



**Large Carnivore Conservation and Management in Europe:
The contribution of EC co-funded LIFE projects**

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Large carnivore conservation and Management in Europe: the contribution of EC co-funded LIFE projects

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Table of Contents

List of abbreviations.....	4
List of Figures.....	5
List of Tables.....	7
Summary.....	9
Introduction.....	11
Methods for analysis.....	12
Data collection.....	12
Data analysis.....	14
Results.....	14
Available documentation.....	14
Total LIFE projects per species	15
LIFE projects per population.....	17
Brown bear	17
Pyrenean Brown Bear Population	20
Cantabrian Brown Bear Population.....	22
Alpine Brown Bear Population.....	24
Apennine Brown Bear Population	26
Carpathian Brown Bear Population.....	28
Dinaric-Pindos Brown Bear Population.....	29
Eastern Balkans Brown Bear Population	31
Wolf	32
North-Western Iberian Wolf Population.....	34
Alpine Wolf Population	36
Italian Peninsula Wolf Population	38
Dinaric-Balkan Wolf Population	40
Carpathian Wolf Population.....	42
Eurasian lynx	43
Alpine Eurasian Lynx Population.....	45
Carpathian Eurasian Lynx Population.....	46
General considerations.....	47
Some good examples:.....	55
The “ideal” LIFE project on Large Carnivores.....	58
Cited Literature.....	60
Appendix I – Large carnivore populations targeted by LIFE projects	62
Appendix II.....	63
Threats for Brown bear populations	63
Threats for Wolf population.....	65
Threats for Eurasian lynx populations.....	67
Appendix III – List of LIFE projects.....	69

List of abbreviations

CCA	Concrete Conservation Action
CL	Canis lupus
COY	Cubs Of the Year
DREAL	Direction Régionale de l'Environnement, de l'Aménagement et du Logement
EC	European Commission
ELOIS	Eurasian Lynx Online Information System
EU	European Union
fYRoM	“the Former Yugoslav Republic of Macedonia”
IUCN	International Union for Conservation of Nature and Natural Resources
LC	Large Carnivores
LCIE	Large Carnivore Initiative for Europe
LIFE	L'Instrument Financier pour L'Environnement
LL	Lynx lynx
MVP	Minimum Viable Population
NGO	Non-Governmental Organisation
NP	National Park
ONCFS	Office Nationale de la Chasse et de la Faune Sauvage
PA	Protected Area
PACOBACE	Piano d'Azione per la Conservazione dell'Orso Bruno sulle Alpi Centro-Orientali
PATOM	Piano d'Azione per la Tutela dell'Orso Marsicano
SPOIS	Species Online Information System
UA	Ursus arctos

List of Figures

Figure 1: Number of LIFE projects implemented / approved in the periods 1992-1999 and 2000-2011 for Brown bear (29 and 18), wolf (13 and 14) and Eurasian lynx (3 and 3).	16
Figure 2: Number of projects addressing the threats indicated to be present on the Pyrenean brown bear population.....	20
Figure 3: Number of projects addressing the threats for the Pyrenean brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	21
Figure 4: Number of projects addressing the threats for the Cantabrian brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	22
Figure 5: Number of projects addressing the threats for the Cantabrian brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	23
Figure 6: Number of projects addressing the threats for the Alpine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	24
Figure 7: Number of projects addressing the threats for the Alpine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	25
Figure 8: Number of projects addressing the threats for the Apennine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	26
Figure 9: Number of projects addressing the threats for the Apennine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	27
Figure 10: Number of projects addressing the threats for the Carpathian brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	28
Figure 11: Number of projects addressing the threats for the Dinaric-Pindos brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	29
Figure 12: Number of projects addressing the threats for the Dinaric-Pindos brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	30
Figure 13: Number of projects addressing the threats for the Eastern Balkans brown bear population.	31
Figure 14: Number of projects addressing the threats for the North-Western Iberian wolf population.....	35
Figure 15: Number of projects addressing the threats for the Alpine wolf population.....	36
Figure 16: Number of projects addressing the threats for the Italian Peninsula wolf population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	38
Figure 17: Number of projects addressing the threats for the Italian Peninsula wolf population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	39
Figure 18: Number of projects addressing the threats for the Dinaric-Balkan wolf population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.....	40
Figure 19: Number of projects addressing the threats for the Dinaric-Balkan wolf population. Red labels indicate threats that were not indicated as affecting the population, but were	

addressed by the projects.....	41
Figure 20: Number of projects addressing the threat subcategories for the Carpathian wolf population.....	42
Figure 21: Number of projects addressing the threats for the Alpine lynx population.....	45
Figure 22: Number of projects addressing the threats for the Carpathian lynx population.....	46

List of Tables

Table 1: Total European Union contribution per LC species.....	16
Table 2: Brown bear populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 1992-1999.....	17
Table 3: Brown bear populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 2000-2011.....	18
Table 4: Pyrenean brown bear population: threats reported and addressed by LIFE-Nature projects in the period 1992-1999.	20
Table 5: Pyrenean brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.....	21
Table 6: Cantabrian brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.....	22
Table 7: Cantabrian brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.....	23
Table 8: Alpine brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.....	24
Table 9: Alpine brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.	25
Table 10: Apennine brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.....	26
Table 11: Apennine brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.....	27
Table 12: Carpathian brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.....	28
Table 13: Dinaric-Pindos brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.	29
Table 14: Dinaric-Pindos brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.....	30
Table 15: Eastern Balkans brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.	31
Table 16: Wolf populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 1992-1999.....	32
Table 17: Wolf populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 2000-2011.....	33
Table 18: North-Western Iberian wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.	34
Table 19: North-western Iberian wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.	35
Table 20: Alpine wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.	36
Table 21: Alpine wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.	37
Table 22: Italian Peninsula wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.	38
Table 23: Italian Peninsula wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.	39
Table 24: Dinaric-Balkan wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.....	40
Table 25: Dinaric-Balkan wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.	41
Table 26: Carpathian wolf population: threats addressed by LIFE-Nature projects in the period	

2000-2011.....	42
Table 27: Eurasian lynx populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 1992-1999.....	43
Table 28: Eurasian lynx populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 2000-2011.....	44
Table 29: Alpine lynx population: threats addressed by LIFE-Nature projects in the period 1992-1999.....	45
Table 30: Carpathian lynx population: threats addressed by LIFE-Nature projects in the period 2000-2011.....	46

Summary

The contribution of the LIFE programme to the conservation of large carnivores (brown bear, wolf and Eurasian lynx) in Europe was reviewed for the period 1992-2010, as part of the service contract nr. 070307/2012/629085/SER/B3 “Support to the European Commission's policy on large carnivores under the Habitats Directive” issued to the Istituto di Ecologia Applicata.

The objective of the review is to assess:

1. The contribution of the LIFE programme for the conservation of LCs at the population level ;
2. The effects of the LIFE programme towards the conservation of LCs with respect to the threats addressed;

A total of 70 projects were implemented in 20 years of the LIFE programme, with the majority of them (47) targeting small brown bear populations (Cantabrian, Pyrenean, Alpine, Apennine). Of these brown bear populations, the Cantabrian and Pyrenean currently show an increasing trend, while the Alpine and Apennine appear to be stable (Kazcensky *et al.*, 2013). Of the seven wolf populations targeted by 27 LIFE projects only one (North-western Iberian, see Kazcensky *et al.*, 2013) is possibly decreasing, although the lack of data makes it hard to assess, and was targeted by only two projects. Lynx were targeted by a total of six projects that always targeted other species in addition. Although these population trends cannot be considered as a direct result of the LIFE projects implemented, the contribution of actions funded by LIFE programme has certainly had a positive effect at least in part of their ranges.

The many threats reported to be affecting LC populations in Europe were not always addressed by LIFE projects, and in many cases the actions implemented through the projects were meant to mitigate “non-threats” (threats not reported to affect the targeted population). Nevertheless, it should be underlined that LIFE projects act at a local scale, thus threats identified at population scale might not be considered as threats present at local scales. The conservation results of such implemented actions are extremely difficult to assess as no systematic surveys of the severity of different threats was made before and after the project implementation.

Recommendations are provided for future actions in each population in order to maximise the potential effect of the LIFE programme, taking as a reference the threats reported to exist for each population in Kazcensky *et al.* (2013). In general terms, the use of an evidence-based conservation approach and a quality assessment of the implemented actions are suggested: the LIFE programme can potentially make a significant contribution if used in the most effective manner, by making sure projects target real threats with the most effective tools. Because of the dynamic nature of threats facing large carnivores and the existence of knowledge gaps in some areas, it would be desirable if the LIFE programme could allow field based investigations using approaches and methodologies that are more normally used in research projects. This would ensure that actions are efficiently targeted at the real threats. In addition, it would be highly desirable if more resources were spent on monitoring the impacts and conservation outcomes of actions using robust methodology which would allow the development of best practices and increase the efficiency of future actions. Finally, and most importantly, the adoption of a population approach should be a priority for future funding.

Introduction

Large carnivores (brown bears *Ursus arctos*, wolves *Canis lupus* and Eurasian lynx *Lynx lynx*) are among the most challenging group of species to reintegrate back into the European landscape. Conservation of large carnivores (LC) in areas at high human population density, as it is typical in Europe, is particularly challenging because of the conflicts between different interests (Treves *et al.*, 2004). Actions to ensure their conservation need to be interdisciplinary and at different levels, from technical to political. For this reason, projects aiming at their conservation should consider a wide arrays of interventions and ensure their effects are on the wider possible territory, as the effects of LC presence can be relevant even far away from where they physically are.

The EC Directive 92/43/EEC (Habitats Directive) lists the three species in the annexes as species whose conservation requires the designation of special areas of conservation (Annex II) and which need strict protection (Annex IV). This directive must be implemented by all members of the European Union through the development of national legislation. Wolves and bears also enjoy the status of *priority* species for conservation, indicated with an * in the annexes. The three species are included in the annexes II and IV with exceptions for sections of certain populations (i.e. Annex II exceptions - **wolf**: Spain north of the Duero river, Greece north of the 39 parallel, Estonia, Latvia and Finland; **bear**: Estonia, Finland, Sweden; **Lynx**: Estonia, Latvia and Finland. Annex IV exceptions – **wolf**: Spain north of the Duero river, Greece north of the 39 parallel, Estonia, Latvia, Lithuania, Poland, Slovakia and Finland within the range of reindeer management area; **lynx**: Estonia). Wolf and lynx are also considered species whose taking in the wild may be subject to management measures (Annex V) for certain countries (i.e., **wolf**: Spain north of the Duero river, Greece north of the 39 parallel, Bulgaria, Latvia, Lithuania, Estonia, Poland, Slovakia and Finland within the range of reindeer management area; **lynx**: Estonia).

In order to assist the Member States in the implementation of the Habitats Directive, the European Commission has developed the LIFE programme (**L**'Instrument **F**inancier pour l'**E**nvironnement), which allows the development of projects aimed at conserving habitats and species in its Nature component (<http://ec.europa.eu/environment/life/>). The LIFE instrument started in 1992 and its fourth cycle is planned to end in 2013. The main aim of the nature component is to provide funds for the implementation of management measures coherent with the Habitats and Bird Directives, and it has been widely used for the

conservation of large carnivores, particularly bear and wolf. We conducted an analysis of the impact that the EU support has had on the conservation of the targeted LC populations and this report provides an overview of our results, with emphasis on the lessons learnt and a look ahead with suggestions on which management actions could be further financed by the LIFE programme and would be expected to have a significant impact on the different European populations of LC.

While reading the report an important consideration should be made concerning the different scales of analysis. The original objective of the study was to assess the efficacy of LIFE projects for the conservation of LCs at a population level. Given that LC populations are generally distributed over very large areas, their conservation depends upon many different factors acting at the same time in different areas of their distribution range. LIFE projects usually are local and rarely have a whole population approach, with the exception of very small populations (usually of brown bear). This mismatch of scale led to a switch of objective from the evaluation of efficacy of LIFE projects to the assessment of their contribution to address and mitigate the threats identified for each population. Although the scale issue persists because some threats are real at a local scale while not relevant at population scale, the analysis of implemented actions could be undertaken more easily.

Methods for analysis

The analytical procedure followed two basic assumptions:

1. The population should be considered as the unit for conservation (Linnell *et al.*, 2008);
2. The IUCN threats as indicated by the LCIE (country and population reports, available at: <http://www.kora.ch/sp-ois/>) should be the reference source of information for evaluating the conservation status of each population. They are easily and directly related to the ones used for reporting under Art. 17 of the Habitats Directives.

Data collection

Data on the funded LIFE projects targeting LCs were obtained from different sources, as no comprehensive information system exists that contains all the technical documents produced by the many projects which have received funding. The project database available at the EC website (<http://ec.europa.eu/environment/life/project/Projects/index.cfm>) was consulted for obtaining a comprehensive list

of funded projects. A database with the targeted species for each project was developed. Because some projects focused on more than one species we "double-counted" these.. Thus each project was considered to have more than one initiative (set of concrete conservation actions) targeting different species.

Material was searched for each project:

- For the projects which were already finalised we used the final technical report,
- For the ongoing projects we used the latest technical report and the project proposal;
- For the recently initiated projects approved in 2011, we used the project proposal.

LIFE projects commonly include four sets of actions: A – Preparatory; C – Concrete conservation; D – Public awareness and communication; E – Project management and monitoring. This structure has slightly changed in 2011, but it essentially contains these components.

Projects that were listed as targeting one of the three LCs in the LIFE database, but appeared to be lacking any Concrete Conservation Action (CCA) specifically targeting them (e.g. some projects generally indicate that they would benefit LCs by implementing actions directed to protected habitats) were not considered for analysis.

The analysis focused on the relevance of the implemented CCAs for the conservation of the different populations. Information and communication activities were also considered to be of concrete conservation nature when addressing threats specifically indicated to be driven by lack of support from the public or some groups of interest.

The threats identified at the time when the project was implemented were considered, and the actions implemented were associated to the threats they were meant to address. Threats for the period 1995-2000 were retrieved from the European action plans for the conservation of the three species (Boitani, 2000, Breitenmoser *et al.*, 2000, Swenson *et al.*, 2000). Given that the majority of projects do not implement actions that target a specific population, but rather some sections of populations, the threats listed for the population were integrated with threats listed at a national level (SPOIS, 2007), so as to make sure that all threats currently pressing the populations were included, even if they were not considered relevant at the wider population level. This was done in order to consider the relevance of implemented actions at local

scales. Gathered material was consulted and implemented CCAs were associated to each threat they addressed, even if it was indicated to be present for that specific population.

In cases where for finalised projects the project proposal was not available and the list of threats addressed was not directly reported, they were extrapolated by reading all the available technical reports.

Data about project total cost and EC contribution were taken from the EC LIFE project database. For projects targeting more than one species the total cost was divided equally by the number of species targeted, although this is obviously a rough estimation, as in some cases projects included actions that were not directed to any LC species, but it was not possible to retrieve information about the specific costs of species-specific actions. Also, for most multi-country projects it was not always possible to obtain information about the budget allocated to different countries.

Data analysis

For each population the list of threats was reported and LIFE project documents were read for identifying actions that were intended to address any of the threat listed.

Data were divided into two groups according to the different lists of threats reported by the SPOIS and the European action plans, relative to periods before and after the year 2000.

A small sample (n = 12) of projects had been previously selected by the EC for an ex-post evaluation in 2012, many years after the projects' closure. The evaluation was undertaken by the ASTRALE GEIE consultancy company. The same consultancy also monitors the ongoing projects, thus an assessment was also made as to whether the addressed threats were still present and in order to assess the long-term effect of the implemented projects. A set of 5 questions were asked to the evaluators, and information was also gathered concerning the difference between the threats addressed when the project was implemented and those that (if any) are currently present.

Results

Available documentation

Seventy LIFE projects were co-funded by the Eu from 1992 to 2011 targeting totally or partially one or more LC species. For 73% of these it was possible to retrieve some kind of documentation. The final or most recent technical report was available for 32 projects, while for 5 projects the technical report was not

available but the technical evaluation of the report could be accessed. For the 14 ongoing projects the project proposal was also available. In the technical reports the clear description of the threats that were meant to be addressed through implementation of actions was not available. In cases where the project proposal was not available the threat addressed was estimated from the description of the actions implemented given in the technical report. Also, a technical quality evaluation of the actions implemented was not possible as details on the methodology adopted for implementing the actions is usually included in annexes to the technical report, which were seldom available. Thus, for consistency, they were not considered.

Total LIFE projects per species

A total number of 70 LIFE projects targeting one or more LC species have been co-funded by the EU from 1992 to 2011, of which 13 targeted more than one species. They are listed in Appendix II. Three projects did not include concrete conservation actions, as their nature did not foresee it (Nature-Coop and Nature-Starter components), and these were not included in further analyses.

Brown bear was the most targeted species, with 47 projects including at least one action towards its conservation. The wolf was targeted by 27 projects, while only 6 projects targeted the Eurasian lynx, always associated with actions targeting at least one other LC species. No projects targeted wolverines (*Gulo gulo*). The total number of initiatives amounted to 97 (some projects targeted more than one species, thus are counted more than once).

The number of projects is not evenly distributed in time, particularly those targeting brown bear, where the majority were implemented before 2000. Figure 1 shows the different numbers of projects implemented per species and per time period.

At the time this report was prepared (Winter 2012-2013), there were 14 ongoing LIFE projects targeting LCs, of which only one is targeting brown bear and wolf together. All the others are targeting one species only.

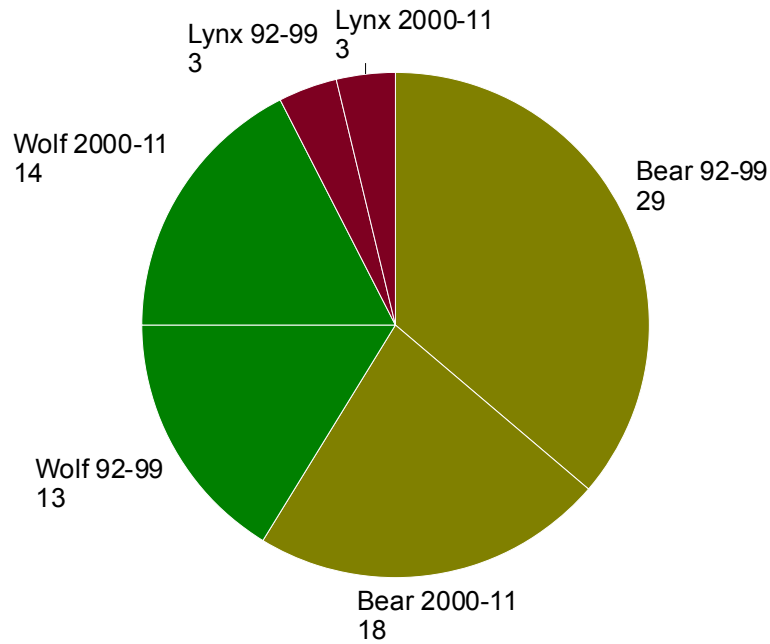


Figure 1: Number of LIFE projects implemented / approved in the periods 1992-1999 and 2000-2011 for Brown bear (29 and 18), wolf (13 and 14) and Eurasian lynx (3 and 3).

The total amount of EU contribution varied between 38% and 75% of total project costs and summed up to over 54 million Euros. The funding was mainly devoted to projects targeting bears. Given that some projects included actions not directly targeting one LC species, or more than one LC species, the accurate estimation of co-financing per species was not possible, but under the assumption that projects targeting more than one LC species devoted equal proportions of the total project budget to each species the estimate of EU contribution to each species is summarised in table 1. The data are provisional as they include the cost of ongoing projects, for which the exact final EU contribution will be known only after their completion.

Targeted species by LIFE	Total EU Contribution by species (€) 1992-2011
Brown bear (<i>Ursus arctos</i>)	36.38 million Euros
Wolf (<i>Canis lupus</i>)	17.24 million Euros
Eurasian lynx (<i>Lynx lynx</i>)	0.7 million Euros
Total	54.32 Million Euros

Table 1: Total European Union contribution per LC species

LIFE projects per population

LIFE projects are usually undertaken at local scales, targeting portions of populations that are sometimes shared with neighbouring administrative units (within or between countries). They represent a valuable contribution to the management of the population, although coordination across boundaries should be sought more often than what currently happens (see Blanco, 2013). LIFE projects were not applied evenly across populations of the same species. One should take into account that some countries that host significant portions of some populations only became part of the EU well after 2000, and few of them took the opportunity offered by the LIFE-third countries component (that ceased to be active in 2003), thus some populations are not included (and not targeted) in the period 1992-1999 or not targeted at all.

Brown bear

Of the 10 brown bear populations described in Kazcensky *et al.* (2013) seven were targeted by at least one project. They were: Pyrenean (PYR), Cantabrian (CAN), Alpine (ALP), Apennine (APE), Carpathian (CARP), Dinaric-Pindos (DINPIN) and Eastern Balkans (EBAL). For these populations the threats reported in the Brown Bear Online Information System (KORA, 2007) and in the European Action Plan for Brown Bear Conservation (Swenson *et al.*, 2000) were considered and major categories are plotted in the figures that follow. A detailed list of all categories and subcategories of indicated threats can be found in Appendix I.

For the period 1992-1999 the threats reported (R) to be present and addressed (A) by the LIFE projects for the populations targeted at the time when the projects were implemented area shown in table 2.

POPULATION	PYR		CAN		ALP		APE		DINPIN	
	R	A	R	A	R	A	R	A	R	A
THREATS										
Habitat Fragmentation & Isolation	X	X	X	X	X	X	X	X	X	X
Forestry	X	X	X	X	X	X	X	X	X	X
Poaching			X	X	X	X	X	X	X	X
Traffic kills					X	X	X	X		
Insufficient food sources	X	X								
Human access to habitat	X	X	X	X	X	X	X	X	X	X
Livestock husbandry, farming	X	X	X	X			X	X		
Artificial food sources							X	X		
Negative public attitude	X	X	X	X			X	X		
Political/economic instability									X	X
Management fragmentation	X	X	X	X	X	X	X	X		

Table 2: Brown bear populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 1992-1999.

For some populations, up to 6 threats addressed were not indicated as actually threatening the populations (see below).

The most frequently addressed threats were related to the practice of livestock husbandry and insufficient food sources, although the latter was indicated as being a threat for only one population (Cantabrian).

It should be noted that the number of documents available for documenting the actions undertaken in the implemented LIFE projects was extremely skewed towards the more recent decade. In fact, of the 29 projects targeting brown bears in the period 1992-1999 it was possible to extract information for only twenty. The data relating to that period were integrated with information extracted from Patrimonio (1998).

Of 9 projects undertaken for the Apennine population in the period 1992-1999 only documents for 4 of them were available. For the period 2000-2011 only 2 projects out of 26 could not be properly documented.

In the 2000-2011 decade the threats are expressed in a different manner, but they are essentially consistent and it is noticeable that the threat posed by poaching is no longer identified in the Cantabrian population and traffic kills are no longer indicated to be a threat for the Apennine populations. On the other hand, new threats are identified: road kills for the Dinaric-Pindos population and lack of sufficient prey base / food for the Cantabrian population. They are addressed by specific projects (Table 3), while most of the other existing threats are not addressed at all for some populations (e.g., human disturbance, intrinsic factors, persecution, traffic kills, etc).

POPULATION	PYR		CAN		ALP		APE		CARP		DINPIN		EBAL	
	R	A	R	A	R	A	R	A	R	A	R	A	R	A
THREATS	R	A	R	A	R	A	R	A	R	A	R	A	R	A
Habitat loss / degradation	X	X	X		X	X	X	X	X	X	X	X	X	
Persecution	X		X	X	X		X		X	X	X	X	X	X
Traffic					X				X		X	X	X	
Natural disasters											X		X	
Changes in native sp dynamics			X	X		X	X	X				X		
Intrinsic factors	X		X	X	X	X	X				X		X	
Human disturbance	X		X		X		X	X	X		X		X	
Other	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 3: Brown bear populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 2000-2011.

In detail, the following sections report the threats addressed by the LIFE projects for each population, with an indication of the number of projects addressing each single threat category or subcategory (for the period 2000-2011).

Pyrenean Brown Bear Population

LIFE projects in period 1992-1999

Total nr. of projects implemented = 5

Total nr. of projects reviewed = 3

Threat Category	Reported	Addressed
Poaching		
Habitat Fragmentation & Isolation	X	
Human access to habitat	X	X
Management fragmentation	X	
Forestry	X	
Livestock husbandry, farming	X	X
Traffic kills		
Artificial food sources		
Negative public opinion	X	X
Political/economic instability		
Insufficient food sources	X	X

Table 4: Pyrenean brown bear population: threats reported and addressed by LIFE-Nature projects in the period 1992-1999.

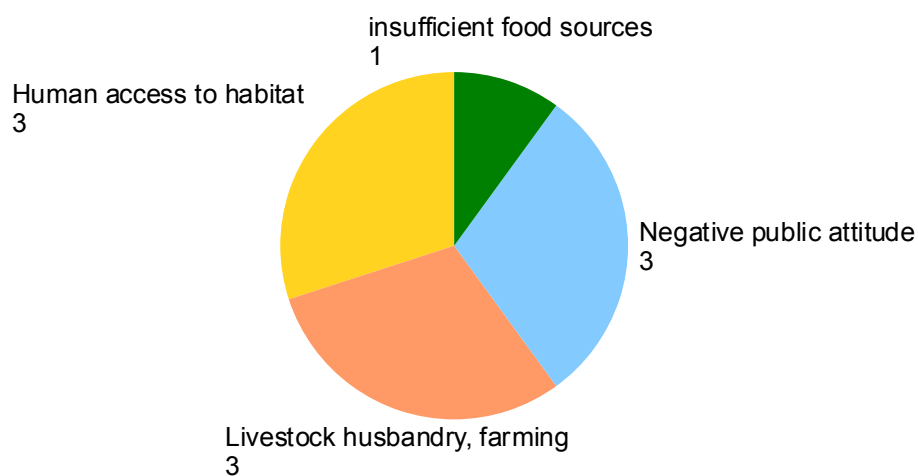


Figure 2: Number of projects addressing the threats indicated to be present on the Pyrenean brown bear population.

Of the five projects implemented, three were undertaken under the responsibility of Spanish institutions, and two by French institutions. It was not possible to retrieve documentations on the majority of projects, but information was obtained from Patrimonio (1998). The main objective of project LIFE96 NAT/F/004794 was the reinforcement of the native nucleus through release of 5 individuals from Slovenia. The project lacked of transboundary collaboration with Spanish institutions and suffered a very strong opposition from local communities. Such collaboration started in 2006 for bear monitoring. The area where the bears were released was evaluated to be too small to provide for the long term stable presence of the bear nucleus. Nevertheless, the project triggered a process that was taken forward by the DREAL Midi Pyrenees, which has been intensively working with hunters, forest owners and ONCFS in order to establish some hunting and forest exploitation rules aiming at reduce the bear disturbance. Furthermore, the LIFE project started providing assistance to livestock producers and farmers for damage compensation and associated measures that were continued by the Ministries of Agriculture and Environment and local NGOs.

Pyrenean Brown Bear Population
 LIFE projects in period 2000-2011
 Total nr. of projects implemented / approved = 1
 Total nr. of projects reviewed = 1

Threat Category	Reported	Addressed
Habitat loss / degradation	X	X
Persecution	X	
Traffic		
Natural disasters		
Changes in native sp dynamics		
Intrinsic factors	X	
Human disturbance	X	
Other		X

Table 5: Pyrenean brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.

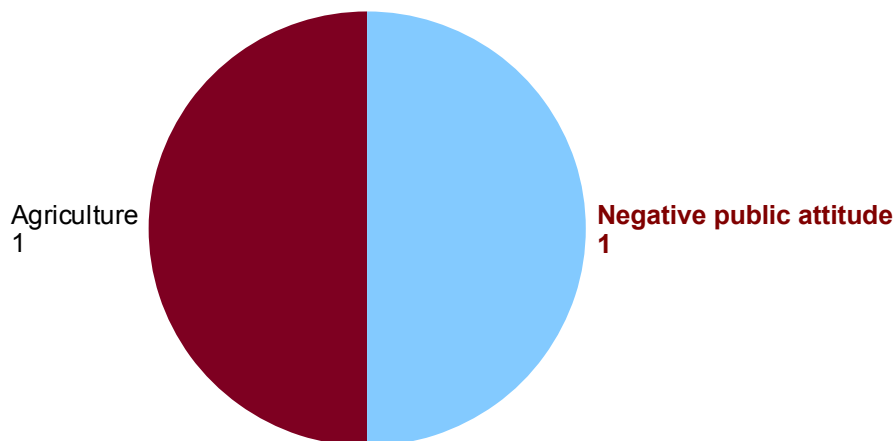


Figure 3: Number of projects addressing the threats for the Pyrenean brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

The project LIFE04 NAT/IT/000144 included actions for mitigating negative attitudes of local communities, through the support of local eco-tourism development and production of local “bear friendly” products in the French Pyrenees. A project proposal was put forward by the Spanish Authorities in 2011 for eventually releasing additional individuals but was not approved for co-financing. This example also shows the importance of addressing transboundary issues and engaging with rural stakeholders before such an activity is initiated.

Kazcensky *et al.* (2013) report that the current most critical management issue is a low degree of acceptance for the re-introduced bears and losses due to poaching or other human related accidents.

Recommendation: Future LIFE projects should aim at minimising the existing conflicts with human activities, low acceptance and illegal killing. Stakeholders should be included from early stages, possibly at the project proposal level. The involvement of local institutions is also important to minimise a local feeling of top-down control.

Cantabrian Brown Bear Population

LIFE projects in period 1992-1999
 Total nr. of projects implemented = 9
 Total nr. of projects reviewed = 4

Threat Category	Reported	Addressed
Poaching	X	X
Habitat Fragmentation & Isolation	X	
Human access to habitat	X	X
Management fragmentation	X	
Forestry	X	X
Livestock husbandry, farming	X	X
Traffic kills		
Artificial food sources		
Negative public opinion	X	
Political/economic instability		
Insufficient food sources		X

Table 6: Cantabrian brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.

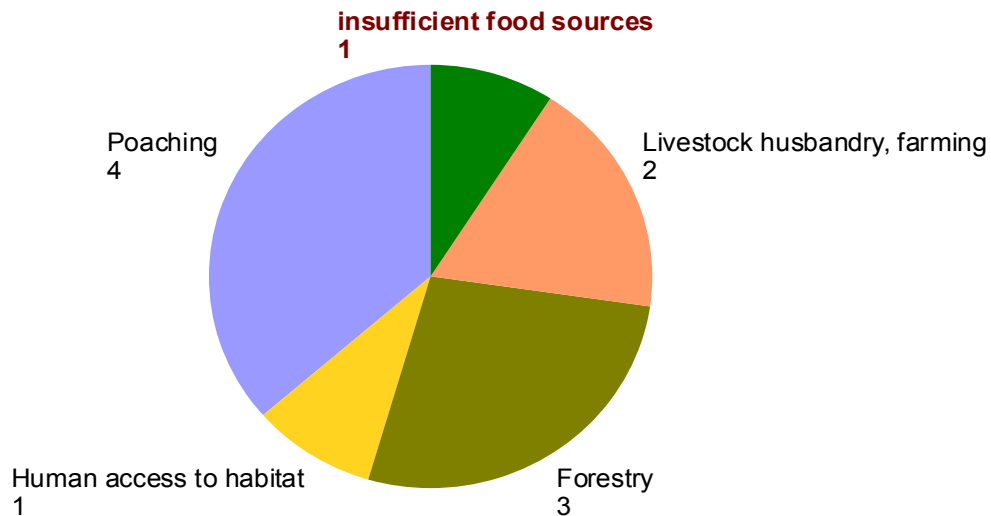


Figure 4: Number of projects addressing the threats for the Cantabrian brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

The majority (n = 14) of projects undertaken were implemented in the years 1992-1998 by the Autonomous Community Governments (Asturia, Cantabria, Castilla y León, Galicia) and the active participation of the NGO Fundación Oso Pardo. The projects composed three phases of the “Conservation programme for the brown bear and its habitat in the Cantabrian Mountains” and were paid by instalments, thus effectively counting as three-phase, multi-beneficiary projects.

The main actions undertaken included the acquisition of land in key feeding and refuge areas, as well as rent of hunting and timber cutting rights to avoid disturbance and habitat degradation in critical habitats. The setting up of patrols for controlling illegal activities has been successful and is still continuing. Additional activities included reforestation of degraded habitats and plantation of chestnuts to increase and diversify food supplies and the development of a damage compensation scheme. The role and presence of Fundación Oso Pardo in the area was extremely positive and gave a sense of collaboration with other stakeholders.

Cantabrian Brown Bear Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 3

Total nr. of projects reviewed = 3

Threat Category	Reported	Addressed
Habitat loss / degradation	X	
Persecution	X	X
Traffic	X	
Natural disasters		
Changes in native sp dynamics	X	X
Intrinsic factors	X	X
Human disturbance	X	
Other		X

Table 7: Cantabrian brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.

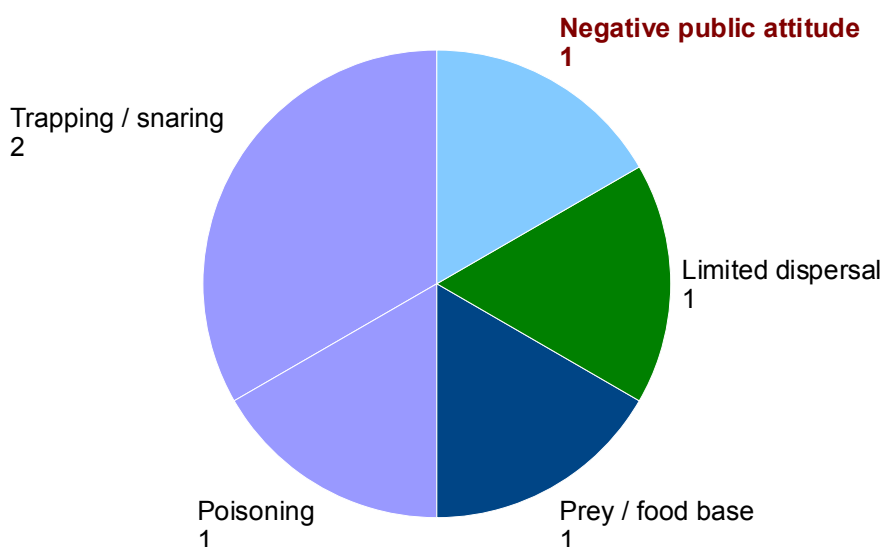


Figure 5: Number of projects addressing the threats for the Cantabrian brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Project LIFE00 NAT/E/007352 continued the patrolling activities and intensified the involvement of hunters evaluating the impact of wild boar hunting on bears through disturbance or illegal killing. Project LIFE07 NAT/E/00735 focused on the increasing difficulties of the two nuclei of the population to interact and eventually exchange genetic assets through increasing habitat connectivity in the corridor areas between the two nuclei and increasing the productivity of native trees and shrubs that represent key food sources for bears. Project LIFE08 NAT/E/00062 is ongoing and does not specifically target brown bears but aims at establishing a system of control against the use of poison to illegally kill native predators, including bear. Karczewska *et al.* (2013) report many threats still present, with the Eastern segment being heavily threatened by intrinsic factors (very few females with cubs of the year).

Recommendation: Future LIFE projects should further promote the connection between the two population segments, work to reduce the fragmentation of the inhabited area, and increase collaboration between management authorities. Close monitoring should be encouraged. Efforts for patrolling should be continued, as they also represent a socio-economic benefit.

Alpine Brown Bear Population

LIFE projects in period 1992-1999
 Total nr. of projects implemented = 5
 Total nr. of projects reviewed = 5

Threat Category	Reported	Addressed
Poaching	X	
Habitat Fragmentation & Isolation	X	X
Human access to habitat	X	X
Management fragmentation	X	X
Forestry		
Livestock husbandry, farming		X
Traffic kills	X	
Artificial food sources		
Negative public opinion		X
Political/economic instability		
Insufficient food sources		X

Table 8: Alpine brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.

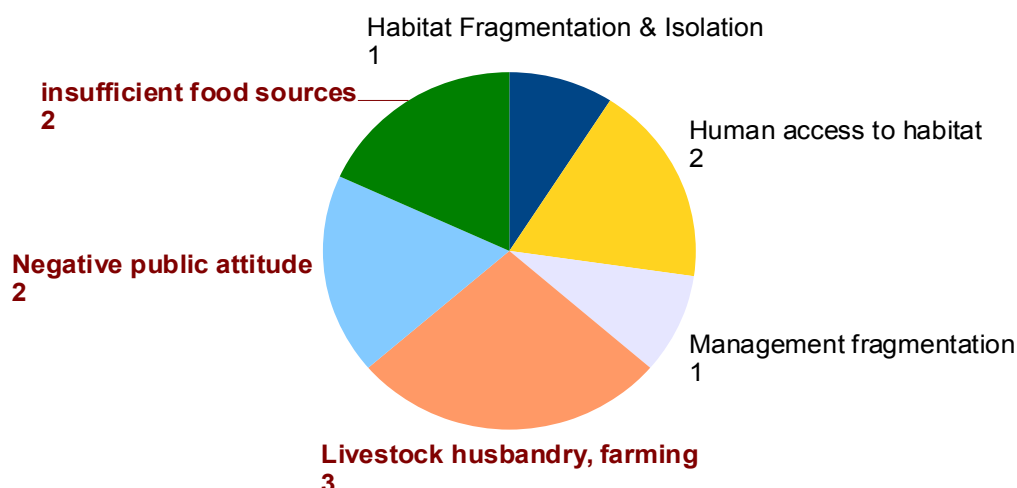


Figure 6: Number of projects addressing the threats for the Alpine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Most of the implemented projects dealt with the lack of management plan and the mitigation of conflicts caused by bear damage to agricultural assets. In Austria (LIFE95 NAT/A/000399) a management plan for brown bear management was developed and an emergency team was set up, although the continuation of the latter is currently difficult due to organisation and economic constraints. Furthermore, the damage compensation scheme set up has not been enough for mitigating conflicts with human activities, which are still present.

In Italy the remnant population was reinforced with 5 individuals from Slovenia (LIFE96 NAT/IT/003152). The project was successful and large part of it was devoted to communication and preparation of the local population. Activities were continued with the EU support through a new LIFE project in 2000.

Many activities were undertaken for raising the awareness of the general public on the “return” of the bear in the Alps. The Italian Ministry of environment promoted the adoption of a National Action Plan (PACOBACE) after the completion of the projects undertaken (LIFE97 NAT/IT/4097 delivered action plans for the conservation of Bear, Wolf and Lynx in the Alps).

Although food sources were not considered to be a relevant threats, activities were implemented for increasing the productivity of wild fruit trees (LIFE98 NAT/IT/005112 in Tarvisio), and mostly for attracting bears to remain inside protected areas, thus discouraging their depredation on human assets outside (LIFE94 NAT/IT/000575).

Alpine Brown Bear Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 4

Total nr. of projects reviewed = 4

Threat Category	Reported	Addressed
Habitat loss / degradation	X	X
Persecution	X	
Traffic	X	
Natural disasters		
Changes in native sp dynamics		X
Intrinsic factors	X	X
Human disturbance	X	
Other	X	X

Table 9: Alpine brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.

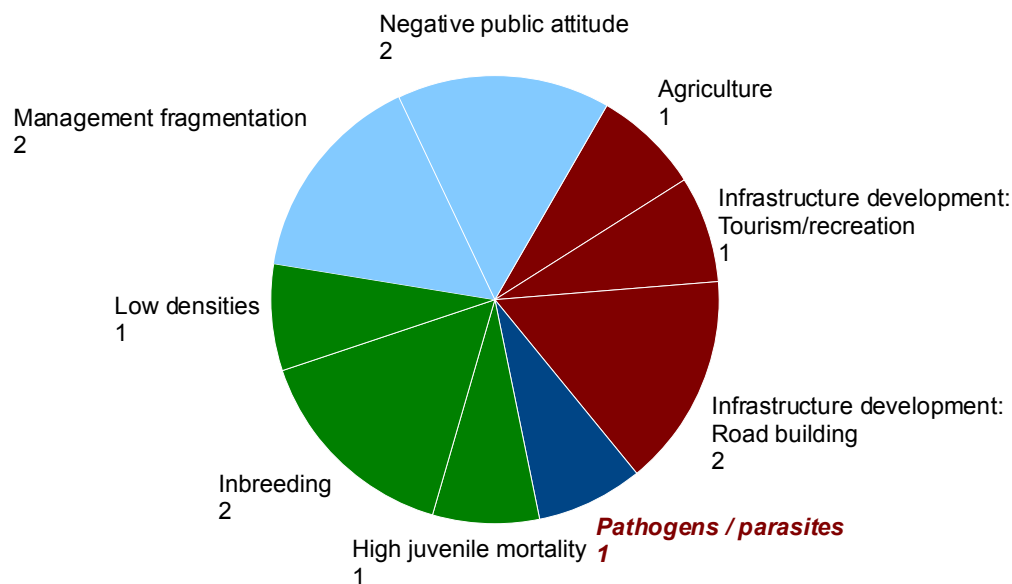


Figure 7: Number of projects addressing the threats for the Alpine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Projects implemented in the decade 2000-2010 mainly targeted issues related to habitat fragmentation and small population as well as the administrative fragmentation of authorities responsible for management of this population that is shared between Austria, Italy and Switzerland. Intensive activities included mitigating conflicts through the introduction of damage prevention measures, the development of public awareness campaigns, and setting up of emergency teams for bears that approach urban areas too closely. In Austria the management plan prepared with the previous project was approved and implemented, then recently reviewed. An assessment was done for the eventual development of corridors for expansion of bears from Slovenia, but international collaboration towards this objective was poor. Public tolerance seems to be the main issue in many areas, particularly as bears approach populated areas. Political support seems to play a crucial role and has decreased recently both in Austria and Italy. At a national level for Italy, the project LIFE09 NAT/IT/000160 has provided a good opportunity for involvement of different authorities (Regions) in the population management, but the collaboration needs to be strengthened.

Recommendation: Future LIFE projects should encourage international collaboration, including the involvement of Swiss and Austrian partners, so as to adopt a population approach that would spread the responsibility beyond the Trento Autonomous Province and share management decisions across provincial and national borders. Activities for mitigating conflicts with local stakeholders as well as reducing illegal killings and traffic mortalities should be a priority.

Apennine Brown Bear Population

LIFE projects in period 1992-1999

Total nr. of projects implemented = 9

Total nr. of projects reviewed = 4

Threat Category	Reported	Addressed
Poaching	X	
Habitat Fragmentation & Isolation	X	X
Human access to habitat	X	
Management fragmentation	X	X
Forestry	X	
Livestock husbandry, farming	X	X
Traffic kills	X	
Artificial food sources	X	
Negative public opinion	X	
Political/economic instability		
Insufficient food sources		X

Table 10: Apennine brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.

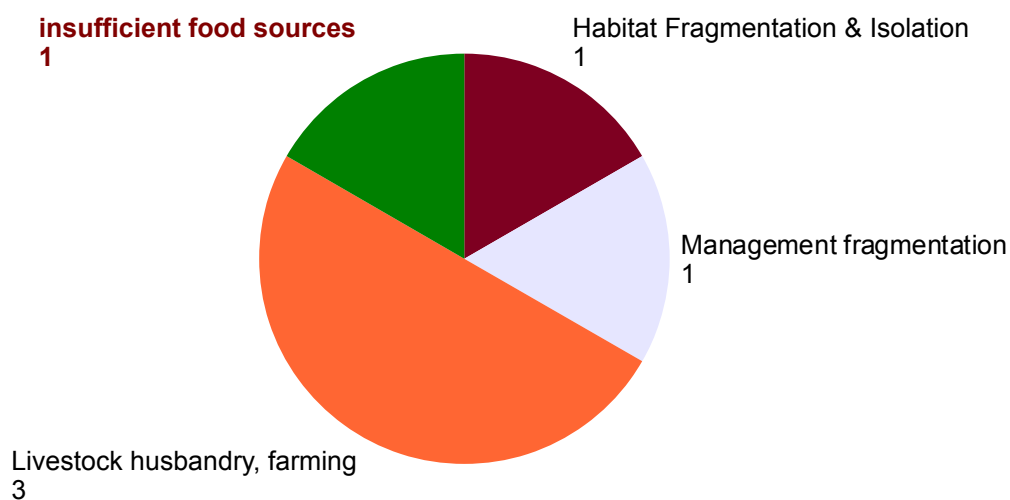


Figure 8: Number of projects addressing the threats for the Apennine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

The Apennine population is shared across several administrative regions and protected areas in Central Italy. The population is isolated and at high risk of extinction. The implemented projects focused mainly on setting up a system for preventing retaliation by farmers who suffered damages to their property. Initiatives for planting fruit trees inside PAs were also undertaken, with the objective of discouraging bears from wandering outside PAs, where conflicts would be stronger. Efforts were made to encouraging bears to use areas assumed to function as corridors towards other PAs (LIFE97 NAT/IT/004115), but with no success. A significant contribution was given by project LIFE99 NAT/IT/006244, which included a standardised protocol for genetic monitoring of bear individuals, much needed for such a small population.

Apennine Brown Bear Population
 LIFE projects in period 2000-2011
 Total nr. of projects implemented / approved = 5
 Total nr. of projects reviewed = 4

Threat Category	Reported	Addressed
Habitat loss / degradation	X	X
Persecution	X	
Traffic		
Natural disasters		
Changes in native sp dynamics		X
Intrinsic factors	X	
Human disturbance		X
Other	X	X

Table 11: Apennine brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.

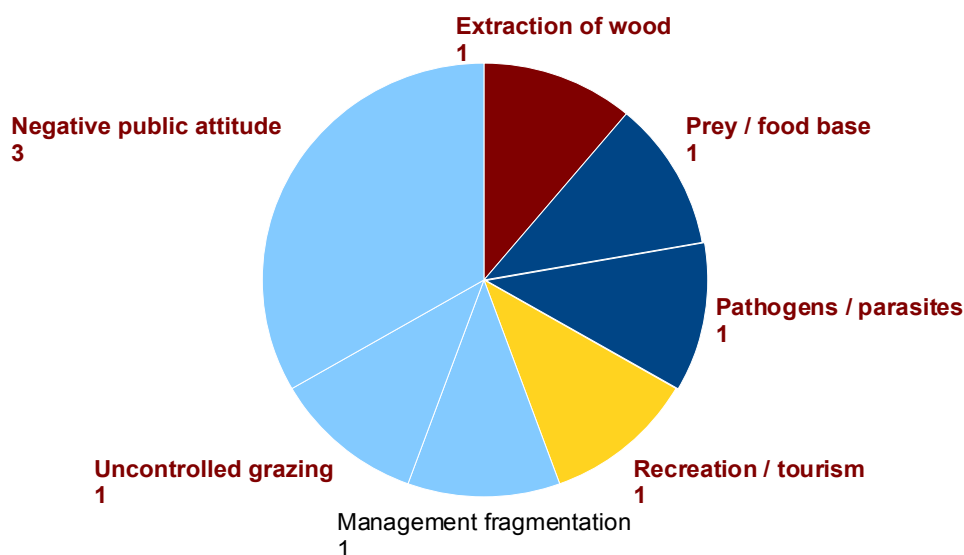


Figure 9: Number of projects addressing the threats for the Apennine brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Most of the activities implemented for the conservation of the Apennine brown bear were addressing threats not included in the IUCN list. This could be due to an increase in awareness of aspects that were considered to be affecting the conservation status of this small population that remains stagnant despite all the management interventions undertaken. The competition with domestic livestock for specific food sources and potential zoonosis seem to be aspects that should not be underestimated. The planting of fruit trees has been done for many years without reaching any obvious results, although it received high visibility for the public. Regulation of human activities in critical areas and the inappropriate management of bears that approach human settlements are sources of discontent among the local populations. The Italian Ministry of Environment has promoted an action plan for the conservation of the population (PATOM) which is hardly being implemented (some actions mainly through project LIFE09 NAT/IT/000160, which acts as a mean for its implementation).

Recommendation: Future LIFE projects should promote integrated management across multiple authorities and support decision makers in undertaking a process for mitigating conflicts with human activities. Inter-sectoral cooperation should be required. Close population monitoring should be encouraged.

Carpathian Brown Bear Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 4

Total nr. of projects reviewed = 4

Threat Category	Reported	Addressed
Habitat loss / degradation	X	X
Persecution	X	X
Traffic	X	
Natural disasters		
Changes in native sp dynamics		
Intrinsic factors		
Human disturbance	X	
Other		X

Table 12: Carpathian brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.

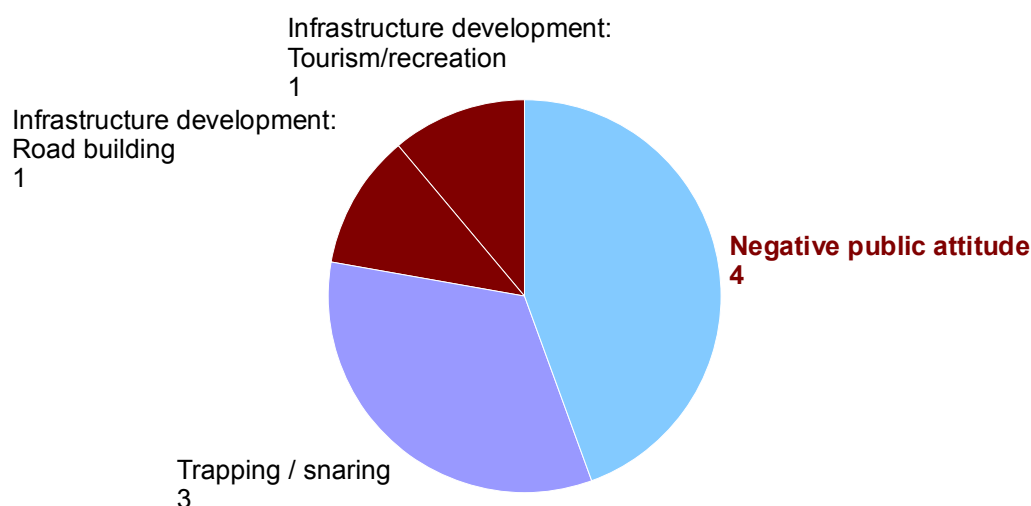


Figure 10: Number of projects addressing the threats for the Carpathian brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

The countries sharing the Carpathian brown bear population did not use the LIFE third countries tool for implementing projects before their accession to the EU. Romania is well experienced in implementing LIFE projects on large carnivores and some projects have successfully established 8 Natura 2000 sites for bears while their implementation between in 2002 and 2008 (LIFE02 NAT/RO/8576 and LIFE05 NAT/RO/000170).

Activities implemented include setting up of a sound monitoring system, the development of regional management plans and collaboration with neighbouring counties. The establishment of emergency teams to rescue injured or captive-kept bears was successful, the establishment of a rehabilitation centre for injured bears, as well as training of veterinarians involved in damage assessment and bear handling.

Recommendation: Future LIFE projects should encourage international collaboration between Slovakia and Poland. Slovakia in particular should be encouraged to implement monitoring and management actions as the bears in this country are facing several threats. Infrastructure development should be associated with LIFE projects aiming at minimising habitat fragmentation. Other actions to be supported include: development of robust monitoring for bears at national level and sharing data with neighbouring countries; management of grazing practices to avoid competition for key food sources, management of forestry activities to minimise impact on bear habitat, capacity building of managers and technicians as well as human dimensions studies and participative approaches to management.

Dinaric-Pindos Brown Bear Population

LIFE projects in period 1992-1999
 Total nr. of projects implemented = 3
 Total nr. of projects reviewed = 3

Threat Category	Reported	Addressed
Poaching	X	X
Habitat Fragmentation & Isolation	X	X
Human access to habitat	X	X
Management fragmentation		X
Forestry	X	
Livestock husbandry, farming		X
Traffic kills		X
Artificial food sources		X
Negative public opinion		X
Political/economic instability	X	
Insufficient food sources		X

Table 13: Dinaric-Pindos brown bear population: threats addressed by LIFE-Nature projects in the period 1992-1999.

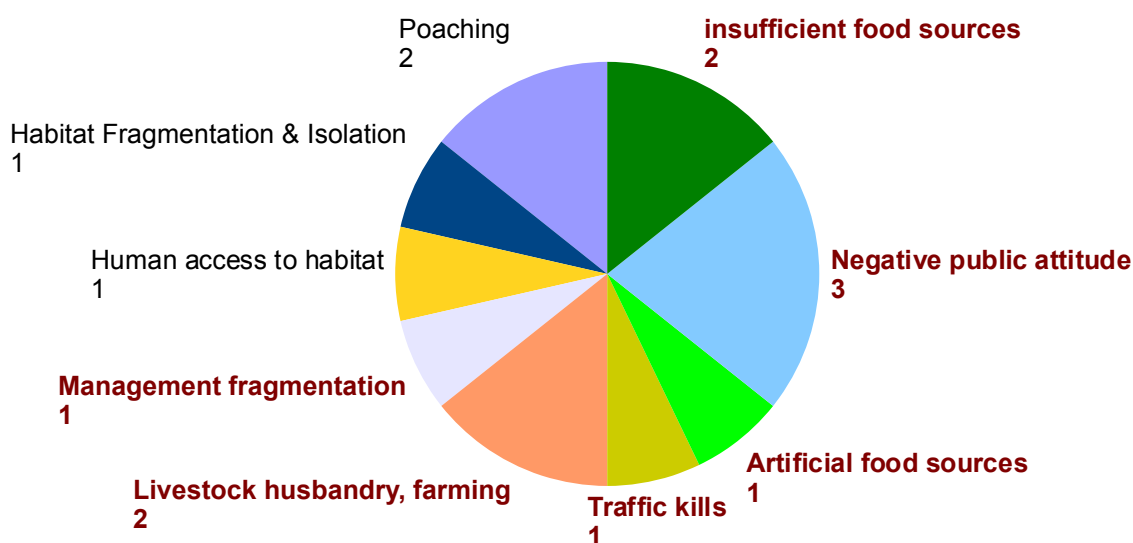


Figure 11: Number of projects addressing the threats for the Dinaric-Pindos brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

The Dinaric-Pindos brown bear population is shared between many countries, the majority of which are not part of the EU. Only Greece has used the LIFE instrument for implementing three projects targeting the population in its country in the period 1992-1999 (LIFE93 NAT/GR/10800, LIFE96 NAT/GR/3222 and LIFE99 NAT/GR/6498). The actions implemented were of various nature, including setting up patrols for the control of illegal killing and bear cub capture, closing forest roads to decrease disturbance to bear habitat, improving the damage compensation scheme, setting up of a sound monitoring protocol and the development of a Bear Action Plan that was implemented many years after the project. Activities also included mitigation actions for the construction of the Via Egnatia Highway, which has strongly affected bear habitat through fragmentation. Initiatives for a population approach were also started, involving collaboration with fYRoM and Albania.

Dinaric-Pindos Brown Bear Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 6

Total nr. of projects reviewed = 6

Threat Category	Reported	Addressed
Habitat loss / degradation	X	X
Persecution	X	X
Traffic	X	X
Natural disasters	X	
Changes in native sp dynamics		X
Intrinsic factors	X	
Human disturbance	X	
Other	X	X

Table 14: Dinaric-Pindos brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.

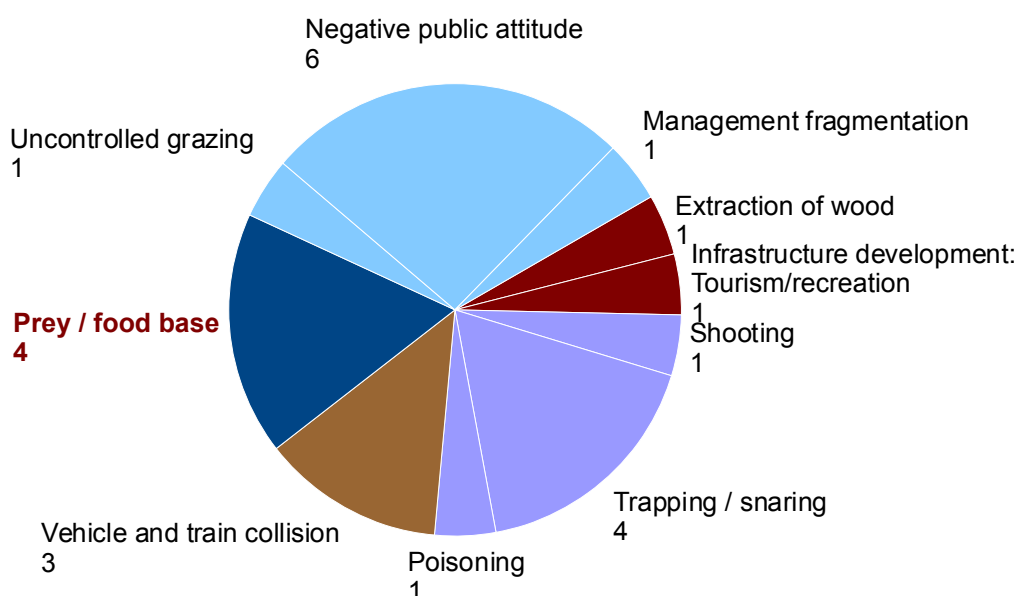


Figure 12: Number of projects addressing the threats for the Dinaric-Pindos brown bear population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Two projects (LIFE07 NAT/GR/000291 and LIFE09 NAT/GR/000333) were implemented by Greek institutions and one has been approved in 2011 (LIFE11 NAT/GR/001014). They mainly addressed threats posed by illegal hunting through the establishment of emergency teams, mitigation of impact posed by the Via Egnatia Highway as well as planting of wild fruit trees for increasing availability of food sources and setting up a network for livestock guarding dog breeding and use. Two international projects (LIFE04 NAT/IT/000144 and LIFE07 NAT/IT/000502) led by Italian institutions involved the Croatian and Greek portions of this populations, mainly with actions aimed at mitigating conflicts with humans through establishment of bear emergency teams, replacing traditional rubbish bins with bear-proof ones, promoting the sale of bear-friendly products and training professionals for damage assessment. Slovenia also implemented a project (LIFE02 NAT/SLO/008585) that allowed the development of their national management plans through a participatory approach, and the setting up of a monitoring system. Bear emergency teams for mitigating conflicts with human activities were also set up, but most importantly the project included a strong participation of local stakeholders.

Recommendation: There is an urgent need to involve non-EU countries that share this population. Future LIFE projects should envisage the possibility to co-fund non-EU beneficiaries. In Slovenia encounters with bears are frequent and are source of conflicts. The reduction of conflict situation should be encouraged (bear-proof bins, damage prevention tools). Mitigation measures to increase the permeability of highways and reduce traffic accidents are also urgently needed.

Eastern Balkans Brown Bear Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 2

Total nr. of projects reviewed = 2

Threat Category	Reported	Addressed
Habitat loss / degradation	X	
Persecution	X	X
Traffic	X	
Natural disasters	X	
Changes in native sp dynamics		
Intrinsic factors	X	
Human disturbance	X	
Other	X	X

Table 15: Eastern Balkans brown bear population: threats addressed by LIFE-Nature projects in the period 2000-2011.

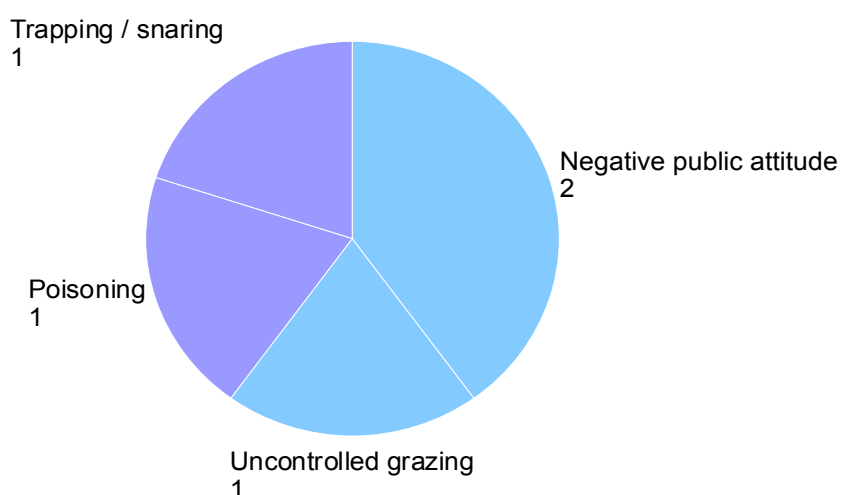


Figure 13: Number of projects addressing the threats for the Eastern Balkans brown bear population.

Only one project was implemented in Bulgaria, as part of the international Italian-led project LIFE07 NAT/IT/000502 through which a standardised monitoring system was set up and training for damage assessment technicians was given. A bear emergency team was also set up for anti-poaching patrolling activities and rescuing injured bears. In the past, only one project (LIFE96 NAT/GR/003222) led by the Greek NGO ARCTUROS targeted the Rhodopi portion of the Eastern Balkans population, mainly through actions for mitigating conflicts with farmers. A new project was approved for co-funding in 2011 (LIFE11 NAT/GR/001014) and it includes actions for installing damage prevention measures.

Recommendation: Further improvement of the monitoring system and international collaboration should be supported by future LIFE projects. Mitigation measures (crossing structures) for the future development of infrastructure should be encouraged, as well as a close collaboration with interest groups (e.g., hunters) for management of food sources.

Wolf

Of the 10 wolf populations described in Kaczensky *et al.* (2013) five were targeted by at least one LIFE project. They were: North Western Iberian (NWIBE), Alpine (ALP), Italian Peninsula (IP), Carpathian (CARP), Dinaric-Balkans (DINBAL). For these populations the threats reported in the Wolf Online Information System (KORA, 2007) and in the European Action Plan for Wolf Conservation (Boitani, 2000) were considered and major categories are plotted in the figures that follow. A detailed list of all categories and subcategories of indicated threats can be found in Appendix I.

For the period 1992-1999 the threats reported to be present and addressed by the LIFE projects for the populations targeted at the time when the projects were implemented area shown in Table 16.

POPULATION	NWIBE		ALP		IP		DINBAL	
	R	A	R	A	R	A	R	A
Hunting/poaching					X	X	X	X
Habitat quality/food availability	X	X	X	X		X	X	X
Range fragmentation	X		X				X	X
Small numbers/low densities			X					
Genetic identity					X		X	X
Legislation			X				X	
Management fragmentation	X		X					
Economic conflicts (livestock damage)	X		X	X	X			X
Negative public opinion				X		X		X
Law enforcement	X		X		X			

Table 16: Wolf populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 1992-1999.

For two populations only projects addressed threats that were not indicated as actually threatening the populations (see below).

The most frequently addressed threats were related to habitat quality and insufficient food availability, which was indicated as being a threat for all populations with the exception of the Italian Peninsula population. Most populations also benefited from actions addressing the threat posed by negative public opinion.

In the 2000-2011 decade the threats are expressed in a different manner, but they are essentially consistent. It is noticeable that the threat posed by poaching is included for the Alpine population, while human

disturbance is no longer considered to be a threat for that population. Pathogens, which were not considered earlier, are now considered to be a threat for the Italian Peninsula populations, while genetic identity and hybridization with dogs is no longer reported as threat for the Dinaric-Balkan population. Road kills were not listed as a threat in any of the wolf populations in the decades 1990-1999, while they emerged as a threat for the N-W Iberian, Alpine, Dinaric-Balkan and Italian Peninsula populations in the second period. This threat is not directly addressed by any of the projects implemented. In fact, only a few threats are addressed by the majority of projects, although they targeted many sub categories.

Most LIFE projects implemented / approved were documented, with only 3 out of 29 lacking documentation. Two projects were not included in further analyses as they did not include any CCA, being a LIFE-Starter and a LIFE-Coop projects.

POPULATION	NWIBE		ALP		IP		DINBAL		CARP	
	R	A	R	A	R	A	R	A	R	A
Habitat loss / degradation	X						X		X	
Persecution	X	X	X		X	X	X	X	X	X
Traffic	X		X		X		X			
Natural disasters	X						X			
Changes in native sp dynamics	X				X	X	X	X		
Intrinsic factors	X		X		X		X			
Human disturbance	X						X		X	
Other	X	X	X	X	X	X	X	X	X	X

Table 17: Wolf populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 2000-2011.

In detail, the following sections report the threats addressed by the LIFE projects for each population, with an indication of the number of projects addressing each single threat category (or subcategory for the period 2000-2011).

North-Western Iberian Wolf Population

LIFE projects in period 1992-1999

Total nr. of projects implemented = 2

Total nr. of projects reviewed = 1

Threat Category	Reported	Addressed
Hunting/poaching		
Habitat quality/food availability	X	X
Range fragmentation	X	
<i>Small numbers/low densities</i>		
Genetic identity		
Legislation	X	
Management fragmentation	X	
Economic conflicts (livestock damage)	X	
Negative public opinion		
Law enforcement		

Table 18: North-Western Iberian wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.

Two projects were implemented by the Portuguese institution ICN, starting in 1995 (LIFE94 NAT/P/1055 and LIFE95 NAT/P/4804). The main activities undertaken were related to increase the knowledge on the biology and behaviour of the wolf population in Portugal through radio-telemetry. Actions aimed at mitigating the conflicts due to damage to livestock had a low impact due to the lengthy procedure for loss compensation. The release of roe deer (*Capreolus capreolus*) was partially successful during the project (less individuals that planned were released due to economic constraints) but were not continued after the project end, thus had no real effects on the population conservation. The main achievement of the projects was the setting up of a standardised monitoring system.

North-Western Iberian Wolf Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 3

Total nr. of projects reviewed = 3

Threat Category	Reported	Addressed
Habitat loss / degradation	X	
Persecution	X	X
Traffic	X	
Natural disasters	X	
Changes in native sp dynamics	X	
Intrinsic factors	X	
Human disturbance	X	
Other	X	X

Table 19: North-western Iberian wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.

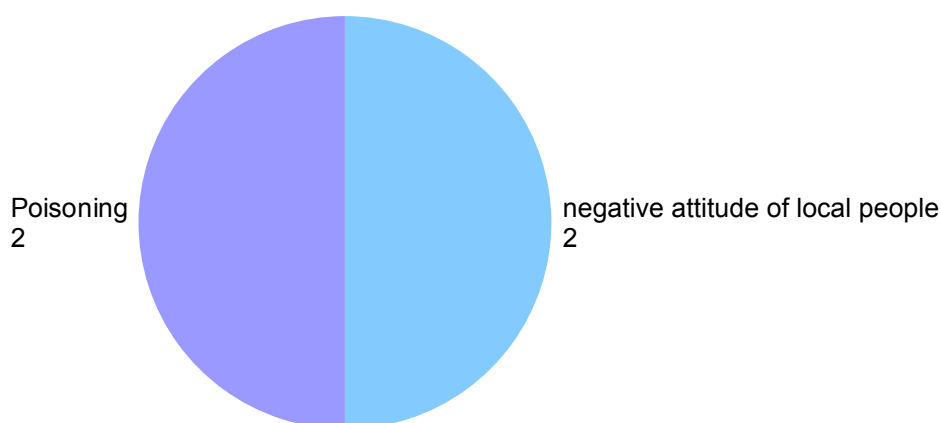


Figure 14: Number of projects addressing the threats for the North-Western Iberian wolf population.

Three projects contributed to the conservation of the N-W Iberian wolf population. All of them are international projects led by Italian or Spanish institutions. Project LIFE04 NAT/IT/000144 targeted portions of the populations both in Spain south of the Duero river and in Portugal, addressing threats posed by conflicts with human activities and damages inflicted to domestic livestock by wolves. Project LIFE09 NAT/E/000533 aims at controlling the illegal use of poisoned baits, and it is implemented both in Spain and in Portugal. Project LIFE11 NAT/IT/0069 targets only the Portuguese portion of the population, and activities planned include establishment of an Iberian Wolf Working group on damage prevention and transboundary collaboration on monitoring techniques. Persecution of illegal use of poison will also be undertaken.

Recommendation: Future LIFE projects should encourage the existing international collaboration and implementation of transboundary activities to ensure the management of the population as a whole. Actions aimed at mitigating the conflicts with human activities and control of illegal activities should be supported, as well as measures for mitigating the impact of infrastructure on the fragmentation of wolf habitat. The integration between science and management should be supported by projects that envisage scientific supervision on CCAs.

Alpine Wolf Population

LIFE projects in period 1992-1999
 Total nr. of projects implemented = 3
 Total nr. of projects reviewed = 3

Threat Category	Reported	Addressed
Hunting/poaching		
Habitat quality/food availability	X	X
Range fragmentation	X	
Small numbers/low densities	X	
Genetic identity		
Legislation	X	
Management fragmentation	X	
Economic conflicts (livestock damage)	X	X
Negative public opinion	X	X
Law enforcement		

Table 20: Alpine wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.

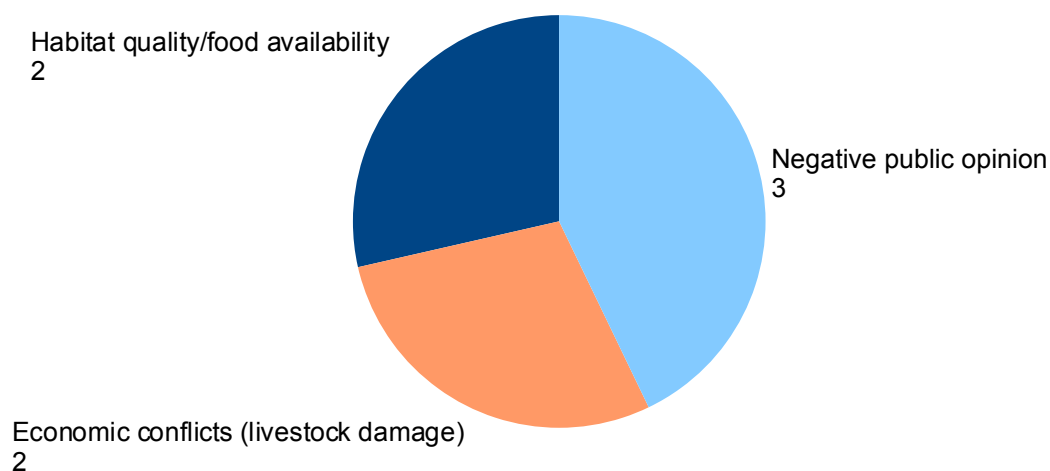


Figure 15: Number of projects addressing the threats for the Alpine wolf population.

Two projects (LIFE96 NAT/F/003202 and LIFE99 NAT/F/006299) were implemented by French Institutions and one (LIFE97 NAT/IT/004097) by Italian Institutions. All were strongly focused on mitigation of conflicts due to wolf depredation on domestic livestock. In France a management plan was developed and measures for assisting shepherds were initiated. A monitoring system was also started and the Ministry of Environment was officially involved. In Italy the activities were limited to providing assistance to livestock breeders with livestock guarding dogs and electric fences. A monitoring of livestock guarding dogs effectiveness was also undertaken. Low involvement of political institutions did not lead to a long term engagement with local authorities.

Alpine Wolf Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 1

Total nr. of projects reviewed = 1

Threat Category	Reported	Addressed
Habitat loss / degradation		
Persecution	X	
Traffic	X	
Natural disasters		
Changes in native sp dynamics		
Intrinsic factors	X	
Human disturbance		
Other	X	X

Table 21: Alpine wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.

Only one project was implemented after the year 2000 for contributing to the conservation of the Alpine wolf population, although other initiatives were undertaken, particularly in a coordinated manner between Italy and France through INTERREG projects implemented in Piemonte region and Mercantour NP.

Project LIFE04 NAT/IT/000144 only targeted the French portion of the population, with actions aimed at mitigating the negative attitude of local people.

Recommendation: Future LIFE projects should support coordinated actions across regions (in Italy) and between countries. Support for continuing the well-structured monitoring system set up by Piemonte region, which is at risk of not being continued for lack of funds, should be provided. Strengthening management capacities of local institutions through training for monitoring techniques in newly colonised areas, as well as communication campaigns that increase the awareness of local people inhabiting areas where the wolf is expanding are strongly needed. Poison and hybridization with dogs seem to be recent threats that need to be looked into and addressed. The involvement of Switzerland in the international dialogue is also to be encouraged.

Italian Peninsula Wolf Population

LIFE projects in period 1992-1999

Total nr. of projects implemented = 6

Total nr. of projects reviewed = 4

Threat Category	Reported	Addressed
Hunting/poaching	X	X
Habitat quality/food availability		X
Range fragmentation		
Small numbers/low densities		
Genetic identity	X	
Legislation		
Management fragmentation		
Economic conflicts (livestock damage)	X	
Negative public opinion	X	X
Law enforcement		

Table 22: Italian Peninsula wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.

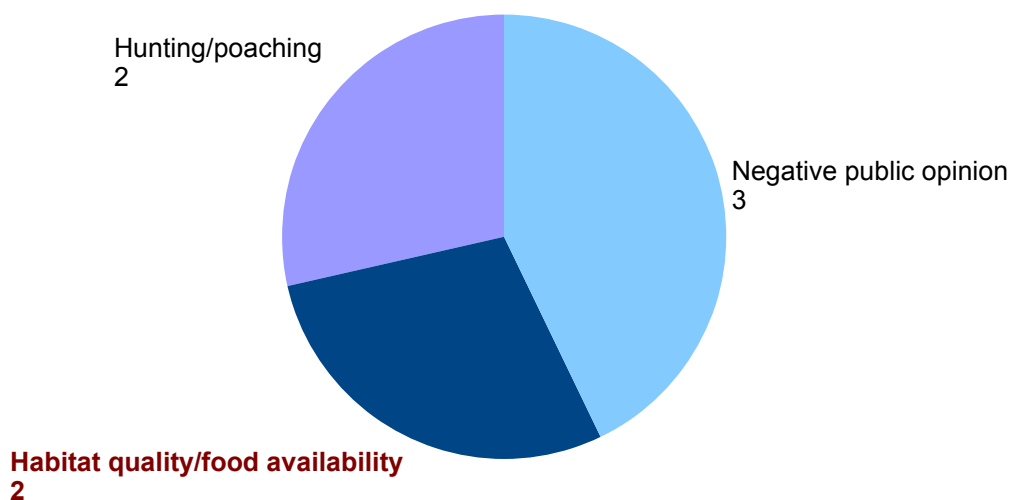


Figure 16: Number of projects addressing the threats for the Italian Peninsula wolf population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Project LIFE96 NAT/IT/003115 was implemented in the northern Apennines (Emilia Romagna region) with actions mainly aimed at setting up a monitoring system of wolf packs and their prey. Damage prevention measures were implemented as well as a system to assess damage events by project staff, which was however not institutionalised within public institutions..

Project LIFE97 NAT/IT/004141 focused on actions to be implemented in newly established National Parks along the Central-Southern Apennines, and was reinforced by project LIFE99 NAT/IT/006209, being implemented in Pollino National Park only. The projects included activities for close monitoring of the packs and implementation of damage prevention measures, but also measures for minimizing the impact of free-ranging dogs and the reinforcement of wild prey (release of roe deer in Majella NP and in Pollino NP).

Project LIFE98 NAT/IT/005094 included the setting up of patrols to control illegal activities in four reserves in Southern Apennines, but no information on the efficacy of such patrols is reported.

Italian Peninsula Wolf Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 6

Total nr. of projects reviewed = 6

Threat Category	Reported	Addressed
Habitat loss / degradation		
Persecution	X	X
Traffic		
Natural disasters		
Changes in native sp dynamics		X
Intrinsic factors		
Human disturbance		
Other	X	X

Table 23: Italian Peninsula wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.

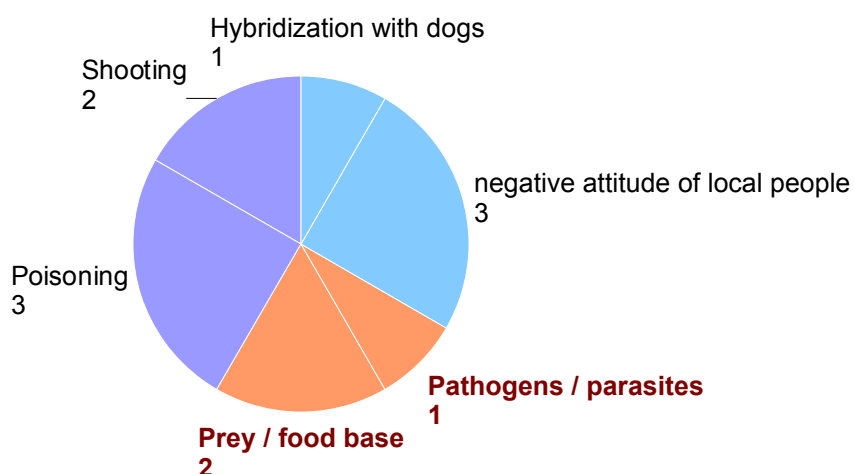


Figure 17: Number of projects addressing the threats for the Italian Peninsula wolf population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Project LIFE00 NAT/IT/007214 was implemented in protected areas of Northern Apennines aimed at improving coordination for detection of illegal activities, implementing close monitoring of wolf packs and installing damage prevention measures. International projects LIFE04 NAT/IT/000144 and LIFE07 NAT/IT/000502 focused mainly on threats posed by damage inflicted by wolves to livestock through actions that included implementation of damage prevention measures, upgrading the procedure for damage compensation and the involvement of the local communities in management activities. Project LIFE07 NAT/IT/000502 also included the release of native prey.

Project LIFE08 NAT/IT/000325 represents a valuable effort for coordinating activities (mainly related to monitoring of packs, damage management) across different PAs along the Apennines.

Project LIFE07 NAT/IT/000436 has set up patrols for detection and control of illegal use of poisoned baits using trained dogs. This experience is taken forward by project LIFE11 NAT/IT/0069 that will transfer the experience to Tuscany region. The latter project will also focus on damage prevention measures with the direct involvement of livestock owners. Project LIFE10 NAT/IT/000265 is the first project entirely devoted to the threat posed by hybridization with dogs. Expansion of the wolf population in new areas has increased the public fear of wolves and has found that rural communities are not prepared for sharing the space with this predator.

Recommendation: Future LIFE projects should urgently encourage a population approach and coordinated actions are needed inside and outside PAs. Wolf pack monitoring seems to be undertaken in detail only at local scales, and coordination of monitoring by national authorities should be requested. Hybridization with dogs seems to be more relevant than officially reported. The expansion of wolves into new areas causes strong conflicts with local communities. Participation of public authorities should be required in order to ensure long term continuation of implemented actions.

Dinaric-Balkan Wolf Population

LIFE projects in period 1992-1999
 Total nr. of projects implemented = 1
 Total nr. of projects reviewed = 1

Threat Category	Reported	Addressed
Hunting/poaching	X	X
Habitat quality/food availability	X	X
Range fragmentation	X	X
Genetic identity	X	X
Legislation	X	X
Management fragmentation	X	
Economic conflicts (livestock damage)	X	
Negative public opinion		X

Table 24: Dinaric-Balkan wolf population: threats addressed by LIFE-Nature projects in the period 1992-1999.

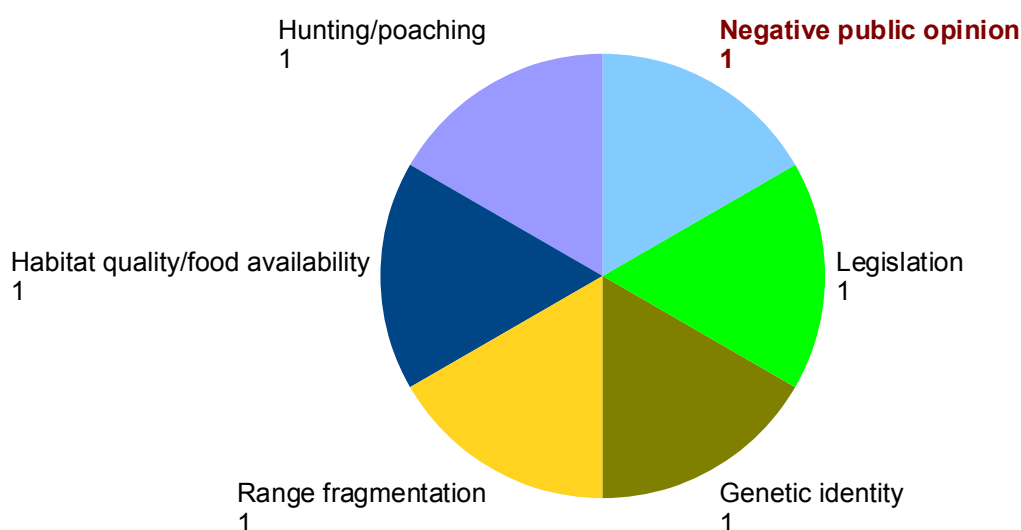


Figure 18: Number of projects addressing the threats for the Dinaric-Balkan wolf population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Project LIFE97 NAT/GR/004249 implemented a series of actions for mitigating various threats. Among them: increasing the awareness of authorities about the detrimental effects of the planned Via Egnatia Highway that would fragment wolf habitat, a campaign for increasing awareness about the detrimental effect of keeping wolf pups in captivity as pets, installation of damage prevention measures and improvement of damage compensation system. The project also contributed to the establishment of a national livestock guarding dog breeding centre. A collaboration with hunters was established for wolf monitoring activities. The project also included the fencing of a garbage dump and the reintroduction of wild preys, but these last two actions were not implemented because of lack of agreements with relevant institutions.

Dinaric-Balkan Wolf Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 4

Total nr. of projects reviewed = 4

Threat Category	Reported	Addressed
Habitat loss / degradation	X	
Persecution	X	X
Traffic	X	
Natural disasters	X	
Changes in native sp dynamics		X
Intrinsic factors	X	
Human disturbance	X	
Other	X	X

Table 25: Dinaric-Balkan wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.

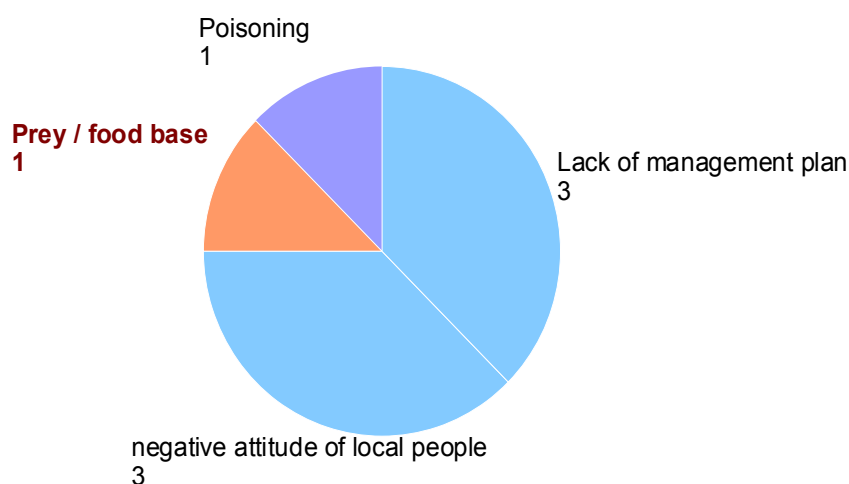


Figure 19: Number of projects addressing the threats for the Dinaric-Balkan wolf population. Red labels indicate threats that were not indicated as affecting the population, but were addressed by the projects.

Project LIFE02 TCY/CRO/014 allowed Croatia to develop a management plan through a participatory process. Damage preventions measure were set up for mitigating conflicts with human activities, and a database for livestock damage was developed. A monitoring system for the wolf in Croatia was set up and the institutional capacity was increased through specific technical training. Communication and public awareness was having a positive impact but was not continued after the project's end. Project LIFE08 NAT/SLO/000244 has set up a monitoring system for the Slovenian portion of the population and holds international coordination meetings with the Croatian authorities. It also undertakes monitoring of the prey species through a participatory process that involves hunters and volunteers. It provides a significant contribution to the management of wolf in the area.

International project LIFE09 NAT/E/000533 targets the Greek portion of the population and addresses the threat posed by the illegal use of poisoned baits.

Project LIFE11 NAT/BG/000363 will undertake actions for reducing conflicts with human activities through the installation of measures for damage prevention. The population is shared among many different countries, some of which are not part of the EU, and their involvement is desirable.

Recommendations: Future LIFE projects should be encouraged in the region. Actions to be implemented include those aimed at mitigating conflicts with livestock owners and involvement of other stakeholders, particularly hunters, improving technical capacity of management structures, controlling illegal activities and hybridization with dogs, as well as mitigation of the impact that infrastructure development will have on wolf habitat. There is also a need to clarify the distribution, status and connectivity of the wolf population in the non-EU countries that constitute the largest part of the populations range.

Carpathian Wolf Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 5

Total nr. of projects reviewed = 5

Threat Category	Reported	Addressed
Habitat loss / degradation	X	
Persecution	X	X
Traffic		
Natural disasters		
Changes in native sp dynamics		
Intrinsic factors		
Human disturbance	X	
Other	X	X

Table 26: Carpathian wolf population: threats addressed by LIFE-Nature projects in the period 2000-2011.

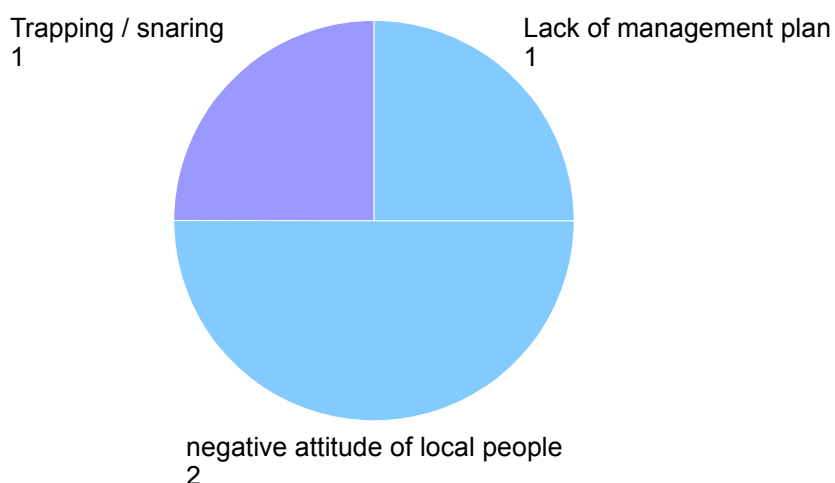


Figure 20: Number of projects addressing the threat subcategories for the Carpathian wolf population.

Project LIFE99 NAT/RO/006435 represented the first effort in Romania and implemented actions mainly aimed at building a knowledge base for the ecology and behaviour of wolf packs in the Piatra Craiului NP through telemetry studies. Damage prevention measures were also set up and a plan for sustainable harvest of wolves was developed for the area.

Project LIFE00 NAT/H/007162 assessed the presence of the wolf in Hungary near the border to Romania, for the small portion of the population present. Radio telemetry studies yielded information on home range and estimation of pack number and distribution. A management plan for wolf conservation was developed. The monitoring activities were taken further after the project end by the Ministry of Environment.

Projects LIFE02 NAT/RO/008576 and LIFE05 NAT/RO/000170 were developed in Vrancea county in Northern Romania and gave a considerable contribution to the establishment of Natura 2000 sites for the wolf, set up a robust monitoring system through integrated methods and transferred experiences to neighbouring counties.

International project LIFE07 NAT/IT/000502 included the improvement of capacity of local technicians on matters related to damage prevention and damage assessment.

Recommendation: Future LIFE projects within this population should encourage international collaboration between Slovakia and Poland, where wolf packs are shared .. Habitat fragmentation seems to be a strong threat for the population, and actions to mitigate it should be supported. Control of illegal hunting activities should be encouraged. Standardised monitoring across and within countries should be required.

Eurasian lynx

Of the 10 Eurasian lynx populations described in Kaczensky *et al.* (2013) two were targeted by at least one LIFE project. They were: Alpine (ALP), and Carpathian (CARP). For these populations the threats reported in the Eurasian Lynx Online Information System (ELOIS, von Arx *et al.* 2004) and in the European Action Plan for Eurasian Lynx Conservation (Breitenmoser *et al.*, 2000) were considered and major categories are plotted in the figures that follow. A detailed list of all categories and subcategories of indicated threats can be found in Appendix I.

For the period 1992-1999 the threats reported to be present and addressed by the LIFE projects for the populations targeted at the time when the projects were implemented area shown in Table 27.

POPULATION	ALP		CARP	
	R	A	R	A
MVP	X		X	
Illegal killings	X	X		
Traffic accidents	X			
Potentially depredation	X			
Habitat fragmentation			X	
Prey base		X	X	

Table 27: Eurasian lynx populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 1992-1999.

None of the indicated threats were addressed for the Carpathian population, while for the Alpine one the addressed threats were related to illegal killings and insufficient food availability, the latter not being indicated as a threat.

In the 2000-2011 decade the threats are expressed in a different manner, but they are essentially consistent. It is noticeable that the threats posed by legal and illegal killings as well as road accidents are included for the Carpathian population, although they were not addressed by any of the implemented projects.

All of the 7 LIFE projects implemented / approved were documented, although one of them is not included in the analysis as it is a LIFE-Coop project, which does not include any CCAs.

Contrary to what was found for wolf and brown bear, none of the implemented projects was exclusively targeting Eurasian lynx. Actions were included in projects targeting at least one of the two other LC species.

POPULATION	ALP		CARP	
	R	A	R	A
THREAT				
Habitat loss / degradation	X		X	X
Legal hunting & trapping			X	
Persecution	X		X	
Traffic	X		X	
Natural disasters	X			
Changes in native sp dynamics	X		X	
Intrinsic factors	X		X	
Human disturbance	X		X	X
Other	X		X	

Table 28: Eurasian lynx populations: threats reported (R) to affect the different populations and addressed (A) by LIFE project in the period 2000-2011.

In detail, the following sections report the threats addressed by the LIFE projects for each population, with an indication of the number of projects addressing each single threat category (or subcategory for the period 2000-2011).

Alpine Eurasian Lynx Population

LIFE projects in period 1992-1999

Total nr. of projects implemented / approved = 2

Total nr. of projects reviewed = 2

THREAT	POPULATION	ALP	
		R	A
MVP		X	
Illegal killings		X	X
Traffic accidents		X	
Potentially depredation		X	
Habitat fragmentation			
Prey base			X

Table 29: Alpine lynx population: threats addressed by LIFE-Nature projects in the period 1992-1999.

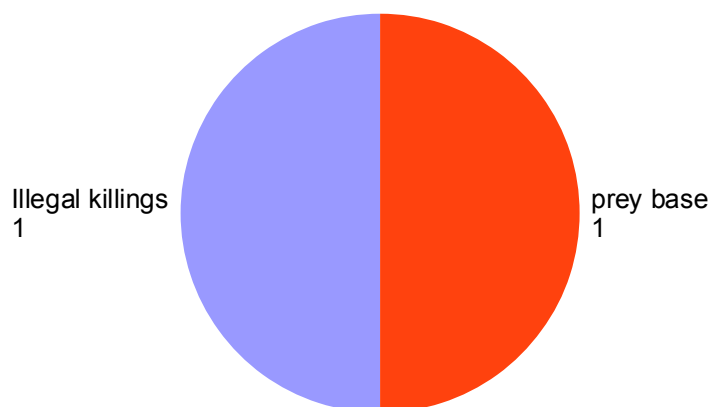


Figure 21: Number of projects addressing the threats for the Alpine lynx population.

Project LIFE97 NAT/IT/004097 has implemented silvicultural actions for increasing habitat suitability for lynx prey in Dolomiti Bellunesi NP and has contributed to the survey of lynx presence in the Italian Alps.

Project LIFE98 NAT/IT/005112 has developed and implemented a sustainable hunting plan with the hunter associations in the Tarvisio Forest Reserve. The project has also set up patrols for controlling illegal killings of LC in general.

No project targeting Eurasian lynx was implemented in the Alps after the year 2000.

The Eastern segment of the population has decreased in the last decade, and the low genetic variability of the western segment is reported to be a relevant threats together with low acceptance from hunters and habitat fragmentation due to infrastructure development.

Recommendation: Future LIFE projects should encourage actions targeting the eastern segment of the Alpine population, and involve intensive collaboration with hunters. Facilitation of genetic exchange may be taken with respect to the western segment. Collaboration with Switzerland should be supported.

Carpathian Eurasian Lynx Population

LIFE projects in period 2000-2011

Total nr. of projects implemented / approved = 4

Total nr. of projects reviewed = 4

THREAT	POPULATION	CARP	
		R	A
Habitat loss / degradation		X	X
Legal hunting & trapping		X	
Persecution		X	
Traffic		X	
Natural disasters			
Changes in native sp dynamics		X	
Intrinsic factors		X	
Human disturbance		X	X
Other		X	

Table 30: Carpathian lynx population: threats addressed by LIFE-Nature projects in the period 2000-2011.

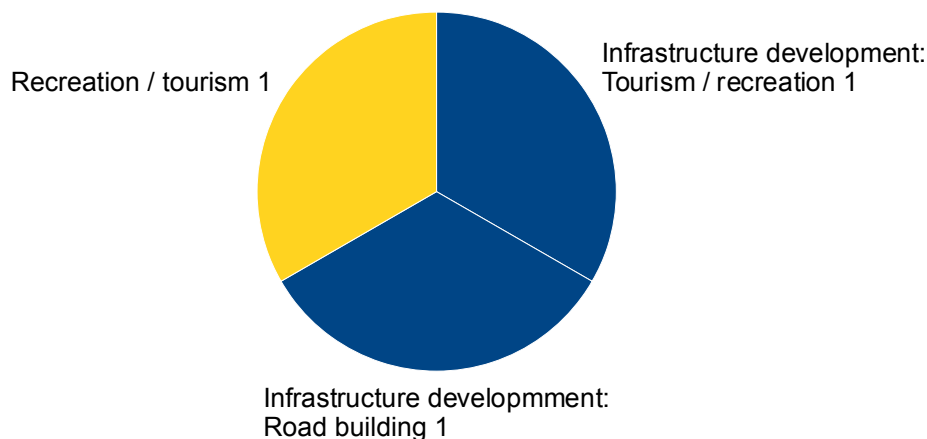


Figure 22: Number of projects addressing the threats for the Carpathian lynx population.

Three (LIFE99 NAT/RO/006435, LIFE00 NAT/H/007162 and LIFE02 NAT/RO/008576) of the implemented projects dealt mainly with the lack of basic research, undertaking telemetry studies for obtaining robust and updated information on lynx ecology, distribution and home range in the different project areas.

Project LIFE02 NAT/RO/008576 also conducted a Vrancea county-wide GAP analysis for identifying areas that would be needed for protection of the lynx, and effectively established the network of Natura 2000 sites. The work was continued further by project LIFE05 NAT/RO/000170, that implemented close monitoring of the three LC species in Vrancea county.

Recommendation: Future LIFE projects involving Poland and Slovakia should be encouraged, where the population appears to be very fragmented. The evaluation of impact of infrastructure development on the population should also be encouraged in all countries sharing the population. The involvement of hunters should be supported. The involvement of non-EU countries (Ukraine) should be encouraged, at least for monitoring activities.

General considerations

The LIFE programme has provided a significant contribution to the conservation of LCs in Europe over the two decades of its activity. Although this may not be measured in terms of conservation status of the targeted species at population level, in the majority of cases, their conservation status and general situation at the local scale has significantly improved and the awareness of LC conservation issues by the general public and public institutions has certainly benefitted in the target regions. Given the geographical and temporal scales at which the LIFE projects are implemented, it is currently impossible to evaluate their impact at the level of whole populations, as this would require a much wider scale assessment. The only evaluation in this direction could be made for the small bear populations, which have been targeted by several projects. As it stands at the moment it appears that only the bear population in the Alps is increasing, thus the actions implemented through the LIFE projects in the region can be considered a success. Other small bear populations targeted by LIFE projects, although not increasing as a whole, report increasing trends at least in some segments (e.g., the Western Cantabrian or the Central Pyrenees) of the populations that would most probably show worse situations in the absence of the actions implemented with LIFE projects.

LIFE represents one of the most valuable instruments for implementing concrete management actions that would otherwise be impossible for the responsible authorities to undertake. When projects are implemented with a robust scientific background (i.e., projects include a scientific advisor in the project staff), they represent the often missing link between research and concrete management. This was the case of some projects where the presence of scientific supervision greatly benefitted the implementation of actions and led to the use of robust methods (e.g., LIFE02 NAT/SLO/8585, LIFE97 NAT/IT/4097 for Friuli Venezia Giulia Region), and sometimes even managed to modify planned action whose feasibility proved impossible or not relevant (e.g., LIFE00 NAT/IT/7214, LIFE93 NAT/GR/10800 and LIFE96 NAT/GR/3222).

The programme is meant to be an instrument for implementing the Habitats and Birds Directives and it is specifically not focused on research. Its main strength is that it represents one of the most valuable financial instruments for effective conservation of species of community interest. Implemented LIFE projects have an obligation to include quantitative indicators of the results obtained through the implementation of the planned CCAs. In its latest cycles the programme also included a mandatory “After-LIFE plan”, which requires a planning of activities that will be undertaken after the project's end.

Although these are useful tools for achieving long term conservation results, given the temporal and spatial scales at which they are usually implemented, their effects on LC populations is hardly measurable immediately after the project reaches its end. They are certainly useful, and should be carefully identified at the planning of action implementation stage. However, it would also be beneficial to plan for an evaluation to be undertaken many years after the end of the project. This can be done through the process of ex-post monitoring, whereby projects that were completed are visited with a time laps that can be as long as 15 years. This process should be continued as it is extremely important for providing a sense of rigour and ownership of the achieved results. It is also unique as most funding programmes (coming either from public or private sources) do not include it, failing to stimulate a sense of responsibility for long term results, which is essential for nature conservation.

Indicators included in the projects are most often to be considered tools for evaluating action implementation rather than conservation outcome indicators. The latter have recently been included in the “After LIFE Plan”, stimulating project beneficiaries to taking the responsibility for wider time windows, much more appropriate for LCs. These outcome indicators are crucial to allow the development of evidence-based conservation which can ensure the future efficiency of funding. Nevertheless, the effect of a mismatch of scales between the targeted portion of the population and the whole population should never be underestimated and long term indicators should clearly be related to the local situation, taking into account eventual effects coming from unknown sources located in other portions of the same population. One measure of the impact of the implemented actions on the targeted portion of the population could be represented by the evaluation of potential impacts of current threats in the absence of the LIFE implemented actions. Project beneficiaries could be asked to provide an assessment of the current situation before the project starts, the same assessment could be repeated in the mid-term and final project technical reports. Such an assessment would require a thorough analysis of the current situation and the contribution of experts on the ecology of the targeted species.

While LIFE projects typically focus on information and communication with local stakeholders and local publics, there is comparatively little dissemination of results to the wider conservation community. This greatly reduces the added value of the projects and prevents the communication of best practices and experience. It would be a huge benefit for nature conservation in Europe, and provide much added value, if

projects reported their results within the professional nature conservation journals that have online archival and which are databased to facilitate access. These journals also include a peer-review process which serves to motivate high standards of documentation and assessment within the project.

Threats addressed should be real and well documented, with robust evidence (derived through an evidence-based conservation approach), thus avoiding the investment of resources on aspects that are not particularly relevant for the conservation of the population. Having said this, one should not overlook the importance of certain threats at local scales that may not be significant at population scales. Nevertheless, given that priority should be given to the population approach to conservation, an estimate of the impact of the identified threats on the population as a whole should be provided by the applicants, requesting an assessment of the severity of the threat identified to other portions of the population that the targeted groups belongs to. This would encourage proponents to simultaneously consider small scale actions within large scale contexts.

The targeted species are mainly indicated as European priority species (although Eurasian lynx is not priority) and all are included in Annexes II and IV of the Habitat Directive's. This has led to an uneven geographical distribution of projects, as most of the Baltic populations are listed as exceptions from these annexes. Although this means that the portions of populations were considered to be at favourable conservation status at the time when the countries acceded to the EU, a close monitoring should be encouraged in order to act immediately as new threats appear that could worsen conservation status.

The majority of projects implemented were multi-beneficiary, thus the programme has fostered collaboration among public and private institutions devoted to nature conservation as well as cross-borders cooperation. The often multi-sectoral cooperation and integration is remarkable and its encouragement should be continued. Particularly, the cooperation of scientific institutions, public authorities, and private institutions from the different stakeholders are extremely good examples of much needed participatory management of LC. The inclusions of representative groups in the project as associated beneficiaries should be a requisite for funding when the targeted threats are related to conflicts with human activities for ensuring long term results.

Given the large portion of most of Europe's major LC populations which is shared with non-EU countries (e.g., wolves and brown bears in the Dinaric Pindos, [Bosnia & Herzegovina, Montenegro,

Albania, "the former Yugoslav Republic of Macedonia", Serbia, Kosovo*], wolves, bears and lynx in the Carpathian [Ukraine, Serbia], Karelian [Russia], and Baltic [Russia, Belarus] populations etc.) it would be highly desirable to find ways to encourage submission of projects (already possible for EU-based beneficiaries) which cover these countries in coordinated actions.

Europe is a rapidly changing environment and the impact of socio-economic development can certainly be considered as a threat to the conservation of LC, particularly concerning the development of transport and energy production infrastructures that likely result in habitat fragmentation, increased human access to habitats, and direct mortality. Thus coordination of the LIFE programme with EU development programmes and funding mechanisms should be sought so as to enhance cross-sectorial cooperation, even when specific measures are envisaged by other sectors but not sufficiently implemented. An inter-sectoral policy agreement should be sought at EU level for species that are considered priorities for conservation, and start-up funds for memorandum of understanding could be envisaged in the LIFE programme.

Agriculture remains one of the most common issue to be tackled while managing LC populations, and the effort of LIFE projects in damage prevention and mitigation of conflicts is certainly noticeable. In general terms, even without having had access to specific actions technical reports, the information available from the documentation consulted provides indication that the majority of projects have implemented effective and most suitable means for minimising damages caused by LC to agricultural holdings. An evaluation of the results achieved, of the best solutions and the long-term viability of such approach should be undertaken, and the lack of an experimental design during the application of such measures does not allow a statistical evaluation of their effect. In fact, the comparison of amount of damages suffered by targeted holdings before and after the installation of protection measures is not to be considered a robust evaluation of the effectiveness of the applied measure towards the mitigation of the threat identified. The fact that the holding is not suffering damages after the installation of a damage prevention measure could well be influenced by many other factors: disturbance of the predators and subsequent displacement, causing damage to other holdings without protection measures, which has the only effect of transferring the threat to other areas, instead of mitigating it. Considering that the damage suffered by livestock owners from wolves, may in many situations be low with respect to losses from other causes and other threats to the viability of

livestock production, an evaluation of the average satisfaction level of the livestock owners in the project areas could be considered an indicator of the level of conflict, and should thus be requested of beneficiaries.

The expansion of wolves into new areas represents severe challenges when it comes to up-scaling and mainstreaming the application of mitigation measures such as electric fencing and livestock guarding dogs. Furthermore, the emerging understanding of the role of social, cultural and political dimensions in conflicts requires consideration of a diversity of actions that are aimed more at people than carnivores (Linnell, 2013). Such approaches may not be seen as classic Concrete Conservation Actions (CCAs), but are absolutely crucial for the long term conservation of LCs in Europe. There are many interest groups that do not often actively express their participation in the conservation of LCs, but their identification and involvement is crucial for ensuring long-term results (Linnell, 2013). Examples include the general public, the local administrations, the tourist sector, rural residents (not livestock owners), spatial planners and scientists. Examples of projects that would have benefited from higher level of stakeholder involvement include LIFE96 NAT/FR/4797 dealing with bears release in the Central Pyrenees, LIFE97 NAT/IT/4097 on large carnivores in the Alps, which did not include any involvement of animal welfare groups dealing with control of free ranging dogs, LIFE 94 NAT/PT/1055 on wolf in Portugal, which did not include any activities for involvement of interest groups such as hunters or livestock raisers. In the latest implemented projects the most prominent interest groups are involved, particularly from the agricultural sector, but the projects most often fail to build a sense of ownership and sharing of responsibility. Positive examples are LIFE09 NAT/IT/502, LIFE02 TCY/CRO/014, and LIFE02 NAT/SLO/8585, which developed active participatory approaches although the interest groups were not formal beneficiaries. Good examples include development of targeted communication campaign that include expensive but effective means such as TV and other media with products of professional quality. Communication professionals should be required for the development of information and communication campaigns as the conservation of LC heavily depends on perceptions, and these can be easily influenced by intensive, long term, articulated and straight forward communication campaigns. It should be possible to ensure that significant amounts of funding can be allocated to these types of activities within the frames of LIFE funding. Although the effects of communication campaigns cannot be assessed during a project lifetime, the communication actions should be treated as CCA, even if costly and not associated with immediate quantifiable results in terms of threat mitigation. Although the LIFE programme also includes a specific component dedicated to communication, such activities are often not

valued enough by public authorities, thus resulting in scarce participation given that the co-funding rate of communication projects is only 50%. Permitting the use of 75% funding, as for CCAs, would stimulate more of these types of activity. In general terms it must be considered that Europe is a very diverse continent in terms of geographical, environmental and socio-economic factors and there are no solutions that work in all contexts, even if the same interest groups are identified. It is therefore necessary to identify the range of potential solutions and then pick the mix which work best in different local contexts (Linnell, 2013).

New emerging threats may need to be rapidly counteracted once they have been identified and LIFE projects are crucial in this respect, as they provide means for prompt interventions. Nevertheless, for their intrinsic nature, new threats may not be familiar to managers and best practice activities to counteract them could be extremely difficult to identify. In order to allow the identification of the best tools for minimising the impact of emerging threats it would be beneficial if LIFE funding could also be used to fund field investigations and carefully targeted trials of different management actions to collect an evidence base on which best practice can be rapidly developed.

The programme has achieved some notable long term results: it has supported the Habitats Directive's objectives through the reinforcement of vanishing populations (e.g. Alpine and Pyrenean bears), it has facilitated the establishment of Natura 2000 sites for LCs and the development of management plans for the newly established sites. In many cases it provided the opportunity to develop species management plans that have lasted for a long time (e.g., Croatia, Hungary). Nevertheless, its impact at the population level cannot be evaluated due to the very nature of LCs. In fact the mean duration of LIFE projects is 3-5 years, which is a relatively short period for LCs to show any considerable change as a result of the actions implemented. A regular and systematic long-term monitoring protocol should be envisaged, in order to assess the real achievements of the implemented projects in the long term.

During the revision process, a number of actions implemented through the projects were found to have been abandoned or not appropriately continued after the projects ended. Particularly communication and awareness raising activities seem to have a higher probability of stopping once the project is over. Some good examples exist of activities that have been started with LIFE projects and then been continued by the responsible authorities. These are most often related to practical activities such as monitoring or livestock damage management. For technical management practices, the involvement of public authorities seems to be

crucial for the taking on board of responsibilities in the long term. Although private NGOs play a vital role in the conservation of LCs, they should have a role of catalysers or coordinators for actions, as they have a simpler administrative organisation and can provide technical staff dedicated to the projects. Nevertheless, without the active participation of local/regional/national authorities responsible for the different aspects of LC conservation and management, the long term results cannot be guaranteed. It should be noted that because of time lags in administrative and political processes it is not often possible to guarantee that action plans will be adopted and implemented within the life span of a typical LIFE project.

Finally, it is imperative that the EU develop a publicly accessible repository for all technical documentation and materials (including communication materials such as images, video and printed material) produced during the implementation of the co-funded projects. Many projects have addressed the same threats without taking into consideration the work done by previous projects, thus leading to potential duplication of efforts. Furthermore, because the projects are co-funded with public economic resources, the results should be publicly accessible to everybody.

The review process has allowed the identification of strengths and weaknesses of the programme.

Strengths	Weaknesses
- Offers opportunity for concrete actions that are sometimes very costly (e.g., infrastructure mitigation)	- No evidence-based conservation results required
- Plays a role of primer for recurrent actions (e.g., monitoring)	- No obligation to make technical materials publicly available
- Offers opportunities for experimenting innovative tools	- Short term for LC issues
- Encourages international collaboration	- Not enough outcome monitoring.
- Encourages public/private institutional collaboration	- No formal requirement of scientific supervision to advise project management and execution
- Provides up to 75% co-funding for priority species	- No rewards for voluntary effort to publish experience and results in peer-reviewed nature conservation journals.
- Increases awareness on LC management issues among groups of interest at different levels	- Lynx is not a priority species, while it should be so for certain populations

<ul style="list-style-type: none">- Provides funds for development of management tools that represent the basis for management policies- Encourages integration of stakeholders- Encourages multi-disciplinary approaches- Encourages sectoral integration (e.g., agriculture, forestry, environment)- Provides opportunities for socio-economic benefits	<ul style="list-style-type: none">- Most up-to-date scientific approaches to monitoring and threat identification not formally required
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Some good examples:

Box 1: Romania → BEAR, WOLF, LYNX

Romania has developed three LIFE Natura projects on large carnivores in Vrancea county. The first one (LIFE02 NAT/RO/8576) started in 2003 and provided the establishment of a robust system for LC monitoring, for the first time developed and taken on board by the responsible provincial authority in Romania. The project also provided the opportunity for developing a GAP analysis for LC at a provincial scale and suggested the establishment of Natura 2000 sites for large carnivores (subsequently successfully designated). The following project (LIFE05 NAT/RO/170) provided the opportunity for establishing Animal Rescue Mobile Units for intervention on LCs that were accidentally injured during car collisions or illegal trapping. A Rescue Centre was also established. At the same time the project provided a series of damage prevention measures and delivered the management plans for the recently established Natura 2000 sites. An ongoing project (LIFE08 NAT/RO/500) has transferred many of the technical capacities to the neighbouring counties of Covasna and Harghita for actions targeting bears, thus ensuring the harmonisation of technical approaches and representing a significant contribution towards a wider approach that is closer to the population one.

Box 2: Slovenia – BEAR

The project LIFE02 NAT/SLO/8585 aimed at improving the conditions for the conservation of brown bears in Slovenia and achieved notable results with the development of a management plan developed through a participatory approach. A robust monitoring system was put in place and hunters were directly involved in field activities. Other stakeholders were involved, including the local communities. The project developed a proposal for a strategy to manage damage caused by bears, which was approved and implemented after the project's end. The project also achieved the establishment of no hunting zone (sanctuaries) for bears (which was considered a game species prior to EU membership).

Box 3: Trentino → BEAR

The population of Alpine bears was at the brink of extinction in late 1990s, when only a few individuals were left in the Italian Alps. The Adamello Brenta Natural Park took the lead and through the implementation of two projects (LIFE96 NAT/IT/003152 and LIFE00 NAT/IT/007131) achieved the reinforcement of the population with individuals translocated from Slovenia. The process took more time than originally planned and called for intense negotiations with responsible authorities (The Italian MoE was originally not in favor of bears being released) and for the development of intensive communication and consultation campaign in order to increase the awareness of local communities. The successful release of the Slovenian bears resulted in an expanding population and their conservation was then taken on board by the local Provincial Authority of Trento Province. Trento bears are now expanding towards neighbouring areas in Austria, and other Italian regions. The decrease of resources invested in communication and information campaigns has recently resulted in strong opposition to the presence of bears.

Box 4: France → WOLF

The expansion of wolves from the Italian Apennines to the Alps led to the reappearance of wolves in the French Alps and caught the livestock owners and shepherds completely unprepared to live with the predator. The Ministry of Environment took the opportunity to undertake two LIFE projects that greatly contributed to the management of the French portion of the Alpine wolf population. Project LIFE96 NAT/FR/3202 allowed the establishment of a robust monitoring of wolf packs in the Alpine region and the establishment of an informal technical working group on wolf monitoring across the Alps, involving Italian, French and Swiss scientists. The project also included the implementation of measures for damage prevention and assistance to shepherds. Project LIFE99 NAT/FR/6299 refined the monitoring techniques for the expanding population and allowed the development of a management plan. The monitoring activities were institutionalised and included as recurrent activities of the ONCFS. They are still ongoing to date.

Box 5: International → capitalisation on transfer and exchange of experiences

Some international projects implement parallel activities in different countries, although they do not target different segments of the same population. Although not to be considered transboundary, thus not providing a significant contribution to the conservation at population level, such projects represent a good example of exchange of experience and capitalisation of the capacity acquired on specific issues. Project LIFE04 NAT/IT/144 was the first of a series that provided an intense exchange of experience between countries sharing the same difficulties in achieving a favourable conservation status for their populations of LCs. The project represented the unique opportunity for important activities to be continued in countries that had benefited of other LIFE projects in previous years. It is the case of activities promoting the coexistence of bears and the rural communities in the French Pyrenees, where the project has implemented activities targeting such interest groups. It also provided the opportunity for continuing some conservation activities on the Portuguese portion of the N-W Iberian wolf population. The project fostered collaboration between countries facing similar problems and minimised project running expenses, thus representing an excellent example of optimization of cost/benefits.

Other international projects of this kind include LIFE07 NAT/IT/502 that represents a continuation of the one presented above, with the objective of transferring best practice techniques to countries that had previously not been involved in such activities (i.e. Romania, Bulgaria). The experience is being currently taken forward by project LIFE11 NAT/IT/069 with the involvement of stakeholders from the agricultural world as associated partners of the project.

Project LIFE07 NAT/IT/436 maximised the information and experiences gained in different countries tackling the threat of poisoned baits affecting LCs and birds of prey.

These international projects foster the exchange of information and experiences, which is vital for dealing with such challenging species, and for ensuring that approaches are more or less coordinated across different countries.

The “ideal” LIFE project on Large Carnivores.

A short consultation among experts on LCs from 20 EC countries provided a set of suggestions on what an “ideal” LIFE project on large carnivores should be:

Focused – The threats addressed should be clearly identified and documented on the basis of (possibly) scientific evidence. When new threats are identified and impact is not documented, then evidence of potential impact should be provided.

Proactive – The threats identified do not need to have severe impacts on the species in order to be tackled. Even in the presence of emerging threats actions should be taken. This avoids costly interventions later on.

Achievable – High and ambitious goals are often not realistic, but are presented for increasing the probabilities to receive funds. Modest goals should be preferred as they grant results and do not pose beneficiaries under pressure when the project is funded.

Useful – Projects should provide increased knowledge on the targeted population (or its portions). New information is useful, and provides the basis for the development of innovative management tools. Particularly information on population trends and genetics should always be included, as they represent control tools for assessment of conservation status. Projects should represent the missing link between science and politics. An effort in educating politicians and managers should be sought.

Effective – Actions implemented should be based on robust methods and scientific knowledge coming from different disciplines (from social to natural sciences), so as to ensure that the technical tools are most relevant for tackling the threats identified. Actions for reducing conflicts should envisage real sources of threats and stakeholders that may cause conflicts. A realistic analysis, supported with documented information, should be provided. The impact of social opposition should never be underestimated and if not mentioned by the proponent, evidence should be requested to make sure it is not affecting the local settings.

Sustainability – Both at temporal and spatial scales. Effects that other elements affecting the population should be considered (not necessarily tackled), and the proponent should clearly demonstrate to have a wider knowledge of the situation at **population** scale as well as at local scale. Also the long term sustainability of activities should be well documented. A system of regular ex-post monitoring should be in place.

Inclusive – Partnerships are crucial for ensuring achievement and sustainability of results. Local and national authorities should be involved (or at least informed) on the initiatives planned. All stakeholders potentially affecting the outcome should be considered.

Measurable – The impact of implemented actions should be measurable and documented. Although detailed planning of activities are not always available at the project proposal stage, they should be envisaged at the early stages project implementation and should include indicators to assess achieved results in the short and long term. A potential impact assessment of a “no action” option should be requested in order to assess the status of the targeted population in the absence of the implemented project. The assessment should be documented with information coming from other case studies and should involve consultation with species experts.

Coordinated – The proponent should be aware of other initiatives ongoing at the **population** level so as to ensure that implemented actions do not go in opposite directions. Actions should include a reference to the population situation, providing clear indication of awareness of the proponent of what goes on beyond the boundaries of the project area.

Demonstrative – The communication component should be well developed and articulated. Most threats for LCs are not physical but depend on (lack of) knowledge and information and other social-cultural situations among different civil society groups. Different levels of communication should be envisaged, and a comprehensive and articulated communication strategy, should be compulsory. The effects of the communication campaign strongly depend on the types of message transmitted and the data used to build the message. Thus the use of robust methods to obtain hard data is necessary for the production of balanced and realistic messages.

Logical – A logical framework should be requested. This helps proponents to follow a straight forward logical path, linking threats to interventions and expected results. It will also help the beneficiaries to implement the actions.

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Appendix I – Large carnivore populations targeted by LIFE projects

Brown Bear

POPULATION	COUNTRIES
ALPINE (ALP)	Italy, Switzerland, Austria, Slovenia
APENNINE (APE)	Italy
CANTABRIAN (CAN)	Spain
CARPATHIAN (CARP)	Romania, Poland, Serbia, Slovakia
DINARIC-PINDOS (DINPIN)	Slovenia, Croatia, Bosnia-Herzegovina, Montenegro, FYROM, Albania, Serbia, Greece
EASTERN BALKANS (EBAL)	Bulgaria, Greece, Serbia
PYRENEAN (PYR)	France, Spain

Eurasian lynx

POPULATION	COUNTRIES
ALPINE (APE)	Switzerland, Slovenia, Italy, Austria, France
CARPATHIAN (CARP)	Romania, Slovakia, Poland, Czech Republic, Hungary, Serbia, Montenegro, Bulgaria

Wolf

POPULATION	COUNTRIES
ALPINE (ALP)	France, Italy, Switzerland
CARPATHIAN (CARP)	Slovakia, Romania, Poland, Czech Republic, Hungary, Ukraine
DINARIC-BALKAN (DINBAL)	Slovenia, Croatia, Bosnia, Bulgaria, FYROM, Serbia, Greece, Albania
ITALIAN PENINSULA (IP)	Italy
NORT-WESTERN IBERIA (NWIBE)	Portugal, Spain

Appendix II

Threats for Brown bear populations

as reported by experts and published in SPOIS (<http://www.kora.ch/sp-ois/>)

THREATS 2000-2011	PYR	CAN	ALP	APE	CARP	DINPIN	EBAL
<i>Habitat loss / degradation (human induced)</i>							
Agriculture	X		X		X	X	
Extraction of wood	X				X	X	X
Infrastructure development: Industry	X	X			X		
Infrastructure development: Human settlement	X		X	X	X		
Infrastructure development: Tourism/recreation	X	X	X		X	X	X
Infrastructure development: Road building	X	X	X		X	X	X
<i>Harvest</i>							
Legal hunting & trapping							
<i>Persecution</i>							
Shooting	X		X			X	X
Trapping / snaring	X	X		X	X	X	X
Poisoning	X	X		X		X	X
<i>Traffic</i>							
Vehicle and train collision			X		X		
<i>Natural disasters</i>							
Storms / flooding							
Wildfire							X
Avalanches / landslides						X	
<i>Changes in native species dynamics</i>							
Competitors							
Prey / food base		X					
Pathogens / parasites							
<i>Intrinsic factors</i>							
Limited dispersal		X				X	X
Poor recruitment/reproduction/regeneration	X		X			X	X
High juvenile mortality	X	X	X				
Inbreeding	X	X	X	X			
Low densities	X	X	X	X			X
Skewed sex ratios	X	X	X	X			
Slow growth rates							
Population fluctuations							
Restricted range	X	X	X				X
<i>Human disturbance</i>							
Recreation / tourism	X	X	X		X	X	X
Research							
War / civil unrest							
Transport	X	X	X		X	X	X
<i>other</i>							
Management fragmentation			X	X			
Uncontrolled grazing						X	X
Negative public attitude			X			X	X

Threats for Wolf population

as reported by experts and published in SPOIS (<http://www.kora.ch/sp-ois/>)

THREATS 2000-2011	NWIBE	ALP	IP	DINBAL	CARP
<i>Habitat loss / degradation (human induced)</i>					
Agriculture				X	
Extraction of wood	X				
Infrastructure development: Industry	X				
Infrastructure development: Human settlement				X	X
Infrastructure development: Tourism/recreation				X	X
Infrastructure development: Road building	X			X	X
<i>Harvest</i>					
Legal hunting & trapping					
<i>Persecution</i>					
Shooting	X	X	X	X	X
Trapping / snaring	X	X		X	X
Poisoning	X	X	X	X	
<i>Traffic</i>					
Vehicle and train collision	X	X	X	X	
<i>Natural disasters</i>					
Storms / flooding					
Wildfire	X				
Avalanches / landslides					
<i>Changes in native species dynamics</i>					
Competitors	X				
Prey / food base	X				
Pathogens / parasites					
<i>Intrinsic factors</i>					
Limited dispersal	X				
Poor recruitment/reproduction/regeneration					
High juvenile mortality	X				
Inbreeding	X			X	
Low densities				X	
Skewed sex ratios					
Slow growth rates	X				
Population fluctuations		X	X		
Restricted range	X				
<i>Human disturbance</i>					
Recreation / tourism				X	X
Research					
War / civil unrest					
Transport	X			X	X
<i>other</i>					
negative attitude of local people	X	X		X	X
decrease of artificial food resources	X				
Hybridization with dogs		X	X		
Lack of management plan				X	X

Threats 1995-2000	NWIBE	ALP	APE	DINBAL	CARP
Hunting/poaching			X	X	
Habitat quality/food availability	X	X		X	
Small numbers/low densities		X			
Range fragmentation	X	X		X	
Genetic identity			X	X	
Legislation		X		X	
Management fragmentation	X	X		X	
Law enforcement	X				
Economic conflicts (livestock damage)	X	X	X	X	
Negative public opinion		X	X		

Threats for Eurasian lynx populations

as reported by experts and published in SPOIS (<http://www.kora.ch/sp-ois/>)

THREATS 2000-2011	CARP	ALP
<i>Habitat loss / degradation (human induced)</i>		
Agriculture	X	
Extraction of wood	X	
Infrastructure development: Industry		
Infrastructure development: Human settlement	X	X
Infrastructure development: Tourism/recreation	X	X
Infrastructure development: Road building	X	X
<i>Harvest</i>		
Legal hunting & trapping	X	X
<i>Persecution</i>		
Shooting	X	X
Trapping / snaring	X	
Poisoning	X	X
<i>Traffic</i>		
Vehicle and train collision	X	X
<i>Natural disasters</i>		
Storms / flooding		
Wildfire		
Avalanches / landslides		X
<i>Changes in native species dynamics</i>		
Competitors	X	X
Prey / food base	X	X
Pathogens / parasites	X	X
<i>Intrinsic factors</i>		
Limited dispersal	X	
Poor recruitment/reproduction/regeneration		
High juvenile mortality	X	
Inbreeding		
Low densities		X
Skewed sex ratios	X	
Slow growth rates		
Population fluctuations	X	
Restricted range	X	X
<i>Human disturbance</i>		
Recreation / tourism	X	X
Research		
War / civil unrest		
Transport		
<i>other</i>		
Illegal trophy hunting		
Hunters attitude		X

Threats 1995-2000	CARP	ALP
MVP	X	X
Illegal killings		X
traffic accidents		X
potentially depredation		X
habitat fragmentation	X	
prey base		X

Appendix III – List of LIFE projects

List of LIFE project co-funded and targeted species (population)

PROJECT	<i>Ursus arctos</i>	<i>Canis lupus</i>	<i>Lynx lynx</i>
LIFE92 NAT/E/014500	X (CAN)		
LIFE93 NAT/E/011800	X (PYR)		
LIFE93 NAT/F/011805	X (PYR)		
LIFE92 NAT/IT/013100		X (APE)	
LIFE93 NAT/GR/010800	X (DINPIN)		
LIFE94 NAT/E/001458	X (CAN)		
LIFE94 NAT/IT/000575	X (ALP, APE)		
LIFE94 NAT/E/004829	X (CAN)		
LIFE94 NAT/P/001055		X (NWIBE)	
LIFE95 NAT/A/000399	X (ALP)		
LIFE95 NAT/E/000624	X (PYR)		
LIFE95 NAT/E/001154	X (CAN)		
LIFE95 NAT/IT/004800	X (APE)	X (IP)	
LIFE95 NAT/P/004804		X (NWIBE)	
LIFE94 NAT/IT/001140	X (APE)		
LIFE94 NAT/E/004827	X (CAN)		
LIFE95 NAT/IT/004802	X (APE)		
LIFE96 NAT/IT/003152	X (ALP)		
LIFE96 NAT/F/003202		X (ALP)	
LIFE96 NAT/F/004794	X (PYR)		
LIFE96 NAT/GR/003222	X (DINPIN)		
LIFE96 NAT/IT/003115		X (IP)	
LIFE97 NAT/IT/004115	X (APE)		
LIFE97 NAT/GR/004249		X (DINBAL)	
LIFE97 NAT/IT/004097	X (ALP)	X (ALP)	X (ALP)
LIFE97 NAT/IT/004141	X (APE)	X (IP)	
LIFE98 NAT/E/005305	X (CAN)		
LIFE98 NAT/E/005326	X (CAN)		
LIFE98 NAT/IT/005114	X (APE)		
LIFE98 NAT/IT/005094		X (IP)	
LIFE98 NAT/IT/005112	X (ALP)		X (ALP)
LIFE99 NAT/F/006299		X (ALP)	
LIFE99 NAT/E/006352	X (CAN)		
LIFE99 NAT/E/006371	X (CAN)		
LIFE99 NAT/IT/006244	X (APE)		
LIFE99 NAT/IT/006209		X (IP)	
LIFE99 NAT/RO/006435	X (CARP)	X (CARP)	X (CARP)

PROJECT	<i>Ursus arctos</i>	<i>Canis lupus</i>	<i>Lynx lynx</i>
LIFE99 NAT/GR/006498	X (DINPIN)		
LIFE00 NAT/A/007055	X (ALP)		
LIFE00 NAT/E/007352	X (CAN)		
LIFE00 NAT/H/007162		X (CARP)	X (CARP)
LIFE00 NAT/IT/007131	X (ALP)		
LIFE00 NAT/IT/007214		X (IP)	
LIFE02 NAT/A/008519	X (ALP)		
LIFE02 NAT/RO/008576	X (CARP)	X (CARP)	X (CARP)
LIFE02 NAT/SLO/008585	X (DINPIN)		
LIFE02 TCY/CRO/014		X (DINBAL)	
LIFE02NAT/ST/IT/00033	X (APE, DINPIN)	X (ALP, NWIIBE, IP, DINBAL)	
LIFE03 NAT/IT/000151	X (APE)		
LIFE02NAT/CP/IT/0046	X (ALP, APE)	X (ALP, IP)	X (ALP)
LIFE04 NAT/IT/000144	X (APE, DINPIN, PYR)	X (ALP, NWIIBE, IP, DINBAL)	
LIFE03NAT/CP/IT/0003	X (ALP)		
LIFE04 NAT/IT/000190	X (APE)		
LIFE05 NAT/RO/000170	X (CARP)	X (CARP)	X (CARP)
LIFE07 NAT/E/000735	X (CAN)		
LIFE07 NAT/GR/000291	X (DINPIN)		
LIFE07 NAT/IT/000436		X (IP)	
LIFE07 NAT/IT/000502	X (APE, CARP, DINPIN, EBAL)	X (IP, DINBAL, CARP)	
LIFE08 NAT/IT/000325		X (IP)	
LIFE08 NAT/RO/000500	X (CARP)		
LIFE08 NAT/SLO/000244		X (DINBAL)	
LIFE08 NAT/E/000062	X (CAN)		
LIFE09 NAT/E/000533		X (DINBAL)	
LIFE09 NAT/GR/000333	X (DINPIN)		
LIFE09 NAT/IT/000160	X (ALP, APE)		
LIFE10 NAT/IT/000265		X (IP)	
LIFE11 NAT/BG/000363		X (DINBAL)	
LIFE11 NAT/GR/001014	X (DINPIN)		
LIFE11 NAT/IT/0069		X (IP, NWIBE)	