

EU PLATFORM ON COEXISTENCE BETWEEN PEOPLE & LARGE CARNIVORES



Minimizing
Conflicts

Finding
Solutions



Case studies for coexistence

Case studies for coexistence: examples of good practice in supporting coexistence between people and large carnivores

22 November 2017

T. Hovardas (Callisto), K. Marsden (adelphi), S. Psaroudas (Callisto), Y. Mertzanis (Callisto), K. Brandt (adelphi)

This report was produced as part of the services provided as the Platform Secretariat to DG Environment of the European Commission, Service Contract No. 07.0202/2016/738209/SER/ENV.D.3. It does not necessarily reflect the views of the Platform or the official view of the European Commission. For more information, please contact lcplatform@adelphi.de.

Visit the Platform at:

http://ec.europa.eu/environment/nature/conservation/species/carnivores/coexistence_platform.htm

Photos Tsingarska © European Commission

adelphi consult GmbH
Alt-Moabit 91, 10559 Berlin

T +49 (0)30-89 000 68-0
F +49 (0)30-89 000 68-10

www.adelphi.de
office@adelphi.de

Contents

1. Introduction	5
1.1 Researching and addressing conflict surrounding large carnivores	5
1.2 The EU Platform	6
1.3 Aim of the report	6
1.4 Structure of the report	7
2. Methods	8
2.1 Sampling good practice	8
2.2 Screening good practice	8
2.3 Collection of further information - interviews	8
2.4 Analysis of the interviews	9
2.4.1 Description and categorisation of stakeholders	9
2.4.1 Fiche	10
2.4.2 Mixed-motive perspective analysis of individual case studies	11
2.4.3 Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis	11
3. Results	12
3.1 Overview of the case studies	12
3.1.1 Location and time	12
3.1.2 Species targeted	13
3.1.3 Interest group targeted	13
3.1.4 Type of case study	13
3.1.5 Source of funding	14
3.2 Detailed description of the selected case studies	16
3.2.1 Practical support	16
3.2.2 Innovative financing	33
3.2.3 Understanding viewpoints	41
3.2.4 Monitoring	54
3.3 Strength, Weakness, Opportunity Threat (SWOT Analysis)	59
4. Implications for large carnivore management and conservation	62
4.1 Integrating a range of coexistence measures	62
4.2 Understanding economic, social and cultural aspects	63

4.3 Adapting good practice over time and to the local context	65
4.4 Understanding the variety in stakeholder interaction	65
4.5 Using good relations between stakeholders to the full	67
5. Final comment on the methodology	69
6. References	70
7. Annex 1: Description of the Case Studies	75
8. Annex 2: Assessment of the case studies – interview questions	77

1. Introduction

The four European large carnivore species (brown bear *Ursus arctos*, wolf *Canis lupus*, Eurasian lynx *Lynx lynx*, and wolverine *Gulo gulo*) are among the most symbolic but challenging groups of species in terms of conservation and management in the European Union (EU). This is because of their biological needs – they have large ranges which cross borders – and the potentially conflicts these needs cause with human economic activities such as farming and hunting and in rare cases, with human safety.

Local improvements in habitat quality, the increased populations of some prey species, public support and favourable legislation have allowed the recovery of some populations of large carnivores from historic lows (Chapron *et al.* 2014). However, there is a great deal of variation across the EU with populations ranging from critically endangered to healthy and robust. This variation is reflected in the protection afforded by the Habitats Directive. Certain populations require the designation of Special Areas of Conservation and are in need of strict protection (with derogations allowed) while for other populations, further management measures, including hunting, are permitted.

This variation is also reflected in the relationship with humans which is also highly diverse, ranging from co-existence to acute conflict. For centuries, large carnivores were persecuted as a competitor for prey and out of fear. The relationship has, however, changed in recent years and is now polarised, with some regarding large carnivores as important keystone species representing wilderness and others regarding them as dangerous pests. Opinions are particularly divided in areas where large carnivores, especially the wolf, are returning after years of absence. This may result in high economic losses, especially for livestock breeders and herders but also potentially other interest groups.

Conflict over large carnivores impacts both the people living in an area with large carnivores and the species themselves. It has both a direct and an indirect impact on large carnivore conservation. In some cases it may result in illegal killings of large carnivores where those affected feel their concerns are not being heard. In other cases, bad press for large carnivores can lead to less supportive conservation regimes.

1.1 Researching and addressing conflict surrounding large carnivores

While conflicts may be fairly concretely based on economic losses or the perceived danger related to large carnivore presence, they also often have deeper cultural roots (Linnell 2013). Conflict may be mitigated or exacerbated by the approaches of managing authorities and a range of interest groups in working together or ignoring one another. Understanding the causes of conflict and the means to address it is therefore of high importance in large carnivore management.

This report combines a number of different ways of measuring and categorising various stakeholder views. This includes categorising “large carnivore” stakeholders into different groups and making generalisations about their viewpoints. While this is necessary in order to be able to transfer good practice from one case to another, care needs to be taken in lumping the viewpoints of a particular group together. In this research, a distinction is made between inter-group characteristics (i.e. between different interest groups e.g. hunters and conservationists) and in-group characteristics (i.e. within a certain group e.g. farmers). To understand the subtleties of conflict surrounding large carnivores, in-group characteristics may be just as important and there may be significant variation between individual’s viewpoints. This question is examined in more detail in the report, particularly in the SWOT analysis and the individual fiches describing each case.

A second important point to address is the costs and benefits to the different stakeholders, in economic terms but also with regards to other values and aims. In many initiatives to reduce conflict, win-wins are primarily sought. This approach often attempts to downplay costs and highlight advantages (e.g. Sunderland *et al.* 2008; Galuppo *et al.* 2014). Concealing costs may however have the perverse effect that they later re-surface and reignite the conflict (e.g. McShane *et al.* 2011). In reality, it is unlikely that one group of stakeholders will either entirely benefit or lose from a process: instead there will be a mixed impact. Stakeholders involved in the process are often aware of this and negotiate to allocate the anticipated costs and benefits (Hoffman *et al.* 1999; Hovardas 2012a, 2012b, 2015). The mixed motive perspective analysis used to analyse each case therefore explicitly incorporates costs as well as benefits.

1.2 The EU Platform

This report was commissioned by the members of the *EU Platform on Coexistence between People and Large Carnivores*. The Platform exists specifically to address conflict related to large carnivores. It is made up of seven organisations¹ representing different stakeholder groups who have signed an agreement, including a joint mission:

To promote ways and means to minimize, and wherever possible find solutions to, conflicts between human interests and the presence of large carnivore species, by exchanging knowledge and by working together in an open-ended, constructive and mutually respectful way.

The Platform Secretariat exists to support the Platform, including with gathering information and carrying out research. An important part of the Secretariat's supporting work over the first years of the Platform's existence has been to assist the members in collecting case studies which represent good practice in bringing stakeholders together to reduce conflict surrounding coexistence with large carnivores. At the time the information for this report was gathered, 35 case studies had been collected.

This report follows a first stage of analysis which drew out aspects of good practice and examined the potential for some of these examples to be supported through the European Agricultural Fund for Rural Development (EAFRD) (EU Platform Secretariat 2016).

1.3 Aim of the report

At the 2016 Plenary Meeting, the Platform members requested that a deeper analysis of a sub-set of the case studies be carried out in order to identify the specific elements that make up good practice, focusing especially on the relationship between stakeholders.

Ten best practice examples that focus on improving stakeholder relations were selected from the cases collected to date. These were chosen to cover a range of biogeographic and political situations as well as all large carnivore species and stakeholder groups. The sub-set of case studies were analysed in more detail through interviews carried out with representative stakeholders. The aim was to identify what makes the case study an example of good prac-

¹ European Landowners' Organization (ELO) (co-chair of the Platform); Joint representatives of Finnish and Swedish reindeer herders; The European Federation of Associations for Hunting & Conservation (FACE); The International Council for Game and Wildlife Conservation (CIC); International Union for Conservation of Nature (IUCN), European Union Representative Office; Worldwide Fund for Nature (WWF), European Policy Office and EUROPARC Federation. The European Commission helped to establish the Platform, acts as a co-chair and funds a Secretariat to support the Platform members.

tice and if the experience has the potential to be used elsewhere to reduce conflict related to coexistence.

1.4 Structure of the report

The report is structured as follows. First, the methodology used to collect and analyse the case studies is described in detail. This is followed by an overview of all the case studies collected to date. The ten cases selected for further analysis are described, including the background to the case, the situation before the activities were carried out and the impacts on stakeholder relations as well as potential impacts on the conservation of the species in question. The socio-economic implications for the stakeholders involved are described, differentiating between the stakeholder groups involved in the case. In order to draw more general lessons from all the cases, a SWOT analysis identifies Strengths, Weaknesses, Opportunities and Threats connected with selected coexistence examples. In the final section of the report, the findings are discussed and recommendations made.

2. Methods

2.1 Sampling good practice

Case studies were initially collected through an online questionnaire. Platform members and individuals who had presented information at the Platform workshops were asked to submit examples. In the second and third year of the Platform's work, members were simply asked to send web links and short descriptions to the Secretariat. Case studies that focused on concrete, transferable good practice examples were selected. This meant that some submitted examples were excluded from the final sample either because they did not focus on good practice (they highlighted problems rather than solutions) or they described a wide range of measures implemented over the course of a project or a scientific study. In these cases, if the project or study included several specific good practice elements, these were included as individual good practice examples.

This process resulted in the collection of 35 case studies at the time that the analysis was started. Further case studies will continue to be collected and added to the Platform website². An overview of the cases is given at the start of chapter 3.

2.2 Screening good practice

The full list of case studies was subjected to a screening in order to select the short list for further analysis. Two reviewers scored each case study based on the following aspects: (1) impact on stakeholder relations (reduction of conflict, consensus and common vision building); (2) socio-economic benefits for residents of the target area; (3) funding source, amount and durability; (4) geographic location; (5) species targeted. As part of this screening, background literature (e.g. websites and project reports) was consulted. Reviewers indicated whether the desired change or outcome had occurred in the case study under consideration. Reviewers could also comment on their ratings, these comments were then used to resolve grey areas where there was no clear yes or no answer. Contact was made with the representatives who submitted the case studies in order to have a full overview of potential information sources.

A long-list of the highest ranking 16 case studies was sent to the Platform members with ten suggested as a shortlist. The Platform members agreed on the ten to examine more closely.

2.3 Collection of further information - interviews

The selected case studies were analysed, examining the following aspects in greater detail: (1) The nature of stakeholder interactions (intensity and durability of the collaboration); (2) the ease of implementation and opportunities to transfer the case; (3) the longevity of the action and likelihood of its continuation.

Information for the further analysis of the case studies was collected by means of semi-structured interviews. An interview matrix was developed by the Secretariat and the Platform members (Annex 2). The matrix was developed in English to allow ease of comparison; however national experts were commissioned to carry out the interviews in the national languages where this was judged to be necessary for engaging a representative range of stakeholder views.

² http://ec.europa.eu/environment/nature/conservation/species/carnivores/case_studies.htm

Based on the individuals who submitted the case studies and further contacts established between the Platform Secretariat and stakeholders involved in large carnivore conservation and management, a first list of potential interviewees was developed. The snowballing method was used to select further interviewees for each case study. In selection of the interviewees, particular care was made to include a member of the project management and a representative of the main stakeholder group targeted by the action. At least three interviews were carried out for each case study. The interviews were carried out after interviewees had granted their consent and were recorded by either the Secretariat or experts in the Member States depending on language needs. Interviews were transcribed and translated into English. An mp3 file in the national language was kept for each interview together with the English transcript.

2.4 Analysis of the interviews

Interviews were recorded and analysed according to standard specifications of qualitative research. This involved developing codes and coding interview extracts. Stakeholders participating in the interviews were allocated to specific groups as described below. This allowed the identification of key themes and cross-cutting aspects to be examined further.

2.4.1 Description and categorisation of stakeholders

For the purposes of this report stakeholders were grouped into the following categories identified as central to large carnivore management (Linnell 2013) (Table 1). While this was necessary in order to analyse relations between stakeholders, particularly for the mixed motive and SWOT analysis (see below), it may result in the loss of the subtleties of positions. These more subtle differences are therefore described in the background of the individual cases.

Table 1. Stakeholders impacting and influenced by large carnivore management (alphabetical order)

Stakeholder	Description	Viewpoints
Environmentalists	Environmental NGOs (eNGOs) representing membership's desires to see large carnivores survive and thrive in Europe. Their focus is on large carnivore conservation.	Large carnivores have a right to exist. Large carnivore presence is ecologically and culturally important.
Farming / animal husbandry	Large carnivores prey on their livestock (especially sheep and goats but also horses and cattle) and reindeer. Beehives, crops and fruit trees may be destroyed by bears. Their focus is on livestock or farming.	Large carnivores damage crops, beehives and fruit trees, kill animals and cause further economic loss e.g. scaring livestock.
Foresters	Varying group. Management decisions can have a direct or indirect impact on large carnivores. Their focus is on forest management.	Large carnivores can be seen as an opportunity (managing ungulate populations) or a threat (e.g. reducing populations of predators of smaller rodents).

Stakeholder	Description	Viewpoints
Hunters	Hunting is widespread across large carnivore ranges and management decisions affect large carnivores. Their focus is on game management.	Large carnivores are part of natural ecosystem and may become a game species if numbers recover. Large carnivores may compete for ungulate prey. Large carnivores kill hunting dogs.
Landowners	Much of the large carnivore habitat is privately owned so this group is very important for management. Their focus is on managing their land and game.	May have forestry, hunting, farming and conservation interests and fall into these groups accordingly.
Managing authorities	Often overlapping with scientists. Viewpoints vary depending on the main area they are in charge of. In most of the case studies, their focus is on conservation or forestry.	EU and national legal requirements need to be met. Administrative burdens (for authorities and stakeholders) should be minimised.
Scientists	Varying group. Often conservation biologists – overlapping interests with environmentalists. Their focus is usually on large carnivore conservation.	Management should be based on good scientific evidence.

2.4.1 Fiche

A fiche was produced describing each of the selected case studies. Each fiche was divided into a number of sections as follows:

- Background (location, large carnivores involved and their population, main conflicts, main conservation issues, measures in place);
- Case study description (stakeholders involved, stakeholders interviewed project duration, funding source and size, aims, key actions for the case);
- Overview of the impact as judged by the interviewees (impact on conflict, consensus, common vision, conservation and socio-economic aspects);
- Division of costs and benefits between stakeholders (mixed-motive analysis of the case as described below, aspects that worked well, aspects that could be improved and the main conditions that need to be met for the case to be transferred to another setting);
- Further information and references.

An initial version of the report including five fiches was checked by Platform members who asked for additional information on the conservation and socio-economic impacts to be included. The fiche template was updated on this basis.

All information gathered in the fiches was based on the answers in the interviews, unless another source is explicitly stated. Additional information e.g. on the status of the species or clarification from experts involved in the case on aspects that remained unclear from the interviews was sometimes sought. The experts were asked to check the last version of the fiche and answer any specific questions which remained outstanding.

2.4.2 Mixed-motive perspective analysis of individual case studies

The mixed-motive perspective method can be used to examine each individual case study to show how trade-offs drive stakeholders toward compromise. In this approach the stakeholders are classified according to their main interests as described above. The analysis includes the cost and benefits that stakeholders identify, which apply both to themselves and to other stakeholder groups involved.

The method involves isolating the relevant statements from interviewees for each case study and assigning them to two broad categories according to main focus or stakeholder interest: (1) Benefits and gains of participation, which may also depict the added value of participation (this includes both direct financial benefits and also benefits in terms of reaching the group's objectives); (2) Costs of participation, which also involves unanticipated side-effects that may be observed.

2.4.3 Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis

A SWOT Analysis was conducted using an adapted version of the standard template (Hovardas 2010). Stakeholder groups were placed in different columns. For each of them, strengths, weaknesses, opportunities and threats in human-carnivore coexistence were outlined over the entire interview corpus.

In-group aspects (e.g., knowledge, attitudes, behaviour intentions or actual behaviour) can either promote (strengths) or hinder coexistence (weaknesses). Whereas strengths and weaknesses addressed each stakeholder group separately, opportunities and threats alluded to stakeholder interaction, specifically convergence of views which promote coexistence or differences which might cause conflict.

A content analysis first revealed the common aspects among the range of case studies examined, characterising interviewee positions for each stakeholder group separately. The aspects that showed the greatest convergence among interviewee positions (highest commonality) for each stakeholder group were used to complete the SWOT template and establish cross-cutting themes (cross-validation of cell content across interviewees of the same stakeholder group). Table 2 briefly describes the themes that were analysed under each of the main aspects to be examined.

Table 2. Template of Strengths, Weaknesses, Opportunities and Threats Analysis (SWOT Analysis)

	In-group	Inter-group
Aspects which might promote coexistence	Strengths (e.g., knowledge, attitudes, behaviour intentions or actual behaviour)	Opportunities (e.g., outcomes of recorded or anticipated stakeholder interaction)
Aspects which might hinder coexistence	Weaknesses (e.g., knowledge, attitudes, behaviour intentions or actual behaviour)	Threats (e.g., outcomes of recorded or anticipated stakeholder interaction)

3. Results

This section gives an overview of all the cases that were included in the initial screening and categorises them into groups. The statistics on the 35 cases are compared to the ten selected for deeper analysis.

In the second part of the results section, each of the ten cases are described in more detail including background information and the mixed-motives analysis of the costs and benefits for stakeholders.

Finally, a SWOT analysis describes some general characteristics of all the cases.

3.1 Overview of the case studies

35 submitted case studies were screened to select a short list for further analysis. Further information on the individual cases is available on the Platform website³.

3.1.1 Location and time

The case studies took place in 14 different Member States. Most of them were national in scope, one third of the submitted case studies were on the regional to local level. Four case studies were cross-border in scope (Table 3). The case studies for further analysis were grouped into geographical regions and this was one of the characterising features taken into account in their selection in order to include a broad geographic range of activities.

Table 3. List of case studies per Member State (case studies may cover more than one member state)

Region	Member State	Number of cases - full list	Number of cases - selected
Balkan	Croatia	1	-
	Greece	4	2
	Bulgaria	2	-
	Slovenia	4	1
Central	Austria	1	-
	France	4	1
	Germany	4	1
	Switzerland	1	1
Mediterranean	Italy	5	1
	Spain	1	1
	Portugal	1	-
Nordic	Finland	4	1
	Lithuania	1	-
	Sweden	2	1

³ http://ec.europa.eu/environment/nature/conservation/species/carnivores/case_studies.htm

The time periods over which the work was carried for each case varied (see Annex 1). In general, those carried out by environmental NGOs or funded by a national or regional governments tended to be longer-term. Many case studies, however, only covered the length of a LIFE project. For some case studies, the main activity described was initial information, gathering for example to understanding viewpoints. In this case, it is unsurprising that a limited time is needed. In other cases, it is likely that the action stopped because the funding source came to an end. This exemplifies the problem of sourcing long-term funding for coexistence activities.

3.1.2 Species targeted

Case studies most frequently targeted the wolf, followed by the bear. Eight case studies targeted more than one species. This was reflected in the ten selected case studies where the main targeted species were wolf and bear and four case studies that targeted more than one species (Table 4).

Table 4. Number of case studies per species (case studies may cover more than one species)

Species targeted	Number of cases - full list	Number of cases - selected
Wolf	23	6
Bear	18	6
Lynx	6	2
Wolverine	2	2

3.1.3 Interest group targeted

A main target group was selected for each case study (see Table 5). In some cases, there are likely to have been further target groups. The most frequently targeted stakeholder group was livestock keepers and herders. This includes farmers, herders, shepherds, beekeepers and reindeer herders.

Table 5. Number of case studies targeting each stakeholder group (case studies may cover more than just one stakeholder)

Stakeholder group	Number of cases - full list	Number of cases - selected
All	6	2
Business	3	-
General public	4	-
Hunters	3	1
Livestock keepers / herders	17	7
National / regional government	3	-

3.1.4 Type of case study

The case studies were divided into five different categories as described in Table 6. Since the case studies selected for further analysis focused on stakeholder relationships, the majority are in the practical support and understanding viewpoints categories.

Table 6. Categorisation of case studies

Category	Descriptions	Number of cases - full list	Number of cases - selected
Advice / Awareness raising	Sourcing of information from individual contact points (websites, experts, volunteers) for the general public responsible authorities or stakeholders. Information aimed very specifically at particular groups (developers, tourists).	9	-
	Awareness raising for tourists to avoid conflict with bears	2	-
	Avoiding infrastructure development in areas important for wolf breeding	1	-
Innovative financing	Volunteer programmes providing livestock keepers with extra capacity	3	
	Eco-labelling schemes to increase value of produce	3	1
	Eco-tourism development based on the presence of large carnivores	1	-
	Payment for results scheme	1	1
Practical support	Practical measures to improve coexistence such as provision of fencing or livestock guarding dogs	5	4
	Establishment of emergency teams to respond to call-outs.	2	1
Monitoring	Good practices in involving stakeholders in monitoring of large carnivores and sharing the results with stakeholders.	5	1
Understanding viewpoints	Studies understanding stakeholder attitudes to different large carnivore species.	2	-
	Intensive efforts to encourage stakeholders to work together.	3	3

3.1.5 Source of funding

The main funding sources for the case studies are listed in Table 7. Only one main source is chosen. In many cases, further funding sources will have contributed to the good practice. For example, EU LIFE or EAFRD funding is always co-financed, generally by national or regional governments. Programmes started by NGOs may also have governmental support and support through private funds, either individuals, or in the case of labelling schemes, through local businesses and farmers.

Table 7. Sources of funding for case studies

Funding Source	Number of cases	Number of cases - selected
National / regional government	13	6
EU LIFE	10	1
NGO Resources / volunteers	7	1
EAFRD	4	2
Private	1	-

The different funding sources are most commonly used for different types of good practice. *Awareness raising* is most often supported through national or regional governments; *Practical support* through the EU LIFE programme or the European Agricultural Fund for Rural Development (EAFRD); *Monitoring* by Member States or the EU LIFE programme; and *Innovative financing* by NGOs.

3.2 Detailed description of the selected case studies

The fiches for each of the ten case studies are listed below by category.

3.2.1 Practical support

Damage Prevention Measures (e.g. fences) through the Rural Development Programme in Greece
Background Information
Member state: Greece
Location: The action included several regions with bear habitat across Greece. These involved 49 Natura 2000 sites in the Regions of Eastern Macedonia-Thrace, Central Macedonia, Western Macedonia, Epirus, Thessaly and Central Greece.
Large carnivores: Brown bear
Population of large carnivores in area: The region covered by the action hosts almost the entirety of the brown bear population in Greece, namely, no less than 500 individuals.
Main conflicts (including e.g. frequency of depredation events etc.): Damage caused by bears to livestock and beehives may depend on various factors, for instance location of corrals and beehive placement. In many instances, bears may habituate to these locations due to their relatively easy access to food resources and they return to the same places meaning that individual local producers experience substantial damage. Any event of severe damage is expected to have a negative multiplier effect since it will most likely catalyse negative attitude towards bears and propagate it further by means of in-group (i.e., among local producers in an area) and inter-group (e.g., among local producers and hunters in an area) interaction. For beekeepers who are not local residents but move their beehives from other areas, negative dissemination may spread more widely.
Main conservation issues: Human-bear conflicts due to damage caused by bears to livestock, beehives, crops and orchards may present a major threat to the species. Specifically, it can fuel retaliation and counter-attacks by local producers by means of illegal killing, which may involve the use of poisoned baits.
Measures already in place to reduce conflict (apart from case study activities): In order to decrease human-bear conflict and ensure that small-scale pastoral and farming practices remain economically viable in mountainous areas, damage prevention measures linked to the brown bear were tested by environmental nongovernmental organizations (eNGOs) within the frame of LIFE Nature projects between 1994 and 2002. With regard to electric fences, feedback from their installation and operation revealed that almost all beekeepers who employed the measure were satisfied because it has proven effective (i.e., 94% of the group sampled). To facilitate the long-term sustainability of this measure, Greek eNGOs initiated an extensive consultation and negotiation process with national competent authorities, mainly the Ministry of Rural Development and Food so that financial support for the measure would be included in the Rural Development Programme (RDP). The inclusion of damage prevention measures in the programme was the outcome of these initiatives.
Stakeholders involved: Stock breeders, beekeepers, members of eNGOs
Stakeholders interviewed: Stock breeders, members of eNGOs, staff of the Management Authority of the Greek RDP (2007 - 2013)

Background Information

Project duration: March 2004 - September 2013

Funding estimate: A measure for electric fences for apiaries and sheepfolds was first included in the RDP in the programming period 2000-2006, which foresaw financial support for the purchase and installation of electric fences by local producers. This measure was however not taken up at all due to underestimation of the costs and excessive bureaucratic requirements (prerequisites regarding the ownership of the land plots where beekeepers install their beehives that could not be met by the potential beneficiaries, etc.). A similar preventive measure was included in the next RDP programming period between 2007-2013. According to the relevant Common Ministerial Decision (Nr. 8512/15.04.2013), the measure should have been implemented in two annual rounds, one in 2013 and another one in 2014, with a total public expenditure of 3 million €. The provisional budget of the measure was 1,000,000 € for 2013 and 2,000,085 € for 2014. In the end, however, only the first call was announced. The second never took place.

The financial support foreseen was the co-financing of 77,5% of the purchase and installation costs, which could range between 350 to 1000€ depending on the selected equipment, with the remaining costs being covered by the interested beneficiaries (beekeepers and sheep and goat breeders). Since livestock-breeders were also eligible for the measure, there were cases where the total eligible purchase and installation cost could have reached up to 2,000€, depending on the number of the animals owned.

Funding source: Implementation of the measure in the framework of the National RDP was financed by the European Union (European Agricultural Fund for Rural Development) and the Greek Government (Hellenic Republic, Ministry of Rural Development and Food). The Region of W. Macedonia also contributed financially.

The measure has been included in current RDP (2014-2020). Furthermore, the action is also supported financially by Greek NGOs including CALLISTO-Wildlife and Nature Conservation Society, and Management Authorities of protected areas in Greece (e.g. the Management Authority of the Rodopi Mountain-Range National Park; the Management Authority of the Northern Pindos National Park). Several financial tools may be employed to support the implementation of the measure, for example, LIFE projects, as well as state funding ("Green Fund", Greek Ministry of Environment). A similar measure was implemented in the framework of the Bulgarian "Operational Programme Environment 2006-2013" in the Rodopi Mountains, District of Smoljan.

Aims: Electric fences may significantly reduce damage caused by the bear to beehives and livestock. In consequence, they are expected to mitigate human-bear conflict. The measure supports good practice in local agricultural production, promoting the coexistence of people with large carnivores.

Key Actions

- Financial support for the purchase and installation of electric fences by stock breeders;
- Financial support for the purchase and installation of electric fences by beekeepers;
- The application of the measure was promoted by the Greek Ministry of Agriculture and Food and it was backed-up by an awareness raising campaign by eNGOs, which has included media work, printed material (e.g., leaflets, posters and technical guides), public events, workshops, and social media.

Impact		
<p>Reduced conflict: The implemented measures have reduced damages caused by the bear, thus significantly reducing human-bear conflicts. A basic requirement for this effectiveness is that technical requirements for the installation and operation of the electric fence are met.</p> <p>Increased consensus: It has been observed that tolerance towards the species has been significantly increased among local producers who have installed electric fences.</p> <p>Increased common vision: For almost all beekeepers, the use of electric fences as a damage prevention method is considered as a prerequisite for starting honey production. Many farmers finance the installation of electric fences themselves, if there is no subsidy available, because they have acknowledged the effectiveness of the measure. A number of beekeepers cooperatives have also adopted the measure through specific financial tools.</p>		
<p>Conservation impact: The impact of the measure on bear conservation relates to decreased human-bear conflicts and, therefore, reduced risk of human-caused mortality through illegal killing (e.g., shooting, trapping, poisoned baits). Although bear numbers tend to increase in the areas where the measure has been implemented, this increase cannot be fully attributed to electric fences.</p>		
<p>Socio-economic impact: Local producers mainly benefit since damages are considerably reduced. In addition, perceived risk of damage is also decreased, which allows for sustaining coexistence conditions and restoring inter-group relations between different stakeholder groups.</p> <p>In some areas, there are local craftsmen who produce and sell electric fences to local stock breeders and beekeepers.</p>		
Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	<p>Human-bear conflict is substantially decreased when electric fences are used.</p> <p>Electric fences promote communication and collaboration among local producers and eNGO members at the local level, allowing for the creation of trust between stakeholder groups.</p>	<p>Damage prevention measures should be planned in an integrated manner within a region, since bears might be excluded from certain parts of the area (through effective damage prevention methods) and unintentionally directed towards other parts (e.g., they might approach closer to human settlements), rendering these locations more vulnerable to bear attacks and damage. For instance, enrichment of the natural food sources for bears (habitat management) should be considered and pursued to avoid the latter risk. This may also mean additional efforts for eNGOs.</p>

Division of costs and benefits between stakeholders		
Agricultural production, live-stock, primary sector activities	Electric fences may be perfectly effective and secure beehives or livestock from bear attacks, provided that all technical requirements are met.	<p>An electric fence may impose certain constraints and restrictions on the beekeeper or stockbreeders. For instance, locations close to trees or on inclined ground should be avoided and grass under the fence must be cut.</p> <p>For beekeepers who move their beehives among different areas, there is an issue with moving the electric fence as well or with the need to possess more than one electric fence.</p> <p>The larger the area to be fenced, the higher the cost of installing the electric fence and the more the input needed by the farmer.</p>
<p>Aspects that worked well</p> <ul style="list-style-type: none"> • The technical implementation of the preventive measures has proven to be very simple and effective in deterring large carnivores from damaging livestock and apiaries. The practical experience that has been accumulated since the early 90s allowed fine-tuning of the technical characteristics, procedures and conditions of these measures and has prepared the ground for its applicability and replicability in the RDP examined; • This case study may be considered as an exemplary case of good practice, since it has revealed a long standing step-by-step procedure for the institutionalization of the measure and its integration in the RDP; • The implementation of the measure has facilitated communication and collaboration among local producers and members of eNGOs, establishing positive experiences to enrich inter-group interaction. This collaboration mainly addressed equipment specifications as well as in situ technical support and follow-up. 		
<p>Aspects that could be improved</p> <ul style="list-style-type: none"> • What has proven quite complicated is the financing of the measure in the long-term, namely, in the transition from one RDP to the next, or after other supporting mechanisms have expired (e.g., LIFE projects). These gaps and inconsistencies may challenge the operational sustainability of the measure; • The first implementation of the measure in the RDP failed to include all beneficiaries (e.g. local producers) due to an inadequate and ineffective outreach and awareness raising campaign. Some eligibility requirements also excluded certain local producers (e.g. cherry producers or non-permanent crops); • According to members of eNGOs, the use of damage prevention methods should be linked to compensation systems (i.e., local producers should be compensated for bear damage only if they have used damage prevention methods, such as electric fences); • According to local producers, adoption of electric fences may also relate to husbandry habits of stock breeders. Especially in the case of free-grazing cows and calves in mountainous areas, which may be left alone during the night, depredation by large carnivores may be quite high. • According to staff of the Management Authority of the Greek RDP, future implementations of the measure should also address the issue of permanent installation of electric fences vs. transhumance and beekeepers moving from one area to another; 		

- According to local producers, future implementations of the measure should address the delay between approval of applications and payment (up to one and a half years). Some beekeepers were discouraged by the bureaucracy involved in applying and instead bought an electric fence at their own expense. However, they often chose cheaper equipment, impacting effectiveness
- According to staff of the Management Authority of the Greek RDP, future implementations of the measure should seek closer engagement with local governments and farmers associations and cooperatives.

Conditions for transfer

- The long experience of trialling the measures in local conditions is important;
- The weaknesses in awareness raising, bureaucracy and targeting of the measure should be addressed in any transfer;
- Experience regarding the technical requirements should be taken into account to ensure that they are effective. This could be supplemented with advice provision.

The measure has already been transferred to several areas in Greece.

More information and references

Information on the case

Hellenic Republic - Ministry Of Rural Development and Food (2017) "Rural Development Programme of Greece" programme webpage [in Greek], available at: <http://www.agrotikianaptixi.gr/>

Developing a network of Livestock Guarding Dogs

Background Information

Member state: Greece

Location: District of Grevena, Western Macedonia

Large carnivores: Brown bear, wolf

Population of large carnivores in area: The brown bear population in the wider region amounts to more than 50 individuals, with an increasing trend in several parts of the region. In contrast, the wolf population has decreased in some parts of the region and it is estimated that there are no more than 70 individuals, overall, in the area..

Main conflicts (including e.g. frequency of depredation events etc.): Large carnivores may attack livestock, especially when they are not appropriately guarded. The practice of many local stockbreeders is to leave their livestock unattended, which may add substantially to depredation risk. In some cases, damage caused by large carnivores may be extensive and cause additional burden to stock breeders, especially in terms of planning their activities in the short- and mid-term. These severe depredation events may have an exaggerated impact due to in-group (i.e., among stock breeders in the area) and inter-group (e.g., among stock breeders and hunters in the area) communication on the issue.

Main conservation issues: The wider area hosts one of the most robust populations of the brown bear and the wolf in Greece. Although large carnivores have always been present in the area, human-carnivore coexistence is challenged by incidents of illegal killing. This may also involve intentional killing of large carnivores by poisoned baits.

Background Information

Measures already in place to reduce conflict (apart from case study activities): Within the frame of the project LIFE PINDOS/GREVENA (LIFE07 NAT/GR/000291), a preliminary assessment of brown bear damage on livestock was undertaken in the region.

Stock breeders may receive compensation from the State if they report damage but they are often discouraged by bureaucracy, insurance premiums, and delays. Loss of cows are much distressing for stock breeders, since it financially equates to the loss of 20-30 sheep. Recently the minimum number of carcasses needed for compensation has been decreased. Compensation depends on carcasses being found. Compensation for damage on livestock from large carnivores is not related to implementation of damage prevention methods.

A Bear Emergency Team was also established in the area and operated for the first time in Greece in the frame of LIFE PINDOS/GREVENA (LIFE07 NAT/GR/000291). The team intervened in cases of traffic accidents caused by bears, when bears approached human settlements in the area, and in cases of damage caused by bears to livestock.

Stakeholders involved: Stock breeders, eNGOs (CALLISTO-Wildlife and Nature Conservation Society), Region of Western Macedonia - Sub-regional office of Grevena, Development Agency of Grevena, Greece National Agricultural Research Foundation/Forest Research Institute

Stakeholders interviewed: Stock breeders; members of eNGOs

Project duration: July 2009 - June 2012

Funding estimate: The incurred costs for the development of the network was 26,612€ for two years, of which 19,522 € were personnel costs and another 7,090€ were travel costs. Indirect costs have not been added in the above amounts.

Funding source: The action was financially supported by the LIFE Financial Instrument (75%) as well as beneficiaries of the project LIFE PINDOS/GREVENA (LIFE07 NAT/GR/000291) (25%).

Aims: A network of owners of Livestock Guarding Dogs (LGDs) was established. The network has facilitated coordination among stock breeders for the exchange of puppies and adult dogs between network members. Using LGDs may considerably reduce the loss of livestock to predators and it contributes substantially towards resolving human – large carnivore conflict. Further, the network supports good practice in livestock management, especially breeding practice, veterinarian care, and training of LGDs, and it contributes to sustaining the quality of LGDs in the area in the long term. The socio-cultural benefits of the action should also be highlighted, particularly in terms of empowering stock-breeders locally, and letting the owners of good LGDs receive social recognition from other animal breeders and farmers, which is common in mountainous areas in Greece. These two latter socio-cultural aspects introduce positive and desirable feedback effects, reinforcing the participation and commitment of stock breeders in the network.

Key Actions

- A registry of all owners of good quality LGDs was developed;
- The facilitator of the network started frequent visits in the area to ask owners to participate in the network, which has focused on exchanging dogs and their experience in using LGDs;
- The facilitator of the network and other staff of CALLISTO-Wildlife and Nature Conservation Society provided support to the network throughout the duration of the action;
- Detailed records were kept and employed to identify, monitor and compare the quality and efficiency of LGDs;

Background Information

- A veterinary expert with long experience in working with LGDs supported all members in the network, mainly through providing free veterinary care and advice;
- The development of the network was backed-up by an extended awareness raising campaign including media work, printed material (leaflets, posters, technical guides), public events, workshops, and social media campaigns;
- The action has been continued through other LIFE projects (LIFE ARCTOS KASTORIA and LIFE ARCPIN) in the region of Grevena and the region of Kastoria.

Impact

Reduced conflict: A major contribution of the action has been the reduction of inter-group conflict among stakeholders through the establishment of a close collaboration and relationship between members of eNGOs, staff of Managing Authorities of protected areas, and stock breeders. Stock breeders in the network proceed to a categorization between different types of pro-environmental action and behaviour of organized groups, e.g., they distinguish eNGOs directly engaged in the action from animal welfare groups, which allows them to approach and trust members of eNGOs. In addition, the action has eventuated in reduction of in-group conflict among stock breeders as well.

Increased consensus: Consensus is facilitated indirectly, once again, primarily through the timely response of eNGO members to stock breeders' request for puppies, and by the appreciation of this contribution and its propagation within the local community through word-of-mouth dissemination and more widely, through social media discourse.

Increased common vision: Common vision is partly established in terms of the effectiveness of LGDs and the need to incorporate them in good livestock management practice.

Conservation impact: LGDs have proven highly effective in reducing damage cause by large carnivores. The conservation impact of the action is indirect but substantial, since stock breeders are able to maintain and enrich the local pool of LGDs. More effective protection of livestock by an increasing number of LGDs leads to a decrease in depredation by large carnivores and therefore a decrease of illegal killing of large carnivores using poisoned baits.

Socio-economic impact: The income of stock breeders who own good quality LGDs is favoured since damage from large carnivores is minimized. Stock breeders who enter the network gain social status because the possession of good guarding dogs is much appreciated and is considered to reflect aptitude and skill. Broadly, networking has also fostered the restoration of social relations among stock breeders themselves in several occasions, which may be counted as another desirable social outcome of the action. The increase of LGDs over a threshold may allow members of eNGOs take puppies from the local surplus and re-distribute it to other areas, where more LGDs are urgently needed and thus provide economic benefits more widely.

Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	<p>Stock breeders become indirectly but actively engaged in large carnivore conservation.</p> <p>Inter-group conflict is decreasing through the establishment of trust and cooperation among stock-breeders and eNGOs.</p> <p>Dissemination of these positive outcomes through word-of-mouth and social media can considerably enlarge the positive effects of the action.</p>	<p>The use of LGDs affects the distribution range of large carnivores, since the latter would attempt to avoid LGDs; this may lead to new conflict elsewhere, for example in villages.</p>
Agricultural production, live-stock, primary sector activities	<p>Participation in the network leads to a decrease in damage to livestock that is caused by large carnivores.</p> <p>Stock breeders enjoy further support by means of free veterinarian services as well as additional minor support provide to them (e.g., small calendars in the form of note-books prepared and offered to stock breeders by eNGOs).</p> <p>Stock breeders who participate in the network gain social status, since their skills in breeding receive recognition from their peers.</p>	<p>Training and taking good care of LGDs is demanding and it may need a considerable investment by stock breeders, increasing their total workload.</p>
<p>Aspects that worked well</p> <ul style="list-style-type: none"> • The LGD network that was created is coupled to a pre-existing “shadow” network between a limited number of stock breeders, which was based on long-lasting and personal relations between members but which also excluded a considerable number of other stock breeders. In this “shadow” network the exchange of puppies or disposal of genitors at the mating period is common practice. The network of LGDs has opened up the “shadow” network to many more stock breeders who were willing to participate; • The action is still continued and stock breeders entering the network are constantly increasing. The same is valid with puppies and dogs that are donated; • The action has empowered stock breeders to take over the network themselves without the intervention of eNGOs; • Stock breeders have been encouraged by eNGOs to take part in specific exhibitions in order to be able to collect documentation and certification concerning the breed of dog. 		

Division of costs and benefits between stakeholders

Aspects that could be improved

- In-group relations among stock breeders may present barriers in the expansion of the network and the redistribution of puppies to other areas;
- There has been in the past a financial subsidy of 400€ for each LGD to stock breeders to cover part of the expenses. This has been discontinued however, such a support is considered necessary, especially when the ongoing financial crisis in Greece is taken into account;
- Support of the measure by the state and local governments and financial support provided by public funds and tools (such as the Rural Development Programmes) is crucial for the continuation of the action in the future.

Conditions for transfer

- Trust among stock breeders and eNGO members enables the latter to re-distribute locally-born puppies born to other areas where more LGDs are needed, or to other areas where no such network yet exists. As the network expands, puppies and dogs are donated to stock breeders in several other parts of Greece;
- Of special importance for the expansion of the network is the identification of motivated young stock breeders who are much more willing to cooperate and are ready to join a network for exchanging LGDs;
- Financial support to cover the expenses of maintaining dogs is still regarded as necessary.

There are already currently 10 nuclei of good quality LGDs now in Greece, which all have originated by the initial network in the study region. A number of Managing Authorities of Greek National Parks have requested from eNGOs (i.e., CALLISTO-Wildlife and Nature Conservation Society) to integrate analogous actions in forthcoming project proposals, so that new networks can be created. Technical specifications and the standard procedures for the creation and operation of networks of LGDs have been developed by CALLISTO.

More information and references

Information on the case

PINDOS/GREVENA - Demonstration of Conservation Actions for *Ursus arctos** and habitat type 9530* in Northern Pindos N.P., Grevena Prefecture, Greece (2012), Project description. Available at: http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3322&docType=pdf

Further references

LIFE EX-TRA (2013) "LAYMAN report" [available in Greek, Romanian, Bulgarian and Italian]. Available at:

http://www.lifextra.it/index.php?option=com_docman&task=cat_view&gid=79&Itemid=30&lang=en

LIFE07 NAT/GR/000291 (2012) "Project description". Available at:

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3322&docType=pdf

Livestock Protection Measures through the LIFE project Medwolf
Background
Member state: Italy
Location: Tuscany region: territory of Grosseto province, in the regional park of Maremma and in Faunistic park of Monte Amiata; region with highest level of cattle husbandry
Large carnivores: Wolf
Population of large carnivores in area: Accurate estimates of the numbers of wolves in the area are currently lacking, a likely estimate of the wolf population could be 100-200 individuals.
<p>Main conflicts: Wolves have been virtually absent in this region for three to four decades. With their return, the conflict between animal husbandry and wolf presence arose.</p> <p>Livestock owners understood the protection of wolves by law in 1971 as a “clear opposition to their interests”. Frictions and conflicts also increased between those livestock owners who introduced some preventive measures and those who refused to use them (using measures was seen as accepting the presence of the wolf).</p> <p>An increased presence of stray dogs in the region aggravated the conflict between man and wolf as the stray dogs cause similar conflicts with livestock owners.</p>
Main conservation issues: Illegal killing targeting both wolves and dogs continues to be the primary cause of wolf deaths. In the past, illegally killed wolves were publically displayed but this practice has diminished in recent years. Accurate numbers for human-caused mortality of wolves are however not available.
Measures already in place to reduce conflict (apart from case study activities): Before the project started, there was no direct compensation system. Preventive measures were disliked by livestock owners. Between 2006 and 2013, compensation was managed through a voluntary insurance scheme which was, however, generally poorly adopted. Furthermore, the province administration offered fences. Monitoring of their installation and functionality was not included (pers. comm. 2017).
Case study description
Stakeholders involved: Environmental NGOs, livestock owners and breeders, provincial and local administrations, professional agricultural associations.
Stakeholders interviewed: A livestock owner and two representatives of an environmental institution.
Project duration: Late 2012 – late 2017
Funding estimate: 3,315,272 € (budget for the entire LIFE project)
Funding source: European Commission (LIFE programme)
Aims: The Medwolf project aims to decrease the conflict between the wolf’s presence and human activities in rural areas where cultural tradition of coexistence with predators has been lost.

Case study description

Key Actions

- Coordination of activities and mediation of interests to find agreed solutions;
- Pre-operational analysis on past damage events in the provincial administration;
- Socio-economic assessment of cost and benefits for damage prevention measures;
- Participatory meetings with different stakeholders;
- Provision of damage prevention measures;
- Fences of various sizes and materials;
- Assignment of livestock guarding dogs to livestock owners;
- Support of project staff with provision of dog food, vet care, behavioural monitoring and mating management for the first two years of a dog's life;
- Establishment of livestock owners association for the management of dogs;
- First project litter delivered to new owners for free.

Impact

Reduced conflict: The increased awareness on the necessity of prevention measures brought about by the project contributed somewhat to conflict mitigation by showing possible measures to reduce attacks by predators. Conflict however still exists and there is currently a very lively debate on the National Wolf Action plan that has reignited some areas of disagreement.

Increased consensus: Some consensus has been reached on, for example, accepting the fact that livestock protection measures are necessary and that livestock keepers need the support of other stakeholders. The presence of the wolf has been accepted by stakeholders. Prevention measures are starting to be accepted as "normal" practice.

Increased common vision: Strong differences at the beginning of the project have been discussed during the project and contributed to a broader comprehension of the situation. Nevertheless, while there is an increased level of awareness, sharing of information and fighting misinformation, different stakeholder groups still adhere to their own viewpoints on many issues.

Conservation impact: The population of wolves has increased lately though this cannot be only attributed to the project actions.

The number of wolf-dog hybrids have also increased. They are more evident and visible during day-time and entire packs are seen (related to the number of feral dogs rather than the project actions).

In terms of illegal killing, before the project started, carcasses were exposed to prove that wolf was indeed present. All interviewees state that this practice has decreased and perhaps represents a decrease in overall killings. Real figures are however unavailable.

Socio-economic impact: Compensation systems have changed from an insurance-based system to a direct ex-post compensation system, but with a limit imposed by the state-aid regulation (de minimis). This is better accepted but improvements are still needed.

Varying impacts on livestock production are reported with some highlighting extensive problems for producers which are compounded by losses caused by wolves. Other interviewees highlighted the benefits for local businesses in producing materials for damage prevention (dogs and fencing) and the tourism sector.

Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	Networking of stakeholders (e.g., stock breeder networks for exchanging livestock guarding dogs) secures long-term commitment of affected stakeholders and the sustainability of damage prevention measures.	If the size of large carnivore populations surpasses a threshold limit for damage prevention measures to be effective, it could result in more conflict.
Livestock	Funding directed to the agricultural sector has increased. Damage prevention measures have improved. Implementation of damage prevention methods increased employment opportunities at the local level (supply of materials and dogs).	Threat to livestock increased due to increased wolf population and reported wolf-dog hybrids.
<p>Aspects that worked well</p> <ul style="list-style-type: none"> • All positions and viewpoints could be discussed through a participative process of exchange; • Livestock owners could make local authorities and occupational units understand their needs regarding the wolves in the area; • The provision of fences and livestock guarding dogs convinced livestock owners that they were not abandoned and that their needs are taken seriously by authorities; • Improved documentation and data collection offered scientific and evidence-based answers and a common reference point for all stakeholders; this encouraged livestock owners to report attacks; • Attitude change may be reflected in the fact that locals no longer display illegally killed wolves; • A network of livestock owners mutually adapted certain preventive measures, which were then transferred to other farmers; • By connecting stakeholders (e.g. livestock interests and environmental NGOs), the project has set the basis for further cooperation after its conclusion. 		
<p>Aspects that could be improved</p> <ul style="list-style-type: none"> • New funding sources are needed for the implementation of preventive measures, e.g. for establishing electric fences after the end of the project; • Higher-level authorities did not appear to value the merits of the project or devote any time to it; • The presence of stray dogs has increased the conflict caused by the presence of wolves; • The compensation system for damage caused by large carnivores needs to be further improved (e.g. needs a functioning controlling system). 		

Division of costs and benefits between stakeholders

Conditions for transfer

- Funding to support preventive measures is needed through a source acceptable to all;
- Measures have potential to be included in the rural development funding but this may be seen as competing with other measures relevant to farming in the area;
- The strong involvement of farmers associations is essential for good implementation of the actions as building trust with farmers relies on peer-to-peer learning;
- Elaboration of guiding principles on agri-economic and technical aspects (e.g. rotational grazing) of herd management with livestock owners should be provided with the input from farming associations.

The project has already transferred some of the good practice and lessons learned. The same key actions were implemented in Portugal. Livestock guarding dogs were also donated to farms in Emilia-Romagna and Florence, for the protection of cattle and goats.

More information and references

Information on the case

Medwolf (2017) Medwolf project website, available at: www.medwolf.eu

Further references

Genovesi P. (Ed.) (2002) "Piano d'azione nazionale per la conservazione del lupo (*Canis lupus*" [in Italian], Ministero Ambiente, Quaderni Conservazione Natura no 13. Available at: http://www.minambiente.it/sites/default/files/archivio/biblioteca/protezione_natura/qcn_lupo.pdf

Practical support under the Slovenian Rural Development Programme

Background Information

Member state: Slovenia

Location: Focus on the core areas of appearance of large carnivores: wider Kočevska region with Ribnica valley, Notranjska region with Krim-Mokrec mountains, part of Dolenjska region and part of Bela Krajina, Nanos, Hrušica, Trnovski gozd, part of Idrija hills.

Large carnivores: Brown bear, wolf

Population of large carnivores in area: There is a substantial variation in the estimates for the size of the bear population in Slovenia depending on the monitoring method used e.g. a change between 1998 - 2006 of 290 individuals in 1998 to 370 individuals (Jerina and Adamič 2008a). Other estimates of the population in 2007 vary between 394-475 using non-invasive DNA techniques and 500-700 individuals measured by the Slovenia Forest Service. The most recent DNA-based estimate completed within the frames of LIFE DINALP BEAR project shows a 33% increase in population size between years 2007 and 2015. All estimates indicate an increase in numbers, and the population is considered in favourable status, but the characteristics and dynamics of the bear population in Slovenia as well as population structure are still a cause for concern from a conservation perspective and are considered too low to secure the population long-term (Jerina and Adamič 2008b).

With regard to the wolf, the current population estimate is around 60 individuals (national wolf population monitoring, 2017). The population trends for wolves show a steady increase since a robust monitoring system was implemented for the first time in 2010. This development allows for a characterisation of the wolf conservation status in Slovenia as favourable. However, the total number of wolves is too low to secure long-term population viability, which renders the connectivity with other Dinaric wolves in Croatia and Bosnia and Herzegovina of paramount importance.

Main conflicts (including e.g. frequency of depredation events etc.): Since land-use practices and availability and distribution of food sources for bears are changing, bears approach closer to human settlements. The main conflict refers to damages caused by the bear, primarily to livestock. The wolf also causes damage to livestock.

Main conservation issues: The brown bear was widespread in Slovenia until the 18th century, when drastic alteration of the bear habitat accompanied by persecution of the species by means of hunting and poisoning led to the retreat of bears in the region of High Karst. Conservation measures were introduced at the end of the 19th century, by which time the population had reached around ten individuals. This led to a recovery of the bear population. The Slovenian Nature Conservation Act and the Brown Bear (*Ursus arctos*) Management Strategy provide the core background for the maintenance of favourable conservation status for the species.

Apart from human-wolf conflicts and resulting lower public acceptance of wolves including requests for higher quotas for shooting wolves, hybridisation with domestic dogs has been highlighted as a potential problem for wolf conservation in Slovenia. In addition, recently established border fences to control for human migration flows may act as barriers and lead to isolation of edge populations of the wolf in Slovenia (Linnell et al. 2016).

Measures already in place to reduce conflict (apart from case study activities): Slovenia has more experience than most member states in including measures for coexistence in their Rural Development Programmes. Measures for animal husbandry in areas with large carnivores have been included in the agri-environment measure in the last three Rural Development programmes.

Stakeholders involved: A wide range of stakeholders from farmer representatives, the Slovenian Forest Service, to environmental NGOs are represented on the Programme Monitoring Committee (PMC) and have been involved with the design of the measure.

Stakeholders interviewed: Farmer, staff of the Slovenian Forest Service, environmental NGO
Project duration: 2004 - present
Funding estimate: In the 2007-2014 period, the total expenditure for the measure <i>Animal husbandry in central areas of appearance of large carnivores</i> was 1,304,443.28 EUR (EU financing and national co-financing). There were 642 applications in total, meaning that payments on average worked out at 2,090€ per applicant (Slovenian Ministry of Agriculture 2015).
Funding source: European Agricultural Fund for Rural Development financed by the European Union and co-financing from the Slovenian Ministry of Agriculture, Forestry and Food.
Aims: The main aim of the action is to promote human-carnivore coexistence and to preserve favourable status of large carnivore populations. A payment per hectare of grassland is included, with top-ups depending on a range of protection measures adopted (livestock guarding dogs, shepherding, and electric fences). A payment is received per hectare of grassland as compensation for costs of extra work required to protect the herd against attacks by large carnivores. The measure is open to farmers and stockbreeders carrying out livestock management on grassland in areas with large carnivores.
<p>Key Actions: The measures have developed over time, in the 2014-2020 programme the following requirements are included:</p> <ul style="list-style-type: none"> • Protection of the herd with mobile protective electric fences and electric nets; • Protection of the herd in the presence of a shepherd; or • Protection of the herd in the presence of a livestock guarding dog. <p>Mobile protective electric fences and electric nets are mainly intended to protect herds at night. Fences are built from electric nets that are at least 160 centimetres in height (min. 5 kV). The provision for a shepherd is foreseen when other damage prevention methods are excluded due to terrain characteristics. In the case of herding dogs, at least three dogs need to be present.</p>
Impact
<p>Reduced conflict: Farmers who adopt damage prevention measures move towards showing increased tolerance towards large carnivores and endorsing coexistence with people (to varying degrees). However, some farmers are reluctant to change their farming practices and adopt damage prevention measures.</p> <p>Increased consensus: Consensus is promoted through the adoption of damage prevention methods and the recognition of the coexistence ideal. However, core differences among stakeholder groups have so far not been significantly affected.</p> <p>Increased common vision: Increased common vision has been fostered by the personal relations that are established between people from different stakeholder groups (e.g., farmers and staff of the Slovenian Forest Service) anytime they need to collaborate on the implementation of damage prevention methods and on the monitoring of this implementation. However in some cases, common vision has been negatively affected when bureaucracy prevails over the actual needs of beneficiaries.</p>
Conservation impact: As described above, large carnivore population levels have increased over the period of implementation of the measures. This cannot be attributed to these measures alone since a number of different measures have been included in the species management plans. Nonetheless, the uptake of the measures suggests that they are likely to have an impact in reducing conflict and illegal killing linked to farming activities.
Socio-economic impact: Damage from large carnivores has been reduced compared with the period before the implementation of damage prevention measures. However, some respondents believed that the payments do not cover all costs and that the increased costs of production that are still experienced by farmers may in some cases be passed on to the consumer.

Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	Adoption of damage prevention measures is usually accompanied by increased tolerance towards large carnivores and the acknowledgment of coexistence with people.	Livestock guarding dogs need training, which is quite demanding, before they can be effective in preventing damage to livestock from large carnivores. Not all of these costs are covered by the programmes and they are sometimes taken on by conservation organisations.
Agricultural production, livestock, primary sector activities	<p>The implementation of damage prevention measures has decreased the number of attacks from large carnivores to livestock and the damage they caused to livestock.</p> <p>When farmers have to move fences quite frequently, then the wolf, to which most livestock damage is attributed, may get used to this damage prevention method and find ways around it.</p>	<p>A synergy of damage prevention methods is excluded by the Rural Development Programme, for instance, if a farmer wished to combine electric fences with livestock guarding dogs this is not covered.</p> <p>A proper establishment of electric fences is crucial for the measure to be effective; if the fence is improperly installed, then damage could be worse than when it has not been there at all.</p> <p>Additional costs for damage prevention, especially when these cannot be fully covered by subsidies, may lead to an increase in the price of agricultural products.</p>
<p>Aspects that worked well</p> <ul style="list-style-type: none"> • The implementation of damage prevention methods has decreased damage caused to livestock by large carnivores; • The measures used have wide-scale potential for application across the country; • The measures have been in place over a significant period of time and have been fairly well accepted by farmers; • A relatively long-term funding source is assured through the EU funding. 		
<p>Aspects that could be improved</p> <ul style="list-style-type: none"> • Requests for additional damage prevention methods may be declined on the basis of an argumentation which is not accepted by farmers (e.g. an interviewee described how an application for an additional fence was declined because no damage had been recorded yet); • Combinations of measures are not included; • The programme and its measures need to be evaluated and updated so additional grazing areas may be eligible, according to interviewees; • The contribution of farmer advisors in the programme needs to be more pronounced so that measures are implemented correctly. 		

Division of costs and benefits between stakeholders

Conditions for transfer

- Rural development programmes are available across the EU and there is significant potential for the use of similar measures in other Member States;
- More awareness raising is needed so that potential applicants know that the measures exist;
- The use of the advisory service measure would help ensure correct implementation.

More information and references

Information on the case

Ministrstvo za kmetijstvo, gozdarstvo in prehrano (2014) "Slovenia's Rural Development Programme 2014–2020" webpage, available at: <https://www.program-podezelja.si/en/rural-development-programme-2014-2020>

Further references

Jerina, K., and Adamič M. (2008) "Fifty years of brown bear population expansion: effects of sex-biased dispersal on rate of expansion and population structure" *Journal of Mammalogy*, vol.89, pp. 1491-501. Available at: <http://www.bioone.org/doi/abs/10.1644/07-MAMM-A-357.1?journalCode=mamm&>

Jerina, K., and Adamič M. (2008) "Fifty years of brown bear population expansion: effects of sex-biased dispersal on rate of expansion and population structure." *Journal of Mammalogy*, vol.89, pp. 1491-501. Available at: <http://www.bioone.org/doi/abs/10.1644/07-MAMM-A-357.1?journalCode=mamm&>

Jerina, K., and Adamič, M. (2008) "Analiza odvzetih rjavih medvedov iz narave v Sloveniji v obdobju 2003-2006, na podlagi starosti določene s pomočjo brušenja zob: končno poročilo" [in Slovenian] Biotehniška fakulteta, Ljubljana. Available at: <http://www.arso.gov.si/narava/%C5%BEivali/ogro%C5%BEene%20in%20zavarovane/rjavi%20medvedi%202003-06.pdf>

Jerina, K., and Adamič, M. (2008) "Analiza odvzetih rjavih medvedov iz narave v Sloveniji v obdobju 2003-2006, na podlagi starosti določene s pomočjo brušenja zob: končno poročilo" Biotehniška fakulteta, Ljubljana [in Slovenian]. Available at: <http://www.arso.gov.si/narava/%C5%BEivali/ogro%C5%BEene%20in%20zavarovane/rjavi%20medvedi%202003-06.pdf>

LIFE DINALP BEAR (2017) "Species distribution in Europe", project website, available at: <http://dinalpbear.eu/brown-bear/distribution-in-europe/>

LIFE DINALP BEAR (2017) "Brown bear – Species distribution in Europe", project website, available at: <http://dinalpbear.eu/brown-bear/distribution-in-europe/>

LIFE08 NAT/SLO/000244 (2016) "Monitoring of Conservation Status of Wolves in Slovenia in 2015/2016 – Summary in English". Available at: http://www.natura2000.si/fileadmin/user_upload/Volk_English_SUMMARY.pdf

Linnell J. D. C., Trouwborst A., Boitani L., Kaczensky P., Huber D., Reljic S., et al. (2016) "Border Security Fencing and Wildlife: The End of the Transboundary Paradigm in Eurasia?" *PLoS Biology*, vol.14, no 6, available at: <https://doi.org/10.1371/journal.pbio.1002483>

Linnell J. D. C., Trouwborst A., Boitani L., Kaczensky P., Huber D., Reljic S., et al. (2016) "Border Security Fencing and Wildlife: The End of the Transboundary Paradigm in Eurasia?" *PLoS Biology* vol.14 no 6, available at: <https://doi.org/10.1371/journal.pbio.1002483>

Slovenian Ministry of Agriculture (2015) Annual progress report Rural Development Programme

Trček, Petra (2017). "Pri nas živi okoli 52 volkov, večina na Notranjskem in Kočevskem" [in Slovenian - 52 Wolves Live in Slovenia, Mostly in Inner Carniola and the Gottschee Region], . Notranjskoprimorske novice. Available at: <http://notranjskoprimorske.si/2017/03/pri-nas-zivi-okoli-52-volkov-vecina-na-notranjskem-in-kocevskem/>

3.2.2 Innovative financing

PastoraLoup Volunteer Programme for shepherding
Background Information
Member state: France
Location: French South Alps; zones with wolf presence in the geographic areas of Alpes du Sud – Alpes de Haute Provence – and adjacent sectors (i.e. (Alpes Maritimes etc).
Large carnivores: Wolf
Population of large carnivores in area: The wolf population for France, overall, is estimated at 300-400 individuals in 2017, which presents a significant increase over the last decade. Wolf numbers seem to follow an analogous increase in natural prey (e.g., wild ungulates).
Main conflicts (including e.g. frequency of depredation events etc.): Wolf diet analyses have shown that 20% of prey consumed are livestock (mainly ovine). Human-wolf conflict is fuelled by wolf attacks on flocks.
Main conservation issues: Increasing wolf numbers are expected to augment human-wolf as well as inter-group conflict among stakeholder groups leading to increased demands for wolf culls and potentially illegal killings, which could have an impact on the population as a whole.
Measures already in place to reduce conflict (apart from case study activities): Volunteer support to local framing (livestock raising – herding- grazing) practices had started already before the establishment of FERUS (2003).
Stakeholders involved: Farmers (livestock raisers-sheep owners), volunteers, staff of FERUS, WWF France; French Ministry of Environment. The program is steered by a permanent working group appointed by the Ministry of Environment and which includes regular delegates from WWF France and FERUS.
Stakeholders interviewed: Farmers (livestock raisers-sheep owners) involved in the project, volunteers, project managers (environmental NGO)
Project duration: 1998 - ongoing (implementation time frame: March to October on an annual basis)
Funding estimate: The program is based on a contribution paid to the volunteers to take part in the training course (80€). In addition, stock breeders provide volunteers with food and sometimes lodging in exchange for their work. The program's total annual budget is 56,000 Euros, of which 23,000 Euros are covered by the State (Ministry of Environment) and another 33,000 Euros are provided by FERUS and WWF France.
Funding source: French Ministry of Environment and WWF France through FERUS (non-governmental organization); FERUS submits an annual evaluation report to the ministry, accompanied by an application for further financial support for the next year.
Aims: The main aim of the program is integrate farming (livestock – mainly ovine raising and herding) and wider rural communities into wolf conservation. This is promoted through recruiting volunteers to support flock protection. Volunteers may take over guarding of sheep flocks during the night in high altitude grazing meadows where the risk of wolf attacks is high. Volunteers also take part in installing electric fences and in testing deterrents (the latter during the last three years of the program).

Background Information		
<p>Key Actions</p> <ul style="list-style-type: none"> • Participants take part in a collective training event; • Volunteers commit to spending a period of two or more weeks helping with project activities; • Volunteers take part mainly in night wardening sessions and auxiliary monitoring activities to help prevent wolf attacks during night hours and track wolf movements; • An emergency intervention team made up of volunteers can be called out in the case of conflict situations caused by wolves; • Volunteers assist with installation of preventive measures (i.e. electric fencing) needed to mitigate human-wolf conflict. 		
Impact		
<p>Reduced conflict: The program has had marked effects on both human-wolf as well as inter-group conflict. Concerning human-wolf conflict, the program has been quite effective for flock protection against wolf attacks, especially during the night. This has been validated by an interviewee (local farmer), who underlined that wolves may be discouraged due to the effective guarding of flocks and re-locate. With regard to inter-group conflict, collaboration of stock breeders with volunteers promotes the acknowledgment of the hardships inherent in farming by volunteers and it also increases the exposure and tolerance of local farmers to rival (e.g., pro-carnivore) views.</p> <p>Increased consensus: Collaboration between farmers and volunteers is a basic requirement of the program. Even if participants (i.e., both farmers and volunteers, the latter being a largely pro-carnivore group from the general public) are already open to conflicting argumentation to take part in the project, interaction during the stay of volunteers in the farms may expose both groups to each other's positioning on a constructive basis of ex-change of viewpoints, opinions and know-how.</p> <p>Increased common vision: Despite the success of the program, general stereotypes still prevail among local people, especially when it comes to a core distinction between "ecologists", on the one hand, and local farmers, on the other.</p>		
<p>Conservation impact: It cannot be estimated how much of the increase in the wolf population can be attributed to the programme. In any case, given the confined numbers of participants (e.g., 15 stock breeders and another 40 volunteers), this contribution would not be substantive in terms of an explicit and direct conservation impact.</p>		
<p>Socio-economic impact: Volunteer work is organised to support farmers in guarding their herds; this presents a direct economic benefit for farmers. A positive socio-economic impact with a multiplier effect, which has been noted by interviewees, was that the programme has contributed in the decrease of losses due either to direct losses and/or to miscarriage of pregnant female sheep.</p> <p>Trained and experienced volunteers may be hired by stock breeders to act as full-time livestock warden assistant, passing from the volunteering status to a remunerated employee status, which is usually subsidised by the French State and EU funding.</p>		
Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	Volunteer work is beneficial in terms of mitigating both human-wolf as well as inter-group conflict.	In some cases, volunteers may abandon their service and mission due to the hardship related to the tasks they have to undertake (e.g., working night hours under quite difficult conditions).

		Another reason for dropping-out may be disagreement or problematic relationship with stock breeders.
Agricultural production, live-stock, primary sector activities	<p>Volunteer work is supporting farming operations and may reduce damage caused to livestock by the wolf considerably on a low-cost basis.</p> <p>Local farmers gain valuable knowledge and skills concerning damage prevention methods, through their collaboration with volunteers.</p>	Volunteer work is contingent upon funding for the program and it is temporarily confined to the duration of the program.
<p>Aspects that worked well</p> <ul style="list-style-type: none"> • Local media have regularly described and promoted the gains which are delivered by the program; • This seems to have also strengthened tolerance of the wolf amongst local people; • The collaboration between farmers and volunteers has allowed each group to learn from one another. 		
<p>Aspects that could be improved</p> <ul style="list-style-type: none"> • Increasing the size of the programme and number of participants could be beneficial. Given the confined number of participants (15 stock breeders and another 40 volunteers), positive effects may not disseminate across wider audiences; • The participants from local communities (i.e., local stock breeders) are too few to be able to resist in-group pressure stemming from the majority of local stock breeders, who still maintain quite hostile attitudes towards the wolf. This may also include illegal killing, which is still reported in the area. 		
<p>Conditions for transfer</p> <ul style="list-style-type: none"> • An interviewee (environmental NGO) has stressed that for any transfer attempt, a necessary condition is the existence of local environmental non-governmental organization (or relevant other body), which would take over local implementation and adjust it to the local context; • The managing body must understand local attitudes towards the program, overall, as well as local attitudes towards large carnivores. <p><i>The program has been already linked to the most updated National Wolf Action Plan in force (2013/17) in France and the accompanying national structures.</i></p>		
<p>More information and references</p>		
<p>Information on the case</p> <p>FERUS (2017) "Pastoraloup" program web-page [in French], available at: http://www.ferus.fr/benevolat/pastoraloup</p>		

Conservation performance payments for wolverine
Background Information
Member state: Sweden
Location: Reindeer herders area within the wolverine range in Sweden
Large carnivores: Wolverine
Population of large carnivores in area: Less than 700 wolverines in Sweden overall (Linnell 2014).
Main conflicts (including e.g. frequency of depredation events etc.): In the spatial overlap between wolverine range and reindeer herders' area (Swedish reindeer husbandry area), wolverines are largely dependent on semi-domestic reindeer for their survival.
Main conservation issues: Reindeer depredation by wolverines presents a challenge for wolverine conservation and necessitates a threshold of tolerance for depredation so that indigenous Sámi reindeer herding and wolverine conservation may be sustained. The measure described here to address this challenge involves a pro-active payment vehicle (linked to a wildlife conservation target) to replace the traditional re-active compensation system (linked to damage caused by wildlife).
Measures already in place to reduce conflict (apart from case study activities): A compensation system for damages (based on carcass documentation) caused by the targeted species was in place before the introduction of the CPP. Lethal control of large carnivores is also carried out based on a quota scheme and reacting to problem individuals.
Stakeholders involved: Reindeer herders, county administration personnel
Stakeholders interviewed: Reindeer herders, county administration personnel, member of environmental non-governmental organisation
Project duration: 1996 - ongoing
Funding estimate: From 1996 - 2001, payment per wolverine reproduction was lower than the originally intended 200,000 SEK (SEK 1 ~€ 0.15), since payment was calculated based on total losses of wolverines in the reindeer husbandry area divided by the number of reproductions (Persson et al. 2015). Since 2002, payments have been set at 200,000 SEK per documented wolverine reproduction (Zabel et al. 2007), with 12-28 SEK paid annually.
Funding source: Swedish government; Swedish CPP program
Aims: The Swedish government replaced compensation payments with conservation performance payments (CPP), paying reindeer herders for the number of successfully breeding wolverines (and occurrence in districts without confirmed reproductions) in their area, regardless of predation levels. CPP aim at addressing losses from depredation or disturbance, as well as the conservation value of the targeted species. This should help to prevent conflict surrounding loss of reindeer to wolverine.

Background Information

Key Actions

- Authorities make payments to reindeer herders;
- Payments are based on the number of documented wolverine reproductions in the respective district, regardless of predation levels;
- Field monitoring of wolverine reproductions is carried out;
- Assessment of demographic effects on the performance indicator has been made using long-term data from radio-marked adult resident wolverines and data from the national population monitoring program.

Impact

Reduced conflict: CPP is found to reduce the number of illegal killings of female wolverine and presumably encourages better stock protection measures (since payments were made whether or not stock were lost). In the transition from damage compensation to CPP, accusations of false claims from reindeer herders (Sami) have been eliminated, which has also contributed in reducing conflict among stakeholder groups.

Increased consensus: Joint monitoring, including county administration personnel and local people from Sami villages, has contributed to increased consensus in terms of creating commonly accepted background information and knowledge with regard to the wolverine population.

Increased common vision: Common vision has also been favoured by the joint monitoring scheme, but this is contingent upon using background knowledge and information to support one's positioning.

Conservation impact: Growth in the wolverine population was observed five years after the programme was set in place. The number of registered reproductions increased from 57 in 2002 to 125 in 2012, with the population expanding into previously unoccupied areas. A primary reason for the recovery of wolverines has been the significantly lower exposure of adult female wolverines to illegal killing, which has been the primary reason of adult mortality for Swedish wolverines (Persson et al. 2009). The measure, overall, has allowed for the population of the targeted species to more than double within a period of ten years (Perrson et al. 2015). The monitoring and its timing are also likely to provide a disincentive to poachers.

Socio-economic impact: Key to the success of CPP is the link between monetary payments and a desired conservation objective. Payments in CPP address efficient herding (i.e. prevention of depredation) and do not penalise with a lower compensation. Payments cover losses in reindeer production resulting from depredation or disturbance, while simultaneously accounting for the conservation value of wolverine (higher value alive than dead). The CPP systems has also generated substantial employment opportunities and subsidies for participation in the monitoring of wolverine populations, which is a quite demanding task in terms of workload and needs to cover extended areas of the wolverine range distribution. The reported expansion of wolverine towards the forested areas, probably denotes effects of high-densities in mountainous areas has resulted in increased dispersal of young wolverines to low-density areas.

Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	<p>An increase in the wolverine population has been observed and documented through monitoring which can be directly attributed to the CPP.</p> <p>A corresponding reduction of human-wildlife conflict can be observed. This has set the stage for an improvement in stakeholder relations.</p>	<p>Pressure is put on people working with monitoring (the field personnel or the methodology are blamed for any inconsistencies).</p> <p>The monitoring system may disturb females, since inspection needs to approach quite close to the den so that reproduction can be documented.</p> <p>Conflict among stakeholder groups may re-surface. For instance, local people do not agree on the criteria used to document reproductions.</p> <p>The CPP may not always align with other large carnivore management measures. Specifically there is a 10% tolerated damage threshold for all large carnivore species. If damage is above this level, lethal action may be taken. It may be difficult to attribute damage to a specific species.</p> <p>Illegal killing of wolverines does still exist as a type of free-riding (e.g. specimen shot after documentation of reproduction has been undertaken).</p>
Agricultural production, live-stock, primary sector activities	<p>Payments in the form of CPP encourage efficient herding (i.e. prevention of depredation) and do not penalize with a lower compensation.</p> <p>They are certainly an improvement over the compensation systems based on documentation of livestock depredation for a variety of reasons (many depredated animals may be never found, significant effort is required to look for them).</p> <p>Involvement in monitoring increases belief in the system and can provide an additional source of income (some is paid)</p>	<p>Weather conditions may not always allow for a reliable assessment of monitoring indices, which may lead to an underestimation of CPP (dependence of monitoring on snow).</p> <p>Reindeer herders underlined that CPP cannot fairly balance livestock losses and request an increase. They also highlight that the system has not been updated since 2002 and would like a higher fee/subsidy for local people involved in monitoring.</p> <p>CPP payments are dependent on the number of reproductions from a location as well as the location of the den in relation to the border of the focal district. A herder may not get compensation even though they are as close to the site, if they are located on the wrong side of the focal district border.</p>

Division of costs and benefits between stakeholders

Aspects that worked well

- The monitoring effort where wolverine dens are searched for and inspected in spring together with the county administration personnel and Sámi village representatives has improved relations between stakeholders;
- With the presence of the effective monitoring system in place, CPP certainly presents an improvement over rival compensation systems based on livestock depredation as time can be put into monitoring rather than searching for carcasses;
- Valuable knowledge and experience is accumulated throughout the years among staff of the County Administrative Board, which is adding to the validity and reliability of the system;
- Representatives of local communities have been given access to the database with large carnivore data (Rovbase), after a change in the system. This increases belief in the figures used.

Aspects that could be improved

- Further evaluation of the system is desirable;
- Unfavourable weather conditions may cause den inspections to fail in some cases, in addition detecting den sites is more difficult in particular habitats (e.g. forests) leading to possibility to underestimate the actual number of dens in the area and thus to compensation level;
- Frequent change in the criteria used to document reproductions may destabilise the system;
- The system should take into account the heterogeneity among local villages in terms of the monetary returns they get from the system vs. the damages they may suffer;
- Re-directing CPP received towards preventive methods may not always be workable for the reindeer husbandry;
- Dead reindeer have no value anymore (no compensation), unless there are instances of mass killing which has been highlighted by Sami people as a major drawback of the CPP system.

Conditions for transfer

- The effectiveness of the program in an area where a large carnivore species preys mainly on livestock illustrates a very promising potential for future implementation in carnivore conservation;
- Socio-cultural aspects of the local context need to be well examined before the introduction of any analogous system (Zabel 2007);
- A valid and reliable monitoring system needs to be established to support and sustain CPP;
- A stakeholders need to be involved in monitoring in order to believe in it.

More information and references

Information on the case

Persson, J., Rauset, G. R., and Chapron, G. (2015) "Paying for an Endangered Predator Leads to Population Recovery", *Conservation Letters*, vol.8, pp.: 345-350. Available at doi: 10.1111/conl.12171

Further references

European Commission (2017) "Conservation performance payments - Sweden" webpage. Available at: http://ec.europa.eu/environment/nature/rbaps/fiche/conservation-performance-payments-sweden_en.htm European Commission (2017) Conservation performance payments webpage. Available at: http://ec.europa.eu/environment/nature/rbaps/fiche/conservation-performance-payments-sweden_en.htm

Linnell, J. (2014) "Status of wolverine in Europe" at Large Carnivore Initiative for Europe website, available at: <http://www.lcie.org/Blog/ArtMID/6987/ArticleID/69/Status-of-wolverines-in-Europe>

More information and references

Persson, J., Ericsson, G. and Segerstrom, P. (2009) "Human caused mortality in the endangered Scandinavian wolverine population", *Biological Conservation*, vol. 142, pp. 325-331.

Zabel, A., and Holm-Müller, K. (2007) „Conservation Performance Payments for Carnivore Conservation in Sweden”, *Conservation Biology*, vol. 22, pp. 247-251.

3.2.3 Understanding viewpoints

Transfer and Communication Project – Baden-Württemberg
Background Information
Member state: Germany
Location: In all four administrative districts of Baden-Württemberg
Large carnivores: Lynx and wolf
<p>Population of large carnivores in area: There are only very few individual lynxes and wolves currently roaming in the area.</p> <p>There is no permanent population of lynxes because female lynxes are missing. There are established wolf packs 60 – 70 km to the south and to the west.</p>
<p>Main conflicts: The conflict in the project region regarding large carnivores is mainly based on fundamental differences in interests between stakeholders (conservationists against farmers and hunters). Farmers and hunters express concerns regarding the possible return of a lynx or a wolf population to the area because there are still many uncertainties about the impacts. The possibility of a lynx scaring livestock by only passing by grazing land, worries livestock owners who are legally responsible for damage caused by escaped livestock. Some hunters fear killing of game by large carnivores.</p> <p>Rumours have been spread that lynxes are secretly being reintroduced or that a group of wolves roam unnoticed by the general public through the area.</p>
<p>Main conservation issues: In the region of the project only 2-3 male lynxes have roamed through. The establishment of a lynx population will only be possible if a female individual is reintroduced in the area, as females do not migrate long distances and therefore have not crossed the natural barriers (mountain ranges) to come to this region. Although Baden-Wuerttemberg has space for approximately 100 lynxes according to experts from the Forest Research Institute Baden-Wuerttemberg (FVA), the hunting association rejects the reintroduction of female lynxes.</p> <p>The only two wolves which recently crossed the regions were killed by cars on the roads.</p>
<p>Measures already in place to reduce conflict (apart from case study activities): A compensation fund was established on a voluntary basis by associations in Baden-Wuerttemberg. In addition, the federal state covers 70% of the costs when damages are compensated which were caused by a wolf. Preventive measures are not compensated.</p> <p>Baden-Wuerttemberg has a new hunting and wildlife legislation which foresees monitoring of protected species and a wildlife appointee in every district.</p>
Stakeholders involved: Managing authorities, hunters, livestock producers, nature conservationists.
Stakeholders interviewed: Four representatives of hunters' and nature conservation associations, research institutions and also environmental authorities
Project duration: September 2012 - September 2017
Funding estimate: 56,000 euros/year
Funding source: Ministry for Rural Areas, Germany

Background Information

Aims: This project aims to promote communication among the different stakeholder groups and to raise awareness of the interests of the other interest groups and on the conflict dynamics among the parties. This project enhanced positive interaction and communication between the stakeholders involved and integrated the affected stakeholder groups within large carnivore management processes. It was set up in an area where single wolves and lynxes are returning and lynx reintroduction is under discussion, but before any significant numbers of individuals or populations were present in the area.

Key Actions

- Local networks (round tables) of stakeholders in four model regions (Southern Black Forest, Northern Black Forest, Central Black Forest and Swabian Mountains) were established;
- Meetings were organised in the regions involving all interest groups;
- Open-minded, well-connected individuals were chosen to represent the interest groups;
- External moderators not connected to any stakeholder group were engaged;
- Rules for communication were agreed in stakeholder discussions;
- Scientific facts were presented to ensure that every representative of the interest groups has the same scope of information;
- Experts and persons affected by large carnivores from other regions were invited as external speakers;
- Communication training was set up for “game wardens”;
- Stakeholders were encouraged to examine the conflicts between the various groups rather than the conflict topic “large carnivores”;
- Participants were trained to consciously respond to conflict-prone statements around large carnivores and reflect on conflict dynamics;
- A crisis team was set up for future conflicts regarding wolf or lynx in the region;
- A contact partner representing each interest group for the media was named.

Impact

Reduced conflict: The conflict has been reduced, as unnecessary fears were alleviated through information acquisition. Representatives of different positions were to an extent reconciled.

A culture of dialogue was constructed between participants, who got to know each other and are aware of the views of the others.

The conflict may flare up again if there are more large carnivores in the area.

Increased consensus: A common call to the local authorities was elaborated and signed by participants of the round tables.

The associations continue to contribute together to a fund for damages caused by large carnivores in Baden-Wuerttemberg.

They also agreed on a communication plan in future situations of conflicts with large carnivores and that there is still a need for clarification in terms of e.g. financing of prevention measures.

Increased common vision: To an extent – there is still a continuing disagreement between the supporters and the opponents of the reintroduction of lynx in the area.

Representatives who participated in the Regional Forums could work on a common vision, but many other members of the interest groups did not witness this process.

Impact		
<p>Conservation impact: Minimal until now – there are too few large carnivores present. The highest human-caused mortality is due to traffic. Illegal killing is currently not thought to be a large problem.</p>		
<p>Socio-economic impact: Little impact yet – there are few large carnivores in the area currently.</p> <p>Possible prevention measures have been discussed to avoid damage. It was concluded that financial assistance is needed to cover the expenses for prevention measures.</p> <p>A culture of discussion between different stakeholder groups could be established through this communication project.</p>		
Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	<p>Open discussion allayed unfounded fears about the return of large carnivore species</p> <p>Presentation of facts and best practices of other regions could challenge rumours</p> <p>Gained recognition as dialogue partners and experts in the field</p>	<p>For a successful outcome of this process, the participant had to spread the information gathered in these round tables within his or her interest group.</p> <p>Acceptance that the costs of damages caused by LC or efforts of installing damage prevention systems are high and will need to be adequately financed and managed</p> <p>Acceptance of a variety of future management techniques, not all of which may suit conservation</p>
Agricultural production, livestock, primary sector activities	<p>Awareness raising about their needs to receive support in prevention of damage/ compensation</p> <p>Strengthened the voluntary association of hunters, eNGOs and livestock breeders to have a fund for damages caused by large carnivores</p> <p>Possibility of receiving financial support</p>	<p>The participant had to spread the information gathered in these round tables within his or her interest group. Some group members did not recognize the agreements made in the round table.</p> <p>Acceptance that there is potential for additional work in carrying out damage prevention measures in future</p>
Game management	<p>Help game management to be better included in the management regime established</p> <p>Gain recognition as contributor to wildlife conservation</p> <p>Help to change the public perception of hunters</p>	<p>Acceptance that there is potential in future for quotas and rights to be re-examined to adapt to the presence of large carnivores</p>

Division of costs and benefits between stakeholders

Aspects that worked well:

- Neutral institution carrying out the facilitation helped engage all participants;
- Inclusive participation reduced uncertainty and stakeholder concerns and may prevent the propagation of unfounded rumours;
- Critical financial instruments for damage prevention were discussed in advance of damage being faced;
- Formulation of a call to the local government with a list of necessary measures which enable the coexistence of people and large carnivores;
- Communication project was implemented in a period of time when there was no acute serious conflict between the interest groups.

Aspects that could be improved

- Representative could in many cases not convince all of the members of their interest groups of their gained knowledge - a strategy on how participants can spread their gained knowledge could help;
- Long-term funding, as a communication process needs time;
- A new guideline for action needs to be elaborated for the case that a wolf pack establishes in the region.

Conditions for transfer

- Establishing the discussion before the conflict starts - has potential in areas where carnivores are returning and where there are active interest groups worried by this;
- A strong lead from an impartial individual is important to set up and moderate the stakeholder engagement process;
- Close relationship with all the stakeholder groups to be able to choose communicative and calm but well-connected representatives;
- If necessary, pay expenses to the participants to ensure that every interest group can take part;
- Significant resources (both financial and energy) needed at the start of the project but once it is up and running, the day-to-day costs are not high.

More information and references

Information on the case

Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg (FVA) (2016) „Transfer- und Kommunikationsprojektes zum Umgang mit Großraubtieren in Baden-Württemberg“ [in German], project website, available at: <http://forum-grossraubtiere.wildtiere-bw.de/>

Further references

Regionales Forum zum Umgang mit Großraubtieren im mittleren Schwarzwald (2015) „Gemeinsamer Appell an die AG Luchs und Wolf“ [in German], available at: <http://www.luchs-bw.de/eip/media/gemeinsamer-appell-des-regionalen-forums-mittlerer-schwarzwald.pdf?fl=20091056>

FVA (2016) „Die Rückkehr des Luchses?“ [in German - „the return of the lynx?“], round table website, available at: <http://forum-grossraubtiere.wildtiere-bw.de/forum-grossraubtiere-bw/rueckkehr-der-grossraubtiere/die-rueckkehr-des-luchses.html>

Cooperation of Stakeholders in the Cantabrian Mountains, Spain
Background Information
Member state: Spain
Location: Cantabrian mountains in Northern Spain, two core bear areas. The western nucleus comprises Somiedo and Fuentes del Narcea Natural Parks (Asturias province) and Alto Sil area (León province). The eastern nucleus is around Fuentes Carrionas Natural Park (Palencia) and surrounding areas. Both areas are connected by a corridor.
Large carnivores: Brown bears
Population of large carnivores in area: At the beginning of the project the bear population was critically endangered. Five to six females with cubs were seen in 1992. Current rate of increase in both sub-populations (western and eastern) is around 10% per year. Both subpopulations amount to 40 female bears with cubs (34 in the eastern and 6 in the western subpopulation) (Fundación Oso Pardo 2016), in total at least 300 individuals in the Cantabrian Mountains. In addition, their distribution range has expanded since the 1960s.
Main conflicts: The main conflict was between large carnivores and livestock owners and beekeepers. In spite of being protected, bears were illegally hunted because the law was not enforced.
Main conservation issues: The Cantabrian brown bears are still endangered because of their low numbers and limited available habitat, the very low rate of genetic exchange between the two subpopulations and the long isolation from other bear populations (Pérez et al. 2014). Illegal hunting was in some way justified by local people in the mid-1960s until 1986 because it was tradition. Furthermore, snares set to kill wild boar caused the death of many bears, but has been reduced in the last 15 years. Poison set for wolves sometimes kills some bears. Trophy hunting and traffic accidents are not a cause for mortality of bears in the region.
Measures already in place to reduce conflict (apart from case study activities): To avoid extinction, bears in Spain have been strictly protected since 1973 (Fundación Oso Pardo 2013). The Spanish government and four regional governments have developed continuously updated Management/Recovery Plans for brown bear populations. The first Management Plan of Somiedo Natural Park, approved in 1989, was already directed towards the conservation of bears. This management plan is updated every five years and is linked to sustainable development. The bear has been identified as symbol of the Natural Park and this contributed to a change in attitude of the local people (earlier than the project start). In Asturias, the damage compensation system has been in place since the early 1980s. If a large carnivore kills livestock or damaged beehives or orchards, a warden has to be contacted via phone to verify the claim for compensation payments.
Stakeholders involved: Beekeepers, conservationists, farmers, foundations which work with wildlife, hunters, livestock breeders, national, regional and local governments, local inhabitants, park authorities, researchers, rural police (<i>guardia civil</i>), tourism business owners and wardens.
Stakeholders interviewed: Representative of a research and nature conservation NGO, representative of a university and a representative of a local authority.
Project duration: January 1993 - ongoing
Funding estimate: 2.34 M€. (100,000-400,000 €/year)

Background Information

Funding source: LIFE projects, Fundación Biodiversidad, Ministry of Environment, private sponsors coordinated by the Fundación Oso Pardo and regional governments.

Aims: To increase bear numbers, improve social acceptance of bears, reduce poaching with illegal snares, promote rural development and avoid indirect impacts of hunting activities.

Key Actions:

- Monitoring of bears;
- Analysis of damages caused by brown bears;
- Discussions in meetings with all stakeholders;
- Training sessions for local people on how to face the challenges of coexisting with bears;
- Education initiatives;
- Publication of manuals and brochures as well as scientific and popular articles and books;
- Joint management of hunting grounds;
- Joint patrols to prevent poaching;
- Removal and prevention of the use of illegal snares;
- Delivery of electric fences to beekeepers and farmers;
- Agreements (memorandum of understanding) with mayors, hunting, farmer and beekeeper associations;
- Development of actions and agreements with beekeepers, cattle-breeders, tourism business owners, local governments, hunting associations and local inhabitants;
- Plantations to improve habitat;
- Clearing vegetation in certain hunting areas.

Impact

Reduced conflict: There has been a clear and significant reduction in conflict since the above mentioned bear conservation actions were taken. An indicator for a reduced conflict is the reduction of human-caused bear mortality. New conflicts sporadically arise, but these are more related to wolves than directly to bears.

Increased consensus: Consensus has increased, especially among hunters and beekeepers. It has been accepted that bears and people can coexist and that the opportunity to observe bears in wilderness is culturally important and has economic advantages. Different stakeholders including hunters, livestock breeders, the local inhabitants and the tourism sector made a social pact to protect bears in the Cantabrian Mountains.

Increased common vision: A common vision has been established on bears in the area, which is supportive of the increasing numbers. Hunters and local communities are currently proud to live amongst bears and there is a greater will to work together for conservation. "To kill bears means to jeopardize the future of Somiedo⁴".

⁴ Municipality that entirely forms part of the Somiedo Natural Park, a UNESCO biosphere reserve

Impact		
<p>Conservation impact: The improved perception of bears amongst hunters and livestock breeders has been crucial for their conservation. Human-caused bear mortality has been drastically reduced to such an extent that bear populations are now recovering. The effort for detecting bears killed by people is increasing, and nevertheless the number of bears recorded as killed by people has decreased. The number of illegal traps (mainly snares) has also been reduced.</p>		
<p>Socio-economic impact: Employment opportunities related to bear conservation, especially within the scope of LIFE projects, have increased for local people. Also the tourism sector is benefiting from bear conservation. Before, the economy was based on livestock. Nowadays it is much more diversified (tourism and service sector) and bears are regarded as a crucial element for the economy of Somiedo. Nonetheless there has been an overall increase in damage caused by bears since the population increased. There is however acceptance of some damage.</p>		
Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	<p>Legal requirements concerning the protected status of the bear are respected</p> <p>Growth of bear population resulting directly from the activities.</p>	<p>The increase in bear numbers can nonetheless result in increased damages (as can the increase in wolf numbers) with the potential that conflict may reignite.</p>
Agricultural production, livestock, primary sector activities	<p>Damage prevention measures have been improved and are effective in reducing damage.</p> <p>Wildlife tourism also increases the demand for agricultural products and opens up new markets.</p> <p>Rural infrastructure is being improved to meet the demands of tourists.</p>	<p>If damage prevention measures are not properly implemented, the damage caused by a few bears can be quite extensive in individual cases.</p>
Game management	<p>It has been recognised that hunting may be compatible with bear conservation.</p> <p>There has been an attitude change within stakeholder groups towards hunters (other stakeholders may accept hunting activities more).</p>	<p>The increase of bears can lead to some temporal restrictions to hunt in some areas.</p>
Tourism	<p>Employment and development opportunities in the tourism sector and the diversification of the local economy.</p>	<p>Increase in bear numbers and tourism sector leads to an increased potential of human-bear encounters with negative consequences.</p>

Division of costs and benefits between stakeholders

Aspects that worked well

- Involvement of all key stakeholders and long-term efforts to establish good working relations and trust between individuals has improved communication between them and resulted in significant attitude change towards bears;
- Agreement reached (also written agreements) between stakeholder groups;
- Long-term education of stakeholders including the diffusion of scientific knowledge and awareness in the local community;
- Agri-environmental funds for livestock breeders to implement conservation measures;
- EAFRD and LEADER funds for rural development have been established from the joint working (direct and indirect subsidies for livestock breeders and aid for economic diversification which is compatible with nature conservation);
- Improvement of damage compensation systems: quick disbursement of compensation payments in most of the bear range, as wardens are contacted by phone to verify the claim within 24 hours;
- Development of the rural tourism sector and diversification of the local economy due to the promotion of bear and wildlife recovery.

Aspects that could be improved

- Growth of bear population creates new challenges for human-bear coexistence, for example, the fear of bears has started to increase in some areas;
- Damage compensation systems need to be improved. Farmers claim that the scales of fees to compensate beehives and the livestock killed by bears are too low because they have not been updated and indirect losses and the loss of profit are not compensated;
- It would be beneficial if local long-term jobs would be created linked to bear conservation;
- A possible next step would be to market products through the brand of the bear (e.g. food, water, nuts);
- New damage prevention technologies need to be promoted in rural areas.

Conditions for transfer

- This case study has great potential for transfer into other regions and could also be implemented to mitigate conflicts with other large carnivore species. It demonstrates the viability of sustainable development involving large carnivores, as it has not prevented economic and rural development;
- It would be useful to have a manual adapted to other species or areas. The context of the different rural societies has to be taken into consideration and methods need to be adapted;
- If the objective is to promote peaceful coexistence between large carnivores and people, a constant communication and dialogue between people has to be maintained. Proper management of other large carnivore species is also important, as conflicts caused by one species can influence the other;
- It is important that efforts are long-term and involve dedicated individuals, well-known in the community for success.

Parts of the approach have been adopted in Italy and Greece, as also in other communities of the Pyrenees.

More information and references

Information on the case

Fundación Oso Pardo (2013) foundation website, available at: www.fundacionosopardo.org

Further references

Fundación Oso Pardo (2013) “The Brown Bear”, foundation website, available at:
<http://eng.fundacionosopardo.org/index.php/the-brown-bear-2/>

Fundación Oso Pardo (2016) „Censos de osas con crías en la cordillera cantábrica”, available at:
<http://www.fundacionosopardo.org/wp-content/uploads/2017/08/Triptico-cenos-osas-con-crias-2016.pdf>

Pérez, T., Naves, J., Vázquez, F., Fernández-Gil, A., Seijas, J., Albornoz, J., et al. (2014) “Estimating the population size of the endangered Cantabrian brown bear through genetic sampling”, *Wildlife Biology*, vol. 20, pp. 300-309.

Core Group Wolf
Background Information
Member state: Switzerland
Location: Canton of Bern
Large carnivores: wolf
Population of large carnivores in area: After the extermination of wolves in Switzerland in the 19th century, the first wolf returned to the Canton of Bern in 2006 (KORA 2012). Since then, only single wolves have passed through, until in 2016 when the first pair of wolves was established in the Canton of Bern and Fribourg. Offspring was expected this year. However, the female wolf was found dead on 9 June in the canton of Fribourg. She had been poisoned. There are no signs of the male wolf anymore for the past few months, either (Staat Freiburg 2017). Currently, there are indications of several single wolves in the canton of Bern.
<p>Main conflicts (including e.g. frequency of depredation events etc.): Depredation of livestock, particularly sheep is the main cause of conflict. Although farmers are satisfied with the compensation, they are emotionally affected by losses and have more labour if they agree to implement livestock protection measures.</p> <p>As the economy of the Canton of Bern depends heavily on tourism and outdoor activities in the picturesque Alps with their grazing herds of livestock, a concerned part of society fears that a growing population of wolves will put this at risk. There have been incidences of livestock guarding dogs attacking dogs of hikers and frightening hikers.</p>
Main conservation issues: Illegal killing of wolves has happened before and is still a major problem. With the potential establishment of a new wolf pack, the canton faces new challenges. Low acceptance of wolf by part of the society combined with symbolic and wider social-economic issues also play a major role.
<p>Measures already in place to reduce conflict (apart from case study activities): The Department of Economic Affairs of the Canton of Bern developed in 2007 an Official Strategy on coexisting with wolves (Kanton Bern 2007).</p> <p>A compensation system has been in place since the re-introduction of the lynx in the 1970s. Until 1988, the Swiss League for the Protection of the Nature (nowadays named "Pro Natura") paid the damage. Since then, payments are made by the authorities. Each case of attack has to be confirmed by a game warden. Compensation is paid 80% by the Federal Government and 20% is paid by the canton.</p> <p>Sheep holders are supported by authorities when implementing damage prevention measures and at small scale by nature conservation organisations in the form of volunteers and funds.</p>
Case study description
Stakeholders involved: Representatives of cantonal authorities, (cantonal) farmer associations, sheep breeder associations, goat breeder associations, hunting associations, game wardens, nature conservation organizations (e.g. WWF and Pro Natura), AGRIDEA (livestock protection Switzerland), livestock guarding dog associations, research institutions, veterinary department and of the tourism sector.
Stakeholders interviewed: Representatives of a farming organisation, a nature conservation association, and a game warden.

Case study description
Project duration: 2007 - ongoing
Funding estimate: All the participants take part of the Core Group Wolf voluntarily. While for some it is covered by their regular working time, others have to attend in their free time.
Funding source: Canton (group travel during excursions), members themselves (time investment and travel costs)
Aims: The main goals of the Core Group Wolf are to encourage and facilitate discussions between stakeholders and improvement of relationships in the light of an increasing wolf population. In addition, the groups look at the practical implementation of damage prevention measures and how best to implement them.
<p>Key Actions</p> <ul style="list-style-type: none"> • Biannual meetings of representatives of all interest groups coordinated by the cantonal authorities; • One excursion a year to look at measures on the ground; • Discussions about livestock management and policy measures; • Implementation of wolf strategy; • Exchange of information and solution-solving approaches; • Consulting of authorities; • Immediate provision of information in case of wolf attack; • Signed agreement to not give any statement outwards without prior discussion with the Core Group, the hunting inspector and the governing council.
Impact
<p>Reduced conflict: Conflict still exists but the interest groups better understand each other's viewpoints and internal communication has improved so that there is a possibility of working together. This means that on the local level solutions to individual problems can be found, even if on the larger scale, positions are still opposing.</p> <p>Increased consensus: Consensus has been built on communication flows. This applies mainly to those stakeholders who are directly participating of the Core Group.</p> <p>Increased common vision: Within the Core Group, there is an increased common vision (a certain understanding of what their aim is), however, it was acknowledged that stakeholders who are not involved in the group or the general public still have a more or less black-and-white perception of the issue.</p>
<p>Conservation impact: After the extermination of wolves in the 19th century, the first wolf returned to the Canton of Bern in 2006. Since then several individuals have roamed the area, but no pack has been formed yet.</p> <p>So far, the wolf topic has been treated relatively factually in the Bernese media (compared to other regions) thanks to the communication activities carried out.</p>
<p>Socio-economic impact: If there is a verified killing of livestock by a wolf, the financial compensation is fair. If it cannot be verified that the killing has been caused by the wolf, and other causes may be more likely then compensation is not paid.</p> <p>Very few people in the area make their living from sheep breeding. Most of them are part time or hobby farmers; nonetheless, loss of livestock has an impact on their livelihood.</p> <p>The opportunities for tourism activities connected to large carnivores are thought to be limited.</p>

Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	<p>Legal requirements concerning the protected status of the wolf are generally respected.</p> <p>Public insecurity related to wolves in the area stirred up by the media can be avoided through previously agreed upon communication flows.</p>	<p>Lethal wolf management may be considered if wolf numbers increase dramatically</p> <p>The increase in wolf numbers has also led to an increase in the damage extent and to occasional illegal killing.</p>
Agricultural production, livestock, primary sector activities	<p>Recognition from other stakeholder groups as possible victims of damages caused by large carnivores and the additional burden in time and investment for farmers implementing livestock protection measures.</p> <p>Excursion participants broaden their knowledge on protection measures against wolf attacks.</p>	<p>If damage prevention measures are not uniformly implemented at the local level, then those local producers who have not implemented the measures may suffer substantial damage.</p> <p>Professional colleagues (e.g. other farmers) outside of the Core Group Wolf assume that a member of this group automatically is in favour of the natural return of the wolf.</p>
<p>Aspects that worked well</p> <ul style="list-style-type: none"> • The cantonal government values the Core Group and participates in the meetings; • Stakeholders agreed to contact the media in a coordinated way and complied with the agreement leading to less sensational reporting; • Pleasant atmosphere in the group and participants have got to know each other over time. Excursions also helped the two parties to approach each other and bring them to a uniform level. This might have increased the chances of participants being willing to step out of their comfort zones and address issues together; • Stakeholder participation acknowledged as a kind of recognition for stakeholder groups who have suffered damage from large carnivores (e.g., farmers, livestock breeders); • Excursion participants broadened their technical knowledge on protection measures and the related challenges and potentially helped them reduce damages. 		
<p>Aspects that could be improved</p> <ul style="list-style-type: none"> • Stakeholder participation led to a perceived power imbalance among certain stakeholder groups; such a feeling may position local producers (e.g., farmers; livestock breeders) as a minority which may discourage stakeholder cooperation; • More research on the functioning of Swiss ecosystems is needed to raise awareness on the importance of each species, including wolf and lynx; • Protection of livestock was very much the focus. However, the wolf (biology, behaviour, conservation) deserves to be discussed more; • The stakeholder basis and general public needs to be more involved into the activities of the Core Group Wolf, as it does not share yet their common vision; • 		

Division of costs and benefits between stakeholders

- The general public needs to be prepared for the establishment of a wolf population in the area;
- Greater involvement of hunting and hiking associations has been requested;
- Work of the Core Group should be presented on the website of the cantonal government for public relations work and to gain public trust (though it should be clear to participants what is confidential and what is public).

Conditions for transfer

- Round tables or coordinated groups are reasonable measures to implement in a situation where polarities have been created and where the topic is exploited by the media;
- The group needs to be led by a person who is highly communicative, non-hierarchical and communicates at eye level;
- It is also recommended to involve an experienced person during the formation of the group;
- To avoid media exploitation, members of the Core Group commit to only release common statements.

Such wolf working groups or round tables have already been established in several Swiss cantons.

More information and references

Information on the case

Juesy, P. (2015) "Bericht Wolf/Herdenschutz Kanton Bern (2006 bis 2015)", available at:
http://www.vol.be.ch/vol/de/index/natur/jagd_wildtiere/publikationen.assetref/dam/documents/VOL/LA/NAT/de/Natur/Jagd_Wildtiere/PUB_LANAT_JW_Bericht_Wolf_Herdenschutz_2006-2015_Kt-Bern.pdf
KORA (2017), NGO website, available at: <http://www.kora.ch/index.php?id=1&L=1>

Further references

Kanton Bern, Volkswirtschaftsdirektion (2007) "Strategie Umgang mit dem Wolf im Kanton Bern" [in German], available at:
http://www.vol.be.ch/vol/de/index/natur/jagd_wildtiere/projekte.assetref/content/dam/documents/VOL/LANAT/de/Natur/Jagd_Wildtiere/LANAT_JW_Umgang_mit_dem_Wolf_de.pdf
KORA (2012) "KORA News – Wölfe im Kanton Bern" [in German], news on KORA website, available at:
http://www.kora.ch/index.php?id=214&L=3&tx_ttnews%5Btt_news%5D=406&cHash=b6fd1afad0f04e02c4b57103493e2538
Staat Freiburg (2017) „Alle News“ [in German], available at:
http://www.fr.ch/ww/de/pub/functions/alle_news.cfm?fuseaction_pre=Detail&NewsID=60739

3.2.4 Monitoring

TASSU monitoring-system and volunteers-based large carnivore contact network
Background Information
Member state: Finland
Location: Countrywide
Large carnivores: European lynx, brown bear, wolf and wolverine
<p>Population of large carnivores in area: The population of lynx, wolf, bear and wolverine have all increased in Finland during the lifetime of the project. In the beginning of the project lynxes and bears were rarely or occasionally seen. Nowadays, both are a regular species. Wolverines appeared a few years ago and wolves are now seen occasionally (referring to the project area).</p> <p>In Finland as a whole, the number of wolverine has also increased and the area expanded to cover most of the country. The number of wolves in Finland peaked in 2006 and has fluctuated over the last ten years but has expanded from Eastern Finland, west and south.</p> <ul style="list-style-type: none"> • Wolves in Finland (Natural Resources Institute Finland (Luke) 2017a): 150-180 individuals (endangered species); • Bears in Finland (Luke, 2017b): 1980-2100 individuals including cubs of the year (near threatened species); • Lynxes in Finland (Luke, 2017c): 2,355-2,495 individuals (not including kittens of the year) (near threatened species); • Wolverines in the North and East of Finland: 220-250 individuals, population growth between 1978 and 2006: 4.7% (endangered species) (Metsähallitus 2017a).
<p>Main conflicts (including e.g. frequency of depredation events etc.): In the field, the biggest problem of coexisting with large carnivores is the threat of wolves to hunting dogs and large carnivores causing damage to reindeer herding, as well as occasional and local damages to domestic animals, beekeeping and agriculture. Fear of large carnivores is also an issue in some areas.</p>
<p>Main conservation issues: Finnish wolf and wolverine populations are still small and suffer from lack of genetic exchange with populations. Wolverine suffers the effects of climate change as full snow cover during winter influences the success of reproduction of this species. Lynx and bear populations are healthier (near threatened, recently down-ranked from threatened) and exchange occurs with the Russian bear population.</p>
<p>Measures already in place to reduce conflict (apart from case study activities): There are many actions in place of which monitoring systems is just one. National management plans for these issues have been created (Metsähallitus 2017b). The new wolf management plan, for example presents 59 different actions and 9 projects aimed at finding solutions to the most central issues in wolf conflict. The bear and lynx plans are currently being revised.</p> <p>A damage evaluation and compensation system based on the Game Damage Act is in place (compensation for carcasses found).</p> <p>The Finnish Ministry of Agriculture and Forestry issues annually hunting quotas for bears, wolves and lynxes. In 2017, a quota was also issued for wolverine for the first time in 35 years following significant damage in a particular area (Finnish Wildlife agency, personal communication 2017).</p>

Background Information
<p>Stakeholders involved: Volunteers, hunting organizations, beekeepers, reindeer and sheepherders, cattle owners, nature protection organisations, police and kennel dog organizations, State Forest Enterprise, local game management associations, Finnish Border Guard, Finnish Wildlife Agency, Natural Resources Institute Finland, Centre for Economic Development, Transport and the Environment, as well as the Finnish Forest Association.</p>
<p>Stakeholders interviewed: Three representatives from the local game management association, a research institution and conservationists.</p>
<p>Project duration: Volunteers-based large carnivores monitoring: 1978 - present, TASSU-system (electronic database collecting system): September 2009 - present.</p>
<p>Funding estimate: 10,000-25,000 euros/year for website duties and trainings. Collection, verification and saving information on observations completely based on voluntary work.</p>
<p>Funding source: The Finnish state (costs of Natural Resources Institute Finland and maintenance costs of TASSU-server and website), volunteer large carnivore contact persons (mainly hunters) on their own cost, hunters also pay for the education work by Finnish Wildlife Agency through annual game management fee.</p>
<p>Aims: To improve accessible scientific data and monitor population sizes through the establishment of an electronic database to which all stakeholders have access. This shall engage stakeholders and increase the acceptance of scientific data.</p>
<p>Key Actions</p> <ul style="list-style-type: none"> • Identification of competent volunteers; • Training for volunteers; • Collection of signs of the presence of large carnivores; • Contact persons collect and attempt to verify large carnivore sightings found by the general public; • Contact persons enter confirmed sightings into TASSU system; • Population assessments; • Annual informative meetings of large carnivores stakeholder groups; • Improvement of information sharing among stakeholder groups and the public.
Impact
<p>Reduced conflict: TASSU has increased the general level of knowledge about large carnivores, thus reducing conflict between stakeholder groups such as researchers, hunters and nature conservationists with originally varying views. On the other hand, the accessibility of information to a larger group of stakeholders enabled more stakeholder groups to take part of the discussions with their own interests and agendas. Objective data can be interpreted from different viewpoints and used for varying purposes.</p>
<p>Increased consensus: Due to the collected information, different stakeholder groups have now a shared starting point for the discussions. During the past few years the different interest groups could approach each other which has increased the common understanding, but the far ends of the discussion are still far apart with strong attitudes (ideologies).</p>
<p>Increased common vision: Within the stakeholder groups a common vision was achieved on certain issues e.g. the management of problem wolves. This does not apply to all issues however.</p>

Impact		
<p>Conservation impact: The case has been running for a long time. In this time the populations of all species have increased in the area. On a national level, the population has increased significantly. The direct impact of the project itself of the population development, however, cannot be judged.</p>		
<p>Socio-economic impact: The biggest socio-economic impact of large carnivores in general are the damages on semi-domestic reindeer (compensation claims were over 10 M€ in 2016). The viability of reindeer herding as a livelihood might still be in jeopardy in areas with strong carnivore populations (Metsähallitus 2017c). Bear damage to beehives and wolf damage to sheep and cattle have increased, as well as cases of wolves killing dogs.</p> <p>Other social impacts are caused by large carnivores coming close to human settlements, which causes fear. According to the studies, around a third of Finns are afraid of wolves and bears. Lynx and wolverine do not cause similar psychological reactions.</p> <p>Interviewees do not perceive that the presence of large carnivores generates new working opportunities in the field apart from some businesses activities in Eastern Finland (e.g. hunting or wildlife observation trips) and unpaid voluntary activities.</p> <p>Resources for research related to wolves have been significantly increased. The wolverine has also gained more attention in recent years. There have been no significant changes in resources for research on lynxes or bears.</p>		
Division of costs and benefits between stakeholders		
Main focus of stakeholders interest	Benefits and gains of participation; added value	Costs of participation; unanticipated side-effects
Large carnivore conservation	Better documentation of presence and numbers of large carnivores.	“Problem” wolves to be detected and removed.
Agricultural production, livestock, primary sector activities	Damage evaluation is deemed satisfactory.	Compensation after damage evaluation is not satisfactory, especially for beekeepers. Damage caused by wolves increases with number of wolves.
Game management	Hunters are the main social actor to collect data on large carnivores.	Hunters' rights and quotas may be renegotiated among stakeholders following new information gathered from monitoring.
Tourism sector	Employment and development opportunities in the tourism sector.	Inappropriate tourism activities have been recorded resulting in large carnivores being attracted to certain areas / associating humans with food. Public opinion may be against increased tourism.

Division of costs and benefits between stakeholders

Aspects that worked well

- Since a variety of stakeholders (especially hunters) contributed to the database, the information was well shared and enjoys a high level of respect from a range of interest groups;
- TASSU observations are one of the key parameters to produce population estimates of lynxes, bears and wolves, to give trends of population changes;
- Key areas for large carnivores in Finland have been determined by the observations stored in TASSU system and in general large carnivores have been brought to the spotlight;
- The system itself is very visible and known to citizens through its public outreach website (in addition to large carnivores observations during last two months in 10x10 km squares, this website includes also a lot of information on population assessments and assessment methods of large carnivores, as well as data on other important game species such as the moose, white-tailed deer, roe deer and wild boar).

Aspects that could be improved

- In some cases, more training, feedback and support of the volunteers is needed;
- Information-sharing with hunters and the public could also be improved. Wildlife managers and scientist ought to share more information about how decisions are taken, on what estimates are based on and how things work;
- The TASSU monitoring system is only a tool to produce and share data and information. The difficulty lies in the following steps and how the data is used for large carnivore management;
- TASSU does not explain unexpected changes in population size estimations. Other monitoring tools need to be considered for this;
- Although everyone can inform the contact person (normally a hunter) about an observation, some people from the conservationists' side or people who dislike large carnivores do not pass on the information.

Conditions for transfer

- All data collectors need to employ the same methodology in the same location. However, the methodologies may need to be different to adapt to local conditions and the species present;
- Feedback and support needed during data collection;
- Stakeholders need to have a genuine interest in implementation and take responsibility;
- Relies on a good system of trainers being in place with good personal relations with the volunteers – this may be difficult to set up from scratch.

More information and references

Information on the case

Finnish Wildlife Agency (2017) Finnish Wildlife Agency's website, available at:
<https://riista.fi/en/https://www.luke.fi/en/>; <https://riista.fi/en/>; <http://www.largecarnivores.fi/>

Metsähallitus (2017) "Estimating the numbers of large carnivores", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/conservation-and-hunting/large-carnivore-research/estimating-the-numbers-of-large-carnivores.html>

Natural Resources Institute Finland (LUKE) (2016) Tassu's public outreach website:
<http://riistahavainnot.fi/>

More information and references

Further references

Metsähallitus (2017a), "Degree of endangerment", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/conservation-and-hunting/conservation/degree-of-endangerment.html>

Metsähallitus (2017b), "Large carnivores and reindeer herding", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/large-carnivores-and-us/damages/reindeer-damages.html>

Metsähallitus (2017c), "Damages caused by large carnivores", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/large-carnivores-and-us/damages.html>

LUKE (2016a) "The Wolf", institute's website, available at: <https://www.luke.fi/en/natural-resources/game-and-hunting/the-wolf/>

LUKE (2016b) "The Bear", institute's website, available at: <https://www.luke.fi/en/natural-resources/game-and-hunting/the-bear/>

LUKE (2016c) "The Lynx", institute's website, available at: <https://www.luke.fi/en/natural-resources/game-and-hunting/the-lynx/>

3.3 Strength, Weakness, Opportunity Threat (SWOT Analysis)

In addition to the individual analysis of each case study, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis for the entire interview corpus was conducted (Table 8). The aim of the SWOT analysis was to identify common themes for each stakeholder group involved in the case studies.

The analysis describes the in-group and inter-group aspects that promote or hinder coexistence as identified by each stakeholder group during the interviews. The aspects refer to either the members of that group or their relationship with other stakeholders. It therefore highlights the concerns of that group more than providing a factual overview of the situation. It demonstrates that despite the variety of the cases, the problems identified by a particular stakeholder groups are often similar. Perhaps more surprisingly, the different stakeholder groups often highlight the same problems and agree on their causes.

Apart from what has been included in the SWOT template, all informants endorsed the processes they had taken part in as examples of effective participatory and collaborative procedure. All respondents also commented on their own change in attitude following participation in the process as well as on the change in attitudes of other actors. This ultimately led to building of trust and increased tolerance towards opposing views and positions.

Despite the commonalities identified, it should be borne in mind that these Strengths, Weaknesses, Opportunities and Threats have been identified by the stakeholders themselves and for particular local examples, they will not necessary apply to these stakeholder groups in other locations.

Table 8. Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis based on all interviews carried out.

	State actors; federal and local governments; managing authorities (including protected areas)	Hunters and hunters' associations	Farmers and farmers' associations, stock breeders, bee keepers, reindeer herders	Environmental non-governmental organizations (eNGOs)
Strengths (In-group aspects which might promote co-existence)	Successful organisation involves striking the right balance between inclusion of all interests while maintaining the practical operational character of the group.	Participation in monitoring schemes may help to reduce uncertainty, increase belief in the system and change risk perception	Producers are recognised through their participation in initiatives for large carnivore conservation and management; their concerns and needs are better acknowledged	Support transfer of knowledge and know-how about damage prevention methods such as electric fences and livestock guarding dogs between different organisations and locations across the EU
Weaknesses (In-group aspects which might hinder coexistence)	In-group or context-dependent variations can be high; this makes transfer of good practice to different institutional settings problematic	Trust and understanding gained among stakeholders through participatory procedures is not always diffused within in-group members who have not been directly involved in the process	Prevention measures are not effective for all types of grazing system (variations with types of livestock and grazing patterns). Implementation of measures by some farmers / herders in an area may be interpreted as accepting the presence of large carnivores and penalised by others. There may be increased competition for funding sources for prevention measures.	The effectiveness and diffusion of damage prevention methods is contingent upon the ability of eNGOs to adjust to the local context (e.g., meeting technical requirements in installing and operating electric fences; addressing social relations among stock breeders in establishing networks for exchanging livestock breeding dogs)
Opportunities (Inter-group aspects which might promote coexistence)	Inclusionary deliberation and consultation procedures may result in agreement among stakeholders without the need to reach a full consensus on all issues	For participative processes to be successful, an unbiased moderator is crucial so that valid points of discussion are selected and trust among stakeholders and commitment to the collaboration is developed	Illegal killing of large carnivores decreased considerably in the case studies due to implementation of damage prevention methods and change in attitude. Prevention measures present an opportunity for better cooperation between stakeholders	Effective implementation of damage prevention methods may decrease damage and increase tolerance to large carnivore species and consensus concerning large carnivore conservation and management as well as improving working relations

	State actors; federal and local governments; managing authorities (including protected areas)	Hunters and hunters' associations	Farmers and farmers' associations, stock breeders, bee keepers, reindeer herders	Environmental non-governmental organizations (eNGOs)
Threats (Inter-group aspects which might hinder coexistence)	Participants involved in deliberation and consultation procedures may not always have the necessary knowledge and skills or be familiar with the local context	Deliberation and consultation, as well as the collection of additional data, can in some cases fuel inter-group disagreement and antagonism if the data is interpreted differently by different groups	Damage suffered by producers may not be reported to managing authorities in cases where complex and bureaucratic procedures may act as a barrier. Implementation of prevention measures sometimes transfers conflict to another group	If compensation payments are not dependent on implementing specific prevention measures, this may reduce the efficiency of the measures and the likelihood of them being implemented

4. Implications for large carnivore management and conservation

The case studies included in this report involved the most recognised and valued examples of good practice in large carnivore conservation and management in the EU as identified by the Platform members and national experts. The fiches provide summaries of the examples with significant potential for transfer. The achievements of the actors involved in these cases in reducing conflict and increasing consensus and common vision from the local to the transnational level, should not be underplayed.

Nonetheless, as well as highlighting benefits from the cases, interviewees frequently highlighted potential for improvement in the implementation of initiatives. Unanticipated knock-on impacts were sometimes experienced which should be taken into account in updating an initiative or transferring it to a new location. Good practice is therefore distinguished not by eliminating any challenge and designing a “perfect” example of working together, but by recognising and adapting to difficulties experienced in order to reach the desired outcomes to the fullest extent possible.

These remarks are of crucial importance for revisiting national initiatives in the context of transfer of good practice and for providing tips for incorporating stakeholder input in a bottom-up fashion in the design of new initiatives. In this section, the various issues which should be taken into account when considering the transfer of good practice are explored in more detail and both positive and negative findings from the cases are highlighted.

4.1 Integrating a range of coexistence measures

Interviewees in several case studies highlighted gaps in the implementation of damage prevention methods. Gaps could be related to the uptake and spatial extent of measures. For example, if measures were not uniformly implemented in a particular region or some individuals implemented them poorly, then the damage caused by large carnivores might be concentrated on a small number of producers as compared to their neighbours. An example of this was seen in the *Italian case study (Medwolf LIFE project)* where not all producers took the opportunity to implement prevention measures. Alternatively, the effective implementation of prevention measures in livestock areas might redirect large carnivores to new areas including human settlements with potential for greater conflict as experienced in the *Greek case study on electric fencing*.

Another issue highlighted was the interaction between measures used and potential synergies and conflicts. For example, the *Rural Development Programme in Slovenia* has encouraged the uptake of damage prevention measures but does not support a variety of complementary measures being implemented by an individual farmer. In *Greece*, protection measures have been integrated into the Rural Development programme, but uptake by potential beneficiaries was zero in the first programming period. It has been poor since then due to a lack of outreach, awareness-raising activities and advice from the Managing Authority. Continuity of financing is also often highlighted as an issue, with beneficiaries expected to pay for measures in advance and sometimes experiencing a serious delay in receiving support.

The interaction between measures aimed at reducing damage and those aimed at compensating for damage is also important. Members of environmental NGOs in the *Greek case studies*, interviewed in relation to the use of livestock guarding dogs and electric fences, highlighted the fact that local producers were compensated for damages whether or not they implemented prevention measures. This may be counterproductive as some producers may be more willing to accept the risk of damages if they know they will in any case receive com-

pensation. It was suggested that only those who had put in place prevention measures such as livestock guarding dogs or electric fences should be eligible for compensation as is already the case in several other Member States.

An alternative approach was included in the *Swedish case study (Conservation Performance Payments, CPP)* in which producers received a payment based on the number of successfully breeding wolverine in an area instead of a compensation payment. This created an indirect incentive to better protect reindeer since financial support was not based on the number killed. However not all aspects of the case demonstrated good integration with other schemes. In particular, the balance between the CPP (incentive structure focused on wolverine reproductions in a linear fashion; the more reproductions, the higher the payment to local communities) and the 10% tolerance level for all large carnivore-caused damage implemented in the reindeer herding area as a whole could work against one another: an increased number of wolverine reproductions results in higher payments, however, if the threshold level was approached, then this incentive structure could not function as planned.

Recommendations:

Damage prevention measures should be **planned in an integrated manner** within a region. This includes taking into account the incentives offered by different funding streams such as national compensation measures, EU Rural Development funding and EU Agricultural support. Land managers should have access to a toolbox of complimentary measures. Awareness raising about the existence of these measures is also necessary in order for them to be taken up.

It is important to fully consider the **conflicts and synergies between measures** implemented in a particular area as well as potential unforeseen impacts on those outside the target area. Involving a range of stakeholders who may be impacted by changes in management is important in this context.

4.2 Understanding economic, social and cultural aspects

A complex interplay of feedback effects has been highlighted in socio-economic terms in the case studies. On the one hand, effective implementation of damage prevention methods and effective large carnivore conservation may create new employment opportunities at the local level, mainly associated with the support of damage prevention methods and the tourism sector. An example of this was provided by the *Spanish case study (bears in the Cantabrian Mountains)* where an increase in bear numbers is widely accepted by the local population due in large part to increased economic potential through tourism. On the other hand, some interviewees in other locations pointed out undesirable side effects of increased tourism, such as the inappropriate behaviour of some operators who provide food for large carnivores in locations close to people, which leads to the increased probability of encounters with humans. This may lead to increased conflict between stakeholders.

When stakeholders involved in an initiative are able to reap economic benefits themselves, the scheme's chances of success increase greatly. This was seen in several damage prevention cases where once users realised that the measures were effective, they were willing to put them in place even without public support. The *Livestock Guarding Dog network in Greece* was an interesting example in that those who successfully managed to breed good quality dogs were able to partially finance themselves and also received social recognition for their skills. On the other hand, this case was not without in-group conflict in that some livestock breeders were excluded from the groups exchanging dogs.

The socio-economic incentives included in funding schemes must be carefully considered to ensure that perverse incentives are not included. The *Swedish case study* was in many ways highlighted as a significant achievement in putting into place positive incentives. The economic incentive to protect wolverine in most cases outweighed the incentives to illegally kill wolverine young, which and led to stakeholders allocating wolverine an economic value. However, some of the stakeholder group resented the fact that this allocation of value to the wolverine seemed to detract from the value of their original product (reindeer meat). Within the scheme, dead reindeer have no value. They still denote livestock loss for reindeer herders and therefore a loss of potential income, despite the increased income from the CPP. At the same time, the distribution of this increased income may be perceived as unfair – there may be instances of higher levels of damage in areas with fewer wolverine young. In some cases it may trigger free-riding such as killing of wolverine young at a later stage after the young have been counted through monitoring and the financial benefits have already been allocated.

At the same time, it should be recognised that stakeholders affected by large carnivores do not act purely in economic terms and that cultural and social aspects also play an important role. This was illustrated through the issue of tolerance levels, which was highlighted in many cases. Some interviewees spoke about cases where the damage caused by large carnivores surpassed a threshold of tolerance and the need for action in these cases (a reaction to economic losses). In other cases, stakeholders called for action in the case that populations increased beyond a particular size, unrelated to the damage they caused (a reaction provoked more by a cultural response). Passing a tolerance barrier resulted in calls for the lethal management of large carnivores or removal of problem animals which was strongly opposed by other stakeholder groups (see for instance the *Swiss and Finnish case studies*).

Further examples of behaviour which might be regarded as more culturally or even emotionally driven was the issue of fear which was mentioned in several cases. For example, in the *Swiss case* fear of the danger to people caused by wolves has increased because of increased awareness of the potential return of large carnivores rather than any incidents that have occurred. Another example is provided by the *German case* where the conflict surrounding large carnivores (and the actions taken to deal with this conflict) pre-date their appearance in the area. In this case the potential feared impact was mainly lynx competing for prey with hunters. Reframing the issue to discuss the conflict between different interests rather than discussing different versions of “the truth” based on interpretation of science and monitoring, helped stakeholders to explore where the real differences (and similarities) lay.

Recommendations:

The case studies have demonstrated that the presence of large carnivores can in the best cases bring **economic gains** to a range of different actors. Further examples of innovative ways to gain financial benefits from the presence of large carnivores would be welcomed by all. However, these examples are unlikely to work in every case and care needs to be taken when promoting new economic streams to make sure that new conflicts are not provoked. In some cases, additional costs need to be accepted by stakeholders and potentially compensated through public funding or new ways of doing things.

In the case studies that were considered, **fear of large carnivores** is not always based on real danger to humans. However, it can present a significant barrier for some stakeholders or can be used as leverage by others to support their viewpoint. There is a need to better understand what provokes fear and how information provision can both reduce unnecessary fear but also reduce risk of any negative interactions between people and large carnivores. In addition, efforts to engage stakeholders should not always focus on the “usual suspects” of land users but also be broadened out to target the wider general public.

If coexistence is to be fully understood, **monitoring socio-economic aspects** and the implications of stakeholder interaction is as important as monitoring large carnivore populations and their range distribution. Different methods are of course required for this and the monitoring itself needs to involve all stakeholders.

4.3 Adapting good practice over time and to the local context

Physical, natural and biological aspects related to the local setting (e.g. weather conditions, which may influence monitoring systems; dimensions and connectivity of large carnivore biotopes; population dynamics, intra-, and inter-species competition between large carnivores) make a difference to addressing a particular case. Socio-cultural aspects can also vary significantly (e.g., local husbandry practices; socio-cultural implications of human-carnivore conflict). All these factors as well as their combined effects may prove crucial in any attempt to transfer elsewhere good practice gained in one locality.

In many case studies, there was a need to adapt good practice to the local context and regularly revisit previous assumptions in the light of evidence accumulated during implementation. For example, adaptations were made to the design of the *Medwolf project (Italian case)* in order to adapt to concerns from the farming community about the long-term adaptation of measures.

Additionally, long-term commitment to a particular case was key to its success. This was seen for a number of cases e.g. the *Finnish case* which has been running since 1978, the *Spanish case* since 1993 and the *French case* since 1998. The long-term engagement of key actors who are able to adapt to changing circumstances has been important for all of these cases.

Recommendations:

Good practice must be **adapted to local circumstances** when transfer of a case is considered. There is rarely a one-size-fits-all answer to promoting coexistence with large carnivores. Adaptive management that takes into account the specific concerns of local stakeholders tends to be more successful. Good practice can only indicate the conditions under which human-carnivore coexistence may be promoted and under which stakeholders can successfully collaborate to reach agreement on certain (but not all) aspects of coexistence. For this reason, a thorough situational analysis of the background to a specific case is needed.

The **long-term engagement of key actors** in a particular initiative to promote coexistence adds significantly to its likelihood of success. Those that have been involved for a longer period are better able to understand each other's positions and more willing to make compromises.

4.4 Understanding the variety in stakeholder interaction

A distinction was made in the analysis between in-group (within a particular stakeholder group) and inter-group (between different interests) relationships. Both need to be considered when examining a particular case and considering the aspects that have worked well and what has potential for improvement.

An essential aspect of all the case studies included was that stakeholder collaboration in the implementation of measures for large carnivore conservation and management contributed significantly to establishing inter-group trust (trust between different interest groups) and reducing conflict amongst stakeholders. Even if in some cases the direct effect of measures were not optimal for all interests, the positive effect of working together on inter-group relations was highlighted by the interviewees. This could be seen for example in the *Finnish case study (TASSU monitoring scheme)* where the involvement of a range of stakeholders built trust in the system even if not all liked the results. In the *French case study*, the intensive personal relationship (volunteers actually living with farmers) provided a highly effective opportunity to learn from one another.

Working together on a particular issue may set the stage for social learning and empowerment of all actors, thereby promoting further stakeholder collaboration. The importance of local stakeholder platforms (as demonstrated by the *Italian, Swiss and German case studies*) therefore cannot be underestimated. In particular, group activities with the Platform members, such as the excursions organised in the Swiss case, gave the opportunity to network and exchange views informally in addition to learning about technical protection measures.

While inter-group convergence of views; agreement of particular points; and establishment of good working relations were built up in all of our identified examples, none resulted in a total overlap of views on all issues (complete agreement was not reached). This shows that stakeholders may continue to collaborate despite partial agreement and can still formulate common objectives and pursue common goals. Tensions between stakeholders are likely to remain unresolved and require a constant negotiation and re-negotiation of positions as is the norm in inter-group relations. This requires the input of an experienced and trusted moderator (see for example the *German case (transfer and communication project)*) to encourage re-examination of a problem or the motivations of a particular group.

Dissemination by word of mouth and within stakeholder groups is of high importance and may have a significant impact on how a case is regarded. When this spread of information reaches a wider audience through social-media discourse and eventually involves the press, it becomes very difficult to control. In the *Swiss case study*, the early agreement of a communication protocol and agreed process for press interaction helped to reduce conflict. In the *French case*, positive reports in the press also contributed to the case being well thought of and supported by the wider public. The same case, however also illustrates the problem of reaching a critical mass in terms of the numbers of individuals involved: the numbers of involved farmers is so far not high enough to change the general opinion within this group.

Inter-group aspects often receive the highest levels of attention in stakeholder analysis. However, the research carried out here highlights that in-group relations can be as important as inter-group relations. While agreement may be reached with a particular group member, this does not mean to say that all classified as belonging to this stakeholder group will agree. It is important that questions of conflict within particular groups are also addressed, see for instance the *German and Swiss case studies* where agreement was reached with participating hunters and farmers but those not involved in the group felt their concerns were not addressed. For this reason, selecting participants for a particular action is of key importance. This was also seen in the *French case study* where volunteers in some cases dropped out of the scheme if the physical conditions were too hard or if there was conflict with the farmers.

Recommendations:

The **selection of participants and appointment of moderators** is key in deliberation and consultation procedures involving a range of stakeholders. An experienced moderator who is able to commit long-term to the process is important. Stakeholders should be open to considering a range of solutions while at the same time be recognised within their peer-group as accurately representing their views.

Establishing **regional or local formal or informally constituted platforms** for a period of

several years has often helped working relationships. In all cases, promoting successful stakeholder participation involves the manager of the process stepping back from and questioning their own beliefs. Learning from mistakes and negative feedback is essential to the process of abandoning stereotypes and reconsidering deep-seated attitudes.

Establishing **communication structures between stakeholders** involved in a process is of significant importance. Communication with one another rather than through means of the press is more likely to achieve positive results. An agreement on communication taking local context into account should be set up at the start of a project. As part of this process, stakeholders should agree to communicate success stories and share good practice between one another.

4.5 Using good relations between stakeholders to the full

In the case that good working relationships are established, local networks of social actors working on the implementation of measures can continue to operate even after the end of the initial funding scheme. The opportunities to learn from one another can be significant. This is seen particularly in monitoring schemes (such as in the *Finnish and Swedish cases*) where engagement in monitoring has the potential both to increase stakeholders' belief in the results and increase their knowledge of the biological needs of large carnivore species and also the understanding of the challenges faced by the various involved groups .

These established networks may also create novel opportunities for fund raising and taking further action, which also needs to be supported. This is demonstrated for example by the *Spanish case study* for which a series of different funding streams have been used e.g. several LIFE projects, regional funds and rural development support as measures have been rolled out more broadly.

Transfer of measures into a new scheme should however be approached with caution. In some cases, measures that were well accepted when they come from one funding stream may cause conflict when they are transferred to another e.g. in the *Italian case*. In this case, while there is interest in adding measures to the Rural Development programme, this is opposed from some sides as the programme is regarded as having the purpose of supporting core agricultural activities.

Support may not always come in monetary form; it may also involve procedural approaches for stakeholder engagement and co-creation of solutions. Recognised methods such as participatory scenario development or multi-criteria analysis (e.g. in the *Italian case study*) which are used to envisage common futures may help to reach agreement.

The timing of activating actor networks and addressing key players can be extremely important. An example here is quick outreach to beneficiaries and key audiences when a call has been published so that stakeholders can react and apply to the call.

Recommendations:

Stakeholders working together should be aware that the very fact that they are collaborating with “opposing interests” increases their potential to **source a range of funding streams**. The EU Platform can help to raise awareness amongst their members about key EU and national funding opportunities and how to apply to them. Using a range of resources can provide more flexibility than always relying on one source.

There is the potential to transfer good practice to more widely available schemes such as **using rural development funds** to support measures tested in LIFE projects. Measures need to be adapted to local circumstances and viewpoints regarding, for example the “ownership” of funds and the acceptability of them being used for coexistence measures should be considered.

Innovative ways to consider future coexistence should be considered. These could be for example in the form of developing future scenarios with stakeholders. Participatory scenario development examines possible futures together with stakeholders under varying degree change to current practice and resource inputs. Stakeholders can help to assess how the changes would affect their well-being and their relationships with one another.

5. Final comment on the methodology

The methodology used in this report can provide valuable insights for stakeholder analysis, consultation and engagement as well as a toolkit to monitor stakeholder interaction, attitudes, and behaviour.

The individual fiches describing the case studies are a valuable resource for those interested in establishing new projects to support coexistence between humans and large carnivores. The cases provide learning opportunities both in the form of what has worked well but also what has worked less well and what has been identified through joint-working as needing improvement.

The mixed-motive analysis, which has been used to identify benefits (gains of participation; added value) and costs (costs of participation; unanticipated side-effects), can support a structured negotiation process among stakeholders. Identification of costs may mean they can be avoided entirely in some cases. Nevertheless, it is important to accept that avoidance will not always be possible and that sometimes, the question is more how costs can become more acceptable to a stakeholder group or be balanced by other gains.

The SWOT analysis template can be used to identify in-group and inter-group aspects that may support or hinder coexistence with large carnivores in a number of analogous case studies. The challenge ahead will always be to build on strengths and opportunities, reduce weaknesses, and address threats, in order to foster human-carnivore coexistence. The analysis of ten varying case studies has shown that in many cases similar strengths, weaknesses, opportunities and threats exist across cases.

Taken together, the report reflects the potential of deliberation and consultation processes to encourage social learning (e.g. Keen *et al.*, 2005; Newig 2011). In the most successful cases, this can lead to a change in attitudes. The acceptance of other viewpoints can also be regarded as a success in many cases (e.g. Collins 2014). The methodological toolkit we have employed in our analyses may be taken over by stakeholders themselves to monitor their interaction and plan their future cooperation. The recommendations above also provide some concrete points to consider when developing new coexistence projects.

6. References

- Burkardt, N. and Ponds, P. D. (2006) "Using Role Analysis to Plan for Stakeholder Involvement: A Wyoming Case Study", *Wildlife Society Bulletin*, vol. 34, no. 5, pp. 306-1313.
- Chapron, G., Kaczensky, P., Linnell, J. D. C., et al. (2014) "Recovery of large carnivores in Europe's modern human-dominated landscapes", *Science*, vol. 346, no. 6216, pp. 1517-1519.
- Collins, K. (2014) "Designing social learning systems for integrating social sciences into policy processes: Some experiences of water managing", in M. J. Manfredo, J. J. Vaske, A. Rechkemmer, and E. A. Duke (eds) *Understanding Society and Natural Resources*, pp. 229-251.
- EU Large Carnivore Platform Secretariat (2016) Supporting good practice for coexistence – presentation of examples and analysis of support through the EAFRD, for the EU Large Carnivore Platform: http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/160906_LC%20Platform-case%20studies%20and%20RD.pdf
- European Commission (2017) "Conservation performance payments - Sweden" webpage. Available at: http://ec.europa.eu/environment/nature/rbaps/fiche/conservation-performance-payments-sweden_en.htm
- FERUS (2017) "Pastoraloup" program web-page [in French], available at: <http://www.ferus.fr/benevolat/pastoraloup>
- Finnish Wildlife Agency (2017) Finnish Wildlife Agency's website, available at: <https://riista.fi/en/>
- Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg (FVA) (2016) „Transfer- und Kommunikationsprojektes zum Umgang mit Großraubtieren in Baden-Württemberg“ [in German], project website, available at: <http://forum-grossraubtiere.wildtiere-bw.de/>
- FVA (2016) „Die Rückkehr des Luchses?“ [in German - „the return of the lynx?“], round table website, available at: <http://forum-grossraubtiere.wildtiere-bw.de/forum-grossraubtiere-bw/rueckkehr-der-grossraubtiere/die-rueckkehr-des-luchses.html>
- Fundación Oso Pardo (2013) "The Brown Bear", foundation website, available at: <http://eng.fundacionosopardo.org/index.php/the-brown-bear-2/>
- Fundación Oso Pardo (2013) foundation website, available at: www.fundacionosopardo.org
- Fundación Oso Pardo (2016) „Censos de osas con crías en la cordillera cantábrica“, available at: <http://www.fundacionosopardo.org/wp-content/uploads/2017/08/Triptico-cenos-osas-con-crias-2016.pdf>
- Galuppo, L., Gorli, M., Scaratti, G., and Kaneklin, C. (2014) "Building social sustainability: Multi-stakeholder processes and conflict management", *Social Responsibility Journal*, vol. 10, no. 4, pp. 685-701.
- Genovesi P. (Ed.) (2002) "Piano d'azione nazionale per la conservazione del lupo (*Canis lupus*)" [in Italian], Ministero Ambiente, Quaderni Conservazione Natura no 13. Available at: http://www.minambiente.it/sites/default/files/archivio/biblioteca/protezione_natura/qcn_lupo.pdf
- George, C. and Reed, M. G. (2016) "Revealing inadvertent elitism in stakeholder models of environmental governance: Assessing procedural justice in sustainability organiza-

- tions”, *Journal of Environmental Planning and Management*, DOI: 10.1080/09640568.2016.1146576.
- Haatanen, A., den Herder, M., Leskinen, P., Lindner, M., Kurttila, M., and Salminen, O. (2014) “Stakeholder engagement in scenario development process - Bioenergy production and biodiversity conservation in eastern Finland”, *Journal of Environmental Management*, vol. 135, pp. 45-53.
- Hellenic Republic - Ministry Of Rural Development and Food (2017) “Rural Development Programme of Greece” programme webpage [in Greek], available at: <http://www.agrotikianaptixi.gr/>
- Hoffman, A. J., Gillespie, J. J., Moore, D. A., Wade-Benzoni, K. A., Thompson, L. L. and Bazerman, M. H. (1999) “A mixed-motive perspective on the economics versus environment debate”, *American Behavioural Scientist*, vol. 42, no. 8, pp. 1254-1276.
- Hovardas, T. (2010) “Stakeholder analysis, LIFE EXTRA – Improving the conditions for large carnivore conservation – A transfer of best practices” (LIFE07NAT/IT/000502), Report of Action A5.
- Hovardas, T. (2012a) “Can forest management produce new risk situations? A mixed-motive perspective from the Dadia-Soufli-Lefkimi Forest National Park, Greece”, in J. Martin-Garcia and J.J. Diez (eds) *Sustainable Forest Management: Case Studies*, pp. 239-258.
- Hovardas, T. (2012b) “Follow up surveys of stakeholder attitudes, LIFE EXTRA – Improving the conditions for large carnivore conservation – A transfer of best practices” (LIFE07NAT/IT/000502), Report of Action E3.
- Hovardas, T. (2015) “Recommendations to the Management Authority of Rodopi Mountain Range National Park concerning stakeholder consultation and engagement” [in Greek], deliverable 3, Monitoring of knowledge and attitudes of stakeholders in national park management. Management Authority of Rodopi Mountain Range National Park.
- Hovardas, T. (in press) “A methodology for promoting coexistence between local communities and large carnivores – Insights from human dimensions research in protected areas”, in T. Hovardas (ed) *Large carnivore conservation and management: Human dimensions and governance* (in press), Routledge, Earthscan.
- Jerina, K., and Adamič M. (2008) “Fifty years of brown bear population expansion: effects of sex-biased dispersal on rate of expansion and population structure” *Journal of Mammalogy*, vol.89, pp. 1491-501. Available at: <http://www.bioone.org/doi/abs/10.1644/07-MAMM-A-357.1?journalCode=mamm&>
- Jerina, K., and Adamič, M. (2008) “Analiza odvzetih rjavih medvedov iz narave v Sloveniji v obdobju 2003-2006, na podlagi starosti določene s pomočjo brušenja zob: končno poročilo” [in Slovenian] Biotehniška fakulteta, Ljubljana. Available at: <http://www.arso.gov.si/narava/%C5%BEivali/ogro%C5%BEene%20in%20zavarovane/rjavi%20medvedi%202003-06.pdf>
- Juesy, P. (2015) “Bericht Wolf/Herdenschutz Kanton Bern (2006 bis 2015)“, available at: http://www.vol.be.ch/vol/de/index/natur/jagd_wildtiere/publikationen.assetref/dam/documents/VOL/LANAT/de/Natur/Jagd_Wildtiere/PUB_LANAT_JW_Bericht_Wolf_Herdenschutz_2006-2015_Kt-Bern.pdf
- Kanton Bern, Volkswirtschaftsdirektion (2007) “Strategie Umgang mit dem Wolf im Kanton Bern“ [in German], available at: http://www.vol.be.ch/vol/de/index/natur/jagd_wildtiere/projekte.assetref/content/dam/documents/VOL/LANAT/de/Natur/Jagd_Wildtiere/LANAT_JW_Umgang_mit_dem_Wolf_de.pdf

- Keen, M., Brown, V. A., and Dybal, R. (2005) "Social learning: a new approach to environmental management", Earthscan, London.
- Kok, K., Biggs, R., and Zurek, M. (2007) "Methods for Developing Multiscale Participatory Scenarios: Insights from Southern Africa and Europe", *Ecology and Society*, vol. 12, no. 1, available at: <http://www.ecologyandsociety.org/vol12/iss1/art8/>
- KORA (2012) "KORA News – Wölfe im Kanton Bern" [in German], news on KORA website, available at: http://www.kora.ch/index.php?id=214&L=3&tx_ttnews%5Btt_news%5D=406&cHash=b6fd1afad0f04e02c4b57103493e2538
- KORA (2017), NGO website, available at: <http://www.kora.ch/index.php?id=1&L=1>
- LIFE DINALP BEAR (2017) "Species distribution in Europe", project website, available at: <http://dinalpbear.eu/brown-bear/distribution-in-europe/>
- LIFE EX-TRA (2013) "LAYMAN report" [available in Greek, Romanian, Bulgarian and Italian]. Available at: http://www.lifextra.it/index.php?option=com_docman&task=cat_view&gid=79&Itemid=30&lang=en
- LIFE07 NAT/GR/000291 (2012) "Project description", available at: http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3322&docType=pdf
- LIFE08 NAT/SLO/000244 (2016) "Monitoring of Conservation Status of Wolves in Slovenia in 2015/2016 – Summary in English", available at: http://www.natura2000.si/fileadmin/user_upload/Volk_English_SUMMARY.pdf
- Linnell, J. (2013) "From conflict to coexistence? Insights from multidisciplinary research into the relationships between people, large carnivores and institutions". Prepared under contract N°070307/2012/629085/SER/B3 from the European Commission. Available at: http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/task_4_conflict_coexistence.pdf
- Linnell, J. D. C. (2014) "Status of wolverine in Europe" at Large Carnivore Initiative for Europe website, available at: <http://www.lcie.org/Blog/ArtMID/6987/ArticleID/69/Status-of-wolverines-in-Europe>
- Linnell J. D. C., Trouwborst A., Boitani L., Kaczensky P., Huber D., Reljic S., et al. (2016) "Border Security Fencing and Wildlife: The End of the Transboundary Paradigm in Eurasia?" *PLoS Biology*, vol. 14, no. 6, available at: <https://doi.org/10.1371/journal.pbio.1002483>
- Lüchtrath, A., and Schraml, U. (2015) "The missing lynx – understanding hunters' opposition to large carnivores", *Wildlife Biology*, vol. 21, no. 2, pp. 110-119.
- LUKE (2016a) "The Wolf", institute's website, available at: <https://www.luke.fi/en/natural-resources/game-and-hunting/the-wolf/>
- LUKE (2016b) "The Bear", institute's website, available at: <https://www.luke.fi/en/natural-resources/game-and-hunting/the-bear/>
- LUKE (2016c) "The Lynx", institute's website, available at: <https://www.luke.fi/en/natural-resources/game-and-hunting/the-lynx/>
- McShane, T. O., Hirsch, P. D., Trung, T. C., Songorwa, A. N., Kinzig, A., Monteferri, B., Mutekanga, D., Van Thang, H., Dammert, J. L. Pulgar-Vidal, M., Welch-Devine, M., Brosius, J. P., Coppolillo, P., and O'Connor, S. (2011) "Hard choices: Making trade-offs between biodiversity conservation and human well-being", *Biological Conservation*, vol. 144, no. 3, pp. 966-972.

- Metsähallitus (2017) "Estimating the numbers of large carnivores", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/conservation-and-hunting/large-carnivore-research/estimating-the-numbers-of-large-carnivores.html>
- Metsähallitus (2017a), "Degree of endangerment", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/conservation-and-hunting/conservation/degree-of-endangerment.html>
- Metsähallitus (2017b), "Large carnivores and reindeer herding", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/large-carnivores-and-us/damages/reindeer-damages.html>
- Metsähallitus (2017c), "Damages caused by large carnivores", website on Finland's large carnivores, available at: <http://www.largecarnivores.fi/large-carnivores-and-us/damages.html>
- Ministrstvo za kmetijstvo, gozdarstvo in prehrano (2014) "Slovenia's Rural Development Programme 2014–2020" webpage, available at: <https://www.program-podezelja.si/en/rural-development-programme-2014-2020>
- Natural Resources Institute Finland (LUKE) (2016) Tassu's public outreach website: <http://riistahavainnot.fi/>
- Newig, J. (2011) "Partizipation und neue Formen der Governance", in M. Gross (Hrsg) Handbuch Umweltsoziologie, pp. 485-502, VS Verlag, Wiesbaden.
- Pérez, T., Naves, J., Vázquez, F., Fernández-Gil, A., Seijas, J., Albornoz, J., et al. (2014) "Estimating the population size of the endangered Cantabrian brown bear through genetic sampling", *Wildlife Biology*, vol. 20, pp. 300-309.
- Persson, J., Ericsson, G. and Segerstrom, P. (2009) "Human caused mortality in the endangered Scandinavian wolverine population", *Biological Conservation*, vol. 142, pp. 325-331.
- Persson, J., Rauset, G. R., and Chapron, G. (2015) "Paying for an Endangered Predator Leads to Population Recovery", *Conservation Letters*, vol. 8, pp.: 345-350, available at doi: 10.1111/conl.12171
- PINDOS/GREVENA - Demonstration of Conservation Actions for *Ursus arctos** and habitat type 9530* in Northern Pindos N.P., Grevena Prefecture, Greece (2012), Project description. Available at: http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3322&docType=pdf
- Regionales Forum zum Umgang mit Großraubtieren im mittleren Schwarzwald (2015) „Gemeinsamer Appell an die AG Luchs und Wolf“ [in German]. Available at: <http://www.luchs-bw.de/eip/media/gemeinsamer-appell-des-regionalen-forums-mittlerer-schwarzwald.pdf?fl=20091056>
- Staat Freiburg (2017) „Alle News“, available at: http://www.fr.ch/ww/de/pub/functions/alle_news.cfm?fuseaction_pre=Detail&NewsID=60739
- Sunderland, T., Ehringhaus, C., and Campbell, B. M. (2008). "Conservation and development in tropical forest landscapes: A time to face the trade-offs?", *Environmental Conservation*, vol. 34, no. 4, pp. 276-279.
- Trček, Petra (2017). "Pri nas živi okoli 52 volkov, večina na Notranjskem in Kočevskem" [in Slovenian - 52 Wolves Live in Slovenia, Mostly in Inner Carniola and the Gottschee Region], *Notranjskoprimorske novice*. Available at: <http://notranjskoprimorske.si/2017/03/pri-nas-zivi-okoli-52-volkov-vecina-na-notranjskem-in-kocevskem/>

Zabel, A., and Holm-Müller, K. (2007) „Conservation Performance Payments for Carnivore Conservation in Sweden”, *Conservation Biology*, vol. 22, pp. 247-251:

7. Annex 1: Description of the Case Studies

The table below shows the case studies (blue = top 15, dark blue = top 10). A full description of 37 case studies can be found on the website: http://ec.europa.eu/environment/nature/conservation/species/carnivores/case_studies.htm

Member State	Area	Title	Short description	Dates
Practical support				
Greece	Balkan	Developing a network of Livestock Guarding Dogs	A network of owners of Livestock Guarding Dogs (LGDs) was created facilitating coordination and the exchange of puppies and adult dogs between the livestock breeders.	2009-2012
Greece	Balkan	Damage prevention measures (e.g. fences) through the RDP in Greece	Installation of electric fences around apiaries and sheepfolds for minimising damages caused by bears.	2004-2013
Italy	Mediterranean	Livestock protection measures through Medwolf	LIFE-project encouraging collaboration between provincial administration, environmental NGOs and professional agricultural associations in representation of livestock breeders.	2012-2017
Slovenia	Balkan	Practical support under the Slovenian Rural Development Programme	Payment per hectare of grassland with top ups depending on a range of protection measures adopted (livestock guarding dogs, shepherd, electric fences)	2004-present

Innovative financing				
France	Central	Labelling schemes for farm cheeses in the Haut Béarn	Marketing approach using the bears' foot imprint to give value to cheese creating some socio-economic benefit for shepherds through the presence of bears.	1995-ongoing
Sweden	Nordic	Conservation performance payments	The Swedish government replaced compensation payments with conservation performance payments (CPP), paying reindeer herders for the number of successfully breeding wolverines in their area.	1996-ongoing
Understanding viewpoints				
Germany	Central	Transfer and Communication Project – Baden-Württemberg	Management of conflicts about large carnivores and development of sound solutions to these conflicts, mainly by enlarging the awareness on conflict dynamics among the conflict parties through mediated discussions.	Ongoing
Spain	Mediterranean	Cooperation of stakeholders in the Cantabrian mountains	A project facilitating cohabitation and collaboration using formal agreements with Hunting Associations and Federations to foster the social acceptance of bears, reduce poaching with illegal snares and avoid the indirect impacts of hunting activities.	1993-2015
Switzerland	Central	Core Group Wolf	Cantonal (regional) Wolf Groups have been established in several Swiss cantons with the main goals to objectify discussions and improve relationships between stakeholders.	2006-ongoing
Monitoring				
Finland	Nordic	TASSU-system and voluntary-based large carnivore contact network	Electronic database which tracks presence of LC. Based on the input from volunteers who are trained by state agencies.	1978-ongoing

8. Annex 2: Assessment of the case studies – interview questions

What is your involvement in the case study? How long have you been involved?

Are the facts presented in the case study description correct?

Evaluation of the case study

Has conflict among stakeholders decreased during the project or after it has ended?

Has consensus among stakeholders increased during the project or after it has ended?

Has common vision among stakeholders increased during the project or after it has ended?

Has human-caused mortality of the large carnivore species targeted has changed during the project or after it has ended?

Has the population of large carnivore species targeted changed during the project or after it has ended?

Has the distribution range of large carnivore species targeted changed during the project or after it has ended?

Has income/property loss or depredation of livestock due to large carnivore changed during the project or after it has ended?

Have compensation/compensation systems for damages caused by large carnivores changed during the project or after it has ended?

Have income or employment opportunities related to large carnivore targeted changed during the project or after it has ended?

Were all the relevant stakeholders involved in the project work?

Did any stakeholder drop out/leave during the project?

For projects that have finished:

Have any project actions continued after the end of the project?

For projects that are ongoing:

Is it planned to continue the project actions when the initial funding comes to an end?

Do you think there is the potential to transfer any lesson learnt to other localities? Have the actions already been replicated elsewhere?