European Commission

LIFE and human coexistence with large carnivores

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Environment

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Foreword

Janez Potočnik
European Commissioner for the Environment
European Commission

The brown bear, the wolf, the lynx and other large carnivores are emblematic species for nature conservation. Since the establishment in 1992 of LIFE, the EU funding programme for the Environment, EU support for endangered large carnivore species and their habitats has focused on targeted practical conservation, restoration and management actions in the protected Natura 2000 network sites throughout the Union.

But conservation of this type can be controversial. Attitudes towards large carnivores vary widely from village to village, region to region, and from country to country. Some see these apex predators as powerful symbols of wild nature and natural systems, while to others they are fundamentally a threat to lives and livelihoods.

These conflicts need to be managed effectively for humans and large carnivores to coexist successfully in the long term. Awareness-raising has a vital role to play in this, and protecting livelihoods is vital, especially in areas that are being recolonised by large carnivores after an absence of decades or even centuries.

As this publication illustrates, the LIFE programme has played a valuable role in demonstrating ways of managing conflicts in the area of coexistence. Involving stakeholders such as stockbreeders and the hunting community has been important in reconciling conservation and socio-economic goals. Some projects have been more successful than others, but valuable lessons can be learned from them all.

Coming from a rural community in Slovenia where people, wolves and bears have cohabited for centuries, I can testify that coexistence is not only possible but brings with it innumerable benefits. I hope that lessons from these LIFE actions can be used to improve the design and implementation of future projects. That way we can minimise conflicts between humans and large carnivores, and ensure the long-term conservation of a vital part of our natural heritage.

Janez Potočnik

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INTRODUCTION

Conservation of large carnivores in the EU - **the policy relevance**

Through policy and stakeholder initiatives the European Commission is working to ensure that humans and large carnivores will be able to coexist more easily in future.

Five species of large carnivores present in the EU (clockwise from left: Eurasian lynx, wolf, brown bear, Iberian lynx and wolverine)

The conservation of Europe's large carnivores has always been controversial and is increasingly a cause of debate in some Member States where age-old conflicts have reignited. There are very different attitudes towards large carnivores in different Member States. Promoting successful coexistence between human populations and large carnivores is particularly challenging in areas where these species are re-colonising, or being reintroduced after absences of tens or even hundreds of years.

Large carnivores, (brown bear, wolf, Eurasian lynx, Iberian lynx, wolverine) are flagship-species for nature conservation. For some people they symbolise wild nature and natural systems. Others see them as a threat to lives and livelihoods. They require large spaces to survive, and suffered a very heavy decline in most areas in Europe in the 19th and 20th centuries. This decline has led to legal protection of many endangered populations in many countries, and these species feature prominently in international nature protection instruments such as the Bern Convention and the EU Habitats Directive[1].

According to a recent survey[2], most large carnivore populations are currently recovering from their restricted ranges and overall numbers are generally increasing. This has been thanks to conservation efforts and changing public perceptions, as well as to landscape/ecological changes (forest cover and increasing game populations in many areas). Wolves and bears have reappeared in areas where they long ago became extinct. However, people in these areas

1 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:01992L0043-20070101:EN:NOT

2 Kaczensky, P., Chapron,G., von Arx, M., Huber, D., Andrén, H. & Linnell, J. (eds) (2013): Status, management and distribution of large carnivores – bear, lynx, wolf & wolverine – in Europe. Istituto di Ecologia Applicata with the contributions of the IUCN/SSC Large Carnivore Initiative for Europe (chair: Luigi Boitani) under contract N°070307/2012/629085/SER/B3.

are no longer accustomed to living alongside large carnivores, which presents several challenges: it is not only potential risks of livestock depredation or other economic damage, or public safety issues that must be borne in mind; there is also a culturally / historically-rooted public perception (Little Red Riding Hood etc) that may not be close to the truth. The existing and potential conflicts are well documented in the scientific and popular literature.

Although overall numbers of large carnivores are on the rise, the picture is not rosy everywhere. Several bear populations, such as those in northern Spain, the Pyrenees, the Alps and the Apennines are very small and effectively isolated. The population of Eurasian lynx that has persisted in the southern Balkans is of uncertain status, but is definitely very small. Also the lynx populations in Central Europe (Alps, Jura, Vosges, Bohemia-Bavaria) are all endangered. The "most endangered of all" is the Iberian lynx, which is currently found in two tiny remnant populations in Andalusia. Although more widespread in the boreal zone, the wolverine is at the margins of its distribution in the EU in Finland and Sweden.

Conflict resolution

Even in areas where large carnivores are doing well, many long-standing conflicts with human interests have resurfaced in recent years. Depredation of livestock is the most widespread conflict, the extent of which varies substantially between regions. In areas where traditional protective systems with shepherds, livestock-guarding dogs and night-time enclosures have persisted, the numbers of livestock killed are minimal. In areas where sheep are kept fenced, losses are rarely high. But if livestock graze unattended in forests or mountain pastures, then losses can be severe. A theme that reappears throughout many parts of Europe: conflicts with large carnivores are almost always most severe when animals return to areas from which they have been absent for decades or centuries. People who are used to their presence generally get along with them, but in their absence have forgotten how to share their living space with big, hairy, fanged and potentially dangerous, large animals.

Depredation of livestock is the most common cause of conflict with large carnivores

Photo: LIFE07 NAT/IT/000502

The widespread interest in issues around large carnivores is also shown by the number of questions from the European Parliament to the European Commission and the number of petitions, as well as a surge in media interest, where strong views both for and against the presence of large carnivores are expressed.

The EU legal framework

Europe's large carnivores have been listed in different ways in the Habitats Directive: under Annex II (requiring designation of Natura 2000 sites), Annex IV (strict species protection) and Annex V (exploitable but subject to management). Some of these variations were already in the original 1992 version of the Habitats Directive (e.g. for Greece and Spain in relation to the wolf) but most of the differences in the general site protection and species protection regimes were introduced for new Member States with the EU enlargements of 1995, 2004 and 2007.

Ten of the Member States, where certain large carnivore species are considered to be less threatened, have negotiated an exemption from the general obligations arising from listing a species in Annex II, and/or in Annex IV of the Habitats Directive. Thus, the brown bear is not listed in Annex II for Estonia, Finland and Sweden, but is in Annex IV for the entire EU.

The situation is even more complex with regards to the wolf. In Annex II, it is not listed in Estonia, Finland, Latvia, Lithuania, and only partially listed in this annex in Greece (south of the 39th parallel) and Spain (south of the river Duero); in Annex IV, it is not listed (or only partially protected) in nine of the 27 Member States. The wolf is an Annex V species (and may therefore be culled for management purposes) throughout Bulgaria, Estonia, Latvia, Lithuania, Poland and Slovakia, as well as parts of Finland ('reindeer-herding areas'), Greece (north of the 39th parallel) and Spain (north of the Duero).

The Eurasian lynx is not in Annex II for Estonia, Finland and Latvia, and in Annex IV with the exception of Estonia, where it is in Annex V.

It needs to be stressed that the listing of a large carnivore species in Annex IV does not mean that the population cannot be managed. It can, but it has to be done carefully, in a very controlled manner and if animals are taken out, such management must be subject to a derogation correctly applied under Article 16 of the Directive.

The EU Biodiversity Strategy to 2020[3] lists six targets, the first one of which is full implementation of EU nature legislation. This includes the completion of the Natura 2000 ecological network, which is largely complete on land, but still a work in progress in marine areas. The latest version of the Natura 2000 database - which can be accessed through the Natura 2000 public viewer[4] - shows that large carnivores are present in many sites: 1 165 sites are indicated for wolves, 680 for bears, 551 for the Eurasian lynx and 54 for wolverines (situation as of 31 May 2013).

Photo: LIFE02 TCY/CRO/014 - Dr. Josip Kusak DVM

Wolf radio-tracking in Croatia - monitoring of large carnivore species is crucial for successful management at population level

Population-level approach

The transboundary character of most large carnivores is indeed a particular challenge. The existing legal framework does not help us to easily address this challenge, including the fact that the responsibility for the implementation of the EU legislation lies with the Member States. However, conservation and management of these populations can only be ensured if the neighbouring countries fully cooperate in this respect.

Recognising the importance of such a trans-boundary approach, the European Commission published guidelines for population-level management plans for large carnivores in 2008[5], which were taken on board by Recommendation No. 137 of the Standing Committee of the Bern Convention in the same year. The guideline document built on the substantial work of the Large Carnivore Initiative for Europe[6] and the earlier work of the group of experts on large carnivores under the Bern Convention[7].

Monitoring of species is the responsibility of Member States, although the analysis is subsequently also carried out by the Commission in the context of each biogeographical region when analysing the reports required under Article 17 of the Habitats Directive on species listed in the annexes. Whereas this may help to provide a wider context in which the information from neighbouring Member States can be assessed, it does not lend itself readily to the issue of population-level management, where more than one population of a species may be present in a particular region.

Unfortunately in 2007, when the Member States filed their Article 17 reports, none availed themselves of the option to do so at the population level of the large carnivores. A recent survey[8] has shown that no population is managed through a joint management plan, although most of the populations are managed with at least some occasional cooperation at a technical level.

Opening a stakeholder dialogue

The process of conserving large carnivores in modern European landscapes is proving to be a very challenging exercise, not least because of a diversity of conflicts that are associated with their presence and controversy over the ways in which they should be managed. One key approach to managing conflicts

3 Our life insurance, our natural capital: an EU biodiversity strategy to 2020 (COM(2011) 244)
4 http://natura2000.eea.europa.eu/#
5 http://ec.europa.eu/environment/nature/conservation/species/carnivores/docs/guidelines_final2008.pdf
6 http://www.lcie.org/
7 http://www.coe.int/t/dg4/cultureheritage/nature/bern/carnivores/default_en.asp

8 Blanco (ed.) (2013): Towards a population level approach for the management of large carnivores in Europe. Challenges and opportunities. Istituto di Ecologia Applicata with the contributions of the IUCN/SSC Large Carnivore Initiative for Europe (chair: Luigi Boitani) under contract N°070307/2012/629085/SER/B3

Photo: LIFE07 NAT/IT/000502

Involving stakeholders is essential for conserving large carnivores

is to develop structured forums for stakeholders to enter into constructive dialogue[9].

In 2012, DG Environment initiated such a process[10], which, after preliminary consultations, led to a stakeholder workshop in Brussels on 25 January, 2013[11]. Participants came from a range of nations and interest groups (environmentalists, conservation biologists, livestock and reindeer herders, landowners, rural interests, administrators, hunters and journalists). Special efforts were made to bring together as diverse a cross-section of stakeholders from as many parts of the EU as possible where large carnivores occur.

The main part of the workshop was dedicated to small group discussions involving a mixture of stakeholder interests. Groups were directed to discuss three key topics: their visions for the future of rural landscapes (including how they perceive the 'good life'); what, in their view, are the main obstacles to achieving this vision; and what are the potential means of overcoming these obstacles. This method of forward-looking visioning has been found to be very useful in bringing out ideas and to clearly indicate where stakeholders' interests lie. Furthermore a structured interview was used to map the underlying values of a cross-section of the stakeholders.

There was a wide diversity of points of view expressed by all stakeholder categories and, as could be expected, the results of this workshop revealed some clear differences in terms of interests and priorities of the different stakeholder groups. However, there was certainly not a highly polarised "pro-carnivore" vs "anti-carnivore" dichotomy of views; rather, the points of view expressed could be said to fall along a more or less continuous gradient. And whilst the extreme ends of this gradient may be very far from each other, there was also considerable middle ground. The existence of this middle ground provides scope for future action for the Commission to follow up on.

One message that came through clearly was the diversity of local situations. This is partly reflected in the fact that the status of large carnivore populations varies across Europe - from large and healthy to small and endangered. However, the major division seemed to be between areas in western, central and northern Europe where large carnivores are recovering after a long absence and areas in southern and eastern Europe where they have been present for a longer period of time.

All the participants recommended the continuation of this type of dialogue-based participatory process at European and more local scales. There was also general support for involving a diversity of stakeholders in common activities. These could include the joint production of information materials where multiple stakeholder groups sign off on a common content and distribute the material through their respective networks. It could also include involving more stakeholders in providing the observation data that serves as the foundation for large carnivore monitoring.

9 Linnell, J. D. C. (ed.) (2013): From conflict to coexistence: insights from multi-disciplinary research into the relationships between people, large carnivores and institutions. Istituto di Ecologia Applicata with the assistance of the Norwegian Institute for Nature Research and with the contributions of the IUCN/SSC Large Carnivore Initiative for Europe (chair: Luigi Boitani) under contract N°070307/2012/629085/SER/B3
10 http://ec.europa.eu/environment/nature/conservation/species/carnivores/index_en.htm
11 Public-access website of the CIRCABC sub-group EU Large Carnivore Initiative . (https://circabc.europa.eu/w/browse/5d75d1b4-c767-4af0-b33a-004b32c33fc4)

INTRODUCTION

LIFE's contribution to improved human coexistence with large carnivores

LIFE has been one of the main sources of funding for concrete conservation actions focusing on minimising and avoiding conflicts between large carnivores – particularly bears and wolves - and humans.

Photo: LIFE07 NAT/IT/000502

LIFE has been implementing concrete actions focusing on improving human coexistence with large carnivores – for example, by supplying sheep farmers with livestock-guarding dogs

Since 1992, the LIFE programme has provided co-funding for more than 1 400 projects across the EU delivering nature conservation actions. LIFE has made a major contribution to the implementation of the Natura 2000 network, in particular with regards to requirements for managing habitats, species and sites established by the EU Habitats Directive. Large carnivores are some of the most problematic species to manage, both because of their ecological requirements and even more so because of negative reactions to their presence in areas with a high human population density. When large carnivores come into conflict with human activities, it can create significant problems for delivering concrete conservation actions and management of large carnivore populations at a European level.

Photo: LIFE05 NAT/RO/000170

LIFE projects have encouraged the involvement and participation of local stakeholders, such as livestock farmers

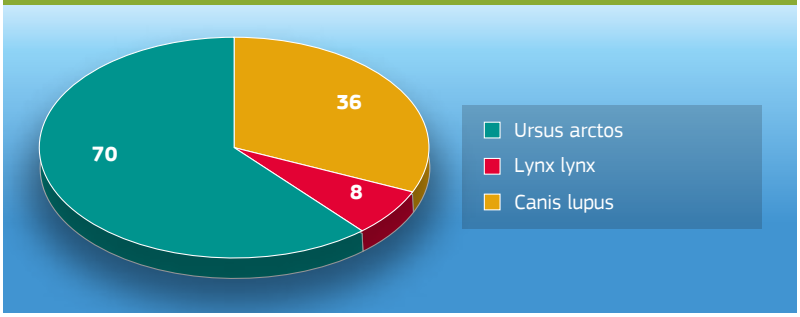
Overview

The objective of this publication is to highlight examples of LIFE projects that have targeted concrete conservation actions at large carnivore species at the population (rather than individual) level, as well as methods (some of them innovative) aimed at minimising coexistence conflicts and increasing tolerance towards large carnivores.

The publication will also highlight lessons learnt from the successes – and sometime the failures of various large carnivore projects, with a view to improving future projects that could be financed by LIFE[1].

1 This review and assessment is based on Salvatori, Valeria (2013): Large carnivore conservation and Management in Europe: the contribution of EC co-funded LIFE projects. Istituto di Ecologia Applicata and with the contributions of the IUCN/SSC Large Carnivore Initiative for Europe (chair: Luigi Boitani) under contract N°070307/2012/629085/SER/B3.

Figure 1. **Number of LIFE projects targeting LC species (1992-2011)**



Source: LIFE Programme Project Database

The publication will focus on three large carnivore species: brown bear (*Ursus arctos*), wolf (*Canis lupus*) and Eurasian Lynx (*Lynx lynx*). The Iberian lynx (*Lynx pardinus*), although, considered a large carnivore, has not been included in this publication as there are no recurrent conflicts across several countries between human activities and its presence and conservation. In addition its range has not been expanding at a comparable rate with that of the bear or wolf in Europe. The wolverine (*Gulo gulo*), a large carnivore species found within the EU only in Finland and Sweden, has also been excluded as it has yet to be the subject of LIFE project actions (see box).

Analysing LIFE's contribution

Since 1992, the LIFE programme has supported 78 projects that have targeted three of the large carnivores - brown bear, wolf and Eurasian lynx. The EU has contributed more than 54 million euros for large carnivore conservation out of a total investment of over 100 million euros. The projects have not been evenly distributed across Europe and across the three species, and 13 projects have targeted more than one large carnivore. The majority of the projects (70) have targeted actions at the brown bear, with 36 projects for the wolf. The Eurasian lynx has been targeted by just eight projects, although none of these dealt with the lynx exclusively.

The brown bear

Of the 10 brown bear populations described, seven have been targeted by at least one LIFE project. These are: the Cantabrian, Alpine, Apennine, Carpathian, Dinaric-Pindos and Eastern Balkans bear populations (see map on pp. 12-13). The Cantabrian, Alpine and Apennine bear populations have been most frequently targeted by LIFE, whereas the Eastern Balkans population has been directly targeted by project actions four times. On the other hand, some projects have addressed threats to several different European bear populations.

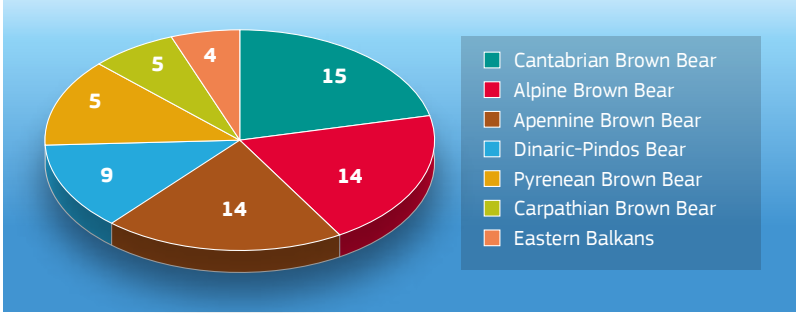
The main LIFE bear project actions are as follows:

- Protective measures for livestock husbandry, including providing electric fences and livestock-guarding dogs;
- Improvement of natural sources of prey and other food (e.g., fruit trees) in order to keep bears from human areas;

- Establishment of compensation schemes for damage caused by bears;
- Reintroduction and/or reinforcement of bear populations;
- Acquisition of land in key bear feeding and refuge areas;
- Setting up patrols for controlling illegal activities (such as poison and traps) and emergency and rehabilitation teams for injured animals;
- Awareness campaigns and the involvement and participation of local stakeholders (hunters, stockbreeders, shepherds etc) in project actions;
- Developing species actions plans and/or management plans;
- Monitoring of bear population trends, genetic diversity and relationships;
- Training of local rangers to assess bear-provoked damage; of veterinary injured bear recovery teams; and of stakeholders on attack prevention measures; and
- Improving habitat connectivity between populations.

The majority of the project actions have been aimed at the local level and seldom target the full population range. Rather, they have been limited by administrative boundaries, whether national or international. For instance, the actions of the first large carnivore project in Romania were limited to Vrancea county, whilst Alpine projects targeting the brown bear have focused on individual populations in Italy, Austria and Slovenia rather than a transboundary approach.

Figure 2. **Number of LIFE projects targeting bear by population (1992-2011)**



Source: LIFE Programme Project Database

Nevertheless, the concrete conservation actions of all the LIFE projects, in combination with bear conservation plans and Natura 2000 legal approval and/or implementation of site management plans, represents a valuable contribution to bear management and the conservation of targeted populations. For example, the Cantabrian and Alpine bear populations have certainly benefited over the past 20 years thanks to LIFE (see pp. 17-21 and 22-26 respectively).

Photo: LIFE05 NAT/RO/000170/BURDUSEL Emilian


© alisdair flickr

The 'missing' bear and wolf populations

LIFE projects targeting large carnivores, in particular the brown bear and wolf, are not evenly distributed across the EU, and there are several geographical gaps. For example, Scandinavian, Karelian and Baltic bear populations have never been targeted by project actions. Even if these populations have been increasing in recent years, they still face threats resulting from coexistence conflicts.

For wolves, the irregular distribution of projects is even more evident with some of the most endangered wolf populations never having been targeted by LIFE, for example, the isolated wolf population of the Sierra Morena (Spain), which is facing extinction according to the latest reports. The Karelian wolf population is also declining and it too has yet to be targeted by LIFE. On the other hand, whilst no LIFE projects have been concerned with the wolf population of the Central European Lowlands, this has been recovering.

The wolf

To date, LIFE projects have targeted five of the 10 wolf populations identified in Europe: the Italian Peninsula, Alpine, Carpathian, Dinaric-Balkan and North-West Iberian populations (see map pp. 38-39). Of these, the Italian Peninsula, Carpathian and Alpine wolf populations have been the most targeted by LIFE project actions, whilst the Scandinavian, Karelian, Central European Lowlands and Sierra Morena populations have never been targeted by LIFE.

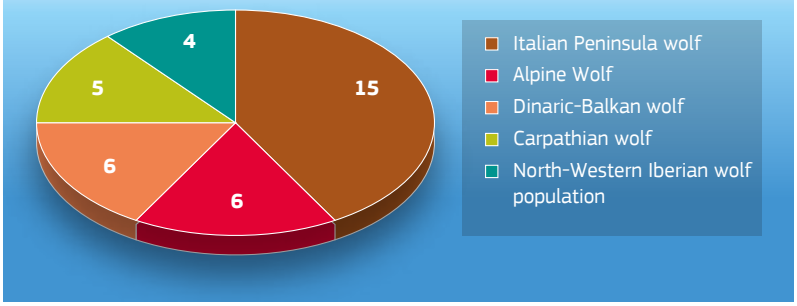
The bulk of wolf project actions have addressed threats related to habitat quality and insufficient food availability, along with actions addressing the threat posed by lack of public acceptance of wolves:

The main actions of LIFE wolf projects are as follows:

- To increase knowledge of the biology and behaviour of wolf populations, especially monitoring of wolf population and human wolf-conflict areas and attacks, and standardisation of procedures;
- Mitigation of human-wolf conflicts caused by damage to livestock by implementing damage compensation schemes;
- Drafting and approval of national wolf management action plans (for example, Slovenia);
- Controlling the illegal use of poisoned baits and traps;
- Measures to prevent attacks, such as electric fences and livestock-guarding dogs (some projects have implemented breeding programmes for guard dogs);
- Reinforcement and management of wild wolf prey (e.g. red deer);
- Public awareness campaigns and stakeholder involvement (hunters, farmers and authorities); and
- Training of local rangers to assess wolf-damage; of veterinary injured wolf recovery teams; and of stakeholders on attack prevention measures.

As with the bear, the majority of the LIFE wolf projects have acted at the local level rather than across the full population range. However, taken as a whole, the LIFE projects' concrete conservation actions at population level represent a valuable contribution to wolf management and conservation. For example, several projects targeting the wolf have led to the adoption of species actions plans at Member State level, and the setting up of prevention measures and damage compensation schemes that, in some cases, have become an integral part of EU Rural Programmes funding.

Figure 3. **Number of LIFE projects targeting wolf by population (1992-2011)**



Source: LIFE Programme Project Database

Wolf (Canis lupus)


Photo: LIFE08 NAT/IT/000325

The Eurasian lynx

LIFE projects have targeted only two of the 10 EU populations of the Eurasian lynx: Alpine and Carpathian. Furthermore none of those projects targeted the lynx exclusively (actions were focused on other large carnivores as well). As a result, project actions have benefitted only the western part of the Alpine lynx population and a very small part of the Carpathian population.

The main LIFE lynx project actions are as follows:

- Improvement of habitat availability via sustainable forestry actions;
- Improvement of habitat for lynx prey and establishment of sustainable hunting protocols; and
- Monitoring and survey of the distribution of the conservation status of the species and definition of Natura 2000 sites (particularly for the Carpathian population in Romania).

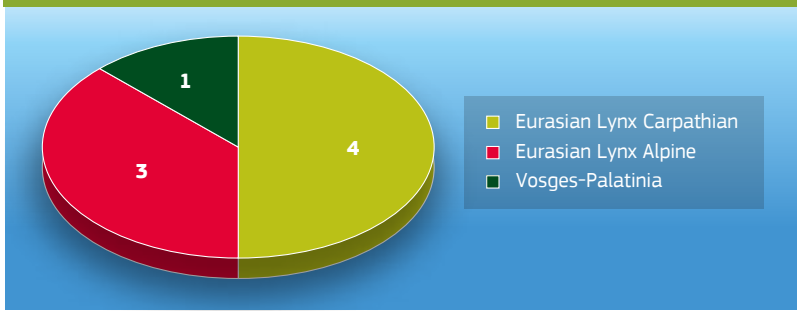
LIFE Co-op and Starter

LIFE has co-funded two Italian 'Co-op' projects that each involved at least three LIFE-Nature projects targeting similar nature conservation subjects, in order to foster the exchange of experience amongst project beneficiaries and partners. The first project (**LIFE02 NAT/CP/IT/000046**) assessed the measures employed by some Italian projects to prevent conflict over large carnivore livestock damage. The second (**LIFE03 NAT/CP/IT/000003**) concentrated on the development and implementation of a dynamic model to assess the presence of areas suitable for bear in the Alps (Italy, Slovenia and Austria) and to stimulate future dynamics of occupation of the same areas. In addition, the partners involved in the LIFE 'COEX' project (see pp 58-62), had prepared the ground with a LIFE 'Starter' project, 'Wildlife and Agriculture' (**LIFE02 NAT/ST/IT/000033**).

Photo: Boehringer Friedrich, Wikimedia Commons

Eurasian lynx (Lynx lynx)

Figure 4. **Number of LIFE projects targeting Eurasian lynx by population (1992-2011)**



Source: LIFE Programme Project Database

Wolverine: a "forgotten" LIFE species?

One European large carnivore for which there has not been a successful application yet for a LIFE project is the wolverine. The species is divided into two separate populations in the EU in Sweden and Finland (Scandinavian and Karelian), numbering no more than 1 300 individuals in total. Although both populations have been rising in recent years, the species is still assessed as having an "unfavourable" conservation status in Finland and Sweden and is listed in Annex II of the Habitats Directive as a 'priority' species for conservation.

Photo: Josh More, under Creative Commons Licence

BEAR (*Ursus arctos*)

LIFE PROJECTS IN EU BY BEAR POPULATION

PYRENEAN

LIFE04 NAT/IT/000144
LIFE93 NAT/F/011805
LIFE95 NAT/E/000624
LIFE95 NAT/E/000628
LIFE95 NAT/E/001159
LIFE95 NAT/E/001160
LIFE95 NAT/E/001162
LIFE95 NAT/E/001164
LIFE96 NAT/F/004794

DINARIC-PINDOS

LIFE02 NAT/SLO/008585
LIFE04 NAT/IT/000144
LIFE07 NAT/GR/000291
LIFE07 NAT/IT/000502
LIFE09 NAT/GR/000333
LIFE11 NAT/GR/001014
LIFE93 NAT/GR/010800
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LIFE07 NAT/IT/000436
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EASTERN BALKANS

LIFE07 NAT/IT/000502
LIFE93 NAT/GR/010800
LIFE96 NAT/GR/003221
LIFE99 NAT/GR/006497

CARPATHIAN

LIFE02 NAT/RO/008576
LIFE05 NAT/RO/000170
LIFE07 NAT/IT/000502
LIFE08 NAT/RO/000500
LIFE99 NAT/RO/006435

ALPINE

LIFE00 NAT/A/007055
LIFE00 NAT/IT/007131
LIFE02 NAT/A/008519
LIFE02 NAT/CP/IT/000046
LIFE03 NAT/CP/IT/000003
LIFE04 NAT/IT/000190
LIFE09 NAT/IT/000160
LIFE92 NAT/IT/013100
LIFE94 NAT/IT/000575
LIFE95 NAT/A/000399
LIFE95 NAT/IT/004802
LIFE96 NAT/IT/003152
LIFE97 NAT/IT/004097
LIFE98 NAT/IT/005112

CANTABRIAN

LIFE00 NAT/E/007352
LIFE07 NAT/E/000735
LIFE08 NAT/E/000062
LIFE92 NAT/E/014502
LIFE94 NAT/E/001458
LIFE94 NAT/E/004827
LIFE94 NAT/E/004829
LIFE95 NAT/E/001154
LIFE95 NAT/E/001155
LIFE95 NAT/E/001156
LIFE95 NAT/E/001158
LIFE98 NAT/E/005305
LIFE98 NAT/E/005326
LIFE99 NAT/E/006352
LIFE99 NAT/E/006371

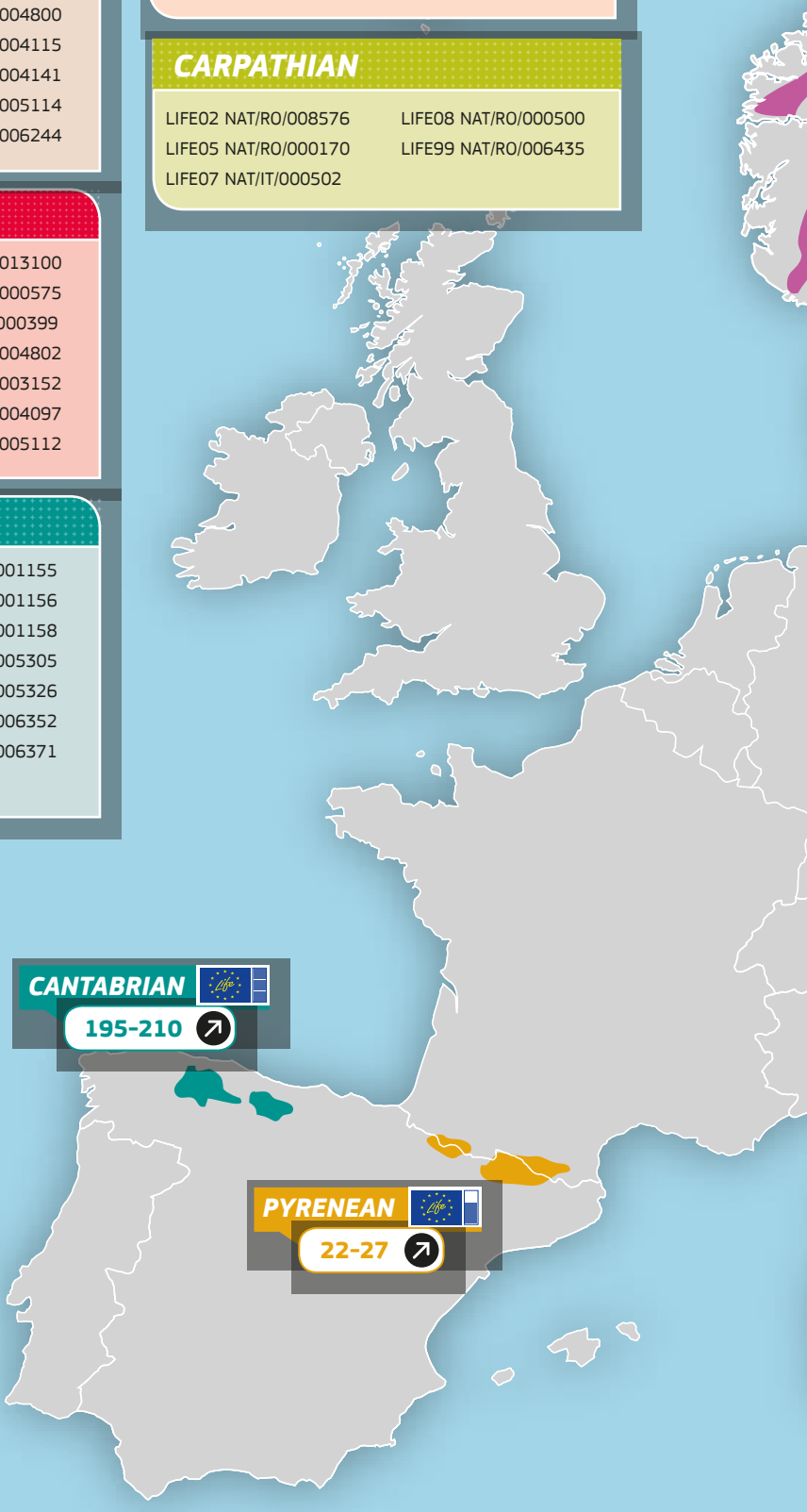
LIFE PROJECTS' IMPACT ON POPULATION TREND

- Relevant
- Partially relevant
- Non relevant

No logo > No LIFE projects

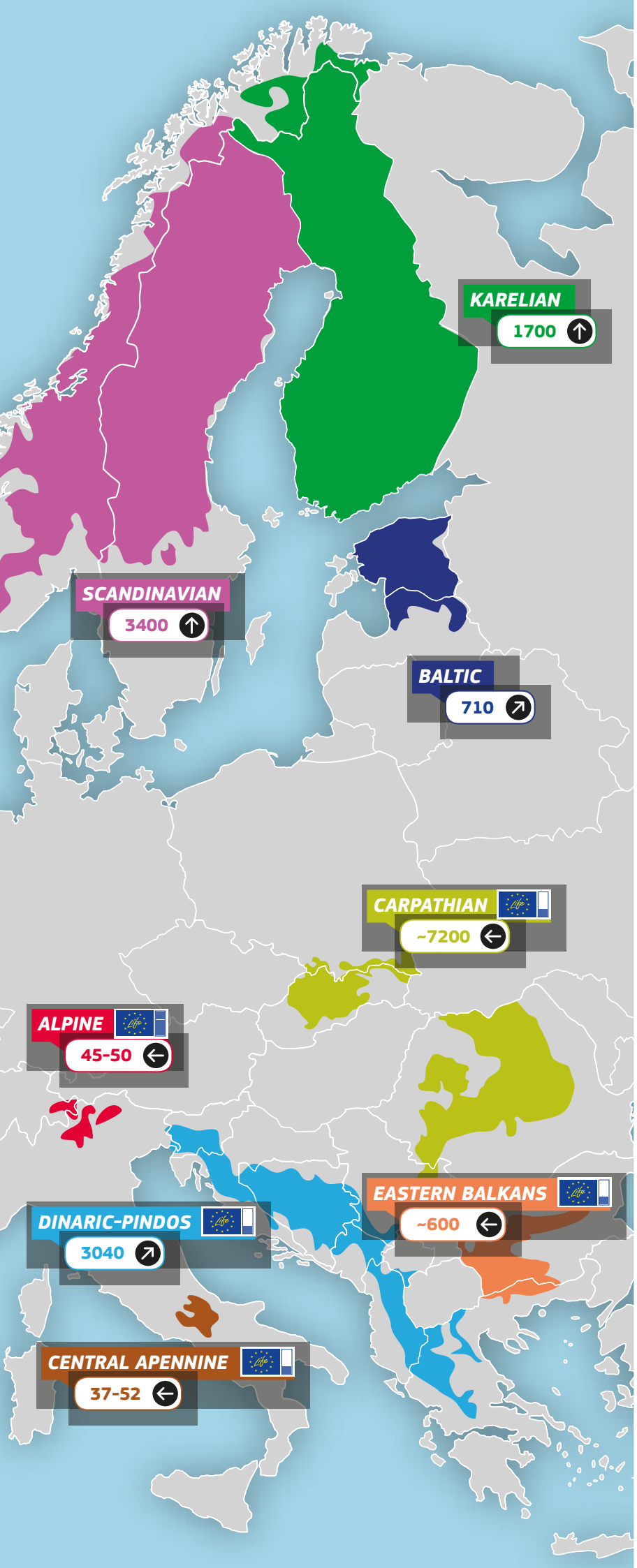
POPULATION TREND

- Strong increasing
- Increasing
- Stable
- Decreasing



Source: Petra Kaczensky, Guillaume Chapron, Manuela von Arx, Djuro Huber, Henrik Andrén, and John Linnell (Editors) (2013). Status, management and distribution of large carnivores – bear, lynx, wolf & wolverine – in Europe, and LIFE project database (1992-2011)

Data from Belarus, Ukraine and Russia are not shown.



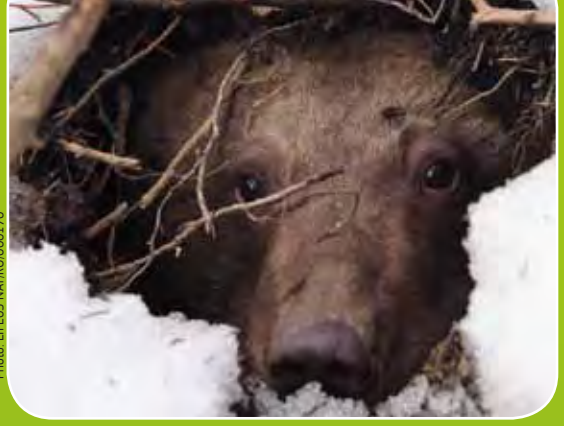


Photo: LIFE05 NAT/RO/000170

BEAR

The brown bear is the most widespread bear in the world. The European brown bear is the same species as the North American grizzly bear, which tends to be much larger in some regions. It has a large head and a heavily built body – the mass of males is between 140 and 320 kg, and females between 100 and 200 kg. The bear is omnivorous and its diet consists of mostly nuts, fruit and many types of vegetables, as well as meat. In winter, bears generally hibernate for between three and seven months in dens dug in the ground or under rocks. The original distribution of the brown bear in Europe illustrates its adaptability to different environmental conditions. With little or no human interference, the brown bear inhabits a wide variety of habitats. Whilst forest and woodland are commonly occupied by this species, it is less dependent on the presence of trees than some other bear species, and can be found around the world in steppes and northern and alpine tundra.

In Europe, the number of bears is estimated to have risen to 17 000 individuals. According to the latest report on bear status, management and distribution, the species is distributed across 10 populations. The Carpathian population is the largest, with more than 7 000 individuals. At the other end of the scale are the Alpine (45-50) and Pyrenean populations (22-27 bears). Although just under half of Europe's bear populations have been showing an increase in their numbers, the smallest populations are critically endangered. The main threats facing bear populations in Europe are habitat loss and fragmentation caused by human infrastructure, the effects of disturbance, and social attitudes: where there is a low acceptance of bear presence it can lead to illegal killing (poison, traps etc).

PYRENEAN

Addressing concerns about **brown bear reintroductions in the Pyrenees**

Attempts by LIFE projects in the 1990s to reinforce the critically-endangered Pyrenean brown bear population range were met with strong local opposition. But the legacy of the project's sheep protection measures suggests a brighter future.

By the early 1990s, poaching and habitat fragmentation had severely endangered the survival of the Pyrenean brown bear population: the last brown bear had died in the central Pyrenees and only five remained in the western part of the mountain range. The most recent population assessment from 2012 puts the number of bears at an estimated 22-27 individuals. This population has been totally isolated for over a century and it seems impossible to re-establish connectivity even with the closest other bear populations (e.g. in the Cantabrian mountains). Therefore, a strategy of re-locating bears from other parts of Europe (i.e. the Dinaric-Pindos bear population) has been trialled by a series of LIFE projects.

Releasing the bears

In 1994, parallel multi-beneficiary LIFE projects in France and Spain (**LIFE93 NAT/F/011804** and **LIFE93 NAT/E/011801**) were launched with the aim of protecting the brown bear and two other

Release of the female bear "Melba" in the Central Pyrenees in 1995

Photo: LIFE96 NAT/F/004794

endangered species - the Pyrenean ibex (*Capra pyrenaica pyrenaica*) and the bearded vulture (*Gypaetus barbatus*). The main outcome of the French project was the introduction of three brown bears from Slovenia to the central Pyrénées (Haute-Garonne). Two pregnant females (Melba and Ziva) were released in 1995 and a male (Pyros) was released in 1996.

This initial reintroduction effort was reinforced by the actions of the follow-up LIFE project, 'Conservation of large carnivores in Europe' (**LIFE96 NAT/F/004794**), which set out to reinforce the Pyrenean brown bear population through the reintroduction of another three individuals. However, this part of the project was cancelled by the beneficiary because of resistance from local farmers.

In a later action, independent of the LIFE projects, another five brown bears (four females and one male) from Slovenia were released in 2006 in the Ariège region, a different part of the central Pyrenees, by the Office National de la Chasse et de la Faune Sauvage (ONCFS - National Office of Hunting and Wildlife: formerly ONC), taking the total number of reintroduced bears to eight.

Unfortunately, LIFE project managers and local authorities had not foreseen the strength of local opposition to the reintroductions, especially from farmers and sheep breeders. The Pyrenees are densely stocked with sheep, and its farmers have historically killed bears that threaten their flocks (legally so until the brown bear became a protected species in 1981).

According to the latest data on compensation loss payments, bears take some 200 sheep a year in the Pyrenees (out of 60 000 sheep in total). Farmers reported increased sheep losses after the bear releases, triggering strong reactions against the reintroduction programme.

Protective measures

The other key objectives of the three LIFE projects were to introduce measures to protect flocks and to reimburse farmers for losses caused by bears – during the LIFE96 project, total payments of €93 787 were made and the compensation scheme is still in operation.

LIFE-funded flock protection measures have included the installation of 10 electric fences around livestock enclosures, putting guard dogs in place, hiring shepherds, and the installation of a radio telephone system on summer pastures to improve communication. These measures are still in use today and are being taken up by an increasing number of landowners, although some farmers still resist measures such as fencing and guard dogs because they are unwilling to change their farming habits or do not want to be seen as pro-bear.

Photo: LIFE96 NAT/F/004794

Melba's movements were monitored in order to improve understanding of bear behaviour and habitat

LIFE funding was invested in livestock-guarding dogs – the breed selected was the white Pyrenean mountain dog or *patou* and 37 dogs were purchased by the LIFE96 project. As the tradition of guarding sheep with the *patou* had fallen out favour, the project restarted a dog breeding programme and provided training to herdsmen. To bond with the flock, the dog has to be reared with sheep from a puppy; the herdsmen were shown

methods for doing this. Following the LIFE project, the French Government began awarding grants to encourage the further use of these traditional guard dogs, which can dramatically reduce livestock losses to bears.

The implementation of the LIFE projects resulted in the creation of many jobs, including the hiring of 68 permanent and 16 itinerant shepherds to help protect flocks (now paid for by the French Ministry of Agriculture under the Rural Development Programme).

Both projects undertook a number of habitat improvement measures, although it was later concluded that the successful adaptation of the introduced bears indicated that the habitat was of good quality. A monitoring protocol using footprints and hair traps was initiated during the LIFE projects; the latter also yielding genetic material for analysing ursine family trees.

Divided opinion

Public awareness-raising material produced by the 1993 and 1996 LIFE projects is still available: the bear population restoration plan and its evaluation via the DREAL Midi-Pyrénées website and the widely disseminated reports of the Brown Bear Network on annual monitoring via the ONCFS website.

LIFE project outcomes helped in developing a management plan for the brown bear population in the French Pyrenees

Nowadays, the aim of the communication strategy produced by the former LIFE project beneficiaries is to improve stakeholder knowledge of bear biology and behaviour and to improve access to information, in particular about the location of individual bears. However, despite such efforts, a common argument voiced by local opponents of bear reintroductions is that decisions are taken in Paris and Brussels, not locally. Although the projects' involvement of local, regional and national stakeholders was relevant and essential, according to a 2012 ex post report by the LIFE programme monitoring team (ASTRALE), more should have been done to involve all the relevant stakeholders, and to articulate the project actions whilst at the same time listening to their concerns. This insufficient coordination is seen in the fact that, for example, whilst financial monitoring was entrusted to the ONCFS, concrete actions were implemented by ONF (National Office of Forests), and certain other measures were operated by NGOs (e.g. the livestock guard dog programme, run by La Pastorale Pyrénéenne). A lack of transboundary cooperation between French and Spanish project partners was identified in the ex post report as another failing of the three projects.

LIFE legacy

Nevertheless, measures introduced by these 1990s LIFE projects have left a lasting legacy, providing some hope that bear-human conflicts can be eased to ensure future coexistence in the Pyrenees.

The cubs of the brown bears from Slovenia helped to recover the Pyrenean bear population from near extinction in the central Pyrenees, contributing to an overall population increase and giving the species a fighting chance of survival. The original brown bear population restoration plan of 1984 considered 50 individuals necessary for a viable population. Strong local opposition may mean that further planned releases may not go ahead. Instead, the French government is counting on the population reaching viability through the reproduction of the existing bears. However, problems associated with in-breeding may occur if no further bears are introduced. The Pyrenean brown bear population therefore remains threatened, and only a significant shift in local attitudes to the presence of bears in the Pyrenees may save it.

CANTABRIAN

Reducing the impact of **hunting activities and poaching**

A series of LIFE projects are helping turn around the fortunes of the endangered Cantabrian brown bear in northern Spain, countering the threats of hunting activities and poaching through stakeholder involvement, awareness-raising and the presence of bear patrols.

Photo: LIFE07 NAT/E/000735 - Fundación Oso Pardo

LIFE support has helped in the recovery of the Cantabrian brown bear population

The Cantabrian brown bear is a population of Eurasian brown bears living in the Cantabrian Mountains in northern Spain. Once found throughout most of the Iberian Peninsula, brown bear populations have become increasingly restricted and reduced because of habitat degradation and fragmentation, poaching and poisoning, low social acceptance and low genetic variability. Nevertheless, the population has been steadily increasing in recent years. The latest estimates put it at between 195 and 210 individuals. This is a significant increase on the 2005 assessment, when only around 100 individuals were present in Cantabria.

"Here in the Cantabrian Mountains bear and man live very close - this is not a wilderness or pristine area. It's a very human area, with much influence on the landscape," explains Fernando Ballesteros of the Fundación Oso Pardo (FOP), an NGO dedicated to the conservation of Spain's brown bear populations. Founded in the early 1990s, FOP has been the beneficiary of a number of projects co-financed by the LIFE programme, beginning in 1992 (**LIFE92 NAT/E/014504**). By 1998, when co-finance was secured for FOP's third LIFE project 'Oso/núcleos reproductores' (**LIFE98 NAT/E/005326**), the brown bear population in the Cantabrian Mountains was estimated to be only some 80 individuals, split into two sub-populations (the western one being the larger).

The LIFE 'Oso/núcleos reproductores' project targeted a reduction in the two main threats to the species, the effects of hunting activities and habitat degradation, in the three areas where most breeding occurred: Ancares-Narcea, Somiedo and Fuentes Carrionas. The

Photo: Justin Toland

Fernando Ballesteros of the Fundación Oso Pardo (FOP) at a bear interpretation centre in Somiedo

collaboration and participation of a range of key stakeholders, including regional authorities, municipalities, local hunting associations and the National Hunting Federation, was central to the success of this project and this approach has continued to inform FOP's later conservation efforts.

To eliminate poaching, six new local rangers were recruited and trained to be able to patrol 30 000 hectares of hunting grounds. FOP's first bear patrol, or 'Patrulla Oso', was actually created with the support of LIFE's predecessor programme (ACNAT), but LIFE co-finance further demonstrated the validity of the concept; the Patrullas Oso continue their work to this day (whilst some of the original patrols are now funded by other public and private sector organisations).

A follow-up project – 'Oso Cantábrico' (**LIFE00 NAT/E/007352**) - was specifically aimed at reducing threats to the western sub-population of bears either as an indirect impact of hunting activities (accidental shooting or disturbance), or as a result of snares and poisoned bait set to catch other species. To combat the threat caused by poachers, the beneficiary identified a target area that is habitually used by bears with cubs, hiring wardens and again raised awareness and promoted acceptance amongst the local population.

Winning people over

Elias Suarez Garcia of the Patrulla Oso Alto Narcea has been involved with the bear patrols since the 1990s and says it is noticeable how much things have changed for the better. Today the patrols "find a lot fewer snares than in those days," he reveals. Much of this success he attributes to the awareness-raising work that has been a feature of all FOP's LIFE projects in the Cantabrian Mountains. The overall aim has been to make local communities proud to live amongst bears, with specific work targeting key groups such as

Observing a female bear in the Somiedo Natural Park, Asturias

Photo: Justin Toland

Photo: Justin Toland

A meeting at Somiedo Town Hall shows the wide range of stakeholders supporting LIFE's bear conservation actions in the Cantabrian Mountains

school pupils, stockbreeders and hunters to facilitate acceptance of the animals.

For instance, by collaborating with hunting associations to avoid risks during hunting activities, the bear patrols have done much to make the associations partners in the conservation of bears: hunts are now carefully monitored and there is a new feeling of the importance and value of bears. Gonzalo Aumente, President of the Hunting Association of Cangas del Narcea, confirms this, pointing out that since the association was formed in the 1990s, "The cultural perception of hunters has changed a lot...They enjoy seeing a bear when they are out hunting."

He adds that the association has, "A very good relationship with FOP and other conservation organisations." As a sign of this, Mr Aumente highlights the fact that, as well as a formal agreement between the two parties, there is also a lot of informal cooperation between the hunters' association's own guards and the Patrulla Oso. "We have had training sessions with them; sometimes they lend us equipment," he says.

"Most hunters who see a bear when they are hunting tell the bear patrol," says Mr Suarez. "I am also a hunter. The other hunters see me as a friend and they know my work depends on bear information and so they pass that information on."

In most cases, the presence of bears does not mean restrictions on where people can hunt. However, as Mr Suarez explains, "When we know the location of a female bear with cubs we check the hunting schedule and if there is a conflict we talk to the hunters' association and regional guards and usually they then change the planned area and hunt in another area."

Antonio Martin Rodriguez is a graduate ecologist who is volunteering with the Patrulla Oso in Somiedo Natural Park. Having grown up in the area he notices the change in attitude both amongst the general population and the hunting community: "People have more respect...hunters stop hunting and move to other areas."

This is confirmed by Simón Brañas of the Hunters' Association of Somiedo: "Hunters, cattle-breeders, everybody has changed their ideas about the bear. People don't see the bear as a problem and are happy to try and coexist with it, even if that means small changes to their habits."

The Mayor of Somiedo, Belarmino Fernandez Fervienza, points to the importance of Somiedo Natural Park (established in 1988), and the fact that its creation was a "bottom-up" process with significant local support is one of the reasons why changing attitudes towards the bear "was not a very long-term process" in his municipality. "In Somiedo there are a lot of cattle breeders and there are some conflicts with wolves, wild boar, red deer, but there are no conflicts with bears, and nowadays the bear is more seen as a positive thing than a negative one." The region is even developing a growing tourism industry based around opportunities for bear-watching (see box).

Photo: Aixa Sopeña

The corridor area that connects the two Cantabrian bear sub-populations is dependent on habitat availability

Connecting bears

Despite the successes of these projects, the viability of the Cantabrian brown bear population remained precarious, particularly as the distribution range of the largest sub-population was steadily narrowing, especially in the 'Leitariegos Corridor', a crucial area for connecting breeding nuclei.

Furthermore, inter-breeding between the two Cantabrian sub-populations is very important for their long-term genetic health. They are separated by a 50km-wide 'inter-population corridor', which is in an acceptable conservation state. However, the corridor is only sporadically used by the bears because their ability to cross it is hindered by obstacles such as roads, railways and human activities (e.g. ski resorts).

Thus, in 2007, FOP proposed a new LIFE project - 'Corredores oso' (**LIFE07 NAT/E/000735**) - specifically targeting actions at these 'bear corridors'. "We thought that if we can join the two sub-populations, we can not only have a demographic rescue of the eastern one, but also a genetic rescue. Genetic variability of the eastern sub-population in particular is at levels dangerous for its survival," explains Mr Ballesteros, who coordinated the project.

"This inter-population area is a very good area for bear re-colonisation in future years. It has good habitat characteristics," he notes.

As well as specific habitat enhancement and management actions, much of the work of the project was aimed at improving the social climate for bears. "The idea was to explain to people - you have bears, bears are going to be more and more abundant and this is very good; and, very importantly, this is not a problem for you. As bears appear [the authorities] are not going to forbid you to hunt; [the bears] are not going to destroy your beehives because we are going to help you to protect them and we are going to give you electric fences and things like that," says Mr Ballesteros.

The beneficiary was able to develop specific collaboration agreements with local authorities and co-operative actions with hunting societies, farmers and beekeepers, demonstrating and promoting the compatibility of bear conservation with economic activities.

Important outcomes of these activities have included a reduction in illegal traps and poaching. Two local inhabitants were also hired to form a new bear patrol in the inter-population corridor (unfortunately, this has since been put on ice until new funding is secured).

Nevertheless, the project has done much to pave the way for sustainable land management in cooperation with key local stakeholders that should help bear populations in the long-term. It has also laid foundations for the integration of bear conservation principles into the policymaking of local councils in the inter-population corridor, producing a management plan that could act as a "pilot plan" for the management of rural mountainous areas in Spain. As part of the project, FOP also developed a 'Handbook of good practice for the management of brown bear corridors in the Cantabrian Mountains'[1]. "We are now putting all these ideas [from the handbook] into practice. We think it's a good starting point for new work in the corridor," says Mr Ballesteros.

Problem solved?

One of the tasks of the Patrullas Oso is to assist with FOP's annual bear census, results of which make very promising reading. "For 2012, we found a minimum of 28 females with cubs, which is a record for this area (western sub-population) in the past 30 years," says Mr Ballesteros proudly. There were also four females with cubs in the eastern

1 http://www.fundacionosopardo.org/wp-content/uploads/2013/03/manual_corredores_oso_2012.pdf

sub-population, leading FOP to estimate a current total Cantabrian brown bear population of some 200 individuals. "We use a conservative approach and only take minimum numbers," says Mr Ballesteros. Based on the number of females with cubs, FOP estimates that the total population is increasing by 10% annually.

Despite this notable success, in part thanks to LIFE co-finance, threats to the region's brown bears remain. For instance, there are still some people setting snares: "They tend to be concentrated in certain 'black spots'," says Mr Suarez. "Last year in March we found 14 in one place." According to Mr Ballesteros, "The snares are mainly used for wild boar, either because they damage fields of crops, or a way of trying to hunt easily, to get meat. But it's residual: the data for the number of snares we find each year shows this is a decreasing problem."

One reason why is that LIFE funding has been used to provide more than 100 electric fences for crop defence. "They are a necessity because the wild boar causes a lot of damage to crops," says Mr Aumente, who adds that the fences are all in use and working well. Mr Suarez notes that the remaining problem areas for snares are places where there are "high value crops such as corn and potatoes...When we give electric fences to hunters they straight away install them around these 'black spots'."

"Poaching has not completely disappeared, but it has been drastically reduced," concludes Mr Aumente. "One of the reasons is the good collaboration between the FOP and our association, especially in the field."

For Mr Ballesteros, "Nowadays the main threats to bears are indirect, they are not things put there to kill bears. Probably the most dangerous is poison," he says (see pp. 63-67). He is particularly worried about the potential inadvertent effects of growing coexistence conflicts between people and wolves: "If concern [about the wolf] is very high then poison appears - this is a very real problem for the wolf and also for the bear. This is a thing we must avoid happening."

Yet, the lesson from these LIFE projects suggests that the communities of the Cantabrian Mountains are willing to take the steps necessary to ensure that the brown bear continues its pattern of recovery in their region. "As we better manage wild boar, cattle, the park, tourism - all the things, because all are interconnected - the better it will be for the bear," believes José Cobrana, a cattle breeder from Somiedo.

The bear economy

"There are two kinds of tourists here {in Somiedo Natural Park]: people who come specifically to see the bear; and people who come to see Somiedo and when they are here then go to look for the bear," explains Publio Alvarez Alvarez, a member of the local hotels and tourism association and owner of a tourist establishment. "The possibility of seeing bears is an exceptional attractor and this possibility must be available to all, not just privileged people," he believes.

Somiedo municipality has suggested that the fifth revision of the management plan for the Natural Park and Natura 2000 sites should include a provision for viewing platforms for people to safely observe bears and other wild animals. "This is a good idea, especially in places like Somiedo because you can see the bears but you cannot disturb [them]," believes Mayor Fernandez.

Jose Luis Fontaniella, Mayor of Cangas del Narcea, is also keen to develop bear tourism within his municipality. "The bear for us is a kind of label of natural quality and very important also for economic activities and tourism and so on. If a bear causes a little damage it is not seen the same way as if a wolf or wild boar or another animal was responsible. Part of the reason for this is the work of FOP in terms of prevention," he explains.

For Mayor Fernandez of Somiedo, the two big changes in the recent history of the municipality have been the return of democracy (1975) and the creation of the Natural Park. "After 25 years the situation has completely changed: now the conservation values in Somiedo are better, a very high level - the recent history of the bear population shows this," he says. "Another important thing has been the economic change," he adds. "The creation of the park has led to high diversification of economic activities, especially tourism, and the bear has been a label and an important attractor for the development of this tourism."

Jose Luis Fontaniella, Mayor of Cangas del Narcea

Photo: Justin Toland

ALPINE

Conserving the Alpine bear population

Thanks to LIFE-supported conservation actions over the past two decades – including reintroductions and transboundary cooperation – the Alps once again holds a small but stable brown bear population.

Photo: Marko Mastert

The Alpine bear population is still in an "unfavourable" conservation status

By the end of the 19th Century the brown bear had all but disappeared from the Alps, with a few individuals remaining in Trentino, Italy, as well as several Austrian and Slovenian Alpine areas. Today, at just 45-50 individuals, the Alpine bear population remains critically endangered, according to the IUCN. Coexistence with the bear still needs to be relearned and encouraged, as continued poaching and the high-profile shootings of 'problem' bears underline – but LIFE co-funded initiatives have improved cooperation between responsible authorities, established protocols and management plans, and aimed to protect livestock as well as facilitate public acceptance. Such actions point to a more secure future for the bear in Alpine regions.

The first LIFE project to target bears in the Alps was carried out by WWF Austria – 'Bear protection program for Austria' (**LIFE95 NAT/A/000399**). A new population has been developing in Austria since

1972, when a bear wandered into the region of Styria from Slovenia. In the mid-1990s, some 20-25 bears were believed to be living in the Austrian mountains, but their continued existence was threatened by the isolation of males, habitat fragmentation and – as the shooting of two young bears in 1994 highlighted – public persecution.

In the initial LIFE project, a series of measures were initiated that are the hallmark of much bear conservation work. Public acceptance was fostered through the establishment of compensation systems for damaged animals and the carrying out of protection measures (e.g. the construction of fences) for livestock and, in particular, beehives.

With LIFE funding, three conservation bodies were able to draw up a management plan covering all these aspects of bear conservation in Austria. Moreover, the LIFE project set up a rapid deployment force of bear experts that is able to respond quickly to the problem of nuisance bears. This group was later named the Bear Emergency Team.

Perhaps the most important outcome of the project, however, was the setting up of the Coordination Board of Bear Management (KOST). Members of this board include representatives of the federal states of Upper Austria, Lower Austria, Styria and Carinthia, the Austrian environment ministry, NGOs and hunters' associations.

Ongoing challenges

The project's aim of increasing the Austrian population of bears to 50 individuals, however, was not achieved. In fact at its conclusion in 1998, the number of bears was merely stagnating. Sightings of mothers with cubs were regularly reported in the main areas for bears – the Lower Austrian and Styrian limestone Alps between Ötscher and Hochschwab and southern Carinthia around Weissensee and the Karawanken – but adolescent bears were simply disappearing when they went off to search for their own territory. Whilst studies showed that the Austrian eastern Alps were a suitable habitat for bears and pointed to the potential for the animal to expand its range in this region, the monitoring results were not encouraging. Researchers believed that young bears were either leaving the region altogether or dying of natural causes or poaching.

WWF Austria therefore carried out a second LIFE project, 'Braunbaer' (**LIFE02 NAT/A/008519**), to address these issues and to step up cross-border co-operation with Italy and, in particular, Slovenia.

The continued small size of the Austrian bear population meant that inbreeding remained a problem. The long-term survival of this group depended on the migration of other bears from the Dinaric Alps.

The project devised a plan for migration routes and worked closely with the road administrative body, ASFINAG, to ensure that traffic planning took into account the needs of the bears. Furthermore, WWF Austria, with the support of LIFE, was able to give valuable input into a proposed nationwide regulation for traffic safety and the protection of animals. The regulation was finalised in 2005 and is legally binding for the ASFINAG.

Scientific studies carried out under the project also helped identify the most important corridors and potential barriers for bear movements. As a result, the bear management plan drawn up as part of the 1995 project was revised during the 'Braunbaer' one. (This revised plan was used to establish a bear management plan for Germany.) A main aim of the project was for this plan to be approved by the relevant Austrian federal states, and whilst none as yet has translated the plan into law, these four states are using the plan as a set of guidelines for bear management.

The 2002 LIFE project was also an opportunity to step up measures aimed at the general public. Some 700 posters were put on display at railway stations, educational materials were produced for schools and events were organised. The publication of a

Beehives damaged by a bear

Photo: Parco Naturale Adamello-Brenta

bear folder (200 000 copies) followed on from the brochures of the first project, but these actions were also accompanied by direct instruction in the handling of problem bears – for example, local people received training in how to scare off bears.

Nevertheless, despite the efforts of the LIFE programme, the bear population in Austria is still under threat of extinction. The population that crosses the border 'triangle' of Austria, Italy, and Slovenia is estimated to be 12-15 bears with some five to eight of these individuals found in Carinthia, a province in the south of Austria. However, reproduction has not recently been recorded here, according to WWF Austria. The border population is connected to the large population of the Dinaric Alps and relies on mostly young males venturing from the core Southern Slovenia area towards the Alps. The numbers of the Austrian bear sub-population are now very reduced and are in fact lower than when the LIFE project started in 2002. The number of bears reaching the Austrian Alps is dependent on the Slovenian hunting regime, and over the last decade the hunting quotas have been considerably increased in response to the damage caused by dispersing bears to beekeepers and stockbreeders. Moreover, local acceptance of bear presence is low in Austria, making successful recolonisation from Slovenia more difficult to achieve.

Ursus Slovenia

Though most bears in Slovenia are part of the Dinaric-Pindos population which is one of the most viable bear populations in Europe, it too has been the target of a LIFE project. Amongst other outcomes, the 'Ursus Slovenia' project (**LIFE02 NAT/SLO/008585**), helped secure migration corridors into the Alps. Coordinated by the Slovenian Forestry Service, the project also developed good networking contacts with regions in Italy and Austria for the exchange of information and know-how.

Bear passages

A specific difficulty of bear migration from Slovenia into Austria, namely a stretch of the A2 motorway, was addressed by one particular project. The section, which was completed in 1984, severely disrupted the passage of bears from Croatia and Slovenia into the Schütt-Dobratsch region of southern Austria. The solution tried by the LIFE project, 'Schütt-Dobratsch' (**LIFE00 NAT/A/007055**), was to construct a 92-metre-wide motorway overpass for bears and other fauna.

The motorway overpass, which directly links two Natura 2000 sites, was constructed using concrete and planted with vegetation and trees to make it seem as natural as possible. The road organisation, ASFINAG, is responsible for the maintenance of the bridge. The first bear observed crossing it was spotted in August 2005. The long-term impact of the overpass is difficult to assess, however. Automated monitoring of migration stopped around 2008 following the repeated theft of the infra-red cameras, but new 'theft-proof' cameras will be installed shortly and monitoring is expected to resume. So far, the major investment in a bear passage has mainly benefitted other species.

Bear passage with the first and (so-far only) evidence of bear use in 2005 (left)

Photo: LIFE00 NAT/A/007055

Reintroductions

One major conservation measure that has been successfully carried out in the Alpine region is the transportation and re-release of captured bears. As part of the 'Ursus/Brenta' project (**LIFE96 NAT/IT/003152**), five individuals from Slovenia were released into the Adamello-Brenta Nature Park in the Italian province of Trentino.

At the start of the project, only three or four bears were present in the park and no new births had been recorded since 1989. The population was heading for extinction, and steps needed to be urgently taken to avoid such a fate. Whilst the park authorities had put an end to the exploitation of forest areas, prohibited the opening of new roads and forestry tracks and banned activities that disturb the bears, the LIFE funding offered it an opportunity to boost the population with genetically-compatible brown bears from Slovenia. Though one of the released bears was killed in 2001 in an avalanche, the first new-born bear was observed in the park immediately after the end of the project.

Another important outcome of the project was the establishment of accurate monitoring in the park. The authorities have been able to follow the growth of this once-declining population, which in 2012 had risen to 41 bears. Monitoring shows that the annual growth rate is 14%. Furthermore, the released bears were radio-tracked in order to obtain a detailed picture of their movement and behaviour following their release. For the first few weeks, the bears wandered well beyond the park's boundaries, but they then mostly returned to the release area. The bears' activities, in fact, resulted in less damage than expected to beehives and domestic stock and compensation to owners was regularly and quickly paid.

A follow-up project was launched in 2000 to release an additional five bears into the park. This project, 'Ursus Brenta II' (**LIFE00 NAT/IT/007131**) further underlined how well the released bears are adapting to their new surroundings. In 2002, two more cubs were born, followed by another two in 2003, and a further five in 2004.

Today, the bears have moved into neighbouring regions: Lombardy, Veneto and Friuli-Venezia Giulia. Two adventurous bears even crossed over into the Swiss Alps, but the outcome for one, JJ3, wasn't happy. Under authorisation of the Swiss government, he was shot in 2008.

Photo: LIFE00 NAT/IT/007131/Photo Archive Provincia Autonoma di Trento

Release of Irma in 2000 at the Adamello-Brenta Nature Park in Italy

JJ3 was in fact the younger brother of JJ1, who achieved fame as 'Bruno' when he became the first bear to be sighted in Germany since 1838 – both young bears were the offspring of Jurka and Joze (hence their official names), two bears introduced from Slovenia. Following numerous reports of the killing of sheep and chickens, however, Bruno was declared a "*Problembär*" and the Bavarian regional government sanctioned his shooting or capture. But the public objected to his killing, and the government revised its order leading to several failed attempts to capture the new media star alive. In June, 2006, the 'problem bear' was shot dead by a local farmer.

The incident demonstrated the need for more effective cross-border communication in order to better manage the bear population. The long-term objective of establishing a link with the Slovenian population, however, has yet to be achieved though it remains necessary. Although the minimum number of bears to form a viable population (considered to be 40-60 individuals) has been reached, the genetic variability of this population remains low.

Nevertheless, the success of the reintroductions has wider implications. Similar attempts to reintroduce bears in Austria had previously failed, and the experience of Brenta presents useful lessons for other reintroduction programmes. The project established a detailed protocol for the capture and release of bears that was refined during the field work and includes outlines on how to correctly handle bears, the necessary health checks, transportation and release methods and the required equipment.

Awareness-raising activities targeting the local population during both projects were particularly

successful in maintaining a positive attitude towards the bear conservation work, but in recent years such efforts have been undermined. Changes in the political landscape and a negative newspaper campaign have weakened public support for the bear initiatives and many stakeholders are now complaining about an apparent lack of involvement in the decision-making process for bear management.

Cross-border cooperation

Where the LIFE programme can really make a difference with regards to bear conservation is in terms of transboundary coordination. This was particularly true for the LIFE project, 'Brown Bear Coop' (**LIFE03 NAT/CP/IT/000003**), which brought together beneficiaries of brown bear projects in Italy, Austria and Slovenia – namely, the University of Udine, WWF Austria and the Slovenia Forest Service – in an initiative coordinated by the Adamello-Brenta Nature Park.

Given the geographic proximity of brown bear populations in the three countries, the project organisers sought to increase the level of interaction between them to effect the development of a metapopulation with improved genetic variability. Such a development depends on safeguarding existing migration routes and creating additional ones for bears from the Dinaric mountain range to enter and re-colonise the eastern Alps of Italy and Austria.

Analysis carried out as part of the project suggested that a future brown bear metapopulation in southern Europe is a distinct possibility, but that brown bear conservation must be considered in a transboundary way. The long-term survival of the species requires the active participation of local and national decision-makers. The project therefore aimed to provide them with up-to-date and reliable data on potential areas of expansion of the bear populations.

It produced a map of distribution sites as well as potential suitable areas into which the species could expand. The four nuclei of bears that it focused on are likely to reach a size at which they are no longer threatened with extinction in the medium-to-long-term future.

Thanks to the project, it was possible to encourage the exchange of experiences amongst different LIFE project beneficiaries and, through the project's final report, to pass on such experiences to other European countries committed to the conservation of the brown bear.

Another key outcome of the project was the sharing of experiences of communicating with the public in Slovenia, Austria and Italy. These lessons fed into several principles for communicating with local stakeholders that were outlined in a document, 'Summary Principles of Communication for Brown Bear Conservation in the Alps'. It was hoped that the cooperation initiated by the project would represent the first step towards greater governmental cooperation. However, in spite of the project's initial efforts, a coherent and permanent cooperation between the three Member States has yet to be put in place – such coordination of activities is vital for brown bear conservation in the Alpine region.

Austrian, Italian and Slovenian managers at a meeting to discuss bear conservation in the Alps

Photo: LIFE03 NAT/CP/IT/000003

APENNINE

Balancing bear and human needs in Italy

LIFE's support for Italy's Apennine brown bear sub-species demonstrates what can be done to help better balance the needs of large carnivores with those of human beings.

An estimated 37-52 animals make up the population of the Apennine brown bear sub-species (*Ursus arctos marsicanus*). Many of the bears live within areas protected by national or regional park designations covering Monti Sibillini, Gran Sasso-Monti della Laga, Maiella-Morrone and Sirente-Velino. Here, LIFE has been active ever since it started in 1992 in helping bears and humans live together better.

The first LIFE projects to target the Appenine (and Alpine) bear populations in Italy were **LIFE92 NAT/IT/013000** and **LIFE92 NAT/IT/013002**. As well as taking concrete steps to improve the natural habitat of the bear in the Apennines, these projects did much to improve knowledge of the species through a thorough analysis of aspects of bear ecology such as habitat selection, roaming distances and its home range in central Italy.

These were followed by the first LIFE project to exclusively target the Apennine brown bear population - 'Gole rupestri' (**LIFE94 NAT/IT/001140**). Its work involved building a local knowledge base and raising awareness about the challenges involved in conserving such European priority species.

As many as 40 different potential sites were identified that could be improved to boost the supply of natural food sources for Apennine brown bears. This management method aimed to encourage bears to remain in habitats that were located away from human activity, and thus in areas where risks of persecution were reduced.

Whilst much of the 'fear factor' that fuels coexistence problems between bears and people relates to their carnivorous characteristics, bears are also famous for their love of honey and similarly sweet products. This fact of bear life is a useful message that can be promoted to help mitigate fears. Practical steps can also be taken to ensure a plentiful natural food supply for bears, thereby reducing the potential for human-bear conflict around farms or villagers. The 'Gole rupestri' project, for instance, planted some 4 200 fruit trees.

Photo: LIFE99 NAT/IT/006244

The Apennine bear population is still endangered despite LIFE actions

Managing the movement of bears in this way means that conservation bodies are better equipped to control risks to the species. The movement of humans near or around known bear-feeding areas can then also be managed through steps such as developing alternative areas to attract people away from bear habitats, warning people about the possible presence of bears in an area, and/or working with local land users to introduce other measures to reduce conflict (e.g. installation of fences)..

A series of LIFE projects (**LIFE97 NAT/IT/004141**, **LIFE98 NAT/IT/005114**, **LIFE99 NAT/IT/006244**, **LIFE03 NAT/IT/000151** and **LIFE09 NAT/IT/000160**)

have had success in applying these coexistence techniques across the Apennines.

Risk reduction

A variety of different approaches have been tested and proven by the LIFE projects as being beneficial for separating bears from human activities. These risk reduction measures include a significant amount of the aforementioned habitat improvement works in specified locations.

Here LIFE has co-financed the planting of thousands more fruit trees, the introduction of beehives and watering sites and the adaptation of forests or upland areas to facilitate corridors and other habitat-connectivity features. In addition, LIFE projects have taken steps to protect bears' hibernation and breeding sites. All these operations continue to be carefully coordinated by the LIFE project beneficiaries as part of a more controlled and strategic approach to distancing bears from people, in order to achieve the objectives of coexistence.

Restricting human access to the improved bear habitats has been an important part of the LIFE projects' strategy for promoting peaceful coexistence. For example, forest roads and tracks have been closed or blocked to prevent people from disturbing bears. Furthermore, projects have funded footpath networks and supported tourism services in areas away from those frequented by bears. Such risk reduction methods remain important components of the Apennine conservation bodies' coexistence toolkit.

"Shall we be friends?" "Why not...are you ready... to put yourself in the bear skin?" (i.e. to put yourself in my place) – an example of the teaching materials used to encourage more positive attitudes towards bear conservation.

Photo: LIFE99 NAT/IT/006244

Practical persuasion

A valuable collection of other coexistence tools has also been validated by the LIFE projects. These include some relatively straightforward actions aimed at dissuading people from considering bears as a threat or menace.

Contrary to popular belief, bears are not normally aggressive, making it fairly easy to apply deterrents. This is underscored by the advice that is provided for people who come across a bear, which recommends adopting a 'confident' stance and keeping eye contact with the bear. Such practice is commonly sufficient to persuade the bear to avoid confrontation and move away.

Practical persuasion is therefore an effective means of protecting people (and their interests) from bear-related problems. LIFE projects have applied this knowhow through a number of methods and most of them have been designed to prevent bears from preying on farm livestock.

Agriculture in the Apennines is limited by natural handicaps that include poor soils and sloping gradients. In these conditions, livestock farming remains one of the only viable sources of economic income for many rural residents. Farmers have a vested interest in protecting their income and this has previously led to the persecution of bears.

LIFE co-finance has been used by the Apennine brown bear projects to help reduce this persecution threat. The two most effective methods of persuading bears to seek food away from grazing pastures – and the likelihood of attacks on livestock – have been found to be the installation of electric fences and the use of specially-bred guard dogs.

Scores of hectares of farmland have been protected with electric fences supplied by the various LIFE projects. This action has also helped establish good working relations between the farmers and the beneficiaries, something that is welcomed by both parties. "Collaboration will continue after EU funding because people appreciate what is possible. They now know that there are solutions," says Gian Paolo Pollini, a farmer from the province of Terni.

A flock's best friend

The other main tool used by the Apennine projects to keep bears away from farmland is a special breed

of large dog. The Abruzzes breed is a mastiff dog that was traditionally used by Italian shepherds as a guard dog for deterring livestock attacks. Abruzzes grow up alongside their flocks and form strong bonds with the sheep.

Around 40 of these dogs were given to Apennine farmers during the 1997 LIFE project, and since then LIFE has expanded their use as a natural form of bear protection.

Freddy Barbarossa from Abruzzo remains a keen advocate of this coexistence method and he has used LIFE to help him run a breeding programme for the dogs: "Although the Abruzzes have been around for over 2 000 years, the breed had started to lose its working dog traits, because it was becoming more a breed for dog shows or a pet," he explains. "We've already gained a good deal of positive experience under LIFE, in terms of trait selection through DNA screening and cross-breeding, in order to get exactly the type of dog that we need. The aim initially was to establish a network of dogs for the farmers of L'Aquila, and now we're expanding the network to include Frosinone (Lazio), Tuscany and Orvieto (Umbria)," says Mr Barbarossa.

Bear truths

As with the vast majority of LIFE-funded nature conservation actions, knowledge about a species (and how different stakeholders can contribute to its status) is considered crucial.

For LIFE's Apennine bear projects, knowledge has been, and continues to be, of paramount importance in helping achieve coexistence. Knowledge about bear behaviour patterns for instance has helped to confirm the need to install fencing around waste dumps to stop bears developing 'bad' habits that threaten their survival. LIFE supported such fencing and a significant amount of additional LIFE assistance has been channelled towards other knowledge-development actions.

Much of this work has focused on dispelling myths about the brown bear and demystifying the methods needed for coexistence. The LIFE projects in the Apennines have used a wide variety of initiatives and communication channels to give accurate information about brown bears, in order to reduce the fear factor and to increase local support for bear conservation work.

Photo: LIFE97 NAT/IT/004141

Breeder receiving mastiff pups

Audiences as diverse as school children, tourists, and hunters have been targeted by the LIFE projects' communication activities. Results indicate that their messages are making a positive difference to changing peoples' perception of bears for the better.

Replicable results

LIFE's support for these awareness-raising campaigns, and all the other Apennine coexistence approaches, hold excellent demonstration value for replication in other parts of Europe where challenges exist in conserving large carnivores.

Experiences gained by the Italian LIFE project examples clearly show the benefits of: providing attractive carnivore habitats located away from human activity; dissuading carnivores from posing problems; and reducing persecution risks caused by misinformed myths.

When these coexistence techniques are applied together they can help safeguard the long-term conservation of our endangered large carnivores.

Ongoing actions

The 'ARCTOS' project (**LIFE09 NAT/IT/000160**) has established a system for evaluating bear-monitoring protocols in the Apennines (and Alps), as well as drafting common guidelines and training personnel. The project is ongoing until August 2014.

CARPATHIAN

Safeguarding the Carpathian brown bear population

LIFE projects have helped to reduce bear-human conflict in the Carpathians, through farming protection measures and damage compensation payments. They have also shaped more positive attitudes toward Natura 2000 sites and the large carnivore populations they protect.

Latest estimates suggest that the Carpathian mountains have the highest density of brown bears in Europe (estimated at more than 7 200 individuals), with more than 6 000 bears (or 40% of the total European population) in Romania.

Despite its size, the Carpathian brown bear population is stable, rather than increasing, and faces several threats: extensive poaching and habitat degradation from forestry; the impact of livestock grazing; the conversion of land for crops; and the building of roads. Measures to reduce bear-human conflict and a change in negative attitudes toward bears are needed to maintain the "favourable" conservation status of the Carpathian brown bear population.

Romanian farmer setting up an electric fence

Photo: LIFE02 NAT/RO/008576

LIFElines

The foundations for brown bear conservation in the eastern Carpathians were laid out in two LIFE projects that ran from 2002 to 2009: 'Vrancea 301/11/2005' (**LIFE02 NAT/RO/008576**) and 'Carnivores Vrancea II' (**LIFE05 NAT/RO/000170**). A key outcome of these projects was the inclusion of eight sites (some 40 000 ha) in the Natura 2000 network and the updating of management plans for these protected areas by the beneficiary, the Vrancea Environmental Protection Agency. This occurred whilst Romania was preparing for its accession to the EU in January 2007.

Following on from these two projects, which concentrated on the conservation of wolves and lynx, as well as bears, the ongoing 'URSUSLIFE' project (**LIFE08 NAT/RO/000500**), which started in January 2010 and runs to December 2013, is focusing solely on the brown bear, across three counties and 15 Natura 2000 sites.

Helping farmers and protecting bears

Livestock and crop protection measures are essential for decreasing the level of conflict between brown bears and the local community. The LIFE-funded Bârseşti demonstration area showed shepherds, animal breeders and farmers how electric fencing can considerably reduce damage caused by large carnivores and in a cost-effective manner. By 2009, 36 electric fence systems had been installed to protect sheepfolds, and a further 12 protected beehives, orchards and crops. There has since been an increasing uptake of electric fence systems, along with other measures to reduce bear-human

conflict, including audible warnings, textile flags and repellent materials, such as lithium chloride. A compensation scheme to reimburse farmers for damage caused by large carnivores, established in 2005, has been another key initiative aimed at stopping poaching and facilitating coexistence.

The LIFE projects established an Intervention Unit, consisting of an Animal Rescue Mobile Unit (ARMU) and the Large Carnivores Rehabilitation and Monitoring Centre (LCRMC) in Lepsa. A Bear Cub Rehabilitation Centre has also received funding. These initiatives have enabled injured brown bears to be treated, orphaned bears to be raised and released back into Natura 2000 sites, and several problem bears near human settlements to be relocated to remote areas rather than being killed.

Before the LIFE projects, monitoring in Romania relied on traditional observation methods. LIFE has helped fund the use of telemetry, scent baits and remote cameras, hair traps, the mapping of dens and other techniques to obtain a more accurate assessment of the brown bear population size. A GIS database is now used to plot key habitat features, such as bear hibernation and feeding sites, and the areas where most bear damage has occurred. This helps to focus resources more effectively on bear protection and bear-human conflict prevention measures.

The disturbance of hibernation dens by forestry activities, in particular, can have a critical effect on young bears. The loss of energy resulting from disturbance increases juvenile mortality. Mapping identified 76 areas with dens. The 'URSUSLIFE' project initiated a ban on logging during the winter months in areas where dens are most common. Measures are also ongoing to build ecological corridors between Natura 2000 sites and important habitat features to overcome problems associated with habitat fragmentation, such as reduced gene-flow within the population when groups of individuals become isolated. An extension of the road network through an area of the eastern Carpathians, for instance, threatens to fragment brown bear habitat and has also resulted in more bears being killed in traffic accidents.

Bears provide benefits

Public-awareness campaigns have played an important role in reducing conflict between brown bears and local people. Previously, the attitude to bears was very hostile; but thanks to awareness-raising activities conducted by the LIFE projects they are now seen in a more positive light. Although the brown bear is a protected species, extensive poaching continues. Some 10% of the bear population may be exposed to this danger. It is therefore important to get the message across that poaching is illegal and that alternative methods are available to protect crops, orchards and sheepfolds. Information boards to that end have been erected in Natura 2000 sites, which also detail the LIFE projects, the species protected and conservation actions taken, and what to do if you encounter a brown bear.

Photo: Frank Vassen

The Carpathian Mountains have the highest density of brown bears in the EU.

There is now a greater understanding of the role of large carnivores in forest ecosystems and a raised awareness of the socio-economic benefits of the Natura 2000 sites. A "bear friendly" eco-label has been introduced to promote local and traditional products from the Natura 2000 areas, including honey, smoked cheese and meat, dried fruit, brandy, and clay and wooden bowls. "Our project led to other initiatives that have developed the possibilities of eco-tourism," explains Silviu Chiriac, leader of the 'Carnivores Vrancea II' project. "For example, the Environmental Protection Agency created nature trails in the park and a bear observation hide."

However, with increasing tourism in the Carpathians, measures such as improved waste management are required to prevent "garbage bears" becoming a problem, along with the designation of "no-go" areas to prevent disturbance to bears with cubs.

DINARIC-PINDOS

Reducing threats to bears in Greece

Two sustainable populations of brown bears cross into northern Greece, where the large mammal is threatened by human activities. LIFE co-funded actions, however, are aiming to diminish some of these threats.

Two main populations of brown bears are found in Greece, separated by a distance of some 250 km: the Pindos population and the Rodopi population. The Pindos population ranges over an area of 11 000 km^2 and forms the southernmost part of the Dinaric-Pindos bear population (the third largest in the EU). It is also expanding - this sub-population is re-colonising sectors of the historical range of the species in the Pindos mountains. The Rodopi population ranges over 2 500 km^2 and is the southernmost part of the Eastern Balkans bear population (see pp 36-37)..

The Dinaric-Pindos brown bear population covers an area of more than 11 000 km^2

Whilst numbers are stable (and showing even positive trends locally), as many as 50 bears in Greece every year are the victim of poaching or other human-related causes of death. A culture of silence - also common to other EU countries - prevents anyone speaking out or exposing the perpetrators, and a lot of work still remains to be done to change attitudes towards conservation and the feasibility of coexistence.

Initial efforts

The first LIFE projects aimed at helping conserve the Dinaric-Pindos brown bear population were carried out by the NGO, ARCTUROS. The main focus of the 'ARCTOS 1' project (**LIFE93 NAT/GR/010800**) was to gather biological, forestry

Photo: LIFE07 NAT/GR/000291/Callisto

Photo: Anastasia Koutsoliotsou

The original sign of Greece's first bear information centre – established by the LIFE project, 'ARCTOS 2'; today the building is the operations centre of the NGO, ARCTUROS.

and socio-economic data and integrate it into a GIS database. Such knowledge was used to draw up a Greek Bear Action Plan. Though this plan was never officially approved, it is now being used as the basis for a new management plan at a national government level.

A follow-up project, 'ARCTOS 2' (**LIFE96 NAT/GR/003222**), carried out a range of typical conservation measures: the provision of sheepdogs; the installation of electric fences for beehives; the plantation of wild fruit trees; the closure of forest roads; and the extension of an existing compensation scheme to cover damages not included in the national compensation scheme. It also carried out so-called 'Specific Environmental Studies', a Greek legal requirement, which led to the official proclamation of two national parks: the Northern Pindos National Park and Rodopi National Park. This is considered to have been a major achievement for bear conservation in Greece.

The beneficiary also carried out a public awareness campaign to strengthen networking with other authorities in the Balkan region, with the goal of ensuring that Greece's bear population maintained its geographical and biological links with the populations in neighbouring countries.

The Dinaric-Pindos bear population faces two main human-related threats: persecution and the impact of transport infrastructure. Bears in Kastoria region, for example, are suffering as a result of a 45 km highway that traverses their range. The fence that surrounds the motorway is inadequate to prevent bears getting onto the road and being hit by vehicles, and its replacement with a more suitable structure has been one of the chief goals of the ongoing LIFE 'ARCTOS/KASTORIA' project (**LIFE09 NAT/GR/000333**).

The need for a new fence – due to be installed by September 2013 – is shown by the fact that 17 bears have died as a result of collisions with traffic on this motorway in the last three years. Out of a total sub-population estimated by genetic fingerprinting at 80-150 individuals! The project, which is being carried out by the Prefecture of Kastoria, the Development Agency of Kastoria and Callisto, an environmental NGO, has enabled research to be conducted to determine the high-risk zones along the critical KA45 highway segment.

Photo: LIFE07 NAT/GR/000291/Callisto

Photo: LIFE09 NAT/GR/000333

17 bears have died as a result of collisions with traffic in the last three years – Thanks to LIFE pressure some proposed additional bear-safety measures were introduced alongside the highway

"We systematically collected samples of bear hair on the highway fence to see which are the areas that the bears most frequently use to cross [the road]," says Iliana Bousiaki of Callisto. Radio and satellite-tracking of bears has also been used to identify high-risk zones.

The final segment of the highway (an additional 25 km, making 70 km in total) is still being completed, This has enabled Callisto to propose additional measures (amended crossing structures) to the construction company in order to safeguard bears, including a 500-metre bear 'cut-and-cover' tunnel. "The construction company wasn't supposed to build this tunnel, but under the project's pressure it has been made possible," explains Ms Bousiaki. Extra warning signs for drivers passing through bear-sensitive zones will be another legacy of this LIFE project.

Long-term goals

The 'ARCTOS/KASTORIA' project has very specific objectives for its target sub-population: firstly, to maintain human-caused mortality in Kastoria at a sustainable level not exceeding 4% of the minimum estimated population in the project area; and, secondly, maintaining yearly reproductive females at no lower than 10-12% of this minimum estimated bear sub-population.

But the economic downturn that has affected Europe in general and Greece in particular, is also affecting conservation efforts. The state forestry authorities are responsible for habitat protection and responding to emergencies, and Callisto recognises the need to convince the authorities of the importance of its work in order to ensure that it continues after the project ends.

Susanne Riegler, a veterinarian who is a member of the Bear Emergency Team (BET) that responds to problem bears or those that have been hit by cars, says that the forestry authority needs to be constantly made aware of her team's activities in order to continue to support them when the LIFE co-finance runs out. The BET consists of two biologists, a vet and an environmentalist. "We are trying to keep it going but we've got to find funding for it. We are transferring our experiences to the forestry authorities...They phone us when they have a problem, but we make sure that they come with us and learn!"

Another aspect of the project in which Dr Riegler has been involved is the development of an exchange network of sheepdog puppies. The aim of such a network of farmers is to provide those livestock breeders in need of protection with a reliable puppy that will become an efficient adult (livestock) guarding dog.

"It took a long time to find the shepherds in the area," says Dr Riegler, who explains that the goal was to find ones who were willing to look after the dogs in the appropriate way: "It is better to have five puppies that are of good quality than 50 that are not cared for," she explains.

The long-term continuation of this initiative is also a concern. "Ideally, the shepherds would work on their own, but it's difficult [to ensure]," cautions Dr Riegler.

The minimum estimated bear population of the entire Pindos mountains is 350, but says Thanos Tragos of Callisto, the population might be "double" that estimate. He explains that: "little is known about several areas of potential and/or suitable bear habitat that have been less well investigated genetically. The monitoring activities carried out during this project are improving our knowledge on the brown bear population and conservation status in this region."

Protecting pine forest habitats

Bears can also be indirectly affected by human activities, such as by the destruction of habitats. Further south from Kastoria, in the area of Grevena and Ioannina, the Pindos National Park – encompassing seven Natura 2000 network sites – hosts one of the key habitats for the brown bear, Mediterranean pine forests with endemic black pine. Although there are some 90 000 ha of this habitat found in the park, the Mediterranean pine forests are nevertheless under threat from several factors: forest fires (both deliberate and accidental); monocultural commercial forestry management plans; and over-exploitation based on inappropriate silvicultural practices.

A LIFE project was thus carried out to improve the conservation status of an area of this priority habitat to the benefit of brown bear conservation. The 'PINDOS/GREVENA' project (**LIFE07 NAT/GR/000291**) aimed to ensure that core bear habitat units within the project area are undisturbed and that human-related mortality is maintained at a sustainable level – i.e. not exceeding 4% of the minimum estimated population.

Another target was to maintain the number of yearly reproductive females at no less than 10-12% of the minimum estimated bear population in the targeted areas (20 individuals within the Natura 2000 sites targeted by the project and 45 individuals in the total project area).

Electric fences protecting beehives from bear attacks

Photo: LIFE09 NAT/GR/000333/Callisto

Lessons from Irma

The story of one particular bear – named Irma – is illustrative of the problems associated with the Kastoria region. Whilst bears are known to inhabit the mountains surrounding the city of Kastoria, in June 2012, one (namely the six-year-old female, Irma) was spotted venturing closer to the urban area. She was seeking a place to build her den and swam 1 120 metres across a lake to a good resting spot within a few hundred metres of the city. The BET was alerted and captured the bear, fitting her with a GSM radio collar and microchip, before relocating her 14 km from the capture site.

Readily available food supplies around human settlements proved too much of a draw, however, and within a week Irma had returned to the southern lake shores, where she stayed for the rest of the summer. The response of the community was mixed: some wanted the bear shot, whilst others were more welcoming. One newspaper even suggested that the bear had been enticed to the area by reckless ecologists. Yet Irma never displayed any aggression towards people and was indeed rarely seen. Moreover, according to Iliana Bousiaki of Callisto, "people didn't feel so afraid because of the brochures that we had produced on how to deal with bears."

However, when Irma began to dig out her winter den in a residential area in a designated 'red zone' of the southern lake shores, the Callisto BET was forced to take action, using rubber bullets to scare her away from the built-up area. The latest monitoring information (from January 2013) shows that Irma has now settled in a rock ravine with dense oak vegetation in the surrounding mountains, but the NGO believes the experience has provided some valuable lessons. The BET has produced a guidebook for dealing with bears visiting human-inhabited areas which is in the process of being adopted by the Greek Ministry of Environment as an official tool for managing such situations.

The anaesthetised Irma is checked by the Bear Emergency Team

Photo: LIFE09 NAT/GR/000333/Callisto

EASTERN BALKANS

Bears in the **Eastern Balkans**

Although no LIFE project has focused exclusively on the Eastern Balkans brown bear populations in Bulgaria and Greece, four wide-ranging projects have included some actions targeting these populations.

The Eastern Balkans brown bear population is found in three distinct segments, extending from Serbia in the west, to Greece and Bulgaria (see map pp. 12-13). The most recent survey – from 2012 – estimates a total population of more than 600 individuals.

Of these, some 530-590 bears are found within Bulgaria, with an additional 50 or fewer bears living across the border in the Greek part of the Rhodope (Rodopi) Mountains.

The larger Bulgarian part of the population has been targeted as part of 'EXTRA' (**LIFE07 NAT/IT/000502**) an international Italian-led LIFE project that covered a number of large carnivore populations across several countries (see pp. 58-62).

LIFE has been helping in the enforcement of the Bulgarian Brown Bear Monitoring Plan that was approved in 2008

Photo: LIFE07 NAT/IT/000502

'EXTRA' in Bulgaria

Specific actions targeting the bear in Bulgaria included the establishment of a standardised monitoring system at national level and training to enable local technicians to assess livestock damage. In the national parks and Smolyan district, LIFE co-finance was spent on bear presence surveys in 2010 and 2011. The 'EXTRA' team also purchased and distributed 90 electric fences out of 186 given to Bulgarian farmers (the remainder were financed by the Ministry of Environment and Waters - MOEW).

A further outcome of this project will be the establishment of five Bear Emergency Teams (BETs), to intervene in cases of troubling bear appearance and investigate unusual bear damage sites and bear deaths. The BET protocol was approved by the MOEW in March 2009. Two of the five BETs are now operational, and have carried out a total of 52 emergency interventions in the course of the project. Citizens are able to dial a national toll-free telephone number to report bear-related incidents to the BETs.

The BETs have also radio-collared and begun tracking seven bears. The first BET was set-up in autumn 2009 in the Rodopi Mountains (using equipment already available); the second is managed by the NGO, AB Balkani (Balkani Wildlife Society). In June 2011, the MOEW set up a team to support the implementation of the three future BETs: one managed by the Central Balkans National Park; one for the Rila mountains; and one for the Prini range.

Since 2010, the project partner Balkani Wildlife Society has taken part in around a dozen meetings with the MOEW and Bulgaria's Environmental Executive Agency aimed at enforcing the Bulgarian Brown Bear Monitoring Plan that was approved in 2008, including through the organisation of a centralised system for data collection. Thanks to these efforts, in sum-

mer 2011, a livestock damage database went online on the MOEW website.

A key part of the project's work in Bulgaria has involved identifying and analysing the most important local stakeholder groups affected by the bear - their community roles and attitudes, their traditional knowledge, needs and beliefs.

Public meetings with stakeholders such as shepherds – to increase acceptance of the use of electric fences - have been an important part of the project's dissemination work, alongside publicity campaigns aimed at a general audience.

Actions in Greece

Three LIFE projects in Greece have targeted the small Eastern Balkans brown bear population along the border with Bulgaria, as part of a national-level approach that mainly concentrated on the much larger Dinaric-Pindos Greek population. Two of the projects – 'ARCTOS 1' (**LIFE93 NAT/GR/010800**) and 'ARCTOS 2' (**LIFE96 NAT/GR/003222**) were two phases of the same approach (see pp.32-35). They developed a Greek Bear Action Plan, which included an integrated management strategy for the bear and its habitats in the Rhodope Mountains.

Although the action plan still has not been approved by the relevant authorities, the projects were able to increase knowledge and understanding of brown bear ecology, including in the Eastern Balkans population. They also implemented concrete actions to protect livestock and beehives, compensate stakeholders and change public attitudes, leading to an observable increase in public awareness.

The most direct and positive result of the projects for the Eastern Balkans population was that a 'Specific Environmental Study' led to the designation of 1 731 km^2 of the Rhodope mountain range first as a National Park, including several Natura 2000 areas. This should provide valuable protected areas of brown bear habitat with limited human confrontation.

Interestingly, this 'safe area' was able to provide a new home to a male bear that was feeding in human areas in the western Greek (Dinaric-Pindos) population nucleus and would otherwise almost certainly have come into conflict with people. This dramatic rescue involved the transfer of the bear to the Rhodope Mountains by helicopter.

Photo: LIFE07 NAT/IT/000502

The Bear Emergency Team tranquilising and subsequently releasing an illegally-trapped bear

The third project - **LIFE99 NAT/GR/006498** - aimed at the management of Rhodope habitats, some of which, such as the black pine forests, are key bear habitats. In addition, a robust (volunteer) wardening system played a crucial role in controlling access to the national park, thereby reducing the threat of illegal activities, such as poaching and poisoning, as well as of habitat deterioration and forest fires. To prevent attacks on livestock, a total of eight electric fences and 22 sheep-guarding dogs were distributed. A significant achievement of the project was to successfully lobby for keeping and raising shepherd dogs to become an applicable measure under the Greek Rural Development Programme. Surveys showed that a majority (52%) of livestock owners with dogs were very satisfied with the protection they afforded and demand for the canines outstripped supply.

As a further consequence of LIFE's initial impact, Greek and Bulgarian NGOs and park authorities are currently collaborating on cross-border projects to conserve the Eastern Balkans brown bear population, with financial support from other EU funding programmes.

WOLF (*canis lupus*)

LIFE PROJECTS IN EU BY WOLF POPULATION

ITALIAN PENINSULA

LIFE00 NAT/IT/007214
LIFE02 NAT/CP/IT/000046
LIFE04 NAT/IT/000144
LIFE07 NAT/IT/000436
LIFE07 NAT/IT/000502
LIFE08 NAT/IT/000325
LIFE10 NAT/IT/000265
LIFE11 NAT/IT/000069
LIFE92 NAT/IT/013100
LIFE94 NAT/IT/000575
LIFE95 NAT/IT/004800
LIFE96 NAT/IT/003115
LIFE97 NAT/IT/004141
LIFE98 NAT/IT/005094
LIFE99 NAT/IT/006209

DINARIC-BALKAN

LIFE02 TCY/CRO/014
LIFE04 NAT/IT/000144
LIFE07 NAT/IT/000502
LIFE08 NAT/SLO/000244
LIFE11 NAT/BG/000363
LIFE97 NAT/GR/004249

CARPATHIAN

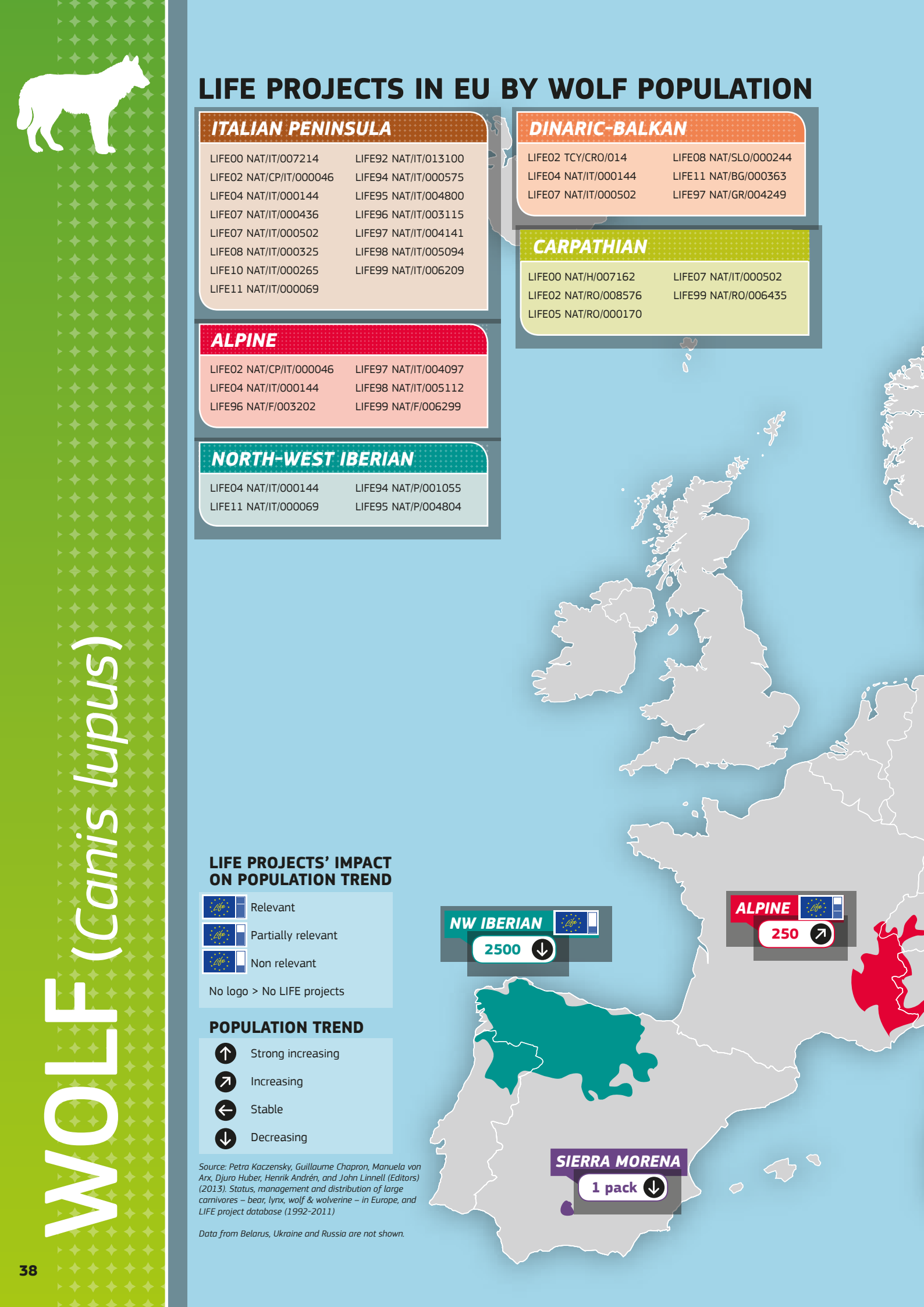
LIFE00 NAT/H/007162
LIFE02 NAT/RO/008576
LIFE05 NAT/RO/000170
LIFE07 NAT/IT/000502
LIFE99 NAT/RO/006435

ALPINE

LIFE02 NAT/CP/IT/000046
LIFE04 NAT/IT/000144
LIFE96 NAT/F/003202
LIFE97 NAT/IT/004097
LIFE98 NAT/IT/005112
LIFE99 NAT/F/006299

NORTH-WEST IBERIAN

LIFE04 NAT/IT/000144
LIFE11 NAT/IT/000069
LIFE94 NAT/P/001055
LIFE95 NAT/P/004804



LIFE PROJECTS' IMPACT ON POPULATION TREND

- Relevant
- Partially relevant
- Non relevant

No logo > No LIFE projects

POPULATION TREND

- Strong increasing
- Increasing
- Stable
- Decreasing

Source: Petra Kaczensky, Guillaume Chapron, Manuela von Arx, Djuro Huber, Henrik Andrén, and John Linnell (Editors) (2013). Status, management and distribution of large carnivores – bear, lynx, wolf & wolverine – in Europe, and LIFE project database (1992-2011)

Data from Belarus, Ukraine and Russia are not shown.

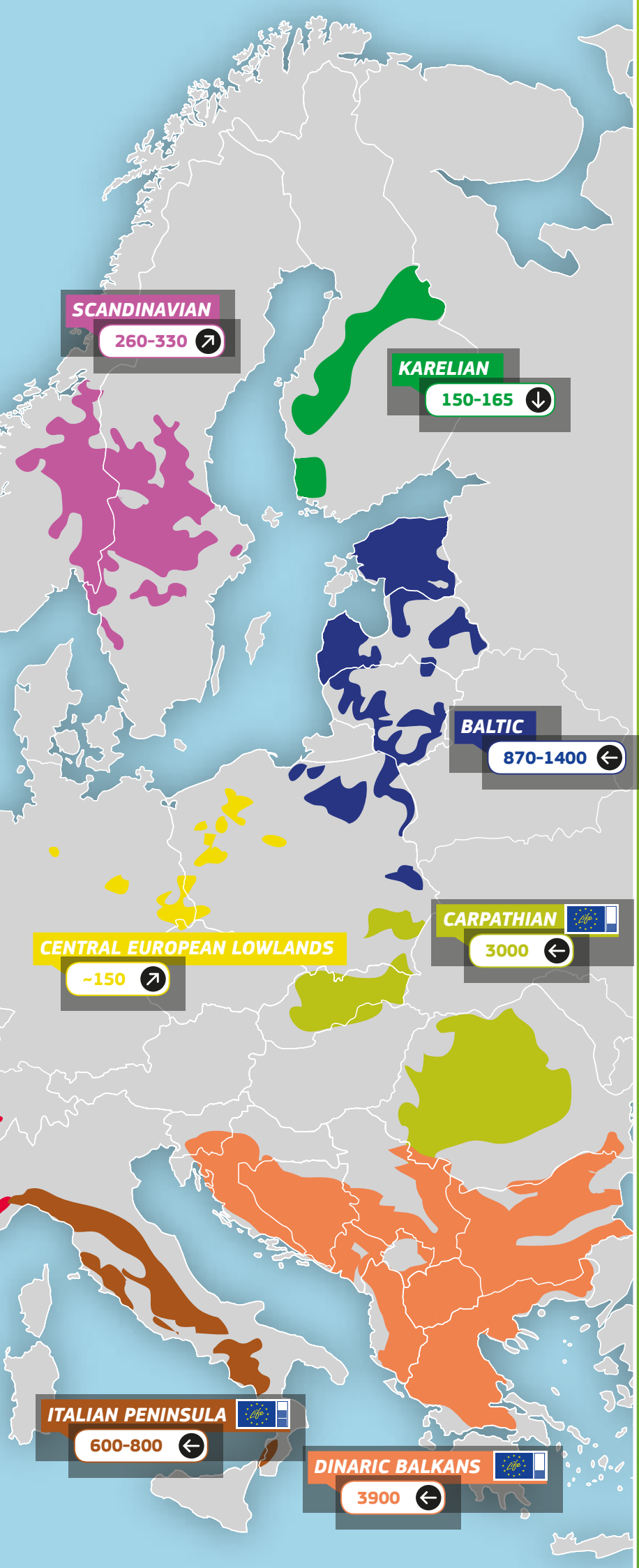


Photo: LIFE08 NAT/IT/000325

WOLF

The survival of the wolf in Europe has been assisted by its ability to adapt to different habitats, types of prey and even human presence. Wolves in southern Europe have a more varied diet than those in the north, which prey mainly on red deer and moose and tend to be larger. An average adult male wolf weighs between 40 and 50 kg (and measures up to 150 cm in length) while a female weighs between 30 and 50 kg.

Based on the latest status and updated census data, it is estimated that there are a total of some 10 000 wolves in Europe spread across 10 populations. The largest populations are the Carpathian and the Dinaric-Balkan (each of more than 3 000 wolves). By contrast, the Alpine population consists of some 160 wolves and the Karelian population of 165 individuals. The Sierra Morena wolf population in Spain is Europe's smallest, with only one pack in 2012 with small numbers. It is completely isolated from the closest other populations and on the brick of extinction.

The biggest threats faced by Europe's wolves include illegal killing (via traps and poison) as a result of human antipathy to wolf presence, as well as habitat loss and fragmentation.

NORTH-WEST IBERIAN

Reducing animosity towards the wolf

LIFE projects in north-west Iberia have attempted to highlight that conflict between the wolf (*Canis lupus*) and farmers can be avoided. However, despite some small steps forward, they have mainly served to highlight the extent of the public relations challenge rather than overcome it.

Photo: www.luis-ferreira.com

The north-west Iberian wolf population is present in the north-west quadrant of the Iberian Peninsula, extending eastwards to the western Basque country and down to just north of Madrid. Some 85% of the population is in Spain with the other 15% in Portugal. There remains debate about whether the Iberian wolf is a distinct sub-species. There is no connection with the nearest other population in the Western Alps or with the Sierra Morena population in the South.

The population has been expanding since the 1960s, reversing the decline to that point. The latest available estimates (from 2005) put the population at 2 200-2 500 individuals, mostly found north of the River Duero. Two other population segments can be identified, south of the Duero in Portugal and a relatively new sub-population south of the Duero in Spain. The populations south of the Duero are fully protected, whilst wolves to the north are subject to management (see introduction pp. 3-6).

The main threat to the wolf in this part of Europe is seen to be infrastructure development, particularly road-building, as well as human persecution – many farmers see the wolf as posing a significant threat to their livestock. Local newspapers in Zamora - which sits on the River Duero near the Portuguese border – have run several reports on wolf attacks in the province. A story from October 2012 described the deaths of 20 sheep panicked by a wolf.

Even in cases where losses are likely to have been the result of attacks by stray dogs, it is often the first instinct of farmers and newspapers to blame the wolf, reinforcing negative opinions of this endangered species.

LIFE interventions

The LIFE project 'Conservation of the Wolf in Portugal' (**LIFE94 NAT/P/001055**) tackled pressures on the wolf in its two Portuguese population segments – north and south of the River Duero. The project helped increase knowledge and understanding of the actual distribution area of the wolf in the country as well as the impact of feral dogs on livestock. This information was used to update a manual for verifying wolf damage.

An important positive outcome of the project was the significantly improved cooperation between bodies working on conservation of the wolf in Portugal. In addition to the aforementioned manual, this work enabled the drafting of a National Strategy for wolf conservation. Although some measures were implemented, the overall strategy has unfortunately never been officially approved.

A failing of the project was that it was unable to tackle the hostile attitude of local communities to the wolf. This was largely because of the negativity surrounding two-year delays in compensation payments to farmers affected by wolf attacks. The relationship between local people and the nature conservation authorities remained extremely confrontational as a result.

Talking to farmers

The 2004 Italian-led LIFE project, 'COEX' (**LIFE04 NAT/IT/000144**), partly addressed this deficiency in public awareness work. The project had the wide aim of improving coexistence of large carnivores and agriculture in southern Europe. Part of this work consisted of more GIS mapping of wolves, public perception surveys, and studies into the damage caused by wolves and the most appropriate prevention measures.

The project hired people to talk directly with stockbreeders in Spain and Portugal to discuss damage prevention measures. It also demonstrated that fences and guard dogs were able to eliminate virtually all damage from wolf attacks. Although 'COEX' made some progress compared to the 1994 project in terms of improving perceptions, nevertheless, it struggled to reach the targeted 80% of farmers in affected areas.

An ongoing LIFE project, 'MED-WOLF' (**LIFE11 NAT/IT/000069**), is hoping to further increase awareness amongst livestock owners in Portugal of the best management techniques to avoid damage from wolves. The aim is to achieve a 20% reduction in damage to livestock in project areas.

Photo: LIFE11 NAT/IT/000069 - Joaquim Pedro Ferreira

Livestock-guarding dogs in the Iberian peninsula have been able to eliminate virtually all damage from wolf attacks

Despite having an Italian beneficiary, two of the main target areas of the project are the wolf populations in Portugal south of the River Duero. As well as working to reduce conflicts between wolves and humans, the project is also developing a standardised methodology and common criteria to improve cross-border monitoring and management of wolves with Spanish counterparts. These tools should be of particular long-term benefit to the north-west Iberian wolf population.

Conclusions

The common theme running through the LIFE projects operating in the north-west Iberian population area so far is the belief that wolves need not pose a significant threat to farmers. However, this remains a difficult message to convey effectively to local communities. This is likely to remain a significant challenge for as long as the wolf continues to appear in newspaper reports in the context of attacks on livestock.

Nevertheless, LIFE projects have started to show that prevention measures can be both successful and feasible. They have also pointed the way to the cooperation that is needed, both within countries and across borders to successfully implement the conservation and buffering measures needed for the successful coexistence of humans and wolves in the north-west Iberian population area.

ALPINE

Return of wolf to French Alps **presents challenges**

In France, the return of the wolf to the Alps through natural recolonisation, after 60 years absence, hasn't been easily accepted by public opinion – and many farmers remain opposed – despite significant efforts by LIFE and others.

The first wolf in the French Alps was observed in 1992, in the Mercantour National Park in the south of France, along the French-Italian border. The wolf naturally recolonised this area from Italy after about 60 years of absence. Four years after this initial observation a first LIFE project (**LIFE96 NAT/F/003202**) was started. It aimed at ensuring the conservation of the recently installed population in Mercantour and finding ways to make its return and presence socially acceptable, in particular by addressing the economic consequences for farmers, shepherds and livestock breeders. At the start of this project, the French population was estimated to be some 12-17 wolves.

A second project, running from 1999 to 2004 (**LIFE99 NAT/F/006299**) followed up this work. It aimed to support the gradual colonisation of the wolf by improving and extending the activities of the first project over the whole French Alps. This project targeted eight départements located in the two regions of Provence-Alpes-Côte d'Azur and Rhône-Alpes. Towards the end of the first project and at the beginning of the second project (in 1999) the population was estimated to be around 25-30 wolves. Both projects were coordinated by the French Ministry of Ecology (MEDDE).

Local tensions

The return of the species after such a long absence, perhaps unsurprisingly, created tensions, mainly because of damage to livestock. But rumours also swiftly took hold – fuelled especially by regional and national media. At the time, people also believed that the wolf had been reintroduced by the French state – a myth that is still perpetuated today.

Farmers voiced very strong objections to the 1996 LIFE project, with farmers' organisations requesting it be stopped during 1998-99. Stockbreeders also were not well disposed to the presence or even return of the species. Very strong local objections were raised to the first LIFE project and opposition, though less intense, continued during the second project.

Photo: LIFE99 NAT/F/006299

The return of the species also demonstrated to farmers and stockbreeders that there was a need to better protect livestock and to compensate for any damage. Among several key actions, the first project targeted improvements in compensation procedures for farmers suffering from livestock damage in areas exposed to the wolf; and began trials for the increased protection and security of livestock (e.g. installing mobile and permanent enclosures and providing guard dogs).

Protection measures

A pastoral technician was also recruited by the first LIFE project. After an inventory of farming practices, he had daily contact with the farmers and shepherds in the areas where the wolves were present, which was a key factor of success, according to the project partners. He presented the protection measures available and helped the farmers fill out the forms to request financial aid. Several of these technicians were recruited for the second project.

Under the first project, 81 farmers benefitted from 69 small mobile enclosures for lambs, whilst 66 livestock guard dogs were provided to 51 farmers. Although the initial project publicised its conservation activities through a newsletter, information boards and expert seminars, these did little to improve the dialogue with the farmers, or to win around a largely sceptical public.

Thus, communication activities were stepped up during the second project with a 'communication officer' joining the LIFE team to implement several new measures, such as organising information meetings for a wide range of target audiences (shepherds, agricultural students, local politicians etc), issuing press releases, articles, leaflets, posters and two project videos. These more concerted actions did help lessen slightly the negative reaction of the local community, as did a more extensive programme of installing enclosures and providing guard dogs (761 mobile enclosures and 37 permanent ones were installed and 205 guard dogs provided to farmers). A technician was also employed during the second LIFE project to help with the care and monitoring of the dogs.

Conservation goals

Despite the difficulties encountered, both projects were considered successful in meeting their main conservation goals, i.e., knowledge of the species was considerably improved, concrete protective actions were implemented, and two of the main threats to the species - poaching and poisoning - were reduced.

Photo: LIFE06 NAT/F/000143 – LARREY Frédéric, ROGER Thomas

A total of 66 livestock-guarding dogs were donated to farmers in the Alps

However, the two French projects were less successful in reducing local opposition and coexistence conflicts.

In order to verify the projects' long-term impacts, a follow-up report was carried out in February 2013, by the Astrale GEIE external monitoring team. The report, based on interviews with local stakeholders, as well as some of the original LIFE team members, found that the projects had a "strong positive effect" on the conservation of the wolf and the compensation for its presence – mainly from the protection measures and payments.

The follow-up report notes that both projects succeeded in initiating activities and had a true starter effect: Their strong impact is still visible today, as is the sustainability of the actions and results. The conservation of the species is now well integrated into national policies. Most activities continue along the same lines and the same administrations are still involved. Funding is secured through the Ministry of Environment and the Ministry of Agriculture.

The report also highlights a "gradual change of behaviour" amongst livestock farmers and shepherds who in the end "objected less" to the projects' activities. In particular, the report notes that the opposition to the presence of the wolf decreased during the second project because of the significant communication work done.

ITALIAN PENINSULA

Stakeholders help safeguard the wolf in Italy

LIFE project assistance has highlighted how coordinated support, proactive compensation systems, and appropriate education schemes can collectively help improve the conservation status of wolf populations in Italy.

The wolf population in the Italian peninsula hit a historical low in the 1970s when only a few packs remained in central Italy around the Apennines. A recovery followed, which saw the species recolonise territories along the Apennine chain and into the Alps.

Several LIFE projects have been involved in helping to sustain this Italian expansion of Europe's wolf population.

One of the first projects to exclusively target the wolf population in the Italian peninsula was 'Lupo/Appennino Reggiano' (**LIFE96 NAT/IT/003115**) in the Appennino Reggiano Regional Park (Parco dell'Alto Appennino Reggiano). Project actions concentrated on the establishment of a system for monitoring wolf packs and their prey. The national park also implemented damage prevention measures, as well as a system for assessing damage events.

A dog-wolf hybrid captured by the 'IBRIWOLF' project

Photo: Ivan Norscia

Soon after came the 'LUPO ROMAGNA' initiative (**LIFE00 NAT/IT/007214**), which focused its support on establishing wolf conservation measures for 10 Natura 2000 sites in three of Emilia-Romagna's natural parks.

Another example is 'IBRIWOLF' (**LIFE10 NAT/IT/000265**), an ongoing project that is seeking to address conservation challenges affecting the genetic integrity of wolves caused by hybridisation with dogs. Such inter-breeding issues present a threat to the long-term survival of the wolf as a distinct species.

In addition to this genetic hazard, Italy's wolves remain at risk from persecution by humans. The 'COEX' project (**LIFE04 NAT/IT/000144**) launched its work programme in 2004 to address this coexistence challenge and follow-up actions through 'WOLFNET' (**LIFE08 NAT/IT/000325**) are currently building on the outcomes of the earlier LIFE project.

Both 'COEX' and 'WOLFNET' have channelled LIFE co-finance towards providing coordinated solutions that improve people's willingness to leave wolves alone and let them live normal lives in their natural habitats.

Coordinated conservation

Simone Angelucci is a staff veterinarian at the Majella National Park, the beneficiary and site of the 'WOLFNET' project. "Our wolf population in this area did not disappear and in fact it was wolves from here that helped to repopulate other parts of Italy," he points out. "The main challenges we face are more due to human factors, especially the gaps that exist in coordination of conservation support from key stakeholders."

It is important to note that whilst the wolf is strictly protected in Italy, it may be culled on the French side. Mr Angelucci is keen to emphasise that, "Coordination between different agencies and authorities in the Alps can help to improve prospects for wolves. Even if from a practical point of view this model has not been successful – with the French authorities asking for, and obtaining, a derogation to shoot some of the wolves – we are convinced that the collaboration amongst different institutions is the key to wolf protection."

To this end, the Majella National Park set out to apply similar collaborative models in the Apennines. "We are using support from the 'WOLFNET' project to create an inter-institutional network that promotes coordinated activities between various public authorities that are involved in managing wolf-related matters," explains Mr Angelucci.

"Conflict resolution sits at the heart of the network's objectives, and we are looking to the national Ministry for the Environment as a source of help to replicate our wolf management model in other Apennine regions," he continues.

The national park is convinced that its methods are transferable because, as Mr Angelucci highlights, "Our achievements are based on continuous contact and collaboration with all the stakeholders, as well as our ability to address the needs of both the wolves and people."

One of the lessons of the project has been that livestock owners who lose animals to wolf attacks are, contrary to expectation, "not so inclined to persecute wolves; farmers' are more interested in ensuring that they receive the compensation to which they are entitled after a wolf attack."

Effective compensation

This realisation led the LIFE project beneficiary to explore ways to improve the effectiveness of the existing compensation system, under which farmers were not easily able to prove that livestock damage was caused by wolves, rather than stray dogs or other reasons.

"We set up special procedures and standards for assessing damage to livestock," recalls Mr Angelucci. "New methodologies were introduced by the LIFE projects to help clarify the characteristics of typical wolf attacks on livestock, and a training course has rolled out these diagnostic techniques for other vets to use. Now the authorities and farmers here are in a much better position to verify if livestock loss is in fact due to wolf activity," he says.

The national park also joined forces with stakeholders to speed up the time it took to process compensation claims. "By working collaboratively through our inter-institutional network we managed to have a new regulation passed that requires compensation claims to be settled in around 60 days," notes Mr Angelucci.

An innovation of the project is that compensation can be paid in kind as well as in financial terms: "The farmers can receive replacement sheep from a high quality flock that the park authority purchased. This is important because farmers take pride in the quality and results of their breeding programmes, which have often been built up over many years. Financial compensation schemes cannot really take account of such losses but our innovation gives shepherds a guarantee that their investments will not be lost," says Mr Angelucci.

Farmers have confidence in the quality of the replacement stock and that makes a difference to conflict resolution. Antonio la Gatta is a local livestock breeder and he sees a big improvement in the compensation system following LIFE's intervention. Illustrating his point, Mr la Gatta recalls how, "In the past no compensation system was foreseen. I once had about 35 sheep killed by a wolf in a single episode and that was a large economic loss. Since the introduction of the park compensation schemes the situation has significantly improved for livestock breeders."

Antonio la Gatta, a livestock breeder in the Apennines

Photo: Simona Bacchereti

Photo: LIFE08 NAT/IT/000325

A farmer receiving replacement sheep from a high-quality flock to compensate for wolf damage

According to Mr la Gatta: "It is not the wolf that is the problem - we can live with these animals; the issue is that we should get refunded for our losses, and it is even better if we can have help to properly protect our animals. That is why projects such as 'WOLFNET' are vital, because they encourage collaboration and dialogue, which helps us to get protection and compensation for damages."

Preventive measures

Wolf deterrents form part of the LIFE project's conservation toolkit and Mr Angelucci agrees that preventing attacks is the ideal solution: "It is better to find ways of avoiding wolf attacks in the first place. So far we have helped 10 farms to install electric fences. These create more work for the farmers because they need to keep their animals inside the fences instead of letting them graze freely. However, the extra work is worth it because using electric fences to protect livestock severely reduces animal losses from wolf attacks."

The 'WOLFNET' project is also providing free veterinary advice to farmers about livestock welfare. Many more animals are lost to sickness than killed by wolves, and thus the LIFE project vets have been raising awareness about practical steps that can be taken to reduce risks of common livestock ailments. Vaccine and other medical treatment costs are also part financed through this educational method.

Behavioural changes

Education has also been applied elsewhere in the 'WOLFNET' project to good effect. Actions have been targeted at school children, with the goal of encouraging the next generation to properly understand the wolf's place in the Apennine environment.

Luisa Manola Tosques, a teacher at a primary school in Francavilla al Mare, has used many of the educational materials produced by the project (e.g. DVDs, posters and teaching packs). "I participated in the programme with a class of eight-year old children. They were able to chose their own ways to illustrate their ideas about wolves. Some children chose poetry and in other classes pupils used videos to think about wolves," she explains.

"At the beginning of the process I realised that ideas and knowledge about wolves among my students were very different. For example, one child might state that the wolf is bad and back up this impression by noting that during the winter wolves can come to the chicken coop and kill all the hens. Another child would counter saying it wasn't true because their grandmother told them that if you beat two stones and make a noise the wolf will get scared and run away. Some of the children seemed a bit confused by these contradictory messages. With the support of the LIFE project material, we have worked on putting the behaviour of this animal in the context of a biological lifecycle," says Ms Manola.

The teaching material also illustrated the social lives of wolves. Ms Manola believes that this helped the children identify with the large carnivore. "We even went to visit an animal reserve to try and see a wolf," she recalls. "The children were extremely silent and finally we managed to see one. This was great since, as well as seeing the animal in real life, the children saw straight away that the wolf was much more afraid of them than they were of it. So they were able to verify for themselves that wolves are scared of people."

Finally, says Ms Manola, she asked her pupils to write a fairy tale where the wolf is a good character, to counteract the powerful influence of typical stories about 'big bad wolves', such as Little Red Riding Hood. "I have worked with 30 kids now using these sorts of teaching methods and I can confirm that at the end of the experience their attitudes about wolves have changed for the better."

Teacher Luisa Manola Tosques has encouraged her pupils to properly understand the wolf's place in the Apennine environment

Photo: Simona Baccherett

DINARIC-BALKAN WOLF

Dinaric-Balkan projects address a range of **pressures on wolves**

The Dinaric mountains of south-eastern Europe house one of the continent's largest wolf populations. Here too, however, the species is under threat from coexistence conflicts.

Photo: LIFE08 NAT/SLO/000244

Karst Shepherd dog puppy protecting its flock

The Dinaric-Balkan wolf population covers a vast area that takes in the whole of the Dinaric mountain range, from Slovenia through Croatia, Bosnia-Herzegovina, western Serbia and Kosovo, Montenegro, FYR Macedonia, Albania, Greece and western and southern Bulgaria. Estimated to hold around 4 000 wolves, it is one of the largest populations of the species in Europe. Although the conservation status of the Dinaric-Balkan wolf population appears to be 'favourable', it is subject to pressures from human activities, particularly at the limits of its range in Slovenia and Greece.

The wolf became extinct in the Peloponnese region of Greece in the late 1930s and, according to official sources, it lost 30% of its former range in the country between 1980 and 2000. Much of this decline is linked to the fact that the species was legally considered to be a pest in Greece until 1991.

The wolf populations of Croatia and Slovenia have recovered significantly following active management started in the 1990s. The current population in Slovenia is estimated at 40-60 individuals, mainly located in the south of the country and in stable contact with a Croatian population of an estimated 200 individuals.

The wolf population appears to be more or less continuous throughout the Dinaric range, although for some countries available data are poor. Challenges facing the species in this area, and in particular in Slovenia, Greece and Croatia, centre on reconciling human activities, interests and fears with the needs of the wolf. People's attitudes to wolves vary greatly across the region, making it more difficult to manage the whole population in an integrated way. Moreover, certain interest groups that may come into conflict with wolves because of their

predation on wildlife and sheep, for example hunters and stockbreeders, have a greater influence on wolf population management decisions than the general community.

A number of LIFE projects in the region have taken steps to address these coexistence issues as part of their wolf conservation actions, including one in Slovenia, one in Greece and a third, funded by the former Third Countries LIFE programme strand, in Croatia. In addition a recently-started LIFE project includes some actions that will affect the Dinaric-Balkan wolf in south-west Bulgaria.

Preventing coexistence conflicts in Slovenia

The 'SloWolf' project (**LIFE08 NAT/SLO/000244**), which began in 2010 and runs until the end of 2013, aims to sustain the long-term conservation of the Slovenian wolf population, in particular by establishing tools and methods for avoiding potential human-wolf conflicts. Although Slovenia is home only to a small part of the Dinaric-Balkan wolf population, pressures on the species there are exemplary of wider threats to the region's wolves, including: Inadequate management of the wolf population because of insufficient knowledge about the population's conservation status; deficiencies in management of prey species (mainly red deer) because of a lack of game management, which, in some cases has led to negative reactions from hunters who have had to 'compete' with wolves for game species; growing human-wolf conflict following livestock attacks by wolves – this has resulted in demands for higher culling quotas and tensions with stockbreeders over the costs of compensation for the damage to their flocks and herds; negative public attitudes towards wolves (amplified by some media reporting); and some infectious and parasitic diseases transferred between domestic and feral dogs (scabies, viral diseases).

Wolf presence surveys are important to assess the conservation status of the species and potential "hot-spots" for human-wolf conflicts

Photo: LIFE08 NAT/SLO/000244

One of the first challenges facing the 'SloWolf' project team – led by the University of Ljubljana – was to implement science-based conservation actions, in particular, by establishing a thorough surveillance system for assessing the size and scope of the Slovenian wolf population by gathering data on: population size and reproductive success; habitat use and preying rate; health status; and the number and distribution of wolf packs and litters. Stakeholders, including hunters, wolf damage inspectors and volunteers, have played an important part in this monitoring effort, which has used a range of methods - collection of 700 non-invasive (i.e. "bloodless") genetic samples per year (saliva, droppings, urine); wolf presence surveys; and radio/satellite tracking of some individuals – to get a better idea about the conservation status and potential "hot-spots" of man-wolf conflicts.

"This is the first time we have a clear picture of the number, location and genetic history of Slovenia's wolves," explains Hubert Potočnik, who is responsible for managing the surveillance of the wolf population. "Now we know what to do and where to manage the wolf population properly," he adds.

Building consensus and trust

The results of the surveillance programme have fed into Slovenia's first wolf Management Action Plan, drawn up with the input of stakeholders via a series of (five) workshops to which all interested stakeholders, including sheep breeders, were invited.

Achieving consensus proved difficult as a result of strong and conflicting views about the presence of wolves held by different stakeholders, from farmers living near woods to NGOs dealing with animal protection, hunters, animal ecologists and the general public. Despite these challenges, the Management Action Plan included diverse views and was

approved by the Slovene authorities in February 2013.

The action plan identifies potential 'hot spots' for wolf-human conflict and recommends best practices for dealing with these. Since actions talk louder than words, the project team has demonstrated efficient protection of livestock to stockbreeders in the conflict 'hot spots', as well as providing a practical damage-inspection manual. One of the practical actions has seen 10 sheep and goat breeders provided with 170 cm high electric fences to keep the wolf at bay. Moreover, 12 guard dogs (Karst shepherd or Tornjak breed) have been given to farmers to help prevent attacks. The conflict 'hot spots' are now being intensively monitored to judge the effectiveness of the different preventive methods.

"This collaboration with farmers is crucial to preventing conflict," says acting project manager, Irena Bertoncelj. This is particularly the case as sheep numbers are increasing, leading to a widely-held (but incorrect) belief that Slovenia's wolf population is growing.

The project has experienced some setbacks in implementing preventive actions. "It has been hard to find interested farmers", says Irena Kavčič, who is leading the damage prevention aspect of 'SloWolf'. She attributes this lack of interest to: "The additional effort needed to place and move fences on difficult terrain, gather sheep during the night and train and look after the dogs. In addition, Slovenian compensation payments for wolf damage are very generous."

Involving farmers and local authorities is a crucial part of conflict prevention

Photo: LIFE08 NAT/SLO/000244

Photo: LIFE08 NAT/SLO/000244

Information board explaining about the presence of livestock-guarding dogs donated by the Slovenian project

Protection works

Results from the project to date have provided some useful lessons about the use of guard dogs: some of the dogs have posed problems and three of the 12 have had to be removed from their flocks - two male dogs because they killed newborn lambs, and one female dog for frequently leaving the flock unprotected.

The project team now appreciates that it is necessary to provide continuous support to the farmer and for the farmer to take firm control of the guard dog in the first year of its life. This latter is crucial for ensuring that the dog bonds fully with its flock and effectively protects the livestock from wolf attacks. The success of efforts to train young guard dogs is improved by the presence of an older, well-trained dog.

The Slovenian Agriculture Advisory Service is now incorporating these demonstration actions into an education programme for the promotion of the co-existence of wolves with agriculture. It can point to the fact that wolf attacks are almost non-existent where sheep and goat farmers use electric fences and have well-trained guard dogs.

The implementation of the protection measures amongst the farming community has also proven to be cost effective over the past two years. This is shown by a reduction in compensation payments for livestock attacks (EUR 100 000 less in 2011 and 2012 than in 2010). The figure for 2012 would be still lower but for the fact that some attacks resulted from incorrect use of the electric fences supplied to the farmers. This suggests a need for ongoing advice and training.

Working with hunters

Slovenia's wolves mainly feed on ungulates (primarily red and roe deer). These species are also quarry for hunters, which is a potential source of conflict. To avoid this, with the help of gamekeepers and hunters' associations, the project has drawn up detailed maps of local population densities of ungulates. It has also established recommendations for improving the management of deer populations, also taking into account the needs of wolves. These recommendations have been incorporated in the Slovenian Wolf Management Action Plan that was approved in February 2013.

The ungulate mapping process revealed that wolves tend to attack young and female deer. When set alongside the hunters' culling of the older males, wolf predation and hunting can be seen to effectively work together to keep the overall deer population in balance. "Hunters need the wolf and the wolf needs hunters," concludes Srečko Žerjav, Director of the Hunters' Association of Slovenia.

Long-term impact from LIFE in Greece

The 'Canis lupus' project (**LIFE97 NAT/GR/004249**) addressed the problem of wolf conservation in Central Greece in an integrated way. Although it ended more than 11 years ago, even today the project's impact is evident, and it is widely recognised as a milestone in wolf conservation in Greece. The project led to greater understanding of the country's wolf population, and the behaviour and ecology of the species.

One of the most important aspects of the project was the establishment of a wolf sanctuary and educational centre in the village of Agrapidia, which receives some 40 000 visitors per year, contributing greatly to raised public awareness of wolf conservation issues. LIFE '*Canis lupus*' also positively influenced the national compensation system for livestock losses caused by wolf attacks and contributed to better prevention by establishing the extensive use of Greek shepherd dogs by stockbreeders, supported by a dog-breeding centre that, like the sanctuary and education centre, is still in operation and still attracting attention from sheep and goat farmers, as well as the wider public. Some 50-60 dogs are provided to shepherds by the centre each year.

Since the project, the compensation system has been extended to cover the loss of smaller livestock (payments of up to 90% of the animal's value following inspection by qualified veterinarians).

Photo: LIFE97 NAT/GR/004249

An illegally captured wolf now recovering at the wolf sanctuary and educational centre in the village of Agrapidia

Surveys suggest that the Greek public's perceptions of the wolf have changed from negative to neutral mainly because of the 'Canis lupus' project. This shift is very helpful not only for the beneficiary (ARCTUROS) and other environmental NGOs (such as CALLISTO) that specialise in wolf conservation, but also for the policy-making authorities when it comes to developing new plans and measures that require social acceptance.

More wolf conservation work is needed in Greece, however - no population goals have been officially established so far and a Wolf National Management Plan tender - developed by the scientific team behind the 'Canis lupus' project - is under consideration from the Ministry for the Environment, Energy and Climate Change for implementation in 2014.

Croatian efforts

The main achievement of the project 'Conservation and management of Wolves in Croatia' (**LIFE02 TCY/CRO/014**) was to draw the attention of public authorities nationwide to the conservation of large carnivores in general and the wolf in particular. At the time of the project, Croatia was not an EU member and there was no mandatory compliance with the requirements of the Habitats Directive.

Thus, one of the outcomes of the project was to prepare the foundations for the country's accession to the EU (on 1st of July, 2013). Indeed, the data collected by the project team were used to identify the candidate Natura 2000 sites for wolf protection for proposal to the European Commission. Furthermore, as the wolf is listed in Annex 2 of the Bern Convention (strictly protected), the Croatian LIFE project was highly relevant for the Convention.

Project actions included the development of management plans and systems, species monitoring, innovative approaches to conflict mitigation, capacity-building and training of experts and the establishment of a compensation system for farmers losing livestock to wolf attacks.

These measures were crucial at the time and results are still visible today. For instance, the management plans for large carnivores developed by the project fed into later action plans and provided a framework for the implementation of concrete conservation and mitigation measures. An updated management plan for 2010-2015 was published after the project ended and informs current wolf conservation activities in Croatia.

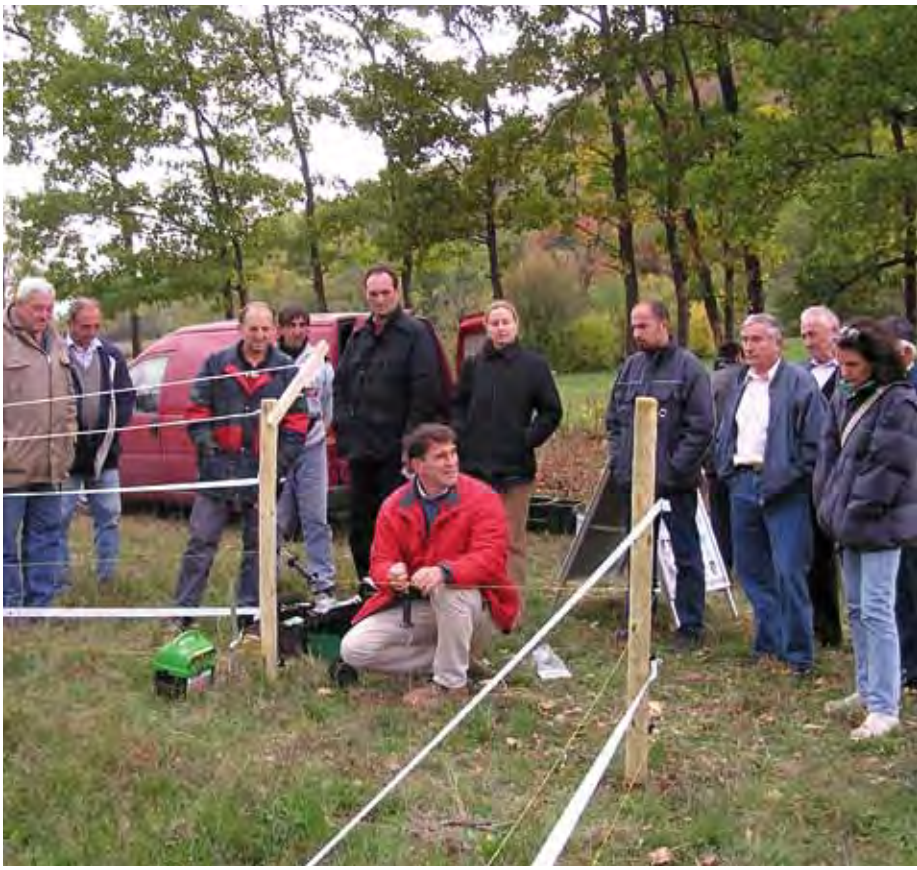


Photo: LIFE02 TCY/CRO/014

Demonstrating to stock-breeders in Croatia how to erect electric fences and check they are working

Avoiding poison use in Bulgaria

The main objective of the recently-started 'LIFE for KRESNA GORGE' project (**LIFE11 NAT/BG/000363**) is to restore the populations of birds of prey and other emblematic species in south-west Bulgaria by reducing the impact of direct persecution and other indirect threats. The project also plans to undertake specific actions aimed at preventing conflicts between wolf and human activities in the Kresna Gorge area. Indeed, it has already set up a Compensation and Prevention Programme that is becoming well-known in the project area. The programme will compensate farmers who lose livestock to wolf attacks with replacement sheep or goats, rather than financial compensation, a first for Bulgaria. In March 2013, six farmers in the villages of Polena and Gorna Breznitsa in Kresna Gorge were compensated in this way for the loss of six goats and three sheep.

The prevention part of the programme involves providing stockbreeders with guard dogs to keep wolves at bay. It is hoped that together, the compensation and prevention measures being implemented by this LIFE project will reduce the incidence of human/predator conflict and the use of poison to control wolves and other species.

CARPATHIAN

Living with wolves in the Carpathians

LIFE projects have instigated a wide range of measures to ensure the survival of Europe's largest grey wolf population.

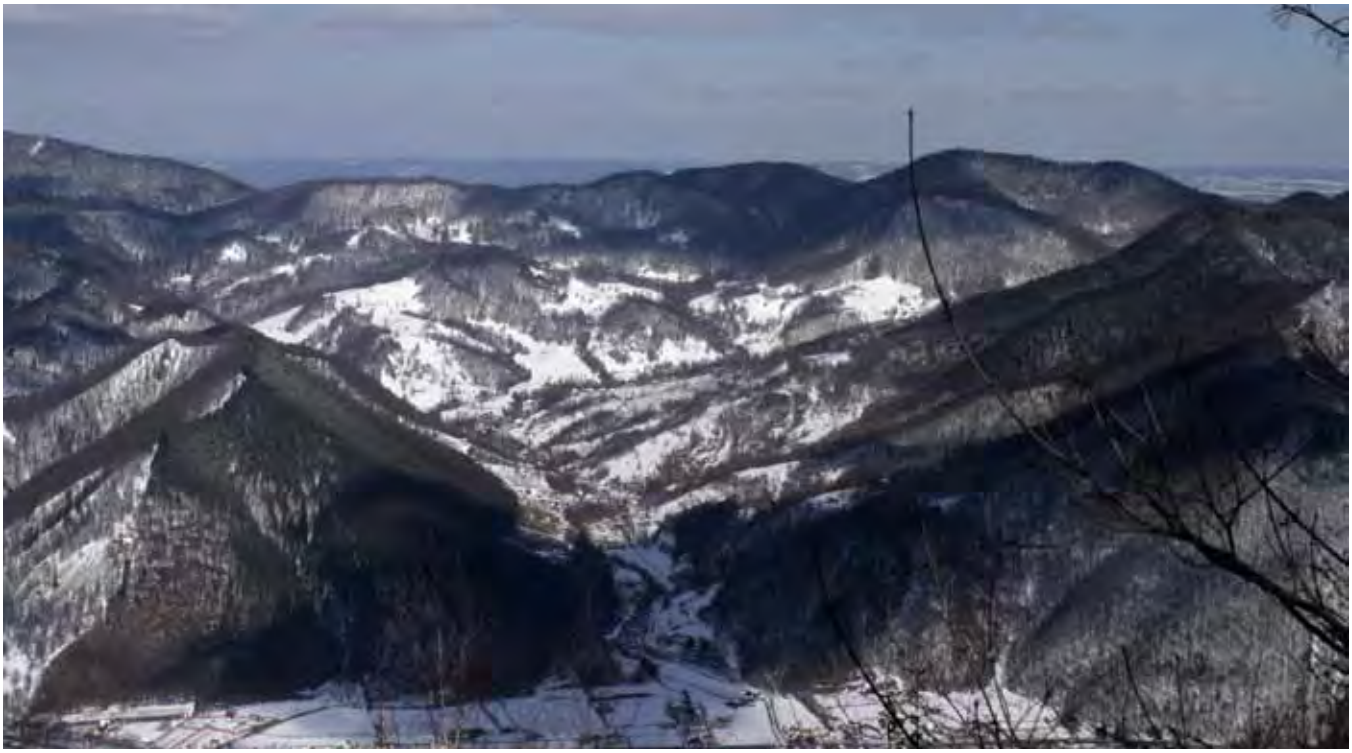


Photo: LIFE02 NAT/RO/008576

The Carpathian Mountains are home to the EU's second largest population of the wolf. Although numbering some 3 000 individuals, this population faces threats from poaching and habitat fragmentation. With human activity increasing in the region, conservation priorities include getting accurate information on the wolf population, implementing measures to reduce wolf-human conflict, and improving the image of the wolf.

A basis for long-term conservation in Hungary

In Hungary, wolves are restricted to forested areas in the north of the country. Since the late 1990s, forestry has dramatically increased following land privatisation and tourism is booming; though illegal hunting remains the biggest threat to the wolf. The LIFE 'Large Carnivore' project (**LIFE00 NAT/H/007162**) was the first systematic attempt to quantify the Hungarian wolf population. A key outcome was the drawing up of a species conservation action plan, which was approved by the Minister of the Environment in 2004. This strengthened legal protection for wolves and increased the penalties for killing them. A system for awarding compensation for damage caused by wolves in Hungary was also established.

Information gathered during the project contributed to the designation of Natura 2000 sites in northern Hungary, whilst a monitoring scheme initiated with LIFE funding, continues to assess changes in wolf numbers and distribution. The most recent

data suggest there are only a few individuals present in Hungary; a small pack in the Aggtelek area. This knowledge has allowed the project beneficiary, St Stephen University, to conduct the first scientific study of breeding wolves in Hungary. Another project output was a documentary film, 'Wolf on the edge', which has helped to raise awareness of threats to the species in Hungary.

Protecting livestock to protect wolves in Romania

Up to 2 700 wolves live in Romania, representing around 30% of the total European population. They live mainly in the Carpathian Mountains, where a surge in logging, farming and tourism has brought wolves into increasing contact with humans. Although deer, rodents and other wild animals form the basis of their diet, sheep have increasingly been taken by wolves. A demonstration area was established in Bârseşti during the LIFE project 'In situ conservation of large carnivores in Vrancea County' (**LIFE02 NAT/RO/008576**). This highlighted cost-effective measures, especially the use of electric fences, to protect livestock from wolves and other large carnivores (bears and lynx).

A follow-up project, 'Carnivores Vrancea II' (**LIFE05 NAT/RO/000170**) helped to incorporate eight national parks into the Natura 2000 network. A monitoring system was put in place to estimate numbers of large carnivores, whilst a team of experts worked alongside farmers to implement measures to protect flocks. A scheme to compensate farmers for losses caused by wolves and other large carnivores was also established. Awareness-raising activities initiated under the LIFE projects are proving successful in Romania, where wolves are increasingly seen as an asset to the expanding eco-tourism industry.

LIFE Nature projects in Romania and Hungary have thus promoted measures to reduce wolf-human conflict and illegal poaching, whilst public involvement has been crucial in realising conservation objectives and giving wolves a more positive image. These are important steps on the way to ensuring the long-term coexistence of wolves and humans in the Carpathians.

Photo: LIFE05 NAT/RO/000170

An illegal wolf trap recovered by the Romanian project team

Photo: LIFE05 NAT/RO/000170

LIFE helped establish an important wolf monitoring system in Romania, in part based around photographing the wolves' jaws and teeth (which, as with people, are a unique identifier)

LIFE PROJECTS IN EU BY LYNX POPULATION

ALPINE

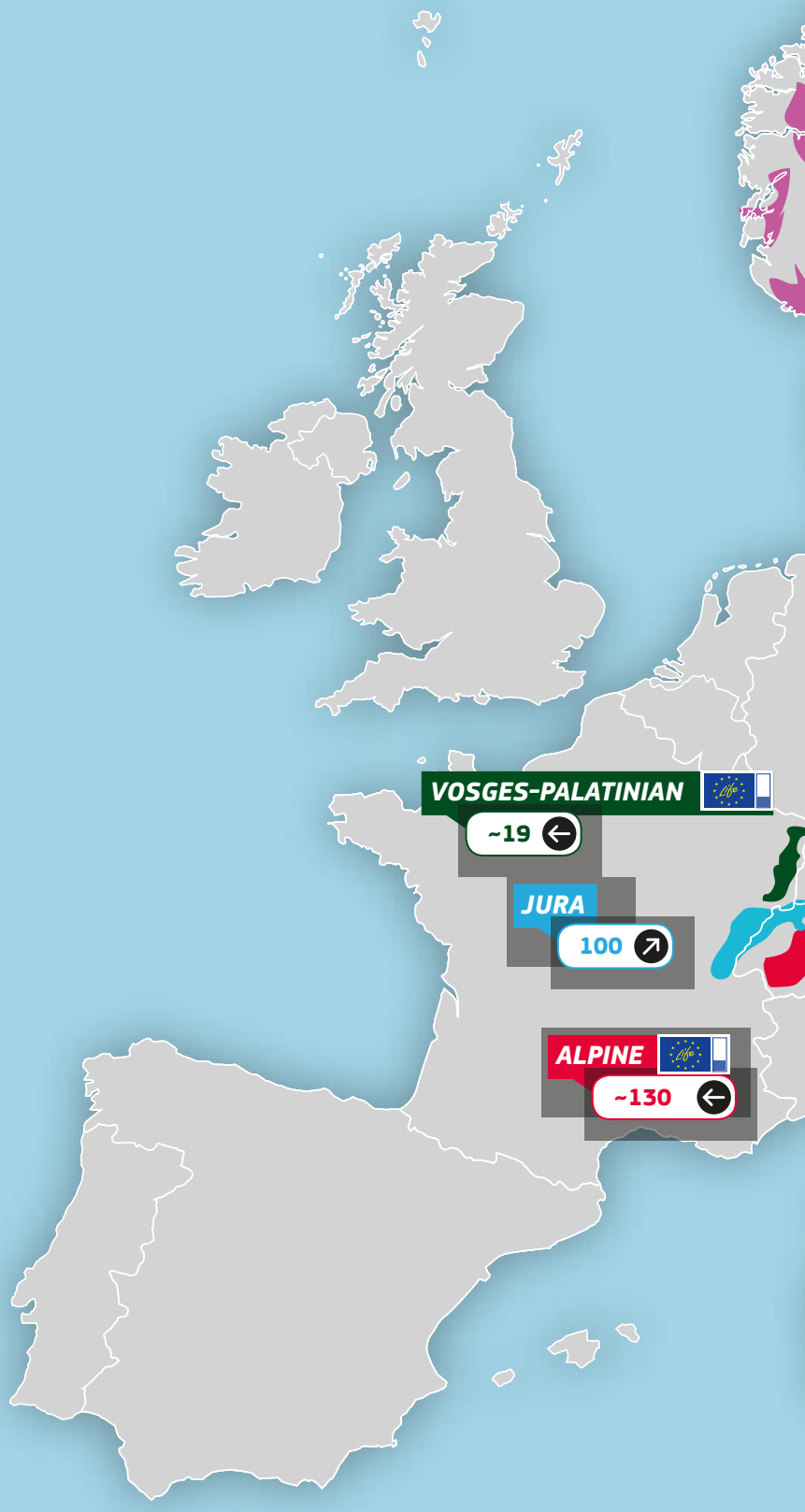
LIFE04 NAT/IT/000190
LIFE98 NAT/IT/005112
LIFE97 NAT/IT/004097

CARPATHIAN

LIFE00 NAT/H/007162
LIFE05 NAT/RO/000170
LIFE02 NAT/RO/008576
LIFE99 NAT/RO/006435

VOSGES-PALATINIAN

LIFE08 NAT/D/000012



LIFE PROJECTS' IMPACT ON POPULATION TREND

- Relevant
- Partially relevant
- Non relevant

No logo > No LIFE projects

POPULATION TREND

- Strong increasing
- Increasing
- Stable
- Decreasing

Source: Petra Kaczensky, Guillaume Chapron, Manuela von Arx, Djuro Huber, Henrik Andrén, and John Linnell (Editors) (2013). Status, management and distribution of large carnivores – bear, lynx, wolf & wolverine – in Europe, and LIFE project database (1992-2011)

Data from Belarus, Ukraine and Russia are not shown.

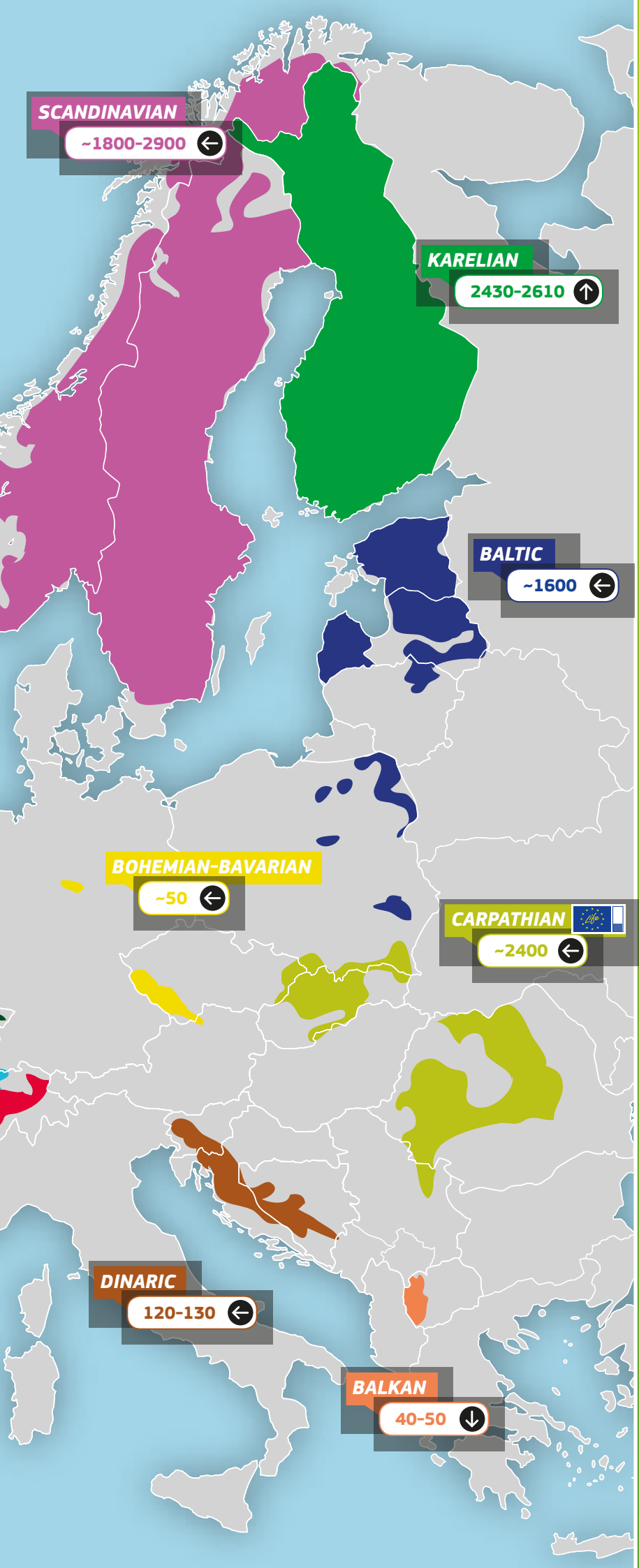


Photo: LIFE00 NAT/H/007162

EURASIAN LYNX

The Eurasian lynx is the largest of the four lynx species. It preys mainly on wild ungulates such as roe deer and chamois, as well as hares. It occurs at very low densities owing to the size of its home range – varying from 100 to 1 000 km^2 – and to the fact that animals of the same sex do not share the same territory. The Eurasian lynx measures around one metre in length and 60-65 cm in height.

Eurasian lynx are distributed in northern and eastern Europe (Scandinavian and the Baltic States) and along forested mountain ranges in south-eastern and central Europe (Carpathians, Balkans, Dinarics, Alps, Jura, Vosges). However, Eurasian lynx have been reintroduced to several areas where they became extinct in the past. All five central European populations - Dinaric, Alpine, Jura, Vosges-Palatinian and Bohemian-Bavarian - originate in reintroductions done in the 1970s and 80s. The latest estimate for the total number of lynx in Europe is 9 000 - 10 000 individuals, with the vast majority found in northern and eastern parts: Scandinavian (~1 800-2 300), Karelian (Finnish part ~2 500), Baltic (~1 600), Carpathian (~2 300). By contrast, the populations that originated with reintroductions are much smaller: Alpine 130-160, Bohemian-Bavarian ~50, Dinaric 120-130, Jura >100, Vosges-Palatinian ~19 lynxes.

Humans are still a major threat to the lynx, particularly to small populations, with low acceptance of its presence, especially by hunters in some areas, which results in persecution and illegal killing. These populations also can be jeopardised by the deterioration and fragmentation of their habitats and by casualties caused by collisions with traffic.

CARPATHIAN AND ALPINE

The elusive Eurasian lynx also hides from potential protectors

The Eurasian lynx is the large carnivore least likely to attack humans or livestock. LIFE projects have worked to improve monitoring of this elusive species and started to convince local stakeholders in mountainous areas that they have nothing to fear from this engendered feline.

Eurasian lynxes tend to live in forested areas, where they rarely come into contact with people. They are not known to attack humans unless threatened. They can potentially pose a threat to livestock - lynx are believed to be able to kill prey up to four-times their size. Nevertheless, they are only half as heavy as wolves and typically hunt alone, so commonly feed on small mammals (e.g. rabbits) and ground-nesting birds, in addition to larger prey.

The Eurasian lynx population in the Carpathian Mountains is an estimated 2 300-2 400 individuals, with over half the animals within this distribution area found in Romania.

LIFE and the Eurasian lynx in Romania

The perceived threat to human life and larger threat to livestock posed by wolves and bears has led to more attention being paid to these species than the Eurasian lynx, which has only been covered by LIFE projects addressing large carnivores more generally.

The 'Piatra Craiului 30/6/2004' project (**LIFE99 NAT/RO/006435**) developed broad actions targeting large carnivores. This included drafting an action plan for the Eurasian lynx in the Piatra Craiului National Park in the Carpathian Mountains of Romania. The plan, which identified important corridors that should be protected for use by the species, was agreed by local stakeholders.

The project also carried out monitoring to increase understanding of the numbers and range of the Eurasian lynx in the park. This information was used to create GIS maps of the population. In addition, support was given to livestock owners to take measures to protect their assets against all large carnivores, including, potentially, lynxes.

Motion-sensitive cameras capture a lynx feeding on a deer carcass in the Italian Alps

Photo: LIFE04 NAT/IT/000190

Vrancea County, also in Romania, is an important area for the Eurasian lynx given its low population and settlement density and suitable mountainous habitats. It is estimated to host some 4% of the total European population of the species. However, tensions between humans and large carnivores, including the lynx, can arise here also. This is because, despite the sparse distribution of both populations, human over-exploitation of habitats and animals has increased pressure on large carnivores to find suitable food and habitat.

Two connected LIFE projects offered increased protection to the Eurasian lynx in this area. The first, 'Vrancea 30/11/2005' (**LIFE02 NAT/RO/008576**), developed monitoring activities that contributed to a management plan for large carnivores, which included species-specific content for the lynx. The project produced ma-

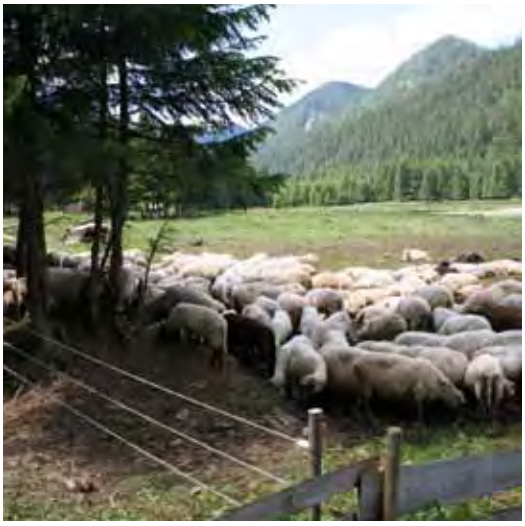


Photo: LIFE05 NAT/RO/000170

Protection measures – electric fences – implemented for bear and wolf are effective against lynx attacks as well

The Alpine lynx population

To date, three LIFE projects have targeted the Eurasian lynx population in the Alps. The Italian project, 'grandi carnivori' (**LIFE97 NAT/IT/004097**) implemented sylvicultural actions to increase the suitability of the habitat for lynx prey in the Dolomiti Bellunesi National Park and also contributed to a survey of lynx numbers in the Italian Alps.

Also in Italy, the 'Tarvisiano' project (**LIFE98 NAT/IT/005112**) developed and implemented a sustainable hunting plan with hunters' associations in the Tarvisio Forest Reserve. This included establishing patrols to control illegal killing of large carnivores in general.

A third project, 'Corpo Forestale' (**LIFE04 NAT/IT/000190**) included some monitoring actions that confirmed the stable presence of 2-3 lynxes in the Tarvisio area.

terial to help local people understand the behaviour of large carnivores, including the Eurasian lynx, and how to coexist with them. The beneficiary, however, struggled to capture lynx to implement planned radio-telemetry tracking.

A follow-on project – 'Carnivores Vrancea II' (**LIFE05 NAT/RO/000170**) – built stakeholder cooperation to protect carnivores, including the Eurasian lynx. It specifically created a network of eight Natura 2000 network sites, covering more than 40 000 ha, for large-carnivore protection. The project used information panels and direct cooperation with stakeholders to improve attitudes to carnivores, including the Eurasian lynx. It also created an Intervention Unit and Rehabilitation Centre to help large carnivores injured by poaching.

Lynx projects in Hungary

A Hungarian LIFE project from the year 2000 started from the position that little was known about the population of the Eurasian lynx in that country. It was not certain whether the species lived permanently in Hungarian territory or just passed through it. The 'Large Carnivores' project (**LIFE00 NAT/H/007162**) therefore started by making the important contribution of a GIS database recording Eurasian lynx distribution and habitat in Hungary.

The project confirmed that the lynx is limited to the northern mountains, with very few and sometimes unconfirmed sightings. To improve the rigour of the monitoring, the project trained field experts in fur identification methods and a multi-level monitoring system based on the different types of evidence available. The project also developed a system for assessing and compensating damage caused by lynx, which resulted in a government decree on compensation.

With the involvement and agreement of all relevant stakeholders, the project drew up a national species conservation action plan (SCAP) for the Eurasian lynx that was subsequently approved by the Minister of the Environment. This included an increase in the fine for killing a lynx from 250 000 to 500 000 HUF. Furthermore, a number of Natura 2000 sites were designated for lynx protection.

However, as in Romania, efforts to capture lynx to carry out tracking by radio-telemetry were unsuccessful. This was because of a combination of the scarce presence of the animal, its avoidance of humans and the illegality of some potential trapping methods.

Finally, an ongoing German project – 'Soonwald' (**LIFE08 NAT/D/000012**) – is set to launch a campaign for social acceptance of lynx and wildcat in the Vosges-Palatinian lynx population via a dedicated conference on this topic in the second half of 2013. However, there is no recent evidence of lynx presence in the project area.

Conclusions

The LIFE projects conducted so far have not been able to go so far as to improve the conservation status of reproductive populations of the Eurasian lynx in Europe. However, they have made some important progress in improving monitoring of the species, protecting important areas for the animal and increasing public awareness about the potential ease of successful coexistence.

COEXISTENCE OF LARGE CARNIVORES AND PEOPLE

Re-learning LIFE with large carnivores

Two ambitious and wide-reaching Italian-led LIFE Nature projects demonstrate ways that human activities can coexist in regions of Europe with the presence of bears and wolves. Key to this is working with all stakeholders.

In order to achieve and maintain a good conservation status of large carnivores, the prevention of conflicts between humans and these species is of paramount importance. All the LIFE projects mentioned in this brochure have managed to implement measures to prevent damage to livestock and livelihoods and established conservation action plans for these species. However, it has been more difficult to secure the involvement of all stakeholders, from farmers to national authorities, in a more participative approach to management, whilst negative attitudes towards large carnivores also persist in many areas where they are found.

Iberian wolf

Photo: Artur V. Oliveira

Two Italian-led projects have placed stakeholder involvement at the heart of their actions, in order to improve coexistence between large carnivores and humans. The first, 'COEX' (**LIFE04 NAT/IT/000144**), which was completed in 2008, successfully implemented a series of measures aimed at reducing conflicts in five Mediterranean countries (Croatia, France, Italy, Portugal and Spain). The main actions included the implementation of effective damage prevention methods, such as traditional and electric fences and use of livestock guarding dogs; the improvement of damage compensation and insurance systems; and monitoring to verify the effectiveness of these measures and how to adapt them to local conditions.

The project also developed a management plan and vaccination programme targeted at stray dogs, which often cause livestock damage that is attributed to protected large carnivore species. 'COEX' also carried out a wide-ranging information campaign aimed at the general public and rural communities, based on the results of surveys on public perceptions of large carnivores. One of the goals of the campaign was to, emphasise the potential economic benefit of conserving carnivores, for example for the eco-tourism sector.

Key results at the end of the project were a slight decrease in the amount of destruction to livestock, beehives and orchards from bears where prevention and protection techniques had been applied and, in cases where fencing systems and livestock-

Photo: LIFE07 NAT/IT/000502

Livestock-guarding dogs help keep this flock of sheep safe from wolf attacks

guarding dogs were introduced, a reduction of almost 100% in the damage to sheep from wolf attacks. Another key outcome was an improvement in attitudes towards and awareness of large carnivores, both amongst the general public and farmers in particular.

'EX-TRA' time

The second project, 'EX-TRA' (**LIFE07 NAT/IT/000502**) which is almost completed, aims to build upon the lessons learned and best practices developed by the earlier project, and to transfer them to new regions in Italy, Romania, Bulgaria and Greece.

Both projects have as a beneficiary, or partner, the Gran Sasso and Monti della Laga National Park (GSMLNP), which is one of Italy's most important national parks, responsible for the management of some 144 000 ha of largely mountainous terrain.

Pina Leone, the internal coordinator of LIFE 'EX-TRA' within the GSMLNP, is responsible, amongst other things, for all the actions involving local stakeholders. She explains how the 'EX-TRA' project is building on the approach already established by 'COEX' in the mitigation of conflicts between shepherds, livestock owners and farmers: "Our aim with 'EX-TRA' is to transfer the best-practices and lessons learned from 'COEX' into new areas and also to set-up a series of innovative measures for ensuring better coexistence between people and large carnivores," says Ms Leone. "The project is also carrying out a wide range of dissemination, networking and awareness-raising actions. We want to prevent conflicts arising and achieve the ultimate objective of improving the conservation status of the targeted large carnivores," she explains.

Carnivore 'pretext'

As a preparatory action, a study was carried out to better understand the attitudes and working practices of stakeholders. This showed very clearly that "large carnivores are not the real problem", but have become a pretext, says Ms Leone. She points out that people are not prejudiced against the animals, but that their attitude and behaviour is often influenced by wrong information. For example, the

park authority is often asked why it has released wolves into the protected areas it manages (which of course, it hasn't). Most of all, she says, the study showed there was high dissatisfaction with the park authority, which is blamed for example, for not paying compensation, or for late payments: "The wolf is often a scapegoat for frustrations against the institutions," she notes.

To combat these problems, the 'EX-TRA' team has established various mitigation measures and has also begun to build a relationship of trust and co-operation with stakeholders. To this end, several information meetings have been organised to discuss specific conservation issues with relevant parties. Even though, at the beginning, some of the farmers were "very suspicious", she says there is now "growing interest and participation".

One example she cites is of an elderly farmer who used to regularly demonstrate against the presence of the wolf, employing tactics such as taking a calf killed by a wolf to the local newspaper offices, and persuading other farmers to carry out similar actions. However, since the start of the information meetings, Ms Leone says he has become a regular attendee and, as a result, tensions have "definitely decreased".

Preventive measures and calf attacks

Another of the measures introduced by the GSML-NP has been the donation of electric fencing to farmers to help them to secure their livestock. Where relevant, the project has also provided a pair of guarding dogs for the protection of animals, with the understanding that in return, the recipients will provide the new generation of puppies to other eligible farmers, free of charge. The dogs used are the same Abruzzo sheepdog breed favoured by the 'COEX' project, as they are

Electric fences were – alongside livestock-guarding dogs - one of the two effective deterrents introduced in eight countries by the LIFE 'COEX' and 'EX-TRA' projects

Photo: LIFE07 NAT/IT/000502

specially selected (genetically) and trained to protect sheep and goats.

Concerning cows, or rather attacks on their calves, by wolves, Ms Leone admits these animals are more problematic to protect, as they are reared differently – free to graze all year-round, not watched constantly, and generally not brought down to the plains during the winter months, which results in a great exposure to predation by wolves. A new Italian project, 'LIFE PRATERIE' (**LIFE11 NAT/IT/000234**), led by the same beneficiary, is currently addressing this livestock management issue.

Meanwhile, the 'EX-TRA' project team is working closely with Italian dog breeders and groups, to develop a network of dogs for the farmers. It is also monitoring the effectiveness of the donated dogs and electric fences, by comparing data from the farms with these 'tools' to those without: Results show clearly that by employing these measures, there is an "important decrease" in damage from the carnivores, says Ms Leone. She adds that this is good news for the park authority, which doesn't need to pay compensation, and for the livestock farmers who don't suffer from the destruction.

A wolf awareness leaflet

Another important issue, first addressed by the 'COEX' project, and now being followed up by 'EX-TRA', has been the monitoring and verification of the damage attributed to large carnivores. For this, the project uses software developed jointly with the nearby Majella National Park. Veterinary doctors have also been trained to correctly assess claims of damage from wolves and bears. "We have already discovered many fraudulent claims", says Ms Leone, explaining that many deaths were found to be caused by disease rather than wolf attacks. To help in this process, the project has also produced a best practices manual.

LIFE experiences: Giulio Petronio, farmer

"I own 1 200 sheep and 70 cows. In my opinion, the first defence against a wolf attack is a good pack of dogs: if the animals are well trained the wolf is not a problem. In the past I have had 54 animals killed in one night. Now I have about 20 dogs, and no longer have any problems.

There was an occasion when all my animals were grazing freely in a field, but protected by the dogs. Close by there were 25 sheep belonging to a neighbour. They were in a poorly maintained, but fenced enclosure. A wolf appeared: he found a weak point in the fence and went in and killed all the sheep. None of mine was attacked, which shows how important it is to have dogs and also fences that are correctly installed and maintained.

I believe that the 'EX-TRA' project is extremely important and I try to pass on the good habits I have learnt to others. Projects such as 'EX-TRA' bring people closer to the institutions, encouraging a process of collaboration and exchange. And in an atmosphere of dialogue and respect, people become more positive and willing to help. Another good result of 'EX-TRA' is the acceleration of procedures to compensate for any damages, because if people lose their animals and are not reimbursed, they can become very angry and may decide to kill a wolf...This is no longer happening here, which means things are working."


Photo: Simona Bacchereti

Giuliano di Gaetano, Coordinator of the park's education centre

"Our engagement in an educational activity with children on the theme of large carnivores started with 'COEX'. For 'EX-TRA', brochures and posters about wolves and bears, and a school education kit produced in the frame of the first project, were translated and adapted to the local needs of the new target areas. We have developed a didactic path on the wolf, 'The wolf teaches', and we have targeted children up to the age of 13 coming from schools in L'Aquila city and in the national park area. We see that children from urban areas often have an idea of the wolf that is very influenced by fairy tales, whilst those that live in more rural areas, more in contact with nature, have a more realistic view, and even may have come into contact with the animals. For example, one day a child came to the centre with a photograph of a wolf, which he had taken with his father, close to where they live. In general, children are very interested in our [large carnivore] educational theme: they are enthusiastic and participative. This is very encouraging, because it also helps with the acceptance of the work of the park."

Photo: Simona Bacchereti

Stakeholder involvement

The ideal, notes Ms Leone, is to implement such best practices, whilst at the same time involving stakeholders: "This is the key to the resolution of conflicts." Whereas with 'COEX' there was only limited stakeholder participation (i.e. a questionnaire at the start of the project), the follow-on project has focused strongly on participative management, involving stakeholders in actions and decisions whenever possible.

The result is a change in people's attitude towards the park authority: "Now if there is a problem they come here and complain, rather than talking their grievances to a newspaper or going to a lawyer... With patient and continuous work, we have established a relationship of trust and respect with the people living in the territory and we are now reaping the rewards," says Ms Leone.

She concludes that: "There can be no conservation without the active involvement of all stakeholders. It is not possible to protect nature just by imposing rules: it if fundamental that all actors concerned sit at the same table and talk to each other. This is the real challenge and key point in nature conservation and is especially true when it comes to such a sensitive issue as mankind's coexistence with large carnivores. And LIFE EX-TRA has accepted the challenge..."

Stakeholder buy-in is essential to the success of measures to avoid coexistence conflicts

Photo: LIFE04 NAT/IT/000144/Angiolini Sandro

POISONING

Putting tools in place **to tackle the threat of poisoning**

Several LIFE projects are taking actions to stop the illegal use of poisoned bait across Mediterranean countries. Methods range from raising awareness of the impacts of poisoning and alternatives to the practice, to giving rangers the ability to gather evidence that can be used in court against perpetrators.

Photo: LIFE08 NAT/E/000062/UNIVE TOLEDO

The 'VENENO NO' project has helped establish a specialist anti-poisoning unit, called 'UNIVE'

The use of poisoned baits represents a serious threat to large carnivores, such as the bear and wolf, as well as scavenger raptors, even in protected areas. This phenomenon is not only connected to the conflict between man and large carnivores. In some parts of Europe, competing hunters and truffle-collectors are using poisoned baits to kill each other's dogs, indirectly causing a problem for the bear and the wolf.

Poisonous substances are too easy to procure and their use is rarely punished. There is a lack of uniformity in the management of cases of poisoning, a lack of knowledge of the issue, even amongst NGOs, and a lack of political will to solve the problem. In Italy, for instance, there is no national law on the use of poison and a regulation (O.M. 18 December 2018) published in 2008 will expire in 2014.

An antidote to indifference

'ANTIDOTO' (**LIFE07 NAT/IT/000436**) is an Italian-led LIFE project that aims to effectively preserve wolves, bears and certain species of scavenger raptor in specific areas of Italy and Spain. The project started in January 2009 and will end in December 2013. The coordinating beneficiary, Ente Parco del Gran Sasso e dei monti della Laga, has worked in partnership with regional authorities in Aragon and Andalusia to pursue an integrated strategy based on reducing the risk of poisoning, mitigating conflict between large carnivores and farmers and restocking key species in target areas.

A key element of the project has been the establishment of three 'anti-poison units' – two in the Gran Sasso Park and one in Aragon – employing a methodology for preventing poisoning incidents that has been successfully implemented in Andalusia since 2004: the use of small packs of dogs trained to detect poisoned bait. The regional government of Andalusia supplied the dogs and specialist training to its LIFE project partners and the packs are now being used to carry out field inspections on a routine basis, as well as specific investigations upon request; detecting the presence of poisoned bait on a number of occasions, as well as finding animals killed by poison.

In order to build on these initial successes, the beneficiary has begun a cooperation with the Italian Truffle Association to enable more packs of poison-detecting dogs to be trained in future.

Another element of the project has focused on improving specialists' ability to identify poisons and increasing awareness amongst stakeholders and the general public of their harmful effects. As an example of the former, the beneficiary has set up a laboratory in Italy to identify poisons in common use; LIFE funds also enabled an Italian veterinary doctor to attend a training course in Zaragoza (Spain) to learn how to carry out diagnostics of poisoned animals.

Poison-detecting dog and handler at work

Photo: LIFE07 NAT/IT/000436 - GASBARRI Roberto

An ongoing awareness campaign seeks to awaken local people to the consequences of illegal poisoning; whilst at national level, the beneficiary is campaigning for public bodies, associations and institutions to fight the practice through the formation of more anti-poisoning dog packs and further training of rangers and other people in the frontline of the fight against poisoning. Such measures are amongst the proposals included in the beneficiary's newly-drafted 'strategy against poisoning in Italy', which also identifies a legislative solution: a national law against poisoning for the country.

Saying no to poison

As highlighted earlier, one of the main reasons why illegal poisoning continues to pose a threat to large carnivores is that cases rarely go to court and the seriousness of the crime is rarely reflected in the punishments handed down.

This is one of the issues being addressed by 'VENENO NO' ("no poison") (**LIFE08 NAT/E/000062**), a LIFE project led by SEO/BirdLife that aims to achieve a significant reduction in illegal poison use in Spain. As well as direct action against the illegal use of poisoned bait, the project is also seeking the adoption of action plans and protocols by the country's 17 Autonomous Communities; as well as running an awareness campaign to persuade wider society to see the wildlife poisoner as unacceptable.

Project coordinator David de la Bodega of SEO/BirdLIFE explains that progress to date (the project closes in March 2014) has been very good on all three fronts. For instance, he says, "Draft action plans and protocols have been developed in nine Autonomous Communities: Asturias, Baleares, Canarias, Cantabria, Catalunya, Galicia, La Rioja, Murcia and Valencia." In addition, "Since the project began, five Spanish regions have approved plans and protocols to combat the illegal use of poison – for us it is a good result."

One key plank of the strategy of direct action against poisoners has been the establishment of a team of specialist forest rangers patrolling Castilla-La Mancha. The six members of this unit (called 'UNIVE') are split into two three-person patrols (one based in Toledo and the other in Ciudad Real). They have been trained specifically to combat the problem of illegal poisoning. "This crime in Spain has a high level of impunity: it is very difficult to investigate and to know who are the guilty parties and how the crime was committed," explains Mr de la Bodega. The UNIVE patrols were established in May 2010 and, after an initial training period, have been active in the field since January 2011.

An important part of the training focused on the procedures necessary to investigate a poisoning incident and to take it to a criminal court (and win). "You have to be very methodical. It's important to prove your case...In the courses we really focus on the importance of not contaminating the evidence," says Mr de la Bodega. "That is really important to later have a successful prosecution."

Putting social pressure on poisoners

'Innovation against poisoning' (**LIFE09 NAT/ES/000533**) is a LIFE Biodiversity project running until September 2015 that aims to implement, monitor, assess and spread innovative and demonstrative actions that significantly improve current strategies for combating illegal poisoning in the EU. Led by Fundación Gypaetus, the project focuses on eight pilot areas in Spain, Portugal and Greece, covering more than 1 million hectares in total. This 'landscape-scale approach' is designed to provide very detailed comparative information about illegal poisoning and its impacts that can feed into a set of (four) technical guidelines on combatting the problem throughout Mediterranean countries.

The beneficiary is working closely with key stakeholder groups (stockbreeders, hunters and municipalities) to encourage the adoption of less harmful practices and to mobilise the effect of 'peer pressure' on the few individuals who carry out this illegal practice. In each pilot area, the project aims to secure the adherence of: 30 selected stockbreeders to the guidelines of the European Network of Stockbreeders against Illegal Poisoning (ENSAIP); 18 hunting zones to the guidelines of the European Network of Hunting Areas against Illegal Poisoning (ENHAIP); as well as all 89 municipalities within the pilot areas to the guidelines of the European Network of Municipalities against Illegal Poisoning (ENMAIP). The beneficiary expects an 80% decrease in poisoning cases related to stockbreeders in the pilot areas as a result of its strategy of engagement with this stakeholder group.

To assess the impact of these awareness-raising measures, a second key aspect of the project is the implementation of a common methodology for trapping, tagging and monitoring bio-indicator species as an illegal poisoning indicator. The methodology developed will give essential baseline data about which measures to fight the illegal use of poisoned baits are effective for which species, with the goal of informing and improving efforts across Europe to combat this serious threat to large carnivore conservation.

The UNIVE patrols have also been helping to give specialised training in evidence gathering to the forest rangers of six Autonomous Communities.

Since the LIFE project began, reported cases of poisoning have increased which, paradoxically, is a "really good result", explains Mr de la Bodega. "When you investigate poisoning you have more cases - if you are not investigating the cases of poisoning you don't have a visible problem."

The number of (successful) prosecutions has also increased thanks to 'VENENO NO'. "We have initiated 22 criminal prosecutions for illegal use of poison and four guilty judgements have been returned – the rest of the cases are still ongoing," says the project manager.

However, as Mr de la Bodega points out, "Environmental crimes are not really considered major crimes [in Spain]; the use of poison is a crime but the consequences are not very severe." Despite the softness of typical sentences, SEO/BirdLife believes such prosecutions have an important deterrent effect, demonstrating to people who might set poisoned bait that they cannot do so with impunity. "You have the opportunity to publicise the case and to spread the news; it has an impact on a village or a region - people will be aware that there is a punishment," he says.

Photo: Justin Toland

David de la Bodega: "The fight against poison is highly demanding and success is never final, but temporary"

'VENENO NO' also focused on the effects of poison on raptors

Photo: Justin Toland

Too easy access

As part of the LIFE project, Mr de la Bodega has authored a study on the use of substances in poison baits. "We asked the Autonomous Communities to give us the information on the poisoning episodes from 2005-2010. We have detected 70 substances. The majority of these substances are plant protection products and biocides. Fifty percent of the poisoned bait is made with aldicarb, an insecticide that was banned in 2007," he reveals.

"The study shows the need to strengthen controls on the marketing and use of plant protection products and biocides and to improve the legislation in this regard," believes Mr de la Bodega. "We hope that a new EU Directive on Sustainable Use of Pesticides and its implementation in Spain will change the access to these products."

However, bi-lateral action is also needed because, as SEO's study demonstrates, "It is very easy to buy products that are banned on the Internet. For instance, you can buy aldicarb that is forbidden in Europe from China or Argentina where it is not banned," highlights Mr de la Bodega. The project beneficiary has made a complaint to the Office of the Environmental Prosecutor in Spain about the online sale of substances whose use and trade are prohibited.

Alternative awareness

The project has also launched a national educational campaign targeting those involved in illegal poison use, achieving more than 600 media impacts in 2012. As well as setting up a website - www.venenono.org – and a network of volunteers against wildlife poisoning, 'VENENO NO' has created a 'poison hotline', giving whistleblowers a means of alerting the authorities when poison is used illegally.

One of the project's successes has been to demonstrate to stockbreeders that there are viable alternatives to poison. Trials with farmers in the Canary Islands showed that surveillance and sheepdogs helped to reduce attacks on sheep by feral dogs and birds of prey. "These results could serve as a reference for other farmers in the rest of the country," believes Mr de la Bodega.

In conclusion, he says that the project team is, "Very happy with the main results - we are putting good pressure on administrations and poison is now a conservation priority; we are achieving the awareness and dissemination of information; and we are achieving a real social awareness of the problem and the consequences of using poison." However, he continues, "There are no grounds for complacency and letting our guard down. The fight against poison is highly demanding and success is never final, but temporary. Only failure is permanent and, thus, all that has been achieved through many years of struggle against poison can vanish in a blink of the eye."

Photo: LIFE09 NAT/GR/000333/Callisto

Poison pellets recovered by the Greek 'ARCTOS/KASTORIA' project team

To avoid this happening will require a sustained, long-term effort, investment and regularly updated approaches.

Now, entering the final year of the project, the beneficiary is making great efforts to disseminate the project results internationally, "For example in the framework of the Convention on Migratory Species or at EU level working with BirdLife International," says Mr de la Bodega.

Photo: LIFE08 NAT/E/000062/UNIVE TOLEDO

The UNIVE patrols have been active in Castilla-La Mancha since January 2011

CONCLUSIONS

Time for LIFE **to move from the local to the population level**

The LIFE programme has had a valuable – in some cases essential – impact on large carnivore conservation at the local level. To address a range of challenges and have an even-greater impact, projects need to coordinate efforts across borders and at the population level.

There is no doubt that the LIFE programme has made a significant contribution to the conservation of large carnivores in Europe. However, assessing the extent of its impact at population level is a difficult process. Nevertheless, it is possible to draw some conclusions.

In the cases of small populations of large carnivores that have had more than one project and are increasing in numbers, it is possible to make a link between an improved conservation status at population level and the role of LIFE. Examples include the Cantabrian brown bear population, whose numbers are increasing, in large part thanks to LIFE co-finance. LIFE has also enabled reintroductions that have prevented the certain extinction of the Alpine and Pyrenean brown bear populations.

Alongside these successes, the impact on conservation status of other actions targeting large carnivore populations has been less easy to gauge. The Apennine bear population provides a useful illustration of this. Despite being targeted by several LIFE projects since 1994, there is no evidence that numbers are increasing (even though cubs are being born each year, these new bears are offset by losses due to poaching or human-related accidents). On the other hand, without LIFE's support, it is almost certain that the status of the Apennine population would be even worse today. Assessing the impact at population level of the many LIFE projects targeting different EU wolf populations is also extremely difficult.

Best practices and challenges

So what conclusions can we draw from LIFE's efforts to date to conserve large carnivores? One thing that is clear is that the LIFE Nature strand of the LIFE programme has enabled project beneficiaries to implement concrete conservation actions that would otherwise have been impossible.

Furthermore, it is clear that best practices in large carnivore conservation have been replicated across the EU. An important lesson from LIFE is that there is no single best practice that can address all the large carnivore conservation challenges; instead, effective action requires multiple combinations of several practices. These include the articulation of damage and conflict prevention actions, loss compensation measures, targeted awareness campaigns and stakeholder involvement – practices that several projects have demonstrated as being the most effective ways of reducing coexistence conflicts between humans and large carnivores and, ultimately, improving species conservation status (see box).

One ongoing challenge is persuading communities to accept the presence of certain large carnivore populations – despite LIFE's best efforts, there are examples from several parts of Europe of low public acceptance of these species. The cases of the wolf in the French Alps, the bear in the Pyrenees and the near-extinct Austrian Alpine bear population, all illustrate the extent of the challenge, one that LIFE investment alone will be unable to solve.

Another challenge is to target the large carnivore species and populations which, until now, have been 'forgotten' by LIFE. For instance, as yet no LIFE project has targeted the wolverine (Gulo gulo), which is considered a priority species for conservation under the Habitats Directive, and is reported as having an "unfavourable-inadequate" conservation status in the Boreal biogeographical region. The same is true for the Baltic, Karelian and Scandinavian populations of wolf and bear, despite facing a number of threats locally, including a low level of social acceptance. Perhaps even more

'overlooked' is the Eurasian lynx (*Lynx lynx*) - probably a result of it not being listed as a priority species for conservation under the Habitats Directive.

Despite these caveats, it is important to stress that LIFE actions to raise awareness of conservation issues at local, regional and sometimes national level have been of great benefit to bears, wolves and lynx. The general public and, most significantly, public authorities and stakeholders that have a direct impact on large conservation are now more aware of these issues.

Moreover, LIFE has provided a platform for the forging of links between nature conservation actors and stakeholders (NGOs, hunters, farmers, scientific institutions and administrative bodies) at local, regional and national level. This cooperation and the high level of participation and involvement of different partners have been essential to the success of some project actions. By contrast, when these links have been absent, as in the case of the Pyrenean bear projects (see pp. 14-16), achieving conservation goals has proved more problematic.

Some of the large carnivore-related projects have also helped to identify sites for the Natura 2000 network, making it easier for Member States to implement the Habitats Directive (for instance, projects in Romania and Croatia).

Room for improvement

Lessons from the LIFE programme are applicable to all future initiatives for managing interactions between people and large carnivores, including projects financed from other sources and policy initiatives, as well as LIFE projects. One way in which the LIFE programme could make a greater contribution to large carnivore conservation is by targeting the wolverine, lynx and wolf and bear populations that have not yet been targeted by LIFE, focusing in particular on addressing growing conflicts between large carnivores and human activities.

As well as LIFE, Member States should draw on other EU programmes (e.g. structural and cohesion funds for infrastructure projects; the second pillar of the Common Agricultural Policy) to address and coordinate these large carnivore population management challenges. Thanks to LIFE, some Member States already make it possible for farmers to pay for specific damage-prevention measures, such as electric fences and livestock-guarding dogs, through Rural Development Programme funds.

What can I learn or use from past LIFE projects?

An impressive amount of testing and trial and error development has been done through LIFE projects. For certain actions, it is worth exploring the host of useful knowledge that could be transferable to similar situations. Here are a few examples:

- Passive protection - many types of passive protection systems (e.g. fences) have been tested and hundreds of them have been distributed to shepherds all over the EU. Compensation schemes have been started where in places where they did not exist; and where they did they have been made faster and more reliable. Indeed, several projects developed very interesting systems to identify and compensate for damage caused by large carnivores.
- Monitoring techniques – these have been improved and long-term monitoring schemes started with the support of LIFE are still operational.
- Livestock-guarding dogs – LIFE co-finance has enabled the reactivation of breeding and training of many 'local' breeds of livestock-guarding dogs; hundreds of such dogs have been given to stockbreeders, with very positive results.

This is just a short, non-exhaustive, list of actions that any new applicant should explore before putting together a LIFE proposal. The list of projects in the annex (pp.70-72) should help in identifying the contact references to learn more about the experiences and lessons learned from each project.

The Integrated Projects of the proposed new LIFE programme regulation also could offer an opportunity to draw on different sources of funding and involve stakeholders across a larger territorial scale, thereby coordinating mobilisation of relevant authorities, organisations and individuals across borders to implement conservation actions for large carnivores at the population level.

Another possible area of improvement is for LIFE projects to do more to share protocols and experiences of large carnivore management across Europe. Sharing of best practices and experiences for conflict prevention and stakeholder involvement, for instance by linking Romanian and French stockbreeders so they can exchange knowledge of prevention and large carnivore acceptance could be crucial for populations in areas where social acceptance is low – e.g. the Alpine wolf and Pyrenean brown bear populations.

Better coordination of conservation actions at population level and across borders – including with EU neighbours such as Russia, Switzerland etc. - would also be welcome from future projects. Management at population level is vital for the conservation of some large carnivore populations: the Alpine and Eastern Balkans bear populations, for instance, would benefit from the articulation of coordinated conservation actions and management plans across states.

Selected projects focusing on large carnivores habitats since 2002

The table below provides a list of the LIFE projects focusing on large carnivores mentioned on this publication since 1992. For more information on individual projects, visit the online database at: http://ec.europa.eu/environment/life/project/Projects/index.cfm

POPULATION	PROJECT	TITLE
BEAR (*Ursus arctos*)		
ALPINE	LIFE00 NAT/A/007055	Schütt-Dobratsch - Schütt-Dobratsch
	LIFE00 NAT/IT/007131	Ursus Brenta II - Project URSUS - protection of the of Brenta
	LIFE02 NAT/A/008519	Braunbaer - Conservation and management of the brown bear in Austria
	LIFE02 NAT/CP/IT/000046	Carnivori e zootecnia: strumenti per la prevenzione del danno
	LIFE03 NAT/CP/IT/000003	Brown Bear Coop - Principles for the establishment of an alpine brow bear metapopulation
	LIFE04 NAT/IT/000190	Corpo Forestale - Conservation actions in NATURA 2000 sites managed by the State Forest Service
	LIFE09 NAT/IT/000160	ARCTOS - Brown Bear Conservation: coordinated actions for the Alpine and the Apennines range (ARCTOS)
	LIFE92 NAT/IT/013100	First phase of the implementation of the Habitats Directive in Italy
	LIFE94 NAT/IT/000575	Second phase of a coordinated action plan in favourof the mammals in the Alps and the Apennines
	LIFE95 NAT/A/000399	Bear protection program for Austria
	LIFE95 NAT/IT/004802	First phase of a coordinated action plan in favour of the mammals in the Alps and the Appennines
	LIFE96 NAT/IT/003152	Ursus/Brenta - URSUS Project : Brenta brown bear conservation plan.
	LIFE97 NAT/IT/004097	grandi carnivori - Priority measures for the conservation of large carnivores in the Alps
	LIFE98 NAT/IT/005112	Tarvisiano - Integrated plan of action to protect two NATURA 2000 sites
APENNINE	LIFE02 NAT/CP/IT/000046	Carnivori e zootecnia: strumenti per la prevenzione del danno
	LIFE03 NAT/IT/000151	ORSO SIRENTE - Conservation of Brown bear in the sites of the Sirente-Velino Regional Park
	LIFE04 NAT/IT/000144	COEX - Improving coexistence of large carnivores and agriculture in S. Europe
	LIFE07 NAT/IT/000436	ANTIDOTO - A new strategy against the poisoning of large carnivores and scavengers raptors
	LIFE07 NAT/IT/000502	EX-TRA - Improving the conditions for large carnivore conservation - a transfer of best practices
	LIFE09 NAT/IT/000160	ARCTOS - Brown Bear Conservation: coordinated actions for the Alpine and the Apennines range (ARCTOS)
	LIFE92 NAT/IT/013100	First phase of the implementation of the Habitats Directive in Italy
	LIFE94 NAT/IT/001077	Second phase of a coordinated action plan in favour of the mammals in the Alps and the Apennines
	LIFE94 NAT/IT/001140	Gole rupestri - Habitat gole rupestri
	LIFE95 NAT/IT/004800	First phase of a coordinated action plan in favour of the mammals in the Alps and the Appennines
	LIFE97 NAT/IT/004115	Taxus e Ilex/Ursus arctos - Conservation actions for Apennines beech forest with Taxus and Ilex, and Ursus arctos marsicanus improvement
	LIFE97 NAT/IT/004141	Lupo/orso/Appenninici - Conservation of wolf and bear in the new parks of Central Apennines
	LIFE98 NAT/IT/005114	Sirente-Velino - Urgent actions for Bear in the SIC of the Sirente-Velino Regional Park
	LIFE99 NAT/IT/006244	Orso appennino - Brown bear (Ursus arctos) conservation in Central Apennines
CANTABRIAN	LIFE00 NAT/E/007352	Oso Cantabria - Conserving the Cantabrian brown Bear and combating poaching
	LIFE07 NAT/E/000735	Corredores oso - CORRIDORS FOR CANTABRIAN BROWN BEAR CONSERVATION
	LIFE08 NAT/E/000062	VENENO NO - Action to fight illegal poison use in the natural environment in Spain
	LIFE92 NAT/E/014502	Oso/Castilla León - First phase of a conservation programme for the brown bear and its habitats in the Cantabrian mountains - Castilla y León
	LIFE94 NAT/E/001458	Conservation programme for the the brown bear ands its habitat in the Cantabrian mountains - 2nd phase (Galicia)

POPULATION	PROJECT	TITLE
CANTABRIAN	LIFE94 NAT/E/004827	Action program for the conservation of the brown bear and its habitats in the Cantabrian mountains - 2nd phase (Asturias)
	LIFE94 NAT/E/004829	Action program for the conservation of the brown bear and its habitats in the Cantabrian mountains - 2nd phase (Castilla y Léon)
	LIFE95 NAT/E/001154	Action programme for the conservation of the brown bear and its habitat in the Cantabrian mountains - 3rd phase (Castilla y Leon)
	LIFE95 NAT/E/001155	Action programme for the conservation of the brown bear and its habitat in the Cantabrian mount mountains - 3rd phase (Castilla y Leon)
	LIFE95 NAT/E/001156	Action programme for the conservation of the brown bear and its habitat in the Cantabrian mount mountains - 3rd phase (Castilla y Leon)
	LIFE95 NAT/E/001158	Action programme for the conservation of the brown bear and its habitat in the Cantabrian mount mountains - 3rd phase (Castilla y Leon)
	LIFE98 NAT/E/005305	Oso en Asturias - Program for the conservation of the brown bear in Asturias
	LIFE98 NAT/E/005326	Oso/núcleos reproductores - Conservation of the cantabrian Brown bear breeding nucleus
	LIFE99 NAT/E/006352	Ancares project : co-ordinate management of two adjoining comunitarian sites of interest (LIC)
	LIFE99 NAT/E/006371	Ancares/Galicia - Ancares Project : co-ordinate management of two adjoining sites of community interest
CARPATHIAN	LIFE02 NAT/RO/008576	Vrancea 30/11/2005 - In situ conservation of large carnivore in Vrancea County
	LIFE05 NAT/RO/000170	Carnivores Vrancea II - Enhancing the protection system of large carnivores in Vrancea county
	LIFE07 NAT/IT/000502	EX-TRA - Improving the conditions for large carnivore conservation - a transfer of best practices
	LIFE08 NAT/RO/000500	URSUSLIFE - Best practices and demonstrative actions for conservation of Ursus arctos species in Eastern Carpathians, Romania
	LIFE99 NAT/RO/006435	Piatra Craiului 30/6/2004 - Enhancement of Piatra Craiului National Park
DINARIC-PINDOS	LIFE02 NAT/SLO/008585	Ursus Slovenia - Conservation of large Carnivores in Slovenia - Phase I (Ursus Arctos)
	LIFE04 NAT/IT/000144	COEX - Improving coexistence of large carnivores and agriculture in S. Europe
	LIFE07 NAT/GR/000291	PINDOS/GREVENA - Demonstration of Conservation Actions for Ursus artcos* and habitat type 9530* in Northern Pindos N.P., Grevena Prefecture, Greece
	LIFE07 NAT/IT/000502	EX-TRA - Improving the conditions for large carnivore conservation - a transfer of best practices
	LIFE09 NAT/GR/000333	ARCTOS/KASTORIA - Improving conditions of bear-human coexistence in Kastoria Prefecture, Greece - Transfer of best practices
	LIFE11 NAT/GR/001014	FOROPENFORESTS - Conservation of priority forests and forest openings in “Ethnikos Drymos Oitis” and “Oros Kallidromo” of Sterea Ellada
	LIFE93 NAT/GR/010800	Protection and Management of the Population and Habitats of Ursus arctos in Greece (first phase)
	LIFE96 NAT/GR/003222	Conservation of Ursus arctos and its habitats in Greece (2nd phase)
	LIFE99 NAT/GR/006498	Gramos and Rodopi - Implementation of Management Plans in Gramos and Rodopi Areas, Greece
EASTERN BALKANS	LIFE99 NAT/GR/006497	Gramos and Rodopi - Implementation of Management Plans in Gramos and Rodopi Areas, Greece
	LIFE07 NAT/IT/000502	EX-TRA - Improving the conditions for large carnivore conservation - a transfer of best practices
	LIFE93 NAT/GR/010800	Protection and Management of the Population and Habitats of Ursus arctos in Greece (first phase)
	LIFE96 NAT/GR/003221	Conservation of Ursus arctos and its habitats in Greece (2nd phase)
PYRENEAN	LIFE04 NAT/IT/000144	COEX - Improving coexistence of large carnivores and agriculture in S. Europe
	LIFE93 NAT/F/011805	First phase of a conservation programme for threatened vertebrates in the Pyrenees
	LIFE95 NAT/E/000624	2nd phase of a conservation programme for three threatened vertebrates in the Pyrenees
	LIFE95 NAT/E/000628	Third phase of the action programme for the conservation of the brown bear and its habitat in the Cantabrian mountains (Cantabria)
	LIFE95 NAT/E/001159	Conservation of threatened vertebrates in the Pyrenees - Cataluña
	LIFE95 NAT/E/001160	Conservation of threatened vertebrates in the Pyrenees - Aragon
	LIFE95 NAT/E/001162	Conservation of three threatened vertebrates in the Pyrenees - Navarra
	LIFE95 NAT/E/001164	Conservation of three threatened vertebrate species in the Pyrenees (french part) - III phase
	LIFE96 NAT/F/004794	ours en Pyrénées centrales - Conservation of large carnivores in Europe : Brown bear in central Pyrenees

POPULATION	PROJECT	TITLE
WOLF (*Canis lupus*)		
ALPINE	LIFE02 NAT/CP/IT/000046	Carnivori e zootecnia: strumenti per la prevenzione del danno
	LIFE04 NAT/IT/000144	COEX - Improving coexistence of large carnivores and agriculture in S. Europe
	LIFE96 NAT/F/003202	loup en France - Conservation of large carnivores in Europe: wolf in France
	LIFE97 NAT/IT/004097	grandi carnivori - Priority measures for the conservation of large carnivores in the Alps
	LIFE98 NAT/IT/005112	Tarvisiano - Integrated plan of action to protect two NATURA 2000 sites
	LIFE99 NAT/F/006299	loup dans les Alpes - Conservation of great carnivores in Europe : return of wolf in the French Alps
CARPATHIAN	LIFE00 NAT/H/007162	Large Carnivores - Funding the base of long term large carnivore conservation in Hungary
	LIFE02 NAT/RO/008576	Vrancea 30/11/2005 - In situ conservation of large carnivore in Vrancea County
	LIFE05 NAT/RO/000170	Carnivores Vrancea II - Enhancing the protection system of large carnivores in Vrancea county
	LIFE07 NAT/IT/000502	EX-TRA - Improving the conditions for large carnivore conservation - a transfer of best practices
	LIFE99 NAT/RO/006435	Piatra Craiului 30/6/2004 - Enhancement of Piatra Craiului National Park
DINARIC-BALKAN	LIFE02 TCY/CRO/014	Conservation and management of wolves in Croatia
	LIFE04 NAT/IT/000144	COEX - Improving coexistence of large carnivores and agriculture in S. Europe
	LIFE07 NAT/IT/000502	EX-TRA - Improving the conditions for large carnivore conservation - a transfer of best practices
	LIFE08 NAT/SLO/000244	SloWolf - Conservation and surveillance of conservation status of wolf (Canis lupus) population in Slovenia
	LIFE11 NAT/BG/000363	LIFE FOR KRESNA GORGE - Conservation of birds of prey in Kresna Gorge, Bulgaria
	LIFE97 NAT/GR/004249	Canis lupus - Conservation of Canis lupus and its habitats in Central Greece
ITALIAN PENINSULA	LIFE00 NAT/IT/007214	Lupo Romagna - Actions to protect the wolf in 10 SIC zones in three parks of the region Emilia-Romagna
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