departmental Federation of Hunters and the Institute of Heritage of Upper Bearn (IPHB)). The DDAF and all bodies making compensation payments on behalf of it are funded by the Ministry of Environment, which means that even if legally the French State is not liable for the damage, it actually takes care of the matter.

In the western Pyrenees (the only area in France where bears existed until the 1996 reintroduction

in central Pyrenees) all bear damage has been covered by the B/FR/PYREN project. The B/FR/PYREN. CENT project has been covering all damage caused by the reintroduced bears in the central Pyrenees since its very beginning in 1996. Total bear damage compensated in the Pyrenees between 1994 and 1997 amounted to 54.580 euro. Of this, 28.565 euro concern damage in the western Pyrenees, while 26.015 concern damage in the central Pyrenees between 1996 and 1997. In wolf areas, wolf damage, which amounts to 151.690 euro for one year, has been covered by the W/FR project since its beginning in 1997. As

a reminder, the beneficiary of all three projects is the Ministry of the Environment.

**GREECE:** The body responsible for decisions related to the compensation of damage by all kinds of natural causes (weather, wild animals, sickness) is ELGA, the Greek Agricultural Insurance Organisation. This is a semi-public body whose financial sources come mainly from the obligatory insurance premia of Greek farmers and livestock raisers. Other financial sources come from commissions on commercial transactions, like irrigation permits. ELGA is therefore considered to be a self-financed body, and receives funding from the Greek State only in the extreme cases of financial deficit (Portillo, 1996).

The projects B/GR/1, B/GR/2 and W/GR (run by the same beneficiary) have covered part of the damage compensation, starting in 1993 and continue until today. They cover mainly damage whose compensation is refused by ELGA. For example, B/GR/1 has covered 21% of total bear damage between 1994 and 1995, that is 29.040 euro, while B/GR/2 has covered so far 6.7% of total damage between 1996 and 1997, that is 13.700 euro.

**ITALY:** National legislation delegates wildlife management to the regional authorities, without obliging them, however, to compensate damage caused by wildlife. Nevertheless, all regions with wolf and/or bear populations have foreseen the coverage of damage, even though in reality many of them have never actually covered damage or have covered only a part of the damage due to a chronic lack of funds. Each region regulates autonomously the procedures and funds for the prevention and compensation of wildlife damage, which are partly financed by taxes on hunting licences, and partly by regional funds (De Klemm, 1996, Portillo, 1996). These funds are managed by regional committees which include representatives from agricultural and hunting associations. The available annual budget is relatively limited and is often exceeded; when this occurs, compensation payments are postponed for the next fiscal year, thus delaying significantly the compensation payments. The financial capacity of the regions for wolf and bear damage is limited due to the fact that a large part of the funds is given for the compensation of damage

from wild and feral dogs, as well as from the wild boar.

The only entities that are constrained by national legislation to cover damage are the national parks, who according to the law on protected areas (LN 394/91) are responsible for the management of protected animals within their territory (this holds only for the National Parks, and not for the Regional ones). This important framework law delegating management authority to national parks was passed in 1991, but was adopted on a regional level at different dates (there are still some regions, like the region of Marche, which have still not adopted it). To summarise, the rather complex compensation situation in Italy is as follows: regions cover, at least theoretically, all wolf and bear damage even though they are not obliged to do so by national legislation. The only damage that they do not cover is damage occurring within the areas of National Parks, which are obliged by national legislation to cover such damage. For instance, in the Abruzzo region the Regional Department of Agriculture and Forests is responsible for compensation of bear and wolf damage in the entire region, with the exception of damage occurring within the areas of the three National Parks (Abruzzo, Maiella, Gran Sasso). Up to now, there is absolutely no co-ordination between the compensation systems followed by the four aforementioned structures operating within the same region. A new regional law was voted in August 1998 in the region of Abruzzo, according to which the authority for damage compensation will belong to the provinces (this law has not been implemented yet). The compensation mechanism will become therefore even more decentralised. The reason underlying this further breakdown of authority is that smaller management units are likely to be more efficient for the management of damage and compensation.

A particular case exists in the Piemonte region in the eastern Alps, where a Solidarity Fund for compensation of canid damage to livestock has been created by WWF Piemonte e Valle d'Aosta, the Province of Cuneo, the Province of Torino, two regional parks and some small associations, who have been covering all wolf damage since 1995.



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Only two Italian LIFE projects are involved in damage compensation payment. The W/IT/APEN project has covered all wolf damage within the area of the Regional Park of Gigante in the region of Emilia Romagna since 1997. During this year, damage amounted to approximately 4.900 euro, an amount which is not high, but is 95% of the budget foreseen for wolf damage for the entire duration of the project (total of 3 years). Prior to the beginning of the project, it was the regional authorities that used to cover wolf damage, which continue to pay for wolf damage outside the Gigante Park. The BW/IT/ALPS project, which started at the beginning of 1998 has foreseen a budget for the coverage of part of the damage occurring in the area of its activities (western and eastern Italian Alps). Wolf damage in the western Alps is being covered by the Solidarity Fund and bear damage in the eastern Alps is covered by the Provinces of Trento and Friuli-Venezia-Giulia. The project provides a compensation additional to the one given by the Solidarity Fund. The objective of this additional compensation is mainly to account for the difference between real market prices and prices compensated by the official compensating

bodies. The project is also considering the creation of a revolving fund (with compensation in kind) in the western Alps in order to speed up the compensation procedure, which is quite long at the moment (six to twelve months).

When looking at the compensation mechanisms used in Italy from the perspective of LIFE projects, it is interesting to note that since these projects are often not confined to a specific administrative unit (i.e. one region, or one national park) we can observe significantly different compensation mechanisms for the same species in the area of one LIFE project (this is also the case in Spain).

**PORTUGAL:** The Portuguese State compensates only the damage of the wolf among all protected species. The entire compensation procedure is set by the Decree Law 139/90. The Institute for the Conservation of Nature (ICN), which is a public body, is responsible for compensation decisions and payments. The funds for compensation are established on an annual basis and come solely from the budget of the State.

**SPAIN:** The regional administrations of the autonomous communities are responsible for the

damage caused by wild animals at least in the areas that are managed by these administrations (i.e. Natural Parks and Game Reserves). Compensation decisions and payments are made in general by the respective public body responsible for the environment at a regional level. The situation varies significantly from region to region, in terms of damage of species covered and duration of compensation procedure (Portillo, 1996).

Both Spanish LIFE projects cover compensation for damage. The project B/ES/CANT1 has so far covered approximately 70% of all bear damage in the four regions concerned, which amounts to 579.980 euro between 1994 and 1997. The sub-projects of the B/ES/CANT1 project however, treat the issue of compensation in different ways. The two sub-projects in Galicia and Asturias, for example, are the only two that cover all bear damage since the beginning of the project in September 1992. The sub-project in Asturias also compensates all wolf damage in bear areas, which amount to 874.010 euro. In Castilla y León, the project compensates approximately 75% of bear damage, while the Region of Castilla y León pays the remaining 25%. In Cantabria, the sub-project covers 100% of bear damage and about 25% of all wolf damage, while the Region of Cantabria pays the remaining 75% of wolf damage. It is important to note that although the wolf is not considered to be a protected species in any of the four regions, its damage is compensated in all of them inside the bear areas. In fact, wolf damage compensation is much higher than bear damage compensation: 579.980 euro for the bear, and 996.110 euro for the wolf have been spent between 1992 and 1997. The main reason why the two regions compensate wolf damage in bear areas is to avoid reprisals against the bears through the use of poison or other means of capture.

On the other hand, each sub-project of the B/ES/PYREN project has covered the compensation of all bear damage that has occurred in its area since 1996, the year that the Slovenian bears were reintroduced on the French side of the central Pyrenees. Bear damage in the Spanish Pyrenees amounts approximately to 31.240 euro between 1996 and 1997. In 1998, one bear alone caused damage worth 27.580 euro in the region of Navarra.

Five of the projects that have specifically foreseen a budget for damage compensation (B/AT, B/GR/1, B/GR/2, W/FR and W/GR) have explicitly stated as project goals the amelioration of the existing compensation systems (see Table 7). More specifically, the Austrian project B/AT (which ended in March 1998) had set as a short-term objective the coverage of bear damage in the two regions of Upper and Lower Austria, where no compensation system was present. The long term objective of the project was the harmonisation of the compensation system in the four regions where bears are present (Upper Austria, Lower Austria, Styria and Carinthia), through the expansion of the system that already existed in Styria and Carinthia (for a more detailed description of the evolution of the Austrian compensation system refer to Box 2). The French project W/FR has overtaken the management of the compensation system, and is currently considering the introduction of a completely new compensation system that will be based on a fixed amount of compensation paid to all farmers with activities in wolf areas. A similar system is currently in place in Sweden (refer to Box 3). The two phases of the B/GR project, as well as the W/GR project, foresee the implementation of measures for further extension of the existing compensation system, which is different for bears and wolves. One of the main expected results is the extension of damage types covered by ELGA in the case of the bear, and the coverage of 100% of confirmed damage in the case of the wolf, instead of 80% (for further details see Box 1).

**ANALYSIS:** Between 1992 and 1998, 1.374.735 euro has been foreseen for compensation of damage from 12 projects out of the 21 studied. The remaining 9 (6 in Italy, 2 in Spain, and 1 in Portugal) have not foreseen a budget for damage compensation. Out of the 1.374.735 euro, 671.775 euro (49%) are foreseen for compensation of bear damage, while 702.960 euro (51%) are foreseen for compensation of wolf damage. Surprisingly, 44.7% of the total amount foreseen for damage compensations from all LIFE projects was dedicated to compensation of wolf and bear damage in the region of Asturias in Spain. Between 1993 and 1997, the B/ES/CANT1 project in Asturias has paid 874.000 euro for wolf damage in bear areas and 133.300 euro for bear

**Box 3.- Compensation for carnivore damage to reindeer herds in Sweden.**

**R**eindeer herding is one of the most widespread land-uses besides commercial forestry and recreation (including hunting and fishing) in northern Sweden. Damage from large carnivores, like the wolverine *Gulo gulo*, lynx *Lynx lynx*, brown-bear *Ursus arctos* and wolf *Canis lupus*, is a serious problem. All these mammal species are listed in the Annex II of the Habitats Directive, while the wolverine and the lynx are also considered to be priority species in Sweden.

The most serious damage to reindeers is caused by the wolverine, closely followed by the lynx. In contrast to the other carnivore species, the wolverine feeds almost exclusively on reindeer and its total distribution area in the European Community is confined to areas with reindeer herding in Sweden and Finland. Its total population size in Sweden is estimated to 200-230 adult individuals. The second most problematic carnivore is the lynx, which is now recovering after serious population declines in the 1950s and again in the 1970s-1980s.

For the administration of reindeer herding, the northern part of Sweden is divided into 51 reindeer herding districts, covering 40 % of the total area of Sweden (approximately

180,000 km<sup>2</sup>), with boundaries not necessarily overlapping with administrative borders between counties, municipalities or parishes.

From 1996, a compensation system based on the verified reproduction of carnivores in each reindeer herding district has been introduced and has replaced an earlier system based on the number of animals found killed. At present, the level of compensation for having a wolverine den or a reproducing lynx family permanently in the district equals the market value of 200 reindeer, irrespective of the number of reindeer actually killed. Thus, there is an incentive to keep reindeer herds under close control in order to reduce the risk of damage, and consequently turn the compensation into an income. Compensation is also paid for the presence of the brown-bear and the wolf, although these two species are less problematic. For 1998, a total cost of approximately 3,400,000 euro has been budgeted.

The compensation is not paid directly to the reindeer owner, but to the reindeer herding district. The compensation funds come from the Ministry of Agriculture. The district board has the sovereignty to decide about the use of the money, i.e., if it will give it to the individ-

ual owners who lost some animals, or if it will be invested to the profit of communal herding. This freedom of choice has contributed to some tensions between individual reindeer owners and district boards.

If the demand for compensation increases above the amount budgeted, permits for culling, shooting or trapping may be issued. This possibility has been used for the lynx, and more restrictively also for the wolverine. This principle is under debate, and a complaint, submitted by Swedish NGOs, raising the issue of whether these actions are in accordance with the application of the Habitats Directive, is currently being handled by the European Commission.

For domestic animals other than reindeer, like sheep and dogs, the primary principle is to reduce the risk of damage, through the use of preventive measures in areas with high risk of damage. In addition, compensation for each killed animal on individual basis is paid. To qualify for compensation, the killed animal must be inspected by a competent person, authorised by the regional county administrative board concerned.

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damage, a sum which exceeds the amount foreseen originally not only in the region, but in the entire project. Interestingly, the Asturian government has chosen to deal with the issue of wolf damages through compensation using LIFE funds (even though the wolf is a game species in the region and despite the fact that wolf populations above the Duero river are not included in Annexes II and IV of the Habitats Directive) instead of using population control measures. The remaining Spanish regions have foreseen 12% of the total amount for compensations from all LIFE projects, thus rising the Spanish total to 56.7%. The percentage of the total LIFE funds attributed for compensation is 25.8% in France, 12.3% in Greece, 4.2% in Austria, 2% in Italy and 0% in Portugal.

Out of the 12 projects covering damage, 4 cover 100% of all damage occurring within their areas: B/FR/PYREN, B/FR/PYREN.CENT, W/FR, and W/IT/APEN. By examining the extremes, some interesting conclusions could be reached: all three French projects cover 100% of the damage, while 6 out of the 8 Italian projects do not cover damage compensation at all. The question that arises from such an observation, is "What is the factor leading a project to opt for the coverage of damage compensation?". Ideally, the decision should be based on the efficiency of the compensation mechanism used by the official body (if there is a such a mechanism). In other words, if a system in a particular region or country is slow and does not cover all damage, then a LIFE-Nature project

could decide to cover the shortcomings of the official system.

However, by examining the type of involvement of the aforementioned LIFE projects in a compensation system, we can see that this is not always the case. For instance, in the Abruzzo region, the compensation systems tend to be slow in terms of payment of compensation, with delays of up to 24 months within the area of the Abruzzo region (excluding the national parks) and up to 12 months in the Sirente Velino regional park, which are mainly due to the lack of funds to cover damage. Nevertheless, none of the four projects operating within this area (BW/IT/ALP&APEN, BW/IT/SIRENTE, BW/IT/APEN, B/IT/SIRENTE) is involved in any way (financial or technical) in the compensation mechanism. On the other hand, the three French projects (B/FR/PYREN, B/FR/PYREN.CENT, W/FR) have completely substituted the financial and technical contribution of the Ministry of the Environment, which had covered all bear damage with no significant delays since 1983, and all wolf damage since 1994, the year when wolves recolonised the Mercantour area. Under such conditions, the complete coverage of damage compensation is understandable only within the context of a project focusing in an area where the species has been re-introduced by the LIFE project (i.e., in the central Pyrenees). Outside such a context, a compensation mechanism based on the “replacement” of an existing compensation structure is not likely to be sustainable. The lobbying for the amelioration of existing compensation systems by official structures (as in the case of Austria and Greece) seems to be a much more sustainable strategy, since no drastic change is likely to occur at the end of the project, when the beneficiary will not support any more the official structure, at least with LIFE funds.

### COMPENSATION PROCEDURE

The general compensation procedure is more or less similar in all countries and regions: damage has to be declared by the person who has suffered it (the plaintiff) with the shortest delay possible to the local authorities which either inspect themselves the damage or contact the competent authorities who send qualified staff for the inspection. The

purpose of the inspection is to determine the cause of death, to estimate the cost of damage (kind and number of animals killed) and to identify the particular characteristics of the attack (e.g., if it took place during the day, if it occurred near a forested area, if the animals were guarded, etc.) The inspection usually consists of an interview with the farmer, an inspection of the area in order to find signs of predators, and an inspection of the remains of the animals or the crops (Dahier et Lequette, 1997). Once the inspection is completed, a report is filled out and sent to the competent authority, which delivers the final decision about the payment or not of a compensation, based on specific inspection outcome categories (for more details on the inspection outcomes refer to the following section). What differs in each country or region are the deadlines for declaration, inspection and compensation payment, and, of course, the competent authorities. Some countries and regions are stricter than others, in terms of the deadlines and the procedures. The specific terms of the compensation procedure are sometimes set by national or regional legislation, or by the competent authorities (as in the case of the national parks in the Abruzzo region in Italy). In other cases, the procedure is not dictated at all by legislation (as in Austria).



© French project LIFE wolf. M.-L. Poulle

*Damage inspection by an agent of the National Park of Mercantour, France.*

**AUSTRIA:** The plaintiff must contact as soon as possible the Bearadvocates, a group of inspection experts trained by WWF, partly through the B/AT project, or the responsible local hunter, also trained by WWF. The responsible person usually conducts the inspection within two days after the declaration of the damage, and then presents a report to the insurance company. At the same time, the plaintiff must present a written claim indicating the value of the damage for which he expects compensation. If the damage estimates presented by the plaintiff seem to be too high, an expert from the Chamber of Agriculture is called to give his own estimate. If there is a doubt about the cause of death of an animal, its remains may be sent for analysis to the University of Veterinary Sciences. The compensation payment is made between 1 to 1.5 month after the compensation decision of the insurance company.

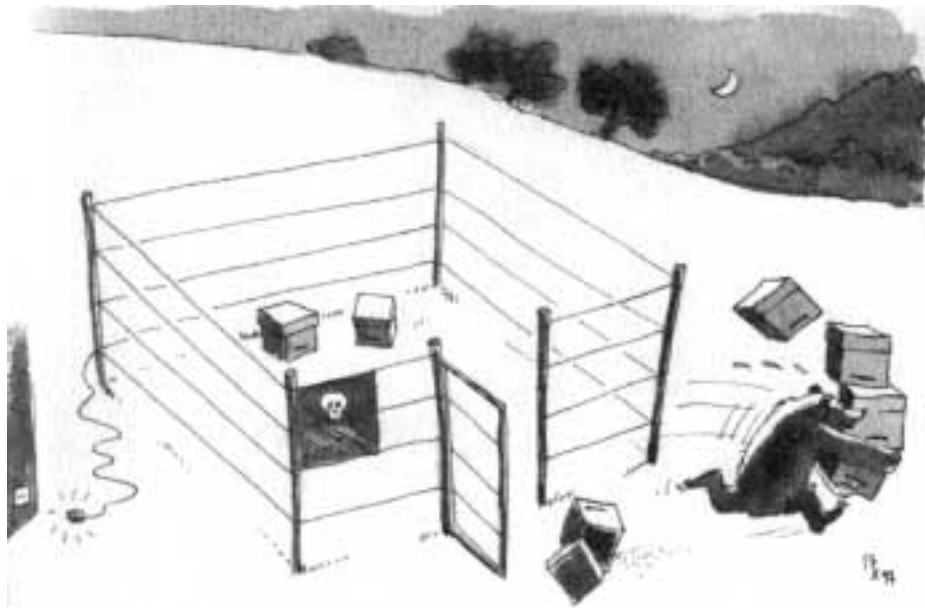
**FRANCE:** Two distinct compensation procedures exist, depending on the area and predator that caused the damage. In wolf areas, the plaintiff has to contact the DDAF, which then contacts either a representative of one of the National or Regional Parks or the Office National de la Chasse (National Hunting Office-ONC). A representative of one of the two structures conducts an inspection and writes up a descriptive report, without a judgement, concerning the nature of the attack. This report is sent to the Departmental Agricultural Direction (DDAF), which transmits this report to the damage expert of the ONC. It is this expert that gives his opinion on the nature of the damage, and then it is the DDAF which makes the final decision about the payment of the compensation. In case of a compensation dispute, the file is presented to the Local Monitoring Group which consists of representatives from DDAF, the agricultural professions, the ONC and the W/FR project. This group meets every six months and deals with all litigious cases. Once the final compensation decisions are made, the files which have been accepted for compensation are sent to the French Foundation for Nature and the Environment (FFNE), which makes the payment within 3 months on average (it can take from 2 to 6 months).

In bear areas, the plaintiff must contact, within 48 hours after the discovery of the damage, one of the

following: a Bear Damage Expert (trained member of the ONC or of the ONC Brown Bear Network), the Economic and Tourist Association (ADET) or the responsible team of the LIFE Local Monitoring Team (not to be confused with the departmental Local Monitoring Teams that exist in wolf areas). The bear damage expert is accompanied by one member of the local Brown Bear Network and/or a member of the B/FR/PYREN or B/FR/PYREN. CENT projects (depending on the location of the damage). In the case of damage other than to livestock the two aforementioned people are also accompanied by an agricultural expert who is responsible for estimation of the value of the damage. These people conduct the inspection within 36 hours after the initial contact, and send one damage report written by the bear expert and one damage declaration filled out by the plaintiff. In the case of agricultural damage, the agricultural expert also sends one report indicating the value of the damage. All documents must be sent to the Departmental Agricultural Direction (DDAF) within five days. After reception of these documents, the DDAF notifies the Departmental Hunters' Association or the ADET, who have a maximum delay of one month after the notification in order to reimburse the plaintiff. The average time needed for the compensation is 3 weeks. If the plaintiff contests the opinion of the experts, or the experts cannot determine with certainty the nature of the damage the file is examined at the end of autumn by the Appeal Committee, and it is the prefect who takes the final decision.

**GREECE:** The plaintiff must present a claim within 24 hours after the discovery of the damage in the summer and 48 hours in the winter. The 48-hour deadline is also accorded to those people living in remote villages. The damage claim is presented to the local representatives of ELGA, the agricultural insurance company (i.e., secretaries of the local communities or municipalities). The claim must be accompanied by an inspection fee, the purpose of which is to discourage 'false' declarations and to cover part of the inspection costs. The fee varies according to the size of the killed animal, and is paid for each killed animal: 1.3 euro per sheep or goat, 16.3 euro per cow, mule, horse or donkey. The fee for the inspection of agricultural damage is 1.6 euro per beehive, 0,6 euro per acre and 0.3 euro per

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tree with fruit. Once the fee is paid, the ELGA representative contacts the local ELGA office, which sends within 24 or 48 hours (depending on the season and the proximity of the location) an inspector (a veterinarian in the case of livestock damage and an agriculturist in the case of agricultural damage). The inspector sends a report to the local ELGA offices indicating the nature of the damage. In the case of agricultural damage this report also indicates whether the damage exceeds 5% of the total area or the crop or not. This report is then sent to the ELGA headquarters in Athens which transfers to the local offices the funds necessary for the compensation payment. The delay of compensation between the time of the presentation of the damage claim and the compensation payment can take on the average 2.5 months. In the case of a compensation dispute, ELGA calls one of its most experienced inspectors or even staff from scientific laboratories of university faculties or specialised institutes. For this second inspection, the plaintiff must pay double the original inspection fee, i.e., 2.6 euro for sheep and goats and 32.6 euro for bovine and equine.

Plaintiffs can also claim compensation from the projects B/GR and W/GR in the case when certain damage is not covered by ELGA. The plaintiff must contact the beneficiary running these three projects (ARCTUROS), who sends one of its six local assis-

tants in order to make an assessment of the extent and value of the damage. The assistant must fill out a special report prepared by ARCTUROS, and then send it to the headquarters. The compensation payment is transferred from the headquarters to the local assistant who pays the plaintiff.

**ITALY:** The compensation procedure varies significantly from region to region, but also within regions, depending on whether damage is located within a national park area or not. Regional legislations do not set specific deadlines concerning the delay of the presentation of claim or the conduct of inspection. However, certain regions do set some deadlines concerning the delay of the compensation payment. In addition, the national law 394/91 on national parks fixes a deadline of 90 days for the payment of compensations of damage occurring within national parks (which is, however, rarely respected).

In the eastern Alps, in the Autonomous Province of Trento in the region of Trentino-Alto Adige and in the region of Friuli-Venezia-Giulia, all bear damage is the responsibility of the regional authorities. The three LIFE projects that are undertaking activities for the conservation of the bear in this area, BW/IT/ALP&APEN, B/IT/BRENTA and BW/IT/ALPS, are not involved at all in com-

pensation payments. The standard procedure followed in these two regions differs: in the Autonomous Province of Trento the damage claim must be presented to the veterinary staff of the Sanitary Services of the province within the 24 hours following the discovery of the damage. The inspection is conducted by a bear technician, who is a trained forest guard, accompanied by a veterinarian, if the damage is to livestock. The report of the inspection must be sent within 30 days to the Service of Parks and Forests of the Trento Province, which has 60 days according to the legislation to conduct the payment. In reality, the compensation is made on the average within 3 months. The decision of the bear technician cannot be contested. In Friuli-Venezia-Giulia, the claim must be presented to the Hunting and Fishing Services within the three days following the discovery of the damage. The inspection is conducted by staff of the Service. The report has to be presented to the regional authorities within ten days, and the payment should be made within 90 days, according to the regional law, which is the average time needed in reality for the compensation.

In the western Alps, where the project BW/IT/ALPS conducts its actions for the conservation of the wolf, the plaintiff must notify the secretary of the Solidarity Fund within 48 hours. The Solidarity Fund has selected a few veterinarians that have attended special training sessions organised by WWF on recognition of canid damage. These specialists visit the area and fill out a report on the nature of damage, which is submitted to the Solidarity Fund Committee. The Committee meets only once a year in November, and treats all compensation files together, as well as any compensation disputes. The payment of compensations is made in January, and the delay of payment can vary between 6 and 12 months. The project is not involved in the compensation procedure, even though it participates in the compensation for damage.

In the northern Apennines (region of Emilia Romagna), which is the area where the project W/IT/APEN is taking place, the plaintiff should contact the headquarters of the Gigante Park, who is the beneficiary of the project, for all wolf dam-



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age occurring within it. The claim is followed by an inspection the following day in the damage area by the responsible of the LIFE project who is usually accompanied by a regional veterinarian. If the inspection verdict is positive, the compensation is paid on the average within 2 months. No particular procedure is foreseen in the case of a compensation dispute.

In the central Apennines (Abruzzo region, Umbria and Marche) damage compensation is not part of the activities of any of the projects taking place in this area (BW/IT/ALP&APEN, BW/IT/SIRENTE, and BW/IT/APEN). Different procedures are followed by the competent authorities, depending mainly on whether damage has occurred within the area of the four National Parks (Abruzzo, Gran Sasso and Maiella in the Abruzzo region and Sibillini in Umbria) or outside their area. If they have occurred within the National Park areas, a claim must be presented to the administration of the corresponding park within 24 hours after the discovery of the damage. The inspection is made by Park Rangers within 1 to 2 days after the declaration, and the payment is effected 3 to 6 months after the compensation decision. Out of the four parks, only the National Park of Sibillini has foreseen a specific procedure for the treatment of litigious cases: such cases must be addressed to the park's Commission for Damage by Fauna. The only exception of procedures followed within the area of a National Park is the part of the Sibillini Park found in the Marche area. As aforementioned, Marche is the only region that has still not adopted the 394/91 National Framework law regarding the responsibilities of the National Parks, and the region continues therefore to compensate damage occurring within its territory, even if part of this territory belongs to a National Park. On the other hand, if the damage has occurred outside the area of the national parks (with the exception of the part of the Sibillini Park in the Marche region), the claim must be presented immediately after the attack, to one of the two provincial technical offices of the region, pertaining to the Ministry of Agriculture (there is one dealing with damage to agriculture, and one dealing with damage to livestock). The inspection is conducted by a veterinarian if damage is to livestock, or by an agricultural expert, if it is to crops. In the Abruzzo region, in the case of livestock damage, the regional

law stipulates that the payment should be made within 30 days after the presentation of the damage claim. However, in reality it can take up to 24 months (the procedure tends to be slower in the case of agricultural damage). The delay can be very long since, according to regional legislation, if the necessary funds are not available at the moment of the claim, the payment is conducted in the next fiscal year. In the region of Marche, the regional legislation stipulates that compensation claims must be examined at least twice per year, but in reality payments are made on the average in 4.5 months.

**PORTUGAL:** The plaintiff must contact the ICN (Institute for the Conservation of Nature) through the staff of the nearest protected area. This contact must take place within 48 hours after the damage has been discovered. The inspection is conducted by rangers or technicians of the protected areas on behalf of the ICN either the same day that the damage has been declared or the following day. Officially, the compensation payment must be made within the 2 months following the decision of the ICN, but in real terms it can take up to 1 year. If there is a compensation dispute, the case is presented to the president of the ICN, who reviews the elements and makes a second decision.

**SPAIN:** The compensation procedure is quite uniform in all regions that have bear populations, and is similar for both bear and wolf damage. The damage claim can be presented to the nearest Forest Rangers who transmit the claim to the appropriate regional authority. The inspection is conducted by the Forest Rangers (with the exception of Cataluña and Galicia, where they are conducted by specialised staff). No fixed deadlines for the declaration of damage or for the conduct of the inspection are set by the law. However, given that Forest Rangers are easy to locate since they are based near the villages, inspections are conducted the same day that the damage claim has been presented or the following day. Despite the uniformity of the compensation procedure there is a significant difference among regions in terms of the delay of the compensation payment. The payment is made 1 to 2 months after the compensation decision has been finalised in Aragón, Cataluña, Navarra, and Asturias while it takes 3 to 4 months in Castilla, 6 months in Galicia and 6 to 18 months

in Cantabria. Litigious cases are also treated in a different way in the various regions. In most regions, if there is a litigious case, it is presented to the Government Council, and if the verdict is negative the case can be taken to the court. However, in Cataluña, litigious cases are treated by a special commission composed of local mayors, the president of Val d'Aran, the administration of the region of Cataluña, and representatives of the cattle breeders. In Castilla, there is no specific procedure for the examination of litigious cases, since all damage defined as 'doubtful' is compensated.

(For more details regarding the specificities of the compensation procedures in the 7 regions, please refer to Box 4).

**ANALYSIS:** As aforementioned, the general procedure is pretty much the same throughout the six countries. The main element that has an impact on the efficiency of the compensation mechanism and differs significantly is the delay of payment (see Chart 6). The shortest period needed for the payment of damage compensation is in the French Pyrenees, where compensation is made on the average within 3 weeks, with the exception of litigious

**Box 4.**— Compensation procedures in Spanish regions.

**I**n Aragón a claim must be presented to the local Forest Rangers (there is no official deadline for the presentation of the claim) who inspect the damage the same day. If necessary, a biologist accompanies the rangers. A report is prepared and sent to the responsible technician of the Wildlife Department in the 24 to 48 hours following the inspection, accompanied by a veterinary report if possible. The decision is made by the general director of the Natural Environment Department. The payment is made one to two months after the compensation decision has been finalised. In case of a litigious claim, the plaintiff may request the file to be examined by the juridical sector of the department.

In Cataluña the plaintiff must address a claim to the Department of Agriculture, which sends one of its two specialists for the inspection of the damage. The inspection is conducted either the same day that the claim was presented or the following day. The compensation payment usually takes between half a month to two months. Litigious cases are treated by a special commission composed of local mayors, the president of Val d'Aran, the administration of the Region of Cataluña, and representatives of the cattle breeders

In Navarra, the damage claim has to be presented to the Forest Rangers of the Department of the

Environment, who inspect the damage either the same day or the next day and submit a report to the same department. The payment usually takes about one month. There is no specific procedure for the examination of litigious cases, since there have been no such cases so far.

In Castilla y León the claim is addressed to the Department of the Environment. As in the case of Aragón, there is no official deadline for the presentation of the claim, but inspections are usually conducted the day following the presentation of the claim. The Forest Rangers who guard the bear areas conduct the inspection and inform the competent authorities. The compensation payment is made three to four months after the decision has been made. There is no specific procedure for the examination of litigious cases, since all damage defined as 'doubtful' is compensated.

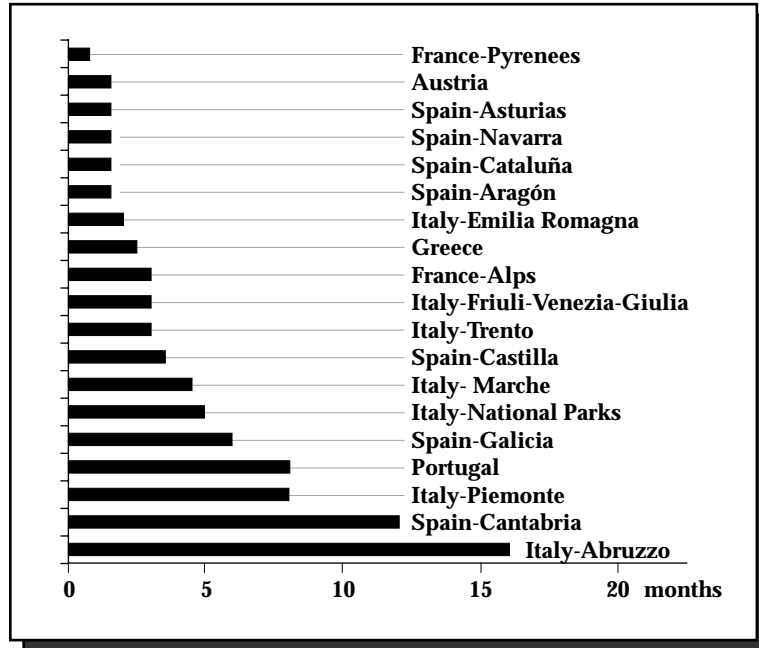
In Cantabria the plaintiff presents a written claim to the forest rangers who work for the Livestock, Fishing and Agriculture Department. Like in Castilla y León and Aragón there is no official deadline for the presentation of the claim. The Forest Guards conduct the inspection and send a report on the nature of the damage to the authorities. The payment can take between six and eighteen months in order to be transferred to the person who has suffered the damage. If there is a

litigious case, it is presented to a higher administrative office. If the verdict is still negative, the case can be taken to the court.

In Asturias the damage claim must be presented either to the nearest Forest Ranger or to Department of Agriculture. According to a Regional Decree, the damage claims must be presented within three days; however, this law is not enforced. The damage is inspected by staff of the regional environmental authority, mainly Forest Rangers or specialised veterinarians. In the case of livestock damage, the inspections are conducted immediately. The payment is made within one month after the compensation decision has been made. If there is a litigious case, it is presented to the Government Council, and if the verdict is negative it can be presented to the courts.

In Galicia, the Forest Guards have to be notified of the damage. They then notify the Department of the Environment. The responsible technician conducts an inspection and sends a report on the nature of the damage to the regional authority which makes the final decision on whether the damage must be compensated or not. The payment is made six months after the compensation decision has been made. No litigious cases have appeared so far, since most compensation disputes arise when there is damage on livestock; so far, there has been no bear damage to livestock in this region.

Chart 6.- Compensation payment delays.



cases. The payment is also fast in Austria, and in Spain in the regions of Aragón, Cataluña, Navarra and Asturias, where it takes place on the average within 1 month and a half, in Emilia Romagna in Italy (2 months), in Greece (2.5 months), in France in the Mercantour area and in Italy in the region of Friuli Venezia-Giulia and the Autonomous Province of Trento, where it is made in 3 months, and finally in the region of Castilla y León (3.5 months). The payment is slower in the Abruzzo National Park (6 months), in Galicia in Spain (6 months), in Portugal (8 months), in the Piemonte region in Italy (8 months), in Cantabria (12 months on the average) and in the Abruzzo region (16 months).

The level of damage should theoretically have an impact on the delay: the more the damage and the claims, the slower the payment, since the administrative work increases. This, however, is not always the case. For instance, in Cantabria, one of the regions with relatively low damage levels, it takes on the average an entire year for the payment of the compensation. On the other hand, in Asturias and Greece, two of the areas that have among the highest damage levels, the respective competent authorities manage to make compensation payments on the average within 2 to 3 months. The rapidity of compensation payment is a key factor in the success of a compensation sys-

tem. A slow compensation system loses efficiency, since it does not manage to achieve one of its objectives immediately: to appease social tension.

It should be noted that despite the fact that we can talk about individual factors affecting the efficiency of a compensation system, it is very difficult (if not impossible) to determine the level of efficiency of a compensation mechanism and to compare different levels of efficiency. This is because efficiency is determined by a large variety of interrelated factors, such as aspects of the fauna (populations, different predatory behaviours, damage levels), socio-economic conditions (type of pasture), poaching levels, number of fraudulent claims, etc. (Ciucci *et al.*, 1997). Only an econometric analysis could determine the exact relation of the aforementioned factors with the level of efficiency of a compensation mechanism. Two parameters that could theoretically be used for the measurement of the efficiency of a compensation mechanism are the decrease in poaching and changes in public opinion concerning the bear or the wolf. Nevertheless, it is almost impossible to distinguish whether any eventual shifts in these two aforementioned factors are a result of the compensation of damage, or of other parameters, such as a general awareness increase, a change in the hunting legislation, or more effective warding.

## TYPES OF DAMAGE COVERED AND PREREQUISITES FOR COMPENSATION

The types of damage covered by the existing compensation systems vary not only between the six countries but also within them, mainly in those cases where wildlife management is set on a regional level, such as Spain and Italy. In all cases, however, damage has to be inspected by the competent authorities in order for it to be eligible for compensation.

Evidently, compensation is paid for bear and/or wolf damage in all EU countries or regions where the bear and/or the wolf are priority species. This is also the case for all wolf damage in Greece even above the 39° parallel, above which the wolf is not included in the Annex II or IV of the Habitats Directive, but is considered to be a protected species according to national law. In Spain, wolf damage is paid in some regions, regardless of whether the wolf is included or not in Annexes II and IV of the Habitats Directive, and regardless of the regional laws concerning its status. For example, wolf damage in Castilla-La Mancha is not compensated even though the species is protected by regional law and considered to be of Community priority, while it is compensated in Asturias, Cantabria, Castilla y León and Galicia, where the hunting of the wolf is permitted, and the species is not of Community priority (Blanco *et al.*, 1990).

In general damage caused by the wolf on livestock, and by the bear on livestock, crops and beehives is covered in all relevant countries. The only exception is in the Abruzzo National Park in Italy, where the “Food Campaign for Fauna” has been launched and which consists in paying traditional producers of corn, carrots and wheat for leaving part of their production for the park fauna. However, there is some types of damage in which there are discrepancies as far as their coverage is concerned between and within countries. These are mainly damage in infrastructure (excluding beehives), damage by stray dogs, and compensation of lost or injured animals.

Damage to agricultural infrastructure is not covered at all in Greece, while damage to hunting infrastructure is not covered in Austria. There are no particular regulations regarding this type of

damage in the remaining countries, i.e., France, Austria, Spain and Italy, which is definitely related to the fact that there is no, or very little, damage to infrastructure. In Greece, ELGA does not accept to cover bear and wolf damage in fences and other types of infrastructure, because if it did, it would then be obliged to pay damage from all natural factors on all kinds of agricultural infrastructure, including greenhouses, whose damage levels are very high. Given ELGA’s refusal to cover bear and wolf damage in infrastructure, it is B/GR/1, B/GR/2 and W/GR that cover them.

In general, confirmed damage by stray and feral dogs is not compensated in France, Portugal or Spain, but is compensated in Greece and in some regions in Italy (in the Region of Piemonte in the Alps, in the Abruzzo region (excluding the Abruzzo and Gran Sasso National Parks but including the Maiella National Park), and in the Marche and Umbria regions (including the Sibillini National



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*A guard dog in the Natural Park of Somiedo, Asturias-Spain.*

Park). It is very difficult to differentiate between wolf and dog attacks. For this reason, attempts to determine the exact predator are usually meaningless, since this poses not only technical problems but also human problems: in the absence of a direct observation, shepherds will rarely admit that the attack was caused by a dog (Dahier et Lequette, 1997). An additional argument for the compensation of feral dog damage is that it minimises retaliation against wolves, who are very often accused for damage caused by dogs. In Italy, many regions are indirectly obliged to compensate feral dog damage given that their killing is illegal, according to a national framework law (281/91). This animalistic law does not permit the elimination of feral dogs, and makes the communes responsible for their sterilisation. Furthermore, as aforementioned, the signs of dog and wolf damage are so similar that in the majority of the cases it is very difficult, if not impossible, to tell them apart. Therefore, in order to simplify the procedures, damage by both animals is compensated. On the other hand, dog damage in Greece falls in administrative terms under the category of "damage from wild animals other than the bear" that ELGA compensates. Thus the motivation of payment of dog damage is not directly related to the conservation of the wolf, but to a simplification of the administrative procedures.

In most countries and regions, lost or injured animals are not compensated by the competent authorities. The only cases where such damage is compensated are in the Piemonte region in Italy, where the compensating body, the Solidarity Fund, pays 25 euro per animal injured, in the Trento region in Italy, which pays the difference between the value of a healthy and an injured animal, and the Aragón region in Spain, which pays between 89.3 and 119.1 euro per injured or lost animal (i.e., exactly the same price as for a killed animal). A particular situation exists in Greece, where ELGA, the agricultural insurance company, compensates for "financially dead" animals. This means that it compensates for animals whose economic value becomes zero as a result of an attack by the bear or the wolf. For example, if a horse cannot be used for transportation as a result of a bear attack, and therefore cannot offer anymore its services to its owner, it is considered to be financially dead, and is compensated.

Each competent body determines which are the possible categories of outcome of a damage inspection, and accordingly determines which categories imply a compensation, and which do not. The inspection outcomes usually refer to the cause of damage; for instance, the inspection outcomes "positive/probable/doubtful/negative" mean that the cause of the damage inspected was "definitely/probably/maybe yes maybe not/definitely not" a wolf or a bear. However, in some cases, like in the case of Greece and France, the categories refer not only to the source of the damage, but also to other factors related to the compensation procedure conditions set by the compensation body (e.g., "damage too old"). There is not only a difference in the way outcome categories are set, but also in the way they are treated; for instance, even though the category "doubtful" may exist in two countries, it may be compensated in one case and not in the other. In the cases where the outcome is neither definitely positive or negative, but doubtful or probable, compensation is often given in order not to create any negative feelings on the side of the local population.

Compensation does not depend only on the nature of the damage, but also on a set of conditions or prerequisites that each competent body sets, like the use of preventive measures. The use of preventive measures, such as guarding of the herd by shepherds and/or dogs, the placement of herds in a pen during the night and the use of electric fences, are some of the most common prerequisites for the compensation of acceptable damage. The objective of preventive measures is to keep damage in levels that are socially and economically acceptable (Portillo, 1996). However, such measures may be expensive and may consequently have a negative impact on the profitability of a farm (De Klemm, 1996). Given the high cost of preventive measures, farmers may be reluctant to invest in them. This is why a large number of the LIFE projects support either with direct financing, technical assistance or through an awareness increase programme the use of preventive measures. In areas where the projects support one type of preventive measure, this measure is likely to become a prerequisite for the compensation of damage. The idea behind this is to involve the population in a strategy that is



**Table 9.** – Budget allocation (in euro) for the support of preventive measures against bear attacks.



COUNTRY	PROJECT CODE	GUARD DOGS	ENCLOSURES	AID TO SHEPHERDS	GUARDING	INCREASE OF WILD FOOD SUPPLY	RELOCATION OF PROBLEM BEARS	PUBLIC AWARENESS	TOTAL (% of total budget <sup>1)</sup> )
AUSTRIA	B/AT	0	57.550	0	0	0	0	0	57.550 (5,36)
FRANCE	B/FR/PYREN	43.170	12.310	68.420	112.720	0	0	49.050	285.670 (13,3)
	B/FR/PYREN.CENT	19.380	0	20.080	47.620	0	0	0	87.080 (5,01)
GREECE	B/GR/1	0	24.000	0	0	87.350	12.070	0	123.420 (7,0)
	B/GR/2	19.250	39.090	0	0	223.730	20.550	6.450	309.070 (10,2)
ITALY	BW/IT/ALP&APEN	0	0	0	0	153.800	0	0	153.800 (9,9)
	BW/IT/SIRENTE	0	0	0	0	71.000	0	0	71.000 (17,8)
	B/IT/BRENTA	0	85.000	0	0	0	0	0	85.000 (15,9)
	BW/IT/APEN	7.500	10.000	0	0	20.000	0	37.500	75.000 (6,9)
	BW/IT/ALPS	40.000	7.500	0	0	0	0	0	47.500 (7,4)
	B/IT/SIRENTE	0	0	0	6.150	100.540	0	0	106.690 (16,6)
	BW/IT/TARV	0	0	0	0	1.050	0	0	1.050 (0,0)
SPAIN	B/ES/CANT1	0	0	0	0	0	0	0	0 (0)
	B/ES/PYREN	0	15.300	44.500	0	0	0	0	59.800 (3,0)
	B/ES/ASTUR	0	14.290	0	0	64.300	0	0	78.590 (12,6)
	B/ES/CANT2	0	0	0	0	0	0	0	0 (0)

<sup>(1)</sup> In the case of projects that also have activities on species other than the bear (B/FR/PYREN, BW/IT/ALP&APEN, BW/IT/ALPS, BW/IT/TARV, B/ES/PYREN), the total budget refers to the part covering activities focusing only on the bear.



**Table 10.**– Budget allocation (in euro) for the support of preventive measures against wolf attacks.

COUNTRY	PROJECT CODE	GUARD DOGS	ENCLOSURES	AID TO SHEPHERDS	GUARDING	INCREASE OF WILD FOOD SUPPLY	PUBLIC AWARENESS	TOTAL (% of total budget <sup>1)</sup> )
FRANCE	W/FR	52.570	24.620	120.620	0	9.050	0	206.860 (16,9)
GREECE	W/GR	1.600	0	0	148.520	16.500	41.940	208.560 (20,7)
ITALY	BW/IT/ALP&APEN	0	0	0	0	0	0	0 (0)
	BW/IT/SIRENTE	0	0	0	0	0	0	0 (0)
	W/IT/APEN	0	48.700	0	0	0	8.240	56.940 (17,3)
	BW/IT/APEN	7.500	10.000	0	0	20.000	37.500	75.000 (6,9)
	BW/IT/ALPS	40.000	7.500	0	0	0	0	47.500 (7,4)
	BW/IT/TARV	0	0	0	0	0	0	0 (0)
PORTUGAL	W/PT	0	0	0	0	13.330	0	13.330 (4,0)
SPAIN	W/ES/EXTREM	0	0	0	0	0	0	0 (0)

<sup>1)</sup> In the case of projects that also have activities on species other than the wolf (BW/IT/ALP&APEN, BW/IT/ALPS, BW/IT/TARV, W/ES/EXTREM), the total budget refers to the part covering activities focusing only on the wolf.




likely to have long-term effects on damage levels. Tables 9 and 10 indicate the level of support of preventive measures in each project expressed in terms of the budget allocated for each particular type of preventive measure.

One important element to be kept in mind is that an efficient use of preventive measures results to a limitation of the food sources for the bears and the wolves. This implies either that the problem of damage is transferred to another region where no or few preventive measures are used, or that there is a general shortage of food sources for the two species. Consequently, a project aiming at the conservation of the bear and/or the wolf should make sure that some complementary actions,

such as the increase of alternative food sources, are implemented, so as to approach the issue of damages in an integrated way.

Two recapitulative maps (Maps 3a and 3b) including all projects (completed, ongoing, and new ones up to and including 1998) are presented. These maps contain three types of information: the source of compensation payment (LIFE or national/ regional/private source), the level of compensation payment and the level of preventive measures foreseen through each project. The last two types of information are indicated schematically, separated in three categories, according to the percentage of the budget allocated to compensation payments/ preventive

measures with respect to the total budget. The categories were determined as follows:

<b>Compensation:</b>	
€	Compensation budget not very significant (Budget between 0.1-2% of total project budget)
€	Compensation budget significant (Budget between 2.1-10% of total project budget)
€	Compensation budget very significant (Budget over 10.1% of total project budget)
<b>Preventive measures:</b>	
	Preventive measures budget not very significant (Budget between 0.1-7% of total project budget)
	Preventive measures budget significant (Budget between 7-15% of total project budget)
	Preventive measures budget very significant (Budget over 15.1% of total project budget)

**AUSTRIA:** The outcome categories of the inspection are “Positive/Probable/Doubtful /Negative, and compensation is paid only if the outcome is “Positive” or “Probable.” There are no particular conditions or prerequisites for compensation of bear damage set by the insurance companies.

**FRANCE:** In the case of the bear, the inspection outcomes can be “Positive/Probable/ Possible /Doubtful/ Non attributable/ Undetermined” and compensation is given immediately if the outcome is “Positive”, “Probable” or “Possible”, and if the outcome is “Doubtful”, the compensation is paid at the end of the summer season after the Damage Committee has given its accord. In the case of wolf damage, the outcomes are the same for the bear, but compensation is always paid if the outcome is “Positive”, and sometimes paid depending on the particular conditions if the outcome is “Doubtful” or “Non attributable” (no “non attributable” cases have been compensated so far). Until recently, only 75% of the value indicated in the list of animal compensation amounts was paid for doubtful cases, but nowadays, 100% of the value is paid, if the case receives a positive verdict from the Damage Committee. There are no direct conditions or prerequisites for compensation of bear or wolf damage, with one exception: in the case of wolf damage, the fee for the lost income is theoretically not paid after the 4<sup>th</sup> attack, if preventive measures have not been put in place. However, this criterion is rarely applied.

**GREECE:** The inspection outcomes set by ELGA are “Positive/Negative/ Claim presented with delay/Old damage/Carcass not found”, out of which compensation is given only in the case of the first outcome. B/GR/1, B/GR/2 and W/GR have set their own categories, namely “Positive/Doubtful/Negative/Carcass not found”, and compensation is given in the case of the first two outcomes. In terms of prerequisites for compensation, ELGA demands proper wardening of the livestock, crops or beehives in cases where there has been repeated previous damage. Nevertheless, this condition is not quantified, which means that its implementation is quite arbitrary. The projects B/GR/1 and B/GR/2 have set as a prerequisite for compensation the use of electric fences, if such fences have been supplied by the projects.

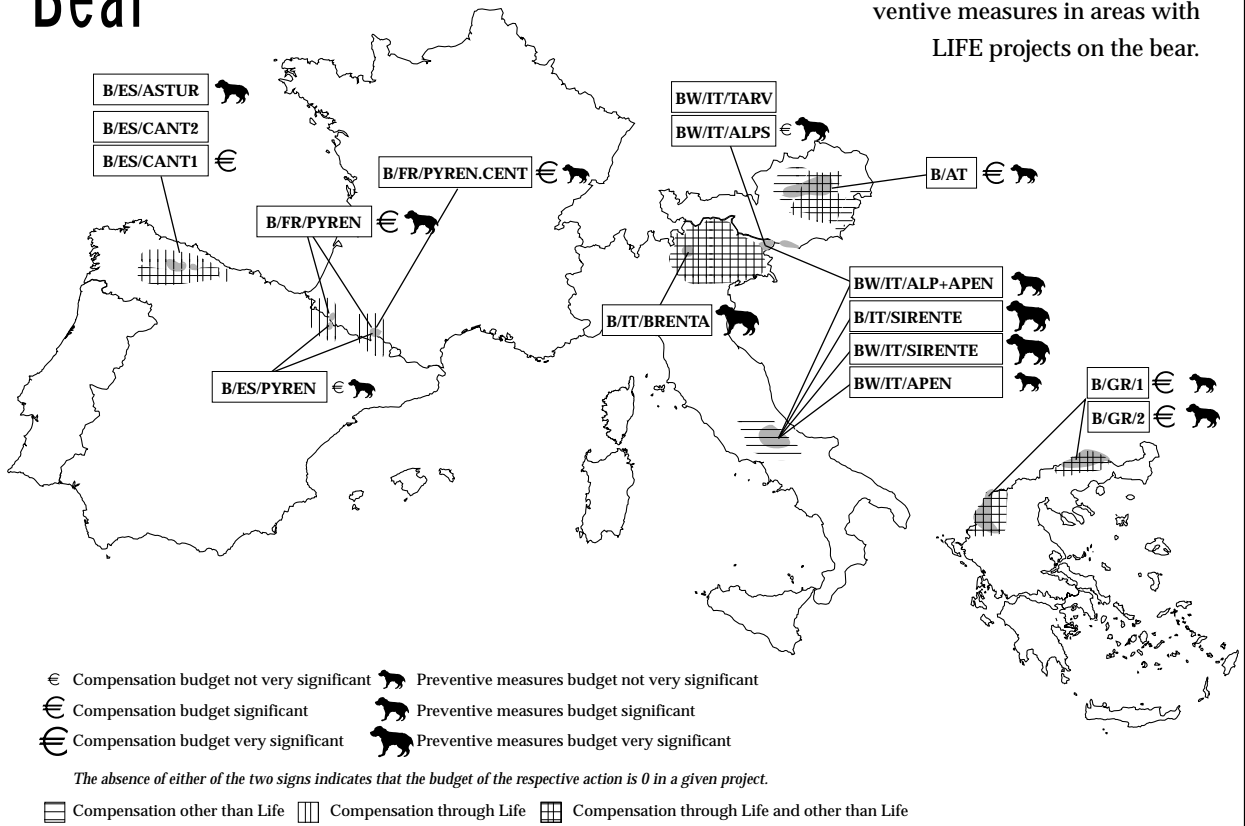
One particular condition set by ELGA is that damage to livestock is eligible for compensation only if it is greater or equal to half an Insurance Unit (IU). The Insurance Unit depends on the size and age of the animal. For instance, an adult cow of at least two years of age are equal to one IU, a sheep or a goat between one and six years old is equal to 0.15 IU, a sheep or a goat less than 1 years old is equal to 0.06 IU, while calves and equines aged less than 1 years old is equal to 0.4 IU. For example, if a bear kills four or more adult sheep or goats, then the damage is eligible for compensation, but if it kills only one to three then the damage is not eligible (4 sheep x 0.15 IU=0.60 IU, which is greater than 0.5 IU). In the case of crops, ELGA does not cover damage if it does not exceed 5% of total crop cover.

**ITALY:** Just as the compensation procedure varies between and within regions, so do the compensation conditions and prerequisites.

In the eastern Alps, in the region of Friuli-Venezia-Giulia and in the Autonomous Province of Trento the inspection outcomes can be “Positive/ Doubtful/Negative” and compensation is paid if the outcome is “Positive” or “Doubtful”. In the Autonomous Province of Trento, the cost of damage must be at least 51.3 euro in order to be compensated and within the Adamello Brenta Park, the use of electric fences is a prerequisite for the compensation of damage (the provision of electric

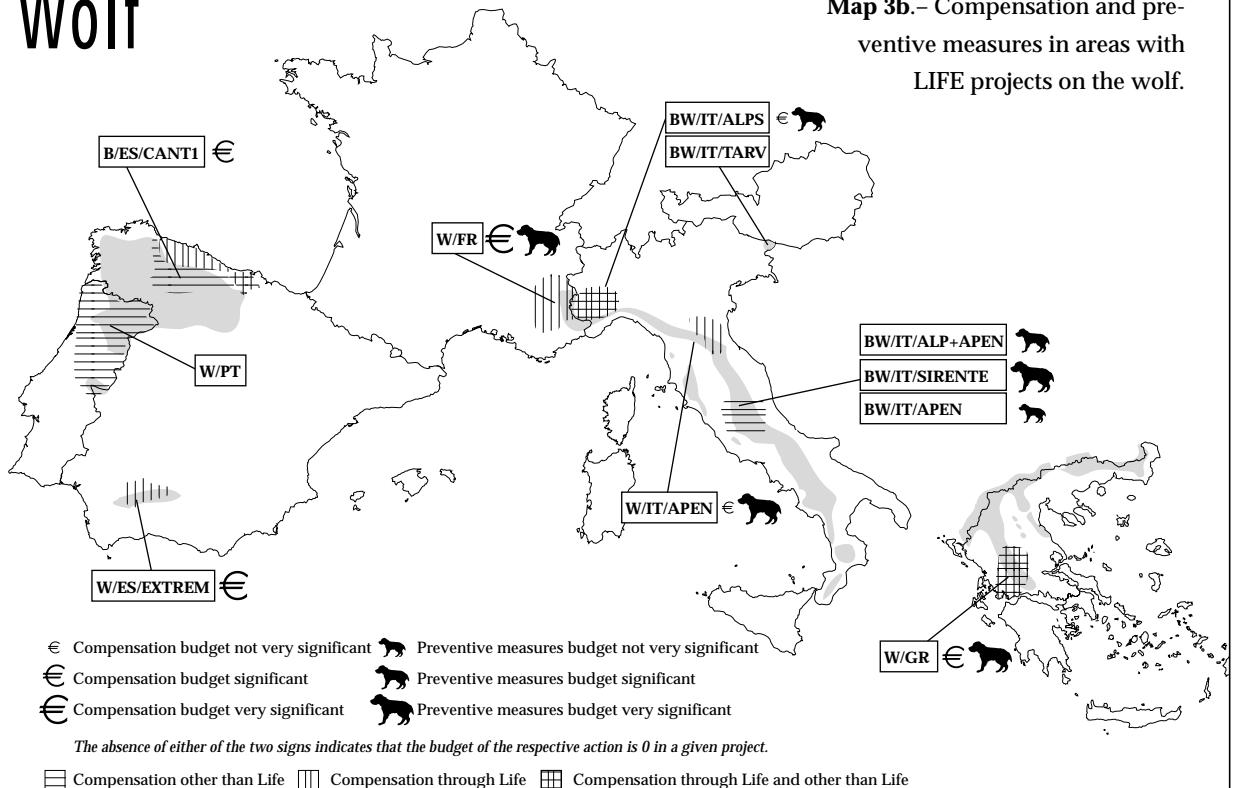
# Bear

Map 3a.- Compensation and preventive measures in areas with LIFE projects on the bear.



# Wolf

Map 3b.- Compensation and preventive measures in areas with LIFE projects on the wolf.



fences is an activity financed by the project B/IT/BRENTA). In the region of Friuli-Venezia-Giulia, damage must be at least 102.6 euro in order to be compensated.

In the western Alps in the region of Piemonte, the outcome categories are “Positive/Probable/Doubtful/Not confirmed/Unverifiable” and compensation is paid only in the first two cases. However, 90% of all damage attributed to a canid in this area is classified as “unverifiable” and is not compensated. There are no particular conditions or prerequisites for compensation in this region, where the BW/IT/ALPS project is conducting its activities for the conservation of the wolf.

In the northern Apennines (region of Emilia Romagna) the outcomes of attacks occurring within the Gigante Regional Park can be “Positive/Very probable/Probable/Little probable/Negative”, and compensation is paid in all cases but the last one. There are no particular conditions for compensation in the Gigante Park

In the central Apennines, including the national parks, with the exception of the Gran Sasso National Park, there are only two categories of outcome, namely “Positive/Negative”, and evidently compensation is paid only when the outcome is “Positive”. In the case of the Gran Sasso National Park, there is a third category of doubtful damage, which however is not compensated. The prerequisites set in the Abruzzo region are theoretically quite strict. According to the regional legislation small animals (such as sheep and goats) must never be left unattended or must be kept in proper enclosures. However, this criteria fits with the actual pastoral practices prevalent in the region, and therefore does not impose an additional effort on behalf of the shepherds. These regulations are also used within the national parks of Maiella and Abruzzo. In these two parks there is the additional condition that shepherds must have obtained an authorisation for grazing from the park administration. The region of Marche is the only region out of the ones studied which sets specific conditions that are also implemented. According to regional legislation, shepherds are obliged to use at least one guard dog per 50 sheep or goats, or protect their animals with enclosures or electric fences.

**PORTUGAL:** The outcome categories are “Positive/Doubtful/Negative” and compensation is paid if the outcome is “Positive” and “Doubtful” only if the damage is in an area where wolf damage has already been observed. The ICN has also some strict conditions in order for damage to be considered eligible for compensation. The conditions that it has set depend on the type of animal. For instance, if sheep and goats are free-roaming, at least one shepherd and one guard dog must be used for every 50 animals with a maximum of five dogs. If sheep and goats are kept in an enclosure they do not have to be guarded by a shepherd, but only by dogs (again, one dog per 50 animals, with a maximum of five dogs). In the case of cattle and equines, if the animals are in groups of less than 8 animals a person must always guard them, while if they are in groups of eight or more animals they have to be checked at least once a week.

**SPAIN:** The inspection outcomes vary by region, regardless of the project. In the regions collaborating in the B/ES/CANT1 project, the situation is the following: In Galicia the potential outcomes are “Positive/Doubtful/Negative”, and compensation is paid only in the first case. In Castilla y León the outcomes are “Positive/Doubtful/Negative”, out of which only the first two are compensated. In Cantabria the inspection outcomes can be “Positive/Probable/Doubtful/Negative”, and compensation is given if the outcome is “Positive” or “Probable”. In Asturias there are only two possible cases, namely “Positive/Negative.” In the three regions of the B/ES/PYREN project, the categories used are as follows: in Cataluña, an outcome can be “Positive/Probable/Doubtful/Undetermined/Negative” and compensation is always given in the first three cases, and sometimes it is also given in the fourth case. In Aragón the inspection outcomes can be “Positive/Probable/Doubtful/Negative”, and compensation is given if the outcome is “Positive” or “Probable.” In the Region of Navarra there are only two possible cases, namely “Positive/Negative.” The region, however, is currently considering a more flexible range of outcomes, namely “Positive/Probable/Doubtful/Negative”, out of which compensation will always be given in the first two cases,

and depending on the particular conditions, it may also be given in the case of “Doubtful.” There are no specific compensation conditions or prerequisites in any of the seven Spanish regions with permanent or temporary bear populations.

**ANALYSIS:** The comparison of the types of conditions that make a damage eligible for compensation, on one hand, and of the categories of outcomes that are compensated in each country or region, on the other hand, reveals that there is a difference in the degree of “strictness” of the compensation mechanisms. For instance, certain countries or regions, like Greece, Portugal and the Abruzzo region in Italy, have numerous strict

criteria that exclude many damage cases from compensation. Other regions have some flexible conditions which are either very easy to fulfil (like the minimum damage cost of 51.3 euro and 102.6 euro set by the regions in the eastern Italian Alps), or exist only on paper and are not applied (like the non-payment of wolf damage if no preventive measures have been taken after the fourth attack in the French Alps).



















Furthermore, doubtful cases are not always treated in the same way; the official authorities of many countries and regions (like the region of Abruzzo in Italy, the regions of Galicia, Asturias, Cantabria, and Aragón, and Greece) refuse to compensate damage that falls under this category. There are other countries (like France, and Portugal) that are more lenient and pay sometimes, depending on the situation, damage that is considered to be doubtful. Still, there are those countries and regions (Austria, the regions in the eastern Italian Alps, the regions of Castilla y León and Cataluña in Spain, and the Gigante Regional park in Italy) that always compensate doubtful damage cases. (Table 11 shows how the doubtful cases are treated in each project area, and which conditions are set.)




We could therefore attempt to classify the various compensation mechanisms according to their leniency or strictness, by combining the two aforementioned factors (as can be seen in Table 11). The degree of “strictness” of a compensation mechanism reveals its degree of damage acceptance by the compensating structure. In other words, the stricter a mechanism is, the lower its damage acceptance level is (i.e., it accepts to pay less damage). The point of trying to determine the degree of damage acceptance is that in general a compensation mechanism that covers all types of damage, regardless of certain conditions, prolongs a socially risky situation and provides no incentives for the avoidance of certain types of damage. On the other hand, compensation mechanisms that limit the types of damage eligible for compensation, provide incentives for the avoidance of such damage. In addition, a stricter compensation mechanism is likely to limit the cases of fraudulent claims, which constitute a significant problem and increase the financial burden of compensation.



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**Table 11.**– Conditions for bear/wolf damage compensation and payment of doubtful cases.

COUNTRY	AREA	CONDITIONS FOR COMPENSATION PAYMENT	PAYMENT OF DOUBTFUL CASES	STRICTNESS OF MECHANISM
AUSTRIA	EASTERN AUSTRIA	–		⊕
FRANCE	PYRENEES	–		⊕
	ALPS	Use of preventive measures before 4 <sup>th</sup> attack (rarely applied)		⊕
GREECE	CENTRAL & NORTHERN GREECE	Wardening and enclosures if prior attacks Livestock damage at least equal to 0.5 insur. unit. Crop damage at least equal to 5% of total crop surface	 (ELGA)	★
		Use of electric fences and dogs (if supplied by LIFE projects)	 (LIFE)	⊕
ITALY	ABRUZZO REGION	Guarding of sheep and goats		★
	ABRUZZO PARK	Prior authorisation for grazing Use of guard dogs/electric fences Livestock kept in pen during the night		★
	GR.SASSO PARK	–		⊕
	MAIELLA PARK	Prior authorisation for grazing		★
	(UMBRIA) SIBILLINI PARK	–		⊕
	MARCHE	At least one guard dog per 50 sheep/goats Use of enclosures		★
	FRIULI-VENEZIA	Damage equal to at least 51.3 euro		⊕
	TRENTO	Damage equal to at least 102.6 euro Use of electric fences		⊕
	PIEMONTE	–		⊕
	(EMILIA ROMAGNA) GIGANTE PARK	–		⊕
SPAIN	GALICIA ASTURIAS CANTABRIA NAVARRA ARAGON	–		⊕
	CASTILLA CATALUNA	–		⊕
PORTUGAL	NORTHERN PORTUGAL	At least 1 shepherd and 1 dog for 50 free-roaming sheep/goats At least 1 dog for every 50 sheep/goats in enclosure Groups of at least 8 free-roaming horses/cows Guarding of groups of less than 8 horses/cows		★

	Never paid	⊕	Lenient: does not set particular conditions, or does not apply the set conditions.
	Paid sometimes	★	Semi-lenient: always pays doubtful damage (and sets particular conditions).
	Always paid	★	Strict: never or sometimes pays doubtful damage cases (and sets particular conditions).

A compensation mechanism could be classified in the following ways:

- **Lenient**, if it does not set particular conditions, or does not apply the set conditions;
- **Semi-lenient**, if it always pays doubtful damage (and sets particular conditions);
- **Strict**, if it never or sometimes pays doubtful damage (and sets particular conditions).

Using this scheme, we can say that the compensation systems for bear damage are lenient in Austria, in the French Pyrenees, in all Spanish regions, while they are semi-lenient in the eastern Italian Alps (including the Adamello-Brenta Park), and strict in Greece and in central Italy (with the exception of the two national parks of Sibillini and Gran Sasso, where the systems are lenient). In the case of Greece, the system could be considered semi-lenient if the contributions of the three LIFE projects are taken into consideration. The compensation systems for wolf damage are lenient in the French Alps, in the regions of Emilia Romagna (within the Gigante Park) and Piemonte in Italy, and strict in Portugal, Greece and in Marche and Abruzzo regions (including the Abruzzo park) in Italy.

### CALCULATION OF COMPENSATION

**C**ompensation is always made in cash, with the exception of wolf and bear damage in the Italian Alps where it can also be made in kind. This means that the killed animal is replaced with a live animal of the same kind. This strategy is used by the BW/IT/ALPS project mainly for the compensation of bear damage, but is quite difficult to implement since there are always some differences in quality between the animal killed and the one exchanged. The new project W/ES/EXTREM has also foreseen such a strategy, which can be used only within the context of areas with relatively low damage.

The amount of compensation depends either on the real market value of the damaged goods or an approximation of the market value. In the case of livestock, a list is usually compiled indicating the compensation amounts for each type of animal (depending on sex, age, breed and whether the

animal is raised for meat or milk production in the case of goats, sheep and cows) which are set on a weekly, monthly or yearly basis. However, in some cases, like in the region of Piemonte in the Italian Alps or the region of Aragón in Spain, there are only a few basic categories for compensation which are fixed and do not take into account the age, sex or race of the animal. In the case of crops, the market value of the specific crop in the specific area is used in order to determine the amount of compensation per acre damaged. For beehives, compensating bodies generally establish the price of the beehive itself, and also set an average market price for the honey and the bees (with the exception of Greece, where the value of the lost honey is not compensated).

In addition to the market value compensated for almost all kinds of damage (i.e., on livestock, crops, and beehives), there are some additional fees paid by some competent bodies whose purpose is to cover additional direct or indirect costs of the damage, particularly for damage to livestock. Such fees may include a compensation for disturbance to the flock, which is a fee for the income lost (e.g., for the decreased milk production and potential abortions that may result from the emotional shock of the attacked animals), disturbance to the shepherd (for the time spent grouping back the flock and declaring the damage), and costs of the medical treatment of injured animals (refer to Tables 12 and 13).

**AUSTRIA:** The insurance companies do not use fixed value lists in order to determine the compensation amount. Compensation is based on the actual claims made by the people who suffered a damage, which ideally reflect market values. If the company deems that a claim is too high relative to average values of the good damaged, it can reduce the compensation amount. No additional fees (i.e. for disturbance or income foregone) are paid.

**FRANCE:** It is one of the few countries where fees additional to the market value of the animal or the crop are compensated, and the only country where there is an additional fee for the disturbance caused to the shepherd. The foregone income fee has been introduced since 1970, while the shepherd disturbance fee since 1979. Veterinary costs for treatment of injured animals are also covered.



**Table 12.**– Calculation of compensation for bear damage to livestock.



COUNTRY	AREA	% OF MARKET VALUE PAID	INCOME FOREGONE	SHEPHERD DISTURBANCE	% OF VETERINARY COSTS PAID
AUSTRIA	EASTERN AUSTRIA	100	0 euro	0 euro	0
FRANCE	PYRENEES	100	30 euro or 10% of animal value if value more than 302 euro	91 euro	100
GREECE	PINDOS & RODOPI	100	0 euro	0 euro	0
ITALY	ABRUZZO REGION ABRUZZO PARK GR.SASSO PARK MAIELLA PARK	88.6 <sup>(1)</sup> 100 100	0 euro 0 euro 0 euro	0 euro 0 euro 0 euro	0 0 100
	(UMBRIA) SIBILLINI PARK	100	0 euro	0 euro	100
	MARCHE	60	0 euro	0 euro	100
	FRIULI-VENEZIA	100	0 euro	0 euro	0
	TRENTO	100	0 euro	0 euro	Difference between value of healthy & injured animal
SPAIN	CANTABRIA GALICIA CASTILLA	100	0 euro	0 euro	0
	ASTURIAS	100	12-20% of animal value	0 euro	0
	ARAGON	120	60 euro	0 euro	0
	CATALUNA	200	60 euro	0 euro	0
	NAVARRA	100	300-450 euro	0 euro	0

<sup>(1)</sup> Average annual percentage

All lists and additional fees are set by the Directorate of Agriculture (DDAF) in collaboration with representatives of the agricultural professions.

One interesting element is that the compensation for livestock damage by bears differs to that by wolves. In both cases, a very detailed price list is issued once every few years indicating the compensation amounts given for each animal, based on age, sex and genetic quality. This list however is slightly different for bear and for wolf damage in terms of prices and of animal categories. In terms

of price differences for instance, a registered sheep less than one year old is compensated with 98 euro if killed by a wolf and with 102 euro if killed by a bear. The general tendency is that compensation for wolf damage is equal or lower to that for bear damage (with a few exceptions for certain categories of domestic animals).

In the case of bear damage to livestock, a disturbance fee of 91 euro per attack is added to this compensation based on the average market value, regardless of the number of animals killed. This



**Table 13.** – Calculation of compensation for wolf damage to livestock.



COUNTRY	AREA	% OF MARKET VALUE PAID	INCOME FOREGONE	SHEPHERD DISTURBANCE	% OF VETERINARY COSTS PAID
FRANCE	ALPS	110	0.75 euro per head, with a maximum of 300 heads + 0.6 euro per kilogram of milk lost	0 euro	100
GREECE	CENTRAL & NORTHERN GREECE	80	0 euro	0 euro	0
ITALY	ABRUZZO REGION ABRUZZO PARK } GR.SASSO PARK } MAIELLA PARK }	88.6 <sup>(1)</sup> 100 100	0 euro 0 euro 0 euro	0 euro 0 euro 0 euro	0 0 100
	(UMBRIA) SIBILLINI PARK	100	0 euro	0 euro	100
	MARCHE	60	0 euro	0 euro	100
	(EMILIA ROMAGNA) GIGANTE PARK	100	20% of animal market value	0 euro	0
	PIEMONTE	60	60 euro for every 5 animals killed	0 euro	0
PORTUGAL	NORTHERN PORTUGAL	100 minus value of remains	0 euro	0 euro	100

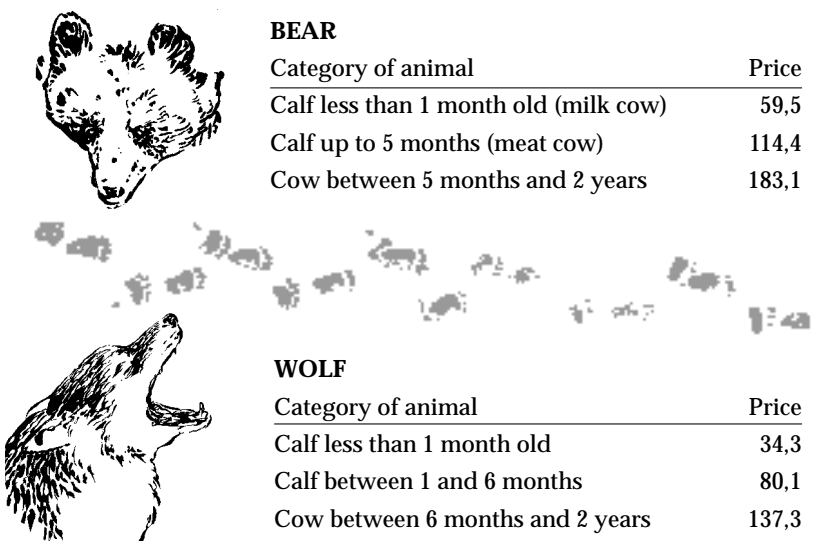
<sup>(1)</sup> Average annual percentage

fee is given to the person that suffers the disturbance, that is the shepherd, or in the absence of a shepherd, the owner. If there is more than one owner, each one receives the fee. Finally, a fee for the income foregone (i.e. reduced milk production or abortions due to stress of attacked animals) is given, part of which compensates also for the potential difficulty of replacing the lost animal. This fee, which is given to the owner of the animals, is equal to 30 euro per head, or 10% of the value of the animal if the value is over 302 euro. For bear damage in agriculture, the compensation consists in paying the average market price, plus a disturbance fee per attack, equal to 91 euro. This fee can be adjusted, depending on the importance of the economic impact of the damage. It is important to note that the definition of an attack in France is “the intervention of a predator on a

given day in a given herd.” However, if there is more than one owner, the attacks in administrative terms are equal to the number of owners. Treatment expenses for injured animals are compensated, and if the animal dies as a result of its injuries from the attack, it is compensated according to the aforementioned conditions.

In the case of wolf damage to livestock, the market values may differ to those paid for bear damage, as aforementioned (refer also to Table 14). Another element of difference is that the compensation paid for pregnant animals is higher than the normal. For instance, in the case of pregnant cows, the compensation may be increased by 20% with respect to the market value indicated in the price list (this holds mainly for cattle and equine). One particularity of the compensation system for wolf damage in France is that it covers two types

**Table 14.**— Example of livestock compensation in France (in euro), depending on predator.

	<b>BEAR</b>	
	Category of animal	Price
	Calf less than 1 month old (milk cow)	59,5
	Calf up to 5 months (meat cow)	114,4
	Cow between 5 months and 2 years	183,1
	<b>WOLF</b>	
	Category of animal	Price
	Calf less than 1 month old	34,3
	Calf between 1 and 6 months	80,1
	Cow between 6 months and 2 years	137,3

of income foregone: indirect and direct. The indirect income foregone fee depends on the size of the herd that was attacked, and is given for each attack. It amounts to 0.75 euro per head, with a ceiling of 300 heads, i.e. 225 euro. If there is more than one owner, this fee is shared among the owners in proportion to the number of animals that each one of them has in the attacked flock. In theory, this compensation is not given after the 4th attack, if the shepherd has not put in place certain preventive methods. The direct income foregone fee is paid only for the loss of animals used specially for cheese production (i.e., at least 50% of the income must come from cheese production). The fee paid for each kilogram of goat milk lost due to the death of a goat is 0.6 euro approximately, with a maximum of 600 kilograms of lost milk per goat (there are specific mathematical formulas used for the calculation of the lost production, which are based on the number of months between the date of death and March, which is the theoretical date of the end of pregnancy, and on the number of months between the date of death and December, which is the theoretical date of the end of lactation). The fee paid for each kilogram of sheep and cow milk is 1.52 euro per kilo

(with a maximum of 220 kilos of milk per sheep and 0.38 euro per kilo (with a maximum of 5000 kilos of milk per cow) respectively. Given the heterogeneity of the production systems for these two kinds of animals, the estimation of the lost production is based on the expertise of the official veterinary on a case by case basis. No shepherd disturbance fee is paid in the case of wolf damage. As in the case of the bear, treatment expenses for injured animals are covered. Some calculations made by the FR/W project have indicated that so far each killed animal has been costing about 150.8 euro, if the basic value and all fees (for dead and live animals) are taken into account (M.L. Poulle, pers. comm.). This price exceeds by far not only the market value of the animal, but also all associated opportunity costs.

**GREECE:** ELGA, the agricultural insurance company, establishes a list on a yearly basis, including the average market values of animals and beehives. This list of market values of livestock depends on the age, sex, size and breed of the animal. The market value of the beehives is also determined on a yearly basis by ELGA, and it includes a compensation fee for the bees themselves, and another fee for the beehive (excluding

honey, which is not compensated), depending on the kind of beehive (i.e. European type, local type, etc.). The aforementioned lists are used regardless of the source of damage; they are used for livestock losses from both the bear, the wolf and other wild animals, but also from disease or adverse weather conditions. One difference, however, is that ELGA pays 100% of the value of bear damage, whereas it pays only 80% of the value of wolf damage. No additional fees are paid for disturbance, income foregone or medical expenses.

**ITALY:** In most of the bear or wolf areas, market prices are used as a basis for the compensation of damage. However, certain regions, like the region of Marche and Piemonte pay systematically 60% of the value of the dead animal. The region of Abruzzo also gives compensations lower than the market value, given the availability of funds. Between 1992 and 1997 it paid on the average 88.6% of the market value of animals. No additional fees or medical treatment are covered in any of the areas in Italy (with the exception of the Piemonte region and the Gigante Regional Park in Emilia Romagna), since many regional laws stipulate that the compensation cannot exceed 100% of the value of the dead animal. In the region of Piemonte, the Solidarity Fund, which is the official body responsible for compensation in the Piemonte region, pays a fixed amount of 60 euro per sheep or goat killed, regardless of sex, age or quality, and 25 euro per sheep or goat injured. In the same region, the BW/IT/ALPS project compensates 1 animal for every 5 animals compensated by the Solidarity Fund, the purpose of which is to adjust the compensation of the Solidarity Fund, which is about 30 to 40% lower than the actual market value of the animals (even though according to regional legislation the region is supposed to cover 100% of the value of the damage). In the northern Apennines, in the Gigante Park, the park consortium compensates through the project W/IT/APEN damage based on a price list of animals that is issued each year, which, as in the case of Greece, France, and Portugal, depends on sex, age and quality of the animals. It also pays a fee for the income foregone, which is equal to 20% of the market value of the animal indicated in the list.

**PORTUGAL:** The ICN uses as a reference for compensation a price list issued weekly by the Min-

istry of Agriculture indicating market prices of different animals according to the different regions and markets. The ICN compensates the market value of an animal minus the value of the remains that can be recuperated. However, farmers almost never wish to use the remains, and the aforementioned regulation is therefore never implemented. All medical expenses for animal injuries resulting from an attack are compensated. No additional fees are paid for disturbance or income foregone.

**SPAIN:** The regions of Cantabria, Asturias and Castilla y León (the partners of the B/ES/CANTI1 project) base their compensation for livestock damage on official lists issued independently in each of the three regions (there is no such list in Galicia since there is no damage to livestock). No additional fees for disturbance of the shepherd, income foregone or medical costs are compensated in Cantabria and Castilla y León. In Asturias, however, there is a fee for income foregone, which amounts to 12-20% of the dead animal's market value. On the other hand, the regions of Aragón and Cataluña (partners of the B/ES/PYREN project) compensate damage using a fixed price higher than that of the market. In the case of Aragón, there is a slight variation in prices for damage caused by the wolf and the bear. For example, there is only one price for goats or sheep killed by a bear, which is 89.3 euro, while for sheep and goats killed by a wolf there are two different prices: 119.1 euro per sheep and 89.3 per goat. As aforementioned, an interesting point which differs from most other countries and regions is that the region of Aragón compensates injured as well as lost animals, using the aforementioned values. The region of Cataluña pays twice the market value of the lost animal plus 60.6 euro per attack as a compensation for the income foregone. The reason that the regions of Cataluña and Aragón pay more than then local market value of livestock is that they are trying to harmonise their compensation levels with those of the French Pyrenees. The third partner of the B/ES/PYREN project, the Region of Navarra, bases the compensation on a market price list, and compensates approximately 100% of the market value. At the same time it also pays a very high fee for income foregone, which varies between 300 and 450 euro, depending on the particular case.

**ANALYSIS:** Bear and wolf damage compensation is very irregular not only when comparing the six countries examined but even when comparing adjacent regions either belonging to one country (like in the case of the Cantabrian mountains) or belonging to neighbouring countries (like in the case of the French and Spanish Pyrenees). A simple example illustrated in Table 15, based on the data presented in Tables 12 and 13, quantifies the discrepancies in the amounts of compensation payment. The table compares the total amount of compensation received for one lamb, weighting 15

kilograms. The market value of lambs in each country is derived from the average price per 100 kg paid in each Member State to farmers for lamb carcasses in May 1998 (DG VI/D2, internal working document). This value is the only indicator of the value of animals comparable among countries. The differences in type and quality of animals between countries are not considered in this case, since the idea is to compare the compensation that would have been received for the killing of one fat lamb with the same characteristics. However, it should be noted that the prices are only

**Table 15.**— Example of compensation received for the loss of a killed lamb of 15 kilos (in euro).

COUNTRY	MARKET VALUE	BASIC VALUE COMPENSATED (a)	INCOME FOREGONE (b)	DISTURBANCE OF SHEPHERD (c)	TOTAL VALUE COMPENSATED (a+b+c)
AUSTRIA	57.9	57.9	0	0	57.9
FRANCE (bear damage) (wolf damage)	57.2	57.2 62.9	30 0.75	91 0	178.2 63.7
GREECE (bear damage) (wolf damage)	53.7	53.7 43.0	0 0	0 0	53.7 43.0
ITALY Abruzzo (Abruzzo Park) (Gran Sasso Park) (Maiella Park) Umbria (Sibillini Park) Marche Friuli-Venezia-Giulia Trento Emilia Romagna (Gigante Park) Piemonte	53.0	47.0 53.0 53.0 53.0 53.0 31.8 53.0 53.0 53.0 31.8	0 0 0 0 0 0 0 0 10.6 0	0 0 0 0 0 0 0 0 0 0	47.0 53.0 53.0 53.0 53.0 31.8 53.0 53.0 63.6 31.8
PORTUGAL	47.9	47.9	0	0	47.9
SPAIN <sup>(2)</sup> Cantabria Castilla y León Asturias Aragón (bear damage) (wolf damage) Cataluña Navarra	45.3	45.3 45.3 45.3 54.4 40.8 90.6 45.3	0 0 9.1 60 60 60 450	0 0 0 0 0 0 0	45.3 45.3 54.4 114.4 100.8 150.6 495.3

<sup>(1)</sup> The market value of one lamb of 15 kilos was calculated based on the average price per 100 kg paid in each Member State to farmers for lamb carcasses in May 1998.

<sup>(2)</sup> The region of Galicia was not included since so far there has been no damage to livestock.

indicative. The differences in the total compensation value paid are based first on the price of the animal, second on the percentage of the market value paid and third on the additional fees.

The variations in compensation values are very significant, not only between countries, but also within countries. The amounts compensated for one lamb killed (regardless of the predator) vary from 31.8 euro up to 495.3 euro among the six countries, the latter being approximately 15 times higher than the former. Significant differences appear also within countries; for instance in France, a lamb killed by a bear is compensated 3 times more than a lamb killed by a wolf. In Italy, where compensation varies by region but not by predators, the compensation of a lamb can be double, if we take the extreme cases (Marche region and Gigante Park). In Spain the compensation of a lamb can be 10 times higher, again if we take the extreme cases.

It would seem that the competent authorities can afford to pay higher compensation in areas with lower damage (like in the regions of Navarra and Cataluña, or in the French Pyrenees). The data collected for this study do not permit a statistical or econometric analysis that would allow us to determine the type of relationship between the level of damage and the level of compensation. However, the analysis of the cases presented, indicates that there tends to be an inverse relationship between damage levels and compensation payments. This suggests that a compensation mechanism might be less and less capable of covering damage as damage levels increase. In addition, the provision of compensation for damage over the entire wolf and bear range can be very costly. Does this imply that compensation systems are likely to be incompatible with increasing bear and wolf populations, assuming that damage increases along with the populations of large carnivores? A solution that has been proposed by certain countries, such as Sweden (see Box 3), and is presently under consideration by the French Ministry of the Environment, is a system based on fixed compensations given out to livestock raisers that have activities in areas with large carnivores. The idea underlying this system is that each livestock raiser receives a fixed amount as a compensation for living in an area with large car-

nivores. The livestock raiser is then free to dispose of the given amount as he wishes. For instance, he may use it for the installation of preventive measures, or for any other personal or professional reason. However, if large carnivores do cause damage on his livestock, he does not have the right to request an additional compensation. The main advantage of such a system is that it alleviates the administrative burden related to compensation systems based on a case-to-case compensation, which is a very time-consuming system. The disadvantage of the fixed-amount system is that it constitutes still another subsidy for livestock-raisers, a group which is already heavily subsidised. Another potential shortcoming is that damage levels fluctuate each year, thus making farmers and livestock raisers very hesitant to accept a system based on fixed amounts.

In some regions, compensations are much higher than the costs related to the loss of an animal or of some crops. In a sense, when the compensation exceeds by far the financial and opportunity costs (which could be the case, for example, in the regions of Navarra, Aragón and Cataluña in Spain or in the French Pyrenees), there is a chance that farmers may find it more profitable to "have their animals eaten" by the large predators than to sell them in the market. It is therefore important that compensations reflect real costs. Compensation mechanisms that are based on price lists that are updated in regular intervals (i.e., monthly), and base additional fees on percentages of market values are more likely to give out compensations that reflect real costs.

Another element that may create misconceptions and distort attitudes is the different treatment of bear and wolf damage, particularly when these two species can be found in the same geographical region. For instance, in France and Greece, the compensation of wolf damage is inferior to the one of bear damage. This discrepancy in France could be explained due to the distinct geographical regions covered by the bear and the wolf. A "preferential" treatment of damage caused by one predator is likely to worsen the public opinion about the predator whose damage is compensated with inferior rates, and have a negative impact on the efficiency of the compensation system. □

## 4

# The European action plans of the Large Carnivore Initiative for Europe

Given the mobile nature of the bear and particularly the wolf, and their tendency to recolonise new areas and move across borders, the issue of damage compensation must be considered not only on a regional and national level, but also on a cross-border level.

The issue of compensation systems may be looked at through the perspective of the European action plans for the wolf and the bear. Such plans are currently being prepared by the Large Carnivore Initiative for Europe (LCIE), which aims at the adoption of the action plans by the Bern Convention. The action plans for the wolf and the bear, along with the action plans for the wolverine, the Iberian lynx and the Eurasian lynx, all five of which have been elaborated by the LCIE, are to be discussed at the Habitats Committee meeting and the meeting of the parties of the Bern Convention within 1999.

The European action plans of LCIE on the wolf and the bear consider that the issue of conflicts between humans and large carnivores has to be managed with three parallel strategies that must be linked: prevention, compensation and management of problem animals.

In terms of prevention, which is, according to the action plans, the only active method of damage decrease, special incentives for the adoption of practices and techniques that are compatible with carnivore conservation should be provided. According to the action plan for the wolf, guard dogs are among the most effective means of prevention. In addition, the expansion of wolf and bear populations should be diverted, if possible, towards areas where potential conflicts are likely to be low.

As far as compensation is concerned, the action plans of the LCIE suggest some basic guidelines:

- Compensation payment is a passive strategy. For this, it should be linked to the level of preventive measures used by the farmer or the livestock-raiser.
- Damage compensation should be equal for all predators present in a given area.
- The identification of the predator that is responsible for a specific damage is very important. The only exception concerns the distinction between dog and wolf damage, which is technically almost impossible.
- All canid damage should be covered, including damage which is doubtful (i.e., including damage that could be from feral dogs).
- Compensation mechanisms should have built-in mechanisms to minimise fraudulent cases.

Finally, in terms of management of problem animals, the action plans indicate that closely regulated hunting in areas where populations are viable is an efficient means for the limitation of conflict. One important means of decreasing the occurrence of problem animals, according to the plan, is the elimination of human-related food sources, such as garbage dumps and artificial feeding.

Some of the general guidelines presented by the European action plans of LCIE are consistent with the recommendations of the present study. Nevertheless, some other elements which according to this study are key ones, are not at all con-

sidered by the two action plans elaborated by LCIE:

- First of all, they do not make any reference to the nature of the compensating structure or the role of secondary structures able to contribute to a compensation mechanism. What kind of structures should be responsible for compensation payments?
- Second, the action plans do not make any reference to the level of compensation pay-

ments. What should be their relation to market prices? Should additional fees, such as shepherd disturbance and income foregone, be also compensated?

- Finally, even though the action plans emphasise the importance of similar compensation amounts for different predators, they do not mention the importance of the similarity of the entire compensation mechanism (types of damage covered, speed of payment, coverage of doubtful cases, etc.). □



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*Mule killed by a brown bear in Pindos, Greece.*

## 5

## Some lessons to be learned?

**A**s aforementioned, it is very difficult, to determine the efficiency of a particular compensation system. This is due to two main reasons: first, how do we quantify efficiency? Can this be done in terms of the decrease of poached carnivores, in terms of an increase in public acceptance, or in other terms? Secondly, how can we isolate the effect of compensation on the two aforementioned factors from the impact of other parameters, such as environmental awareness campaigns or changes in hunting legislation? In addition, it is impossible to generalise and select the ideal compensation system, since each system has to be adapted to local conditions and particularities.

For these reasons, the present study did not attempt to determine which compensation systems are more efficient than others. Instead, there was an effort to identify individual elements of the compensation systems analysed that seem to be working better than others. Here follows a review of the individual elements of the compensation systems that have been analysed previously in each section referring to a particular issue of the compensation mechanism. The following elements could be considered as recommendations addressed to structures responsible for compensation.

The first such element is the role of the unofficial structures involved in compensation mechanisms. By “unofficial” we refer to those structures that receive compensation funds other than national or regional funds. The review of the existing compensation mechanisms has revealed that there are three general categories of operation of the unofficial bodies: first, there are those that completely replace the official compensation structure for a given time period (i.e., the duration of a project)

through the exclusive use of LIFE funds for the coverage of all compensation costs. Second, there are those that contribute to the operation of the official compensation structure through the partial use of LIFE funds in order to cover some shortcomings of the official compensation mechanism. And third, there are those unofficial structures that do not interfere at all with the official compensation systems. It would seem that the contribution of an unofficial body to the improvement of a compensation system run by an existing compensation structure, is a much more efficient and sustainable method and a better use of community funds rather than the complete replacement during a project of the financial sources provided prior and after a project by an official structure. The complete coverage of all damage within an area by an unofficial structure could be understandable only in those cases where a large carnivore has been re-introduced by the same structure, or in the cases of a complete absence of an official compensation system.

Another important element is the capacity of a structure to respond in a prompt and punctual way to the financial demands of individuals with marginal economies. Prompt responses tend to appease social tensions, and reduce the negative image created by carnivores such as the bear and particularly the wolf. Delayed responses not only increase the possibilities of direct retaliation on behalf of the person that has suffered the damage, but also strengthen and eternalise the negative public image of the aforementioned carnivores. If a compensating structure is administratively unable to make compensations within given periods that would seem to be acceptable to the public (e.g., between half a month and four months), it should at least try to respect the compensation

payment deadlines, which are usually set by the structure itself. Respecting the deadlines does not only appease social tension, but also increases the creditability of a structure.

Lenient compensation mechanisms that cover practically all types of damage, without specifying certain prerequisites, such as the use of preventive measures, are a counter-incentive for the avoidance of certain types of damage both in the short and the long run. In order for a compensation mechanism to be financially viable, the establishment of a set of conditions to be fulfilled in order for damage to be eligible for compensation seems to be a must. This becomes more and more necessary in view of the increasing damage (both declared and real) that can be observed in most countries studied in the present paper, since damage compensation throughout the entire bear and wolf range is not only a very heavy financial burden but also a heavy burden in terms of personnel required for the inspection and all administrative procedures related to compensation. In addition, lenient compensation systems that always cover doubtful cases, facilitate the declaration and payment of “false” damages. It is true that compensation mechanisms have to be flexible so as to take into account cases of true damage declaration. However, this flexibility is often taken into advantage, thus increasing the financial burden of compensation. The optimal (even though not perfect) solution could probably be found in a system compensating doubtful cases on a case-by-case basis (i.e., sometimes compensate, and sometimes not) depending on a set of specific criteria to be set based on local conditions.

An additional and very important element to be taken into account is the value of the compensation, compared to the financial and opportunity value of a killed animal or a destroyed field. The compensation should be equal to the value of the lost product plus the value of the opportunity cost (e.g. time spent for declaration and income foregone), and should in no way exceed the sum of these two costs. If it does exceed them, there is a financial benefit in favour of the person that has suffered the damage, which implies that it becomes more profitable to have animals eaten by “the big bad wolf” rather than to sell them to the market. In other words, compensation must not

exceed real costs (direct and indirect). This can be done by making sure that the basic compensation value of an animal, a crop or a beehive does not exceed market values (which can be achieved through the updating of price lists on a regular basis) and by compensating income foregone and shepherd disturbance based on percentages of market values rather than on fixed amounts.

The comparison of the different compensation systems used in areas with LIFE projects stresses the degree of heterogeneity of the different systems even within regions or countries sharing the same population of wolves or bears. Such a heterogeneity is likely to be problematic in the sense that damages caused by the same bears or wolves are compensated in distinct ways (if they are compensated at all) and with varying levels of efficiency as soon as the large carnivores cross the borders of adjacent areas. In such cases, social conflicts and the negative public opinion in the region or country where damage compensation is inferior or where the entire compensation mechanism is slower and less responsive, are likely to be quite significant. Ideally, countries and particularly regions that share the same population of bears or wolves should attempt to harmonise their compensation systems. This may be quite feasible in regions of the same country, but more complicated in neighbouring countries, where legislation, standards of living and market prices may vary significantly.

Another type of harmonisation that should be applied concerns damage compensation of different large carnivores. Compensation mechanisms should ideally make sure that no predator receives a “preferential” treatment, in terms of the level and efficiency of damage compensation, since this is likely to increase prejudice against other predators that can be found in the same region. The harmonisation of compensation systems becomes more and more important as large carnivore populations increase, and particularly in the case of wolf, which is a highly mobile species. This “rule” should apply only to protected large carnivores, and not to carnivores which are not protected, or whose population can be controlled (e.g., wolf in northern Spain, feral dogs in most countries).

Nevertheless, the present heterogeneity of compensation systems permits us to identify certain

particularities, which could eventually be considered by other structures if they respond to specific local needs. Such particularities could be, for instance, the use of hunters' financial contribution to the insurance premia in Austria, the system of minimum Insurance Units (in a more evolved form) and the payment of an inspection fee in Greece, the weekly update of the livestock price list used as the basis of compensation in Portugal, or the compensation of income foregone in France. These individual elements are mentioned here as a pure example of the diversity of the compensation systems, and not as suggested elements improving compensation systems.

There are three specific recommendations related to compensation policy financed through LIFE-Nature projects:

- Damage from species that are not of community interest or are not strictly protected (i.e., that are not included in Annexes II or IV of the Habitats Directive) should not be financed. This is particularly so in the cases where the populations of such species can be controlled. The logic underlying this argument is that LIFE should take into account the damage only of those animals whose protection and conservation is dictated on a Community level.
- LIFE-Nature funding should focus on the temporary support of official structures and/or the support of secondary structures

willing to contribute to the official compensation system. In no way, should LIFE-Nature undertake the complete coverage of all compensation costs or the support of a secondary structure aiming to the substitution of the official structure for a given time period. LIFE is an instrument whose purpose is to support innovative projects with a pump-priming effect. It is in no way intended to be an instrument that covers national and regional deficiencies in the area of nature conservation on a permanent basis.

- LIFE-Nature should not support compensation systems that do not aim at the minimisation of damage through the promotion of preventive measures and do not set any prerequisites for compensation. Lenient compensation systems do not attack the root of the problem and cannot be sustainable or financially viable in the long-run.

Even with the most efficient prevention measures, the coexistence of human populations with large carnivores will always imply unavoidably a certain level of damage. Even with the best compensation system, damage by carnivores will always stir emotion and social agitation. In order for the human-carnivore coexistence to be compatible, the key element is to find the maximum level of damage that can be socially acceptable and to attempt not to exceed this level, through coherent national compensation systems that fit into the context of clear national strategies for large carnivores. □



## 6

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# 7 Annexes

## ANNEX I

### Questionnaire on damages by wolves and bears, and their compensation

**P**lease be as precise as possible. Feel free to add any comments on the margins next to each question. Always indicate the amounts in euro. Please fill out a separate sheet for wolves and a separate one for bears (if applicable in your case). In case you do not have the answer to a question please indicate N.A. (not available). If you fill out the questionnaire for both species, and if some of the information is repetitive, you can simply indicate “same as for the wolf/bear” in one of the two questionnaires. Thank you.

All questions refer to the entire project period (if the project is completed) or to the period from

the beginning of the project to date (if the project is still running) in the area covered by the specific project. In case there are more than one beneficiaries for each project, then each beneficiary should answer for his own sub-project.

Project title:

Contract number:

Duration:

Questionnaire filled out by:

Position & Name of organisation:

Date:





6e) *If yes, how is the compensation for disturbance calculated?* \_\_\_\_\_

6f) *Does the compensation include an amount for disturbance of the shepherd?*

YES

NO

6g) *If yes, how is the compensation for disturbance calculated?* \_\_\_\_\_

6h) *Does the compensation include any other fees?*

YES

NO

6i) *If yes, what are those other fees, and how are they calculated?* \_\_\_\_\_

7) *Please briefly describe the compensation procedure, following the questions 7a-7f.*

7a) *What is the procedure for presenting a claim for compensation of wolf damage (forms to be filled out, to which authority should they be addressed, delay of presentation of claim)?* \_\_\_\_\_

7b) *Who does the inspection of the wolf damage (which organisation conducts it, what is the professional background of the inspector, and in what delay is the inspection conducted)?* \_\_\_\_\_

7c) *What is the procedure for resolving a compensation dispute, if the compensation issue for wolf damage cannot be settled in a friendly way?* \_\_\_\_\_

7d) *What is the delay for compensation payment of wolf damage between the time of the presentation of claim and the payment?* \_\_\_\_\_ months.

7e) *Which are the categories of the inspection outcome for wolf damage (sure, probable, doubtful, etc.)?*

7f) *Please specify in which of these categories a compensation is paid.* \_\_\_\_\_

8a) *Is the existence of preventive measures a prerequisite for compensation of wolf damage?*

YES

NO

8b) *If yes, which are these preventive measures?* \_\_\_\_\_

8c) *Does (or did) your project support the creation of preventive measures against wolf attacks?*

YES

NO

8d) *If yes, which preventive measures does (or did) it support?* \_\_\_\_\_



8e) *If yes, in what way does (or did) it support them (e.g. direct financing, increase of public awareness...)?*

8f) *If preventive measures are (were) financed directly by your project, how much is (was) allocated for each preventive measure (in euro)? (indicate the measure and the corresponding amount).*

9) *Are damages by stray dogs compensated if it is known that a damage has been caused by them?*

YES

NO

10) *Does another compensation system for wolf damages exist in other areas of your country?*

YES

NO

11) *If yes, can you briefly describe it?*





# BEAR



1) What is the annual level of damage in euro caused by the bear in the area of your project?

	1992	1993	1994	1995	1996	1997
Annual damage						

2) What are the total levels of damage caused by the bear in the different types of human activities in the area of your project, and what are the compensation levels? (Fill in the following table).

Damage on:	Compensation covered by the project (a)	Compensation covered by other source (b)*	Amount not compensated (c)	Level of bear damage (a+b+c)
Livestock				
Agriculture				
Beehives				
Other (specify)				
TOTAL				

\*If there are more than one sources, please indicate the compensation covered by each source separately.

3) If a part of the compensation for bear damage has been covered by another (other) source(s), which source(s) is(are) this(these)? \_\_\_\_\_

4a) Have any other types of damage occurred in the area of your project by the bear which are not compensated?

YES NO

4b) If yes, which types of damage are they? \_\_\_\_\_

5a) Are any compensations for bear damage made in kind?

YES NO

5b) If yes, what is the amount of the total compensation made in kind? \_\_\_\_\_ euro

6) Please describe how the compensation amount for bear damage is calculated in the area of your project, following questions 6a to 6i.

6a) Is the compensation based on the market value of the lost animal?

YES NO

6b) If yes, could you please attach a copy of the list with the market values of different kinds of domestic animals (if you have one)?

6c) If the compensation is not based on the market value of the lost animal, on what is it based?

\_\_\_\_\_

6d) Does the compensation include an amount for disturbance of the flock?

YES NO

\_\_\_\_\_



6e) *If yes, how is the compensation for disturbance calculated?* \_\_\_\_\_  
\_\_\_\_\_

6f) *Does the compensation include an amount for disturbance of the shepherd?*

YES NO

6g) *If yes, how is the compensation for disturbance calculated?* \_\_\_\_\_  
\_\_\_\_\_

6h) *Does the compensation include any other fees?*

YES NO

6i) *If yes, what are those other fees, and how are they calculated?* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7) *Please briefly describe the compensation procedure, following the questions 7a-7f.*

7a) *What is the procedure for presenting a claim for compensation of bear damages (forms to be filled out, to which authority should they be addressed, delay of presentation of claim)?* \_\_\_\_\_  
\_\_\_\_\_

7b) *Who does the inspection of the bear damages (which organisation conducts it, what is the professional background of the inspector, and in what delay is the inspection conducted)?* \_\_\_\_\_  
\_\_\_\_\_

7c) *What is the procedure for resolving a compensation dispute, if the compensation issue for bear damages cannot be settled in a friendly way?* \_\_\_\_\_  
\_\_\_\_\_

7d) *What is the delay for compensation payment of bear damage between the time of the presentation of claim and the payment?* \_\_\_\_\_ months.

7e) *Which are the categories of the inspection outcome for bear damage (sure, probable, doubtful, etc.)?* \_\_\_\_\_  
\_\_\_\_\_

7f) *Please specify in which of these categories a compensation is paid.* \_\_\_\_\_  
\_\_\_\_\_

8a) *Is the existence of preventive measures a prerequisite for compensation of bear damage?*

YES NO

8b) *If yes, which are these preventive measures?* \_\_\_\_\_  
\_\_\_\_\_

8c) *Does (or did) your project support the creation of preventive measures against bear attacks?*

YES NO



8d) *If yes, which preventive measures does (or did) it support?* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



8e) *If yes, in what way does (or did) it support them (e.g. direct financing, increase of public awareness...)?*

\_\_\_\_\_

8f) *If preventive measures are (were) financed directly by your project, how much is (was) allocated for each preventive measure (in euro)? (indicate the measure and the corresponding amount).* \_\_\_\_\_

\_\_\_\_\_

9) *Does another compensation system for bear damage exist in other areas of your country?*

YES

NO

10) *If yes, can you briefly describe it?* \_\_\_\_\_

\_\_\_\_\_

Thank you very much for your collaboration



## ANNEX II

## Bear and wolf damage levels - figures used for Charts 1-4

The following are the figures used for the creation of Charts 1-4 of the present study. The data came directly from the beneficiaries of the LIFE projects, and in a few cases where they did not have the data, the structures responsible for damage compensation provided the data. It is important to keep in mind that the data concern the areas of each country covered by the LIFE-Nature projects examined for the present study. The average

number of the estimated population of each species was used in order to calculate the damage per bear/wolf in each country (for instance, if the estimated population of wolves in Italy is 400-500, then the figure used for the calculation was 450). The only exception was the case of damage per bear in France, where, due to the reintroduction in 1996, two distinct figures were used: 6 bears for 1994-95 and 9 bears for 1996-97.

**Table 16.**– Cost of total bear damage (in euro).

	1992	1993	1994	1995	1996	1997
Austria	5.970	25.040	69.390	14.750	3.240	8.640
France	N.A.	N.A.	7.750	2.205	13.120	31.510
Greece	N.A.	73.530	65.050	73.090	72.920	130.870
Italy	N.A.	500	16.815	15.660	19.492	33.603
Spain	N.A.	66.779	41.847	41.847	42.341	70.562

**Table 17.**– Cost of total wolf damage (in euro).

	1992	1993	1994	1995	1996	1997
France	N.A.	5.540	28.920	68.460	146.800	151.690
Greece*	N.A.	N.A.	386.150	N.A.	870.075	708.330
Italy**	N.A.	N.A.	1.472.143	1.670.014	835.402	1.095.164
Portugal	93.500	148.940	182.070	258.500	266.010	407.010
Spain***	N.A.	187.574	220.191	211.555	200.657	173.970

(\*) The figures for Greece are very approximate since there is no data exclusively for damage caused by the wolf. Wolf damage is included in the category of damage caused by wild animals other than the bear, and wolf damage has been inferred. No data are available for 1995.

(\*\*) Ciucci *et al.*, 1997

(\*\*\*) The figures for Spain refer only to the regions of Asturias and Cantabria, two of the four regions compensating damages, and the only two for which damage compensation data are available on a regional level.

**Table 18.**– Cost of damage per bear (in euro).

	1992	1993	1994	1995	1996	1997
Austria	239	1.002	2.776	590	130	346
France	N.A.	N.A.	1.292	368	1.458	3.501
Greece	N.A.	613	542	609	608	1.091
Italy	N.A.	7	224	209	260	448
Spain	N.A.	835	523	523	529	882

**Table 19.**– Cost of damage per wolf (in euro).

	1992	1993	1994	1995	1996	1997
France	N.A.	139	723	1.712	3.670	3.792
Greece	N.A.	N.A.	1.545	N.A.	3.480	2.833
Italy	N.A.	N.A.	3.271	3.711	1.856	2.434
Portugal	267	426	520	738	760	1.163
Spain	N.A.	1.250	1.468	1.410	1.338	1.160

N.A. not available

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