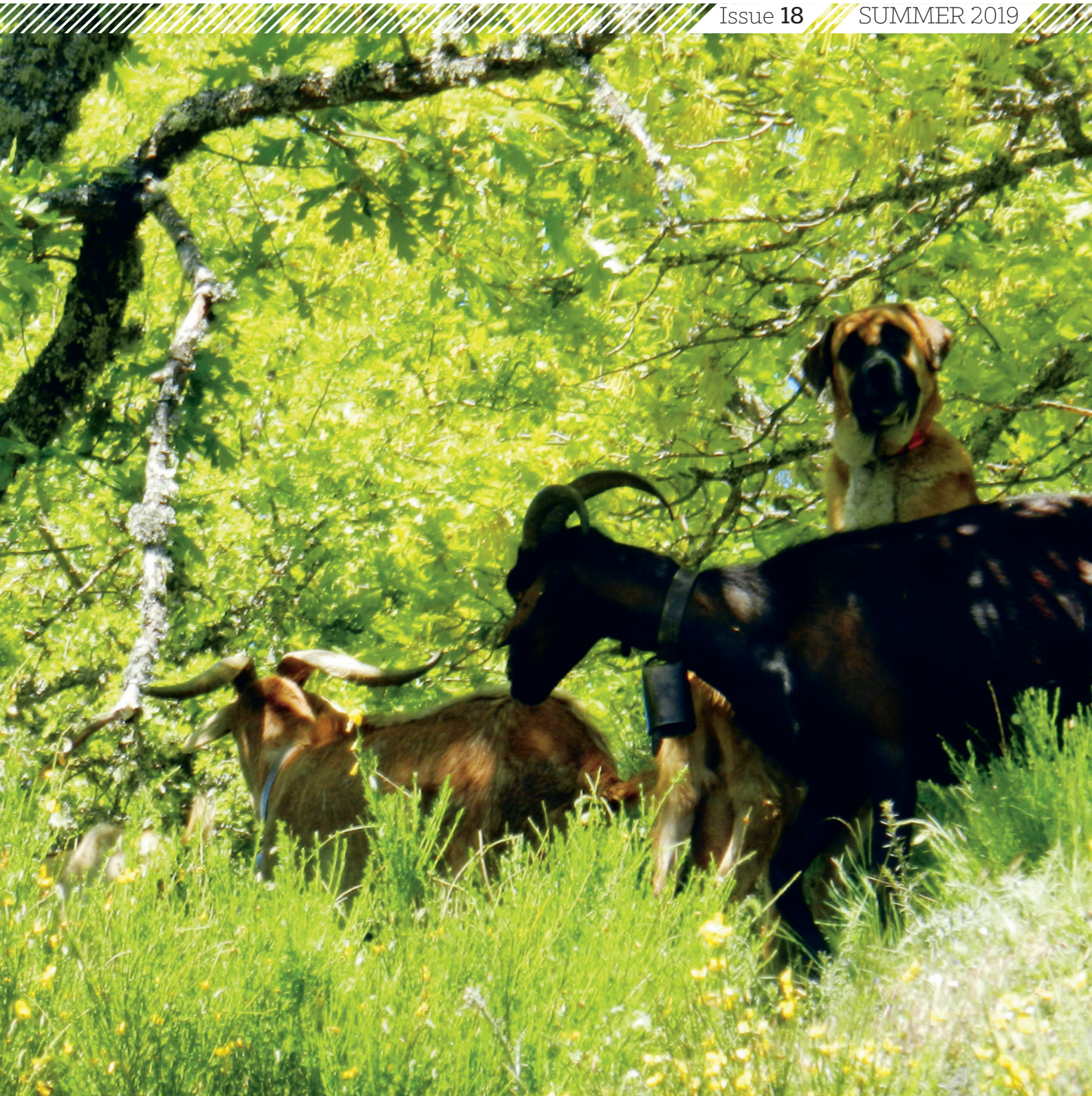


CDP **news**

Carnivore Damage Prevention

Issue 18

SUMMER 2019



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Welcome to the first issue in a new series of *Carnivore Damage Prevention News (CDPnews)* published by AGRIDEA – Swiss Association for the Development of Agriculture and Rural Areas. AGRIDEA provides a link between science and farming: promoting the exchange of knowledge and experience between people working in agricultural extension and advisory services, research, practice, administration and policy. It is therefore an ideal “home” for our newsletter.

At *CDPnews* we recognise the value of having a multiplicity of options. In our newly revised Instructions for Authors, we have defined our scope as, “an interdisciplinary approach to the challenge of coexistence between large carnivores and human activities”. We have also increased the range of different types of contributions in order to achieve our goal of acting as a forum to raise awareness of practical solutions, to facilitate collaboration and to improve knowledge exchange.

Since AGRIDEA took over publication of *CDPnews* from the LIFE Med-Wolf project in 2018, there have been several important events and developments. The European Commission has amended its Guidelines for State aid in the agriculture sector, enabling full compensation of damages and protection measures related to large carnivores. See page 8 for details.

Two events organized by the Europarc Federation in collaboration with the EU Platform on Coexistence between People and Large Carnivores explored different methods of addressing human-carnivore conflicts. The webinar *Large Carnivores: Strategies for a Better Coexistence* looked at different management practices and prevention measures from the perspective of national government as well as non-governmental organisations. The workshop *Fear versus Facts* held within the Europarc Conference in the Cairngorms National Park, Scotland, sought to promote effective communication for coexistence with large carnivores. You can find summaries of these two events on page 31.

Recent scientific reviews have called for more systematic assessment and documentation of the effectiveness of efforts to reduce losses of livestock to carnivores. On page 24 we include a summary of a workshop on *Evaluation of Damage Prevention Measures* that formed part of the final conference of the LIFE MedWolf Project in Grosseto, Italy. The project ENhancing COexistence through SHaring (ENCOSH) aims to establish an online platform to facilitate the exchange of knowledge, skills and experience worldwide (page 34), while the municipal goat flock in Guadarrama Mountain, near Madrid, is a good example of a local initiative to foster coexistence with wolves (page 12).

It is increasingly acknowledged that mitigating conflicts is not only about implementing technical solutions to reduce damage. Effective, long-term management calls for those involved to recognise problems as shared ones and to integrate the specific social context into any solutions. The Campo Grande Group in Spain (page 15) presents a good example of seeking to gain a deep understanding of the nature of a particular conflict in order to find appropriate interventions that really hit the heart of the problem.

The success of such approaches depends on many factors, including the willingness of stakeholders to participate. This is often influenced by perceptions of how their concerns are treated. We therefore recommend anyone interacting with people impacted by large carnivores to read Seth Wilson’s *Guidebook to Human-Carnivore Conflict* (page 38), which is full of sage advice and valuable experience. The guidebook was produced within the LIFE DinAlp Bear Project in Slovenia. Another of this project’s creative innovations to foster coexistence – bear friendly labelling – is showcased on page 1.

We hope you find this issue of *CDPnews* exciting and inspiring! As always, we welcome your feedback, ideas and proposals for new articles.

Project

BEAR FRIENDLY LABELLING

PROMOTING COEXISTENCE WITH BEARS

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1. Background

Population densities of brown bears (*Ursus arctos*) in the northern Dinaric Mountains (Fig. 1) are among the highest in Europe (Jerina et al., 2013). The bear population in the region is growing and bears are also recovering in the Alpine region of Slovenia (Skrbinšek et al. 2018). Forest landscapes in the northern Dinarics are tightly intertwined with fields and settlements. Bear habitat therefore overlap considerably with human activity.

Bears are charismatic species but due to their large habitat requirements and opportunistic feeding behaviour, they cause damage to communities living within their home ranges (Morehouse and Boyce,

2017). Conflicts between humans and bears remain an on-going threat to the conservation of bears in human-dominated landscapes, therefore facilitating coexistence between people and bears is essential to their long-term persistence (Carter and Linnell, 2016).

Improving coexistence between bears and people is one of the main goals of the 5-year LIFE DinAlp Bear project (LIFE13 NAT/SI/000550) that started in 2014 (Figure 1 shows the project area). Project partners and collaborators from Croatia, Slovenia, Italy and Austria are striving to establish transboundary bear population monitoring and reduce human-bear conflicts through effective damage prevention measures and restricting bears’ access to anthropogenic food sources. To increase tolerance towards bears within the local community, the project promotes responsible use of bears through tourism and bear friendly products.

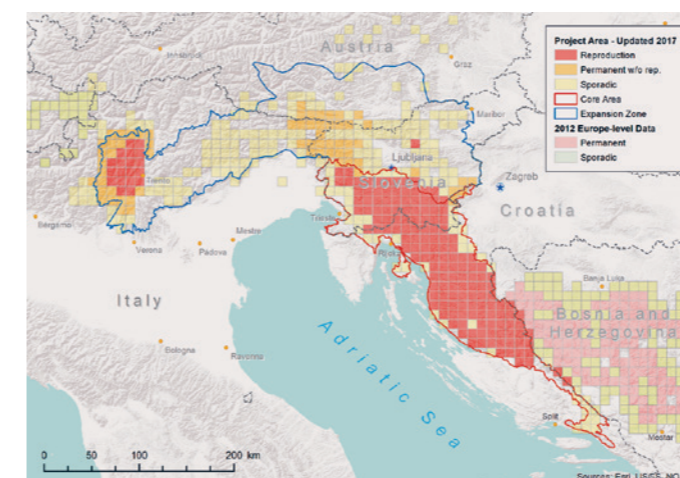


Fig. 1 Bear distribution in the LIFE DinAlp Bear project area, showing areas of permanent presence with reproduction, permanent presence with no reproduction and sporadic presence in the core project area (Dinaric Mountains) and expansion zone (Alps).
(Source: Skrbinišek et al., 2018)



Fig. 2 Bears in the northern Dinarics present new opportunities for local communities.

(Photo: Miha Krofel)

2. Non-consumptive use of bears

Non-consumptive forms of wildlife-based activities usually involve observing, photographing or otherwise interacting with non-captive wildlife, in contrast to consumptive forms like hunting and fishing (Higginbottom, 2004). Nowadays, the non-consumptive use of wildlife is changing the landscape of the tourism sector, providing ample opportunities for the effective conservation of species and the development of alternative sources of revenue for local communities (Karamanlidis et al., 2016). To maximize their conservation impact, wildlife-based ecotourism initiatives should directly contribute to the mitigation of threats, which is achieved through the generation of revenue for conservation efforts, increased community education and stewardship (Altmann, 2016).

Although bears are hunted in many European countries, they are increasingly valued alive in the context of wildlife tourism, as well as for conservation and educational reasons (Fig. 2). A nine-month study, titled *The Economic Impact of Bear Viewing and Bear Hunting in the Great Bear Rainforest of British Co-*

lumbia, found that bear viewing tourism generated 12-times more in visitor spending than trophy bear hunting (CREST, 2014). If carefully planned, bear-related ecotourism activities can have multiple benefits for tourism, local communities and bears. Bears can represent a core of the marketing strategy in rural regions, facilitating development of unique and diverse tourism products, which can finance and promote conservation efforts and raise awareness about the importance of bears and coexistence measures on the local and international level (Karamanlidis et al., 2016).

On the other hand, poorly managed bear-related tourism can lead to processes such as food conditioning and habituation. Food rewards may encourage undesirable behaviours, such as exploring the vicinity of settlements, increasing the level of conflicts between people and bears (Penteriani et al., 2017). Regulations on bear ecotourism and guidelines for the development of bear-related tourism products are therefore needed.

3. Guidelines for responsible practices in bear tourism

At international, national and regional scales, legislation, policy and various written guidelines are the principal tools used to manage impacts of tourism and other activities on wildlife (Higginbottom, 2004). We have developed guidelines to support tourism operators in taking precautions to minimize unintended consequences and maximize positive indirect conservation impacts of bear tourism (Karamanlidis et al., 2016). The following are the main highlights of the guidelines:

1. Viewing groups should be small and under the constant supervision of a qualified guide (Fig. 3);
2. Interpretation should include an overview of bear biology, ecology, behaviour and coexistence measures to enhance visitor education;
3. All precautions need to be taken to avoid human food-conditioning and habituation in bears.

The document also gives basic recommendations on the development of bear-related tourism programmes, which should not be based solely on bear observations, but should include learning about human-wildlife coexistence heritage within local communities in the region. In addition to these guidelines, we propose that a portion of revenues from bear-related tourism activities be invested directly in activities promoting conservation of the species or improvement of human-bear coexistence.



Fig. 3 Tourists in bear watching hides should be under the constant supervision of a qualified guide.

(Photo: Irena Kavčič)

4. Bear friendly label

To award practices that contribute to better coexistence between bears and humans, the LIFE DinAlp Bear project has developed a bear friendly label (Fig. 4). Since the label was introduced in October 2015, 55 providers of products and services in Slovenia, so-called 'bear friendly ambassadors', have been awarded the label. Three different categories were defined for bear friendly label: farming, tourism and active promotion. Each category has a different set of criteria which need to be fulfilled to obtain the label. In December 2015, a labelling committee was formed comprising experts from different fields of expertise (tourism, damage prevention measures and large carnivore conservation). The committee screens each application on an individual basis. The whole application process is designed to be an opportunity for applicants to receive feedback that helps them meet the criteria and includes possible suggestions on upgrading their practice towards better coexistence with bears.

Farmers and beekeepers that received electric fences from the LIFE DinAlp Bear project for effective large carnivore damage prevention are regularly visited in the field by the Slovenia Forest Service team. They inspect the correct use and maintenance



Fig. 4

Bear friendly label developed within the LIFE DinAlp Bear project.



Fig. 5 The bear friendly label can be applied to a wide variety of local products that contribute to human-bear coexistence.

(Photo: Irena Kavčič)

of electric fences twice per year. There is no regular audit of bear friendly ambassadors awarded in the tourism and active promotion categories: they are trusted to maintain the standards they met during the application procedure. Monitoring is mostly done by regular communication with the ambassadors and customer feedback, when possible.

4.1 Bear friendly farming

Farmers and beekeepers are part of the community that is most impacted by the presence of bears in their territory and the first to experience conflict situations with large carnivores. For successful coexistence with large carnivores, they need to adopt protection measures such as effective electric fencing of livestock, beehives and property or use of livestock guarding dogs on pastures. The bear friendly label can be used on products like honey (Fig. 6), jam, meat and milk products to recognise the use of effective protection measures, therefore reducing the number of human-bear conflicts. So far, honey products from 27 beekeepers, milk and meat products from five goat breeders and fruit products from one farmer protecting orchards during the fruit ripening season have been labelled as bear friendly.

As farmers suffer most losses due to living in large carnivore areas, engaging them in tourism activities might encourage them to become more supportive of bear conservation. The label gives them a sense of recognition of their committed use of conflict mitigation measures and shows them the opportunities based on the presence of bears. Local bear friendly apicultural and agricultural products can become important parts of the culinary offer in tourist facilities, farmers can be directly promoted within tourism programmes (e.g. visiting a bear friendly beekeeper) and their products can be offered to tourists as authentic souvenirs, telling a unique story about the large carnivore coexistence heritage in this region.



Fig. 6 Bear friendly honey produced in a beehive effectively protected by an electric fence.

(Photo: Petra Draškovič Pelc)

4.2 Active promotion of bear conservation in the local area

Local products such as natural soaps (Fig. 7), clay ceramics, magnets, wooden souvenirs and many other handcrafted souvenirs in large carnivore areas already feature a bear motif, indicating their important value to people and culture. Besides having a bear motif, souvenirs labelled as bear friendly need to provide other relevant information about bears, their conservation issues or coexistence measures to raise awareness about these topics among tourists and other buyers. So far, souvenirs from 11 bear friendly ambassadors have been labelled as bear friendly. Such products can enrich the tourism offer in the areas where bear-related tourism is becoming increasingly popular and help to build up the positive image of the bear within the local community working to protect its heritage.



Fig. 7 A leaflet included with bear friendly handmade soap communicates key bear conservation issues.

(Photo: Petra Draškovič Pelc)

4.3 Bear friendly tourism

Within the tourism category, tourist accommodation, restaurants and bear-related tourism programmes can be labelled as bear friendly. Successful applicants must meet criteria related to raising awareness among tourists about proper behaviour in bear areas and prevention of bears' access to anthropogenic food sources.

Bear-related tourism programmes need to follow the responsible bear tourism guidelines (Karamanlidis et al., 2016) to minimize negative impacts of tourism activities on bears. Programmes should not be based solely on bear observations but rather include experiencing the bear habitat, recognizing signs of their presence, as well as learning about coexistence and local environmental stewardship efforts (Fig. 8).



Fig. 8 Bear tourism programmes should include experiencing the bear habitat, recognizing signs of their presence and learning about human-bear coexistence.

(Photo: Aleksandra Majić Skrbinišek)

The bear friendly label promotes funding of large carnivore conservation through tourism revenues. Bear friendly tourism programmes are offered by different tour operators that have agreed to allocate at least 5% of revenues to nature conservation non-governmental organizations (NGOs). Recipients of these funds were selected via an open call based on their

previous activities related to large carnivore conservation. This contribution is a step forward toward responsible tourism financially contributing to nature conservation efforts, which is one of the basic principles defined by The International Ecotourism Society. Five tour operators, offering 11 bear friendly programmes, signed contract agreements with NGOs in 2017. So far, €1,008 from bear friendly tourism programmes were donated to selected NGOs during the May to October bear watching season in 2018. Moreover, the label was awarded to five tourist accommodation facilities in the bear region.

5. Promoting bear friendly offers

To promote bear friendly ambassadors and bring attention to responsible bear tourism practices, we have created the Discover Dinarics web portal (www.discoverdinarics.org), which has been online since March 2017. Within the portal, there is a map displaying an inventory of bear friendly products, enabling users to quickly find a bear friendly offer in their proximity. The portal enables direct inquiries for best practice bear friendly tourism programmes offered by different tour operators who are willing to donate part of their revenues for large carnivore coexistence.



Fig. 9 Stand promoting bear friendly offers and the Discover Dinarics portal at a tourism fair.

(Photo: Irena Kavčič)



Fig. 10 Educational seminars for tourist guides and hunters interested in bear-related tourism, held at the Biotechnical Faculty, University of Ljubljana, in January 2016.

(Photo: Irena Kavčič)

To make bear friendly products more known and to increase awareness of the benefits these products have for human-bear coexistence, the LIFE DinAlp Bear project promotes the Discover Dinarics portal and the bear friendly label through publications, presentations on projects events, study tours, agricultural and tourism fairs (Fig. 9), public events and scientific conferences. The story about promoting responsible wildlife tourism and wildlife friendly practices is shared as part of a branding campaign communicating the benefits of Natura 2000 areas for nature and people (www.natura2000branding.eu). An educational seminar for tourist guides and hunters was organized to present relevant legal aspects, basic bear biology and ecology, tourist group management and recommendations for development of bear tourism programmes (Fig. 10).

A study tour for a limited number of journalists and tourism agents to present the highlights of best practice bear tourism programmes was organized in September 2017. Development and outcomes of the bear friendly scheme and bear tourism products were presented at the 26th International Conference on Bear Research and Management, held in Ljubljana from 16th to 21st of September 2018. A bear friendly market was organized during the conference, where ambassadors were able to present and sell their products to conference attendees. In March 2019 we organized a workshop for current users of the label in cooperation with a marketing agency, to receive feed-

back on their use of the label and to obtain marketing recommendations for future development of the label.

Organizing events where participants can share ideas with each other and socialize has proven to be an important way to give something back to the community and has helped in the process of new applicant recruitment via word of mouth communication.

The bear friendly label promotes the use of coexistence measures that can also easily be applied to other large carnivores, such as lynx and wolves, so we will continue to promote its use in future large carnivore-related projects. We have also proposed to the Ministry of the Environment and Spatial Planning to include a budget for bear friendly labelling in the Action Plan for Brown Bear Management in Slovenia.

6. Benefits of the bear friendly label

A questionnaire to receive feedback from current users of the bear friendly label was developed in March 2019 and we received 34 responses. More than 90% of respondents believed that their customers have a positive or very positive response to the label and 94% will continue to use the label after the end of the project. Most respondents (62%) estimate that the label increases the market value of their products or services. They believe customers are becoming increasingly more aware of nature friendly and responsible tourism practices and are more likely to buy, or are willing to pay extra, for bear friendly labelled products and services. A large majority of respondents (92%) communicate the bear friendly story to their customers, which shows that the label is a good platform to raise awareness about bear conservation, responsible tourism practices and human-carnivore coexistence measures. Sharing positive stories about bears in areas where they are often perceived as a burden may enhance perception of the value of the bear within local communities.

Tourism can finance and promote conservation efforts. Through the bear friendly label, wildlife tourists can recognize responsible bear tourism programmes that channel some of the revenue raised from tourism into conservation and human-bear conflict mitigation activities. Moreover, wildlife tourism increases the demand for agricultural products and local handicrafts. The bear friendly label provides a link between farming and tourism and gives farmers an opportunity

for more active involvement in ecotourism activities, increasing their potential to generate an alternative income source. The label communicates the unique story of human-bear coexistence heritage in the region to tourists and empowers them to choose programmes and products that support on-the-ground conservation of bears, while supporting associated communities.



Acknowledgements

The bear friendly label and Discover Dinarics portal were developed in the frame of LIFE13NAT/SI/000550 LIFE DinAlp Bear, co-funded by the EU under the LIFE Programme.

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Short Communication

CHANGES TO STATE AID

EUROPEAN GUIDELINES FOR FINANCING COMPENSATION AND PREVENTION MEASURES

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In November 2018, the European Commission amended its Guidelines for State aid in the agriculture sector¹, enabling full compensation of damages and protection measures related to large carnivores. Until this change, while the direct costs for an animal killed or equipment destroyed could be compensated by a Member State, compensation for indirect costs such as treatment costs of wounded animals could only be covered up to 80%. Additionally, Member States could only finance investments into protection measures up to 80%, except in case of collective investments (although such measures could be funded up to 100% in the framework of Rural Development Programmes).

This situation had been criticised by managing authorities and stakeholders as disadvantaging farmers experiencing depredation of livestock². The European Commission therefore decided to amend the State aid Guidelines to permit up to 100% financing of compensation for indirect costs as well as for supporting prevention measures with state budgets.

In February 2019, the European Commissioner for the Environment, Maritime Affairs and Fisheries, Karmenu Vella and the European Commissioner for Agriculture and Rural Development, Phil Hogan

wrote a joint letter³ to the Ministers for the Environment and Agriculture in the EU Member States. This highlighted *inter alia* the available financial support for coexistence with large carnivores under the European Agricultural Fund for Rural Development (EAFRD) and under the EU's environment and climate programme (LIFE), as well as the new opportunities to support livestock managers experiencing depredation through State aid.

1. Support for damage prevention measures

Rural Development Programmes, under the EU Common Agricultural Policy, can provide support for protection measures that help eliminate or reduce the risk of damage from large carnivores as non-productive investments up to 100%. Such protective measures can include installation of electrified fences; training of shepherds on best practices in protecting livestock against wild animals; purchase of livestock guarding dogs; construction of shelters for shepherds to stay near herds; as well as studies to analyse methods of extensive animal rearing in the presence of carnivores. These are financed as one-off payments cover-

ing costs of materials, training or studies. Furthermore, maintenance costs covering additional labour costs for farmers to check and maintain protective fences or to move fences, as well as for feed and veterinary costs for livestock guarding dogs, may be covered by agri-environment-climate payments⁴. These should be paid as annual payments over a set time period (normally five years). Such measures are not available everywhere and depend on the priorities set at national or regional level⁵. The procedures to apply for financing from Rural Development Programmes also vary between countries and regions⁶. Similar measures can also be funded entirely by national or regional governments if they follow State aid rules (see below).

2. State aid

State aid is defined as “any advantage granted by public authorities through state resources on a selective basis to any organisations that could potentially distort competition and trade in the European Union (EU)”. The Treaty of the Functioning of the European Union (TFEU) in general, prohibits State aid. However, under certain circumstances it is allowed to address specific market failures. Exceptions for the specific situation of land use management are described in the European Union Guidelines for State aid in the agricultural and forestry sectors and in rural areas 2014 to 2020⁷.

According to the Guidelines, allowable financial support includes the state component of rural development support i.e. co-financing for Rural Development Programmes (Pillar 2 of the Common Agricultural Policy (CAP), supported under the European Agricultural Fund for Rural Development (EAFRD)). For the above-described measures included in Rural Development Programmes, approval of the programme includes approval of the co-financing of the measures within it, so no additional measures for State aid compliance are needed.

Protection measures can be funded either through the EAFRD (see above) or through State aid, or through a mixture of the two. Compensation for damages caused by large carnivores is not possible under rural development; it is only possible as pure State aid. In these cases, the Member States must submit a “notification” to the Commission, describing the intended aid scheme and must wait for Commission approval before putting the measures in place.

Member States may also make use of the specific *de minimis* aid regime for the agricultural sector, exempting aid under certain thresholds from the notification requirement⁸. In February 2019 the Commission increased both the maximum aid amount per single undertaking (from €15,000 to €20,000 over any period of three fiscal years) and national caps (from 1% to 1.5% of annual output)⁹. Higher thresholds may be applied if certain additional conditions are fulfilled (sector cap and use of national central register).

When paying compensation, according to the Guidelines¹⁰, Member States must also ensure that farmers are incentivised to minimise risk and take “reasonable prevention measures, such as safety fences where possible, livestock guarding dogs, which are proportionate to the risk of damage caused by protected animals in the area concerned”. Furthermore, the Guidelines require a direct causal link between the damage suffered and the behaviour of the protected animal to be established by the Member State.

3. Recent changes to the measures to finance compensation and prevention measures

The 2018 amendment to the Guidelines for State aid in the agricultural sector does not change the measures included in Rural Development Programmes¹¹ co-financed under the EAFRD. It only



(Photo: Elena Tsingarska)



affects Member States' abilities to finance compensation and prevention measures under their own budgets. The changes are summarized in Table 1. The extract from the Guidelines with the changes marked is shown in Box 1.

(Photo: Elena Tsingarska)

Table 1 Impact of amendment to Guidelines for State aid in the agricultural sector.

Compensation for direct costs	
Compensation covers	Damage for animals killed, plants destroyed. Material damage to: farm equipment, machinery and farm buildings and stocks.
Funding source	Member State financing only (national / regional government) under de minimis or through a State aid notification.
Permitted % support until 2018 amendment	100% of market value of animals or plants. Repair cost or economic value of the affected asset before the event that caused the damage.
Permitted % support after 2018 amendment	No change.
Compensation for indirect costs	
Compensation covers	Veterinary costs from the treatment of wounded animals. Labour costs related to the search for missing animals.
Funding source	Member State financing only (national / regional government).
Permitted % support until 2018 amendment	80% of total costs.
Permitted % support after 2018 amendment	100% of total costs.
Prevention measures	
Compensation covers	Costs associated with prevention measures such as fencing, livestock guarding dogs or shepherding.
Funding source	EAFRD co-financed with national / regional budgets. Or Member state financing only (national / regional government).
Permitted % support until 2018 amendment	100% if under non-productive investment measure or agri-environment-climate measures within Rural Development Programmes (co-funded by EAFRD). 100% if under de minimis. 80% if notified under State aid – 100% for collective investments.
Permitted % support after 2018 amendment	100% if under non-productive investment measure or agri-environment-climate measures within RDPs (co-funded by EAFRD). 100% if under de minimis. 100% if notified under State aid.

Box 1 Extract of the guidance with amendments marked.

(underlined = addition; ~~crossed-out~~ = subtraction)

Protection measures: Aid for investment in tangible assets and intangible assets on agricultural holdings linked to primary agricultural production [...]

(143) The investment must pursue at least one of the following objectives:

(e) the restoration of agricultural production potential damaged by natural disasters, exceptional occurrences or adverse climatic events which can be assimilated to a natural disaster, animal diseases and plant pests, protected animals and the prevention and risk mitigation of damage caused by those before-mentioned events and factors; [...]

(155) As regards investment with preventive objectives in point (143)(e), the maximum aid intensity must not exceed 80%. However, it may be increased up to 100% if the investment is carried out collectively by more than one beneficiary or if the objective is to prevent damage caused by protected animals.

Compensation measures: Aid to compensate for the damage caused by protected animals

(390) Damage to equipment, infrastructure, animals and plants caused by protected animals is a growing problem. The success of Union conservation policy depends partly on the effective management of conflicts between protected animals and farmers. As a consequence, and in respect of the principle of proportionality, the Commission will consider aid to compensate for the damage caused by protected animals compatible with the internal market under Article 107(3)(c) of the Treaty if it complies with the common assessment principles of these Guidelines and with the following conditions. [...]

Aid intensity:

(401) Compensation may be granted up to 100% of the eligible costs.

(402) ~~Compensation for indirect costs must be proportionate to the direct costs and must not exceed 80% of the total indirect eligible costs.~~

(403) The aid and any other payments received to compensate for the damage, including payments under other national or Union measures or insurance policies for the damage receiving aid, must be limited to 100% of the ~~direct~~ eligible costs ~~and 80% of the indirect eligible costs.~~

¹ European Commission news release, November 2018, Amendments to the State aid Guidelines for the agriculture sector to better address damages caused by wolves and other protected animals: https://ec.europa.eu/info/news/amendments-state-aid-guidelines-agriculture-sector-better-address-damages-caused-wolves-and-other-protected-animals-2018-nov-08_en

² E.g. discussed in Goslar, Germany at the 2018 Regional workshop of the EU Platform on Coexistence between People and Large Carnivores: http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/EU%20LC%20Platform_Workshop_statement_Goslar.pdf

³ EU Platform website: <http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/190211LETTER%20VELLA-HOGAN%20to%20ENV-AGRI%20Ministers.pdf>

⁴ See the EU Platform for Coexistence between People and Large Carnivores webpage on Rural Development Programmes for examples: http://ec.europa.eu/environment/nature/conservation/species/carnivores/case_studies_sub_rural_development_programmes.htm

⁵ See EU Platform for Coexistence between People and Large Carnivores webpage on Rural Development Programmes for overview of where such measures are in place: http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/145_Case%20studies%20and%20RD-update.pdf

⁶ See ENRD country data for contact points in each country: https://enrd.ec.europa.eu/contact/country-data_en

⁷ European Union Guidelines for State aid in the agricultural and forestry sectors and in rural areas 2014 to 2020: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2014.204.01.0001.01.ENG&toc=OJ:C:2014:204:TOC

⁸ Commission Regulation (EU) No 1408/2013 of 18 December 2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to de minimis aid in the agriculture sector: <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32013R1408>

⁹ Commission Regulation (EU) 2019/316 of 21 February 2019 amending Regulation (EU) No 1408/2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to de minimis aid in the agriculture sector: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R0316>

¹⁰ European Union Guidelines for State aid in the agricultural and forestry sectors and in rural areas 2014 to 2020: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2014.204.01.0001.01.ENG&toc=OJ:C:2014:204:TOC

¹¹ [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018XC1109\(04\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018XC1109(04)&from=EN)

Focus

A MUNICIPAL GOAT FLOCK IN SPAIN

GOAT FLOCK MANAGEMENT IN SIERRA DE GUADARRAMA

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1. Introduction

El Boalo, a village in the Guadarrama mountains north of Madrid, used to have more than 2,000 head of sheep and goats. This was a region of good shepherds, goatherds and cattle breeders. The village is connected with others in the area, including Cerceda and Mataelpino, by a dense network of *Vías Pecuarias*: a complex system of drove roads formerly used by local farmers for the seasonal north-south migration of transhumant flocks of Merino sheep in search of greener pastures (Grande and Botin, 2012). In the traditional husbandry system, shepherds always accompanied their flocks and used Spanish Mastiff dogs to protect them from wolf attacks.

The wolf disappeared due to hunting and the modernization and social transformation of rural Spain after 1960 meant that most farmers switched from sheep and goats to dairy cattle, mainly Friesians, with a more intensive production system. Later, in the 1990s, many farms closed due to a fall in milk prices and remaining farmers turned to production of veal from Avileña and its crossbreeds. Their products are currently marketed with the Guadarrama protected geographical indication label (www.carneguadarrama.com), being pro-

duced on farms of communal fenced pastures. Along with pressure from tourism and growing sport and leisure activities such as mountain biking and running, this situation has led to decreasing use of the *Vías Pecuarias* by shepherds and livestock.

To this we must add the recent reappearance of wolves, that have managed to re-colonize Guadarrama after an absence of almost 70 years (MAAMA, 2015), and the creation in 2013 of Guadarrama National Park. This generated great uncertainty among farmers, as they had to face a new problem and a new legal framework regulating agricultural and grazing practices within the park, forcing them to change their routines and jeopardizing the economic feasibility of their farms.

In the midst of this complex scenario, in October 2016 the municipality of El Boalo initiated a project to recover traditional grazing and extensive husbandry, founded on the principles of sustainability and agroecology. This project was based on the formation of a municipal flock of Guadarrameña goats: an autochthonous and protected breed, well adapted to conditions in Spanish mountains.

2. Objectives

The first objective of the municipal flock was to reconnect people with the countryside and traditional husbandry, as this is a necessary element to achieve conservation of the local mountain ecosystem. The second objective was to reduce organic waste by feeding it to the goats and producing compost on the municipal farm. Third was the search for synergies to attract entrepreneurship related to transformation of the basic products from the flock, namely meat and milk, into artisanal products to be consumed locally within a circular economy. The fourth objective was prevention of forest fires in the peri-urban areas of the municipality. The last goal of this singular project is to improve coexistence of extensive livestock grazing and wolves in the national park by promoting the use of preventive measures such as livestock guarding dogs and by providing farmers affected by wolf attacks with replacement animals.

3. Development

The project began with 75 goats, the goal being to reach 150 breeding purebred Guadarrameña females. There are currently 130 breeding individuals and 60 yearling goats, along with 15 bucks and 30 wethers. Two farmers affected by wolf attacks have bought breeding males from the municipal flock for their own herds. The municipal flock is part of the Guadarrameña Goat Breeders Association that carries out selection and genetic improvement programmes.

The flock participates in the fire prevention programme of the Madrid Community firefighters, being assigned several hectares to graze during the year.



Fig. 1 Spanish Mastiff with goat kids in a corral (*majada*).

(Photo: Javier de los Nietos Miguel)

To improve management, the flock is divided into three groups: males, lactating females and young animals. This splitting of the flock allows diversifying into grazing and clearing areas, as well as meeting requests from other municipalities to take advantage of the services provided by the municipal flock to clear vegetation on farms and along roads. The villages of Navarrevisca, Guadarrama and Miraflores de la Sierra are good examples of this. Thanks to this initiative, which is framed in a local circular economy programme, the municipality of El Boalo was recognised by Zero Waste Europe (www.zerowasteurope.eu) and the Ministry of Ecological Transition.



Fig. 2 Spanish Mastiff with goat kids in a corral (*majada*). Guadarrama National Park is visible in the background.

(Photo: Javier de los Nietos Miguel)

The flock is protected by four Spanish Mastiffs that were donated by another farmer. They are neutered and kept with the goats in corrals (*majadas*) to protect them from predators and thieves (Figs. 1 and 2). During the day they accompany the grazing flock. Due to frequent visitors, the Mastiffs are used to the presence of large groups of people and families. They are effective guardians around the corrals, are not too aggressive with other dogs and do not display overt aggression towards people. While the flock is grazing they sometimes wander away to search for food from visitors in nearby picnic areas. Interactions with tourists, who treat working dogs as if they were pets, are the trickiest issue to manage.

A year after establishing the flock, young entrepreneurs assist by caring for and milking the goats and guiding visitors. Milk is collected by an artisanal cheese factory (Alimentos de Miraflores), which produces both pasteurised and unpasteurised cheeses. The price for one litre of milk in 2018 ranged



Fig. 3 Transhumance with a group of young people taking part in an environmental education activity, passing Santillana reservoir, Manzanares el Real. (Photo: Javier de los Nietos Miguel)

from 0.51 to 0.82 euros, which was still below the 0.90–1.00 euro needed to cover all production costs. Goat kids can be bought for consumption at public auctions and the annual Guadarrameña Goat Fair brings locals and visitors together to savour products from the flock.

The herd is also used as a didactic resource to educate and raise awareness among young people and families. This is done through workshops with schoolchildren, guided tours and herding the flock (Fig. 3) as well as promotional campaigns on television. Visitors to the flock are accompanied by an environmental education guide. Guides can be hired through the sustainable tourism portals of Guadarrama National Park. People can also help by volunteering (Fig. 4). Information is disseminated through the



Fig. 4 Volunteers with Spanish Mastiffs that protect the flock. (Photo: Javier de los Nietos Miguel)

flock website (www.cabrasbcmblog.wordpress.com), which has already received 8,000 visits from 60 different countries in two years. There is a blog with news about daily activities and events organized within the project, but also focused on relevant issues about goat breeding.

4. Final considerations

The commitment of El Boalo to recover traditional husbandry by creating a municipal flock has been a model of disruptive innovation in a sector that needed to find new proposals and solutions to modern day challenges. There is growing collaboration and support for the project, which is the subject of study by university students¹. As a result, different stakeholders, from livestock breeders to administrators and conservation groups, are following this innovative project to assess whether it is transferable to other regions. Replication in other parts of Spain should be possible, as long as the specific local context and characteristics are taken into account.

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¹ Several theses have focused on the project with topics related to agroecological initiatives and conflicts between wolves and extensive livestock breeding in the Sierra de Guadarrama.

Article

SOCIAL MEDIATION INITIATIVE

COEXISTENCE OF IBERIAN WOLVES AND EXTENSIVE LIVESTOCK FARMING

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1. Introduction

The conflict between pastoralism (“the use of extensive grazing on rangelands for livestock production”; FAO, 2001) and the wolf is probably the most paradigmatic regarding natural resources and biodiversity on the Iberian Peninsula. Coexistence, while enduring for millennia in Spain, has become a battlefield between two deeply antagonistic parties. This confrontation has led to a growing conflict, fuelled by symbolism of the wolf as the “beast”, that has now transcended the reality of predation on livestock to encompass the whole social sphere of rural areas.

By mid-2014, some people linked to the Entretantos Foundation who were deeply worried about this situation started to focus on the social aspects of the conflict rather than technical or political ways of

dealing with it. The foundation performed an internal social diagnosis¹ on the situation in the most conflicted areas of the country, especially the northwest quadrant including the regions of Galicia, Asturias, Cantabria and Castilla y León (Fig. 1). This assessment showed a deeply rooted conflict developing in a dangerous way. Consequently, the team decided to adopt a mediation perspective, using dialogue and collaborative tools to allow some narrowing of the distance between different sides in the conflict.

Following this path, the Entretantos Foundation designed a Social Mediation Initiative, aiming to defuse the conflict rather than to focus merely on solving the problems of coexistence. The backbone of this initiative consists of the development of a participato-

¹ This document, together with other documents developed during the process, has not been published or released for public consultation, so it remains internal to the working group. However, the Campo Grande Group is currently reviewing some of them in order to make them public on its website www.grupocampogrande.org.

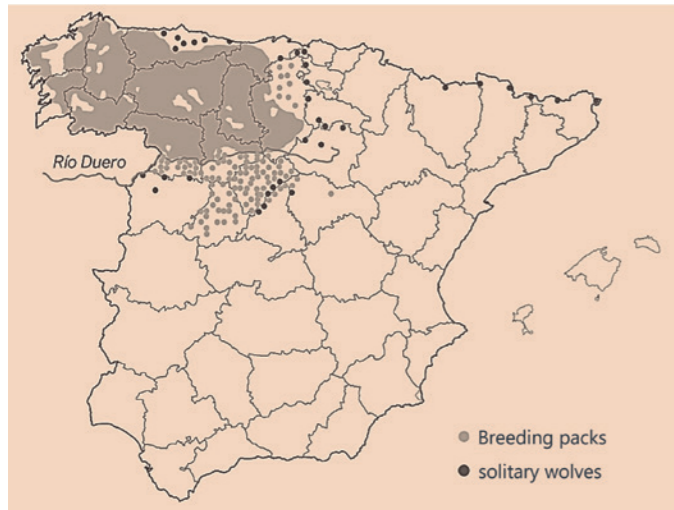


Fig. 1 Distribution map of the Iberian wolf in Spain according to Sánchez et al. (2018). The last official census was conducted in 2012–2014. (MAAMA, 2015)

ry nationwide think-tank, the Campo Grande Group, where people linked to several sectors related to the conflict participate. After more than two years of hard work, this platform has reached its first set of agreements and negotiated propositions to diffuse tension.



Fig. 2 Coexistence between wolves and extensive farming has become a serious conflict in Spain.

2. Not one conflict, but many

The conflict over the wolf in Spain affects biodiversity, conservation, management of natural resources and pastoralism but, on top of that, it mostly affects people who feel already threatened. Following our analysis, which is presented in the following sections, we describe the situation as an emerging situation loaded with complexity, symbolism and antagonism. It is a breeding ground for social outrage, with episodes of aggression that could be more harmful than any predation (Fig. 2).

When the Entretantos Foundation began using a social approach to the situation (Redorta, 2004), one of the first outcomes reached by diagnostic activities was the multidimensionality of the problem. The reality around wolves included a conglomerate of entangled conflicts, with very different backgrounds, agents and landscapes. This was not just about a single problem related to economics, communication, conservation, lack of understanding between stakeholders, ethics or management, but a very complex social-environmental issue with many visions, perceptions, empathy, certainties, discourses, communication and

even action structures. Mostly, these components are not intended to solve or de-escalate the conflict but to generate opinion and antagonism, without any place available to hold a negotiation or simply some peaceful dialogue.

The cartography of the conflict, also following Redorta (2004), displays at least 12 of 14 categories of conflict, including power, self-esteem, interests, legitimacy, rule of law, identity and personal values. This characterisation leads to consideration of the problem as a cluster of interlinked conflicts evolving around a central issue: the wolf. Henceforth, as we speak of the conflict, we will be referring to the whole cluster. This is a key issue to understand the degree of confrontation displayed by the situation.

It should be emphasised that, when we refer to “solving the conflict”, we are not promoting only technical solutions. We do not want simply working collaborative management models. On the contrary, we intend to address the confrontation and antagonism between different social sectors. The toolbox to develop this social approach is included in this mediation process, where agreements are just one outcome, a tool to reach wider goals, e.g. building trust, facilitating dialogue between conflicted parties, generating mutual empathy between both sides and finding consensus to help deflate the conflict.

On the other hand, the scenario emerging from initial contacts between stakeholders, sectors and social environments involved with the wolf showed a display of escalating emotions and actions creating a threatening situation for both extensive farming and wolf conservation, becoming personal, transcending to society and already approaching the maximum degree in a scale of conflict (Fig. 3). Conse-

quently, despite hundreds of initiatives developed around this topic, such as Living with Wolves by Ecologistas en Acción (www.ecologistasenaccion.org), the cooperation project Wolf: Wild Life and Farmers (www.redruralnacional.es) and the LIFE Lobo project in Andalusia (www.lifelobo.es), the positions of the different agents involved have become increasingly disparate, the confrontations increasingly virulent and solutions are definitely increasingly difficult to find.

The Foundation team identified three key aspects to face the challenge of the situation. Firstly, a conviction that no solution would be effective without a basic social agreement built upon dialogue. Secondly, a need for dialogue that can only be started if all parties agree on it. Finally, the assumption that any mediation initiative set in motion would require, as a preceding step, hard work to define, characterise and assess the different conflicts around the wolf.

3. Background assessment

To meet this assumption, in January–March 2016 the Entretantos Foundation team carried out 27 direct interviews (some with groups of 2–3 people) with social agents interacting with the conflict. The selection of interviewees leaned mostly on the previous involvement of Entretantos with pastoralists and an intimate knowledge of networks involving the main stakeholders. The team first classified these agents according to the following categories: conservationists linked to areas with attacks, country-wide conservationists, professional agricultural organisations, farmers’ associations in areas with attacks, individual farmers and shepherds with experience dealing with attacks, researchers, and experts. Selecting

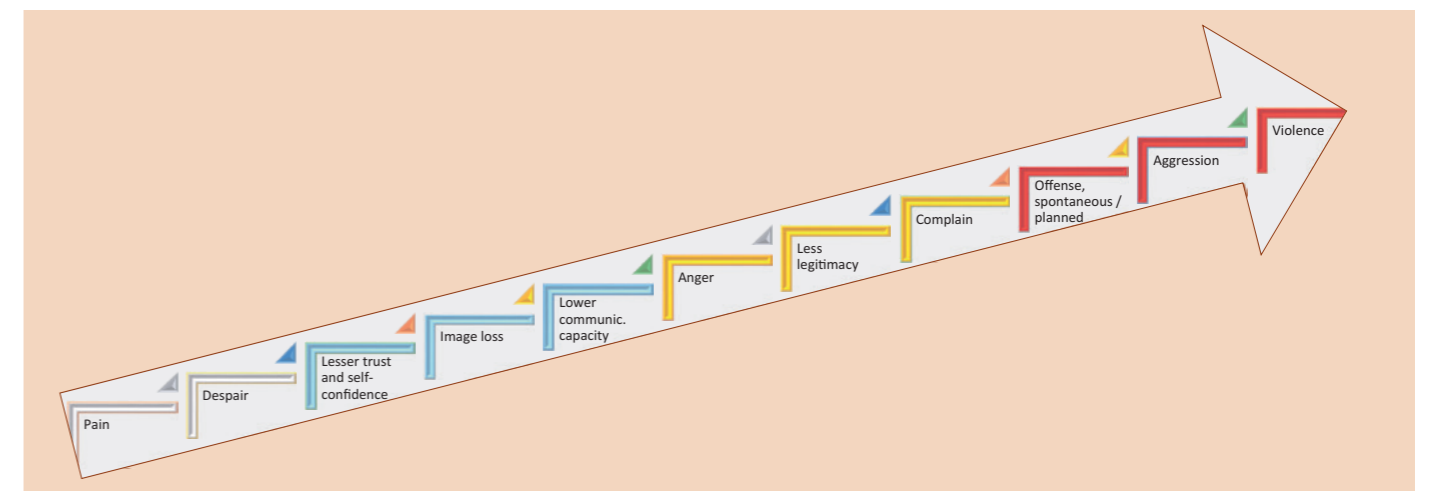


Fig. 3 Conflict escalation depicted by Fundación Entretantos, inspired by Redorta (2004).



Fig. 4 Simplified map of actors in the conflict. The map represents both sides of the conflict (right and left) and other agents involved. The positioning of the different agents and their relationships contributes to the complexity of the problem.

(Source: Fundación Entretantos)

individual participants was a dynamic process, starting with the most significant local stakeholders and asking them for people whose voice should be heard regarding this conflict. Step by step, the team cast a wide net in which all major players, at each local level, were included (Fig. 4).

Face-to-face interviews (some via videoconference) were performed in the provinces of Salamanca, León (northern region), Asturias, Cantabria and Madrid. These provinces were chosen mainly for their level of conflict. We avoided the Galicia region, where another working group (O Xan) was already developing its work. Interviews were designed following a script focused on positioning and perspectives of the conflict emanating from people questioned. Each interview was conducted by two people, without recording equipment (to improve trust). Notes taken during interviews were later processed and analysed using a discourse analysis tool (Conde, 2009) to extract the representation and social perception of the conflict and fine-grain mapping of the areas in conflict. The process began with a transcription, as accurate as possible, of the whole interview. The interviewer then performed a text review to assess the categories of organization of the discourses, deconstruct the text

in elemental analysis units, regroup the data, assign categories and, finally, analyse and interpret.

4. A dialogue group

The first real outcome of this process has been the constitution and facilitation of the Campo Grande Group (CGG). This dialogue group is the main working tool to pursue dialogue, reflection, analysis and creative solutions to the conflict. It answers the need for a neutral space to talk, establish positions, confrontation and disagreement in a safe and independent mode.

The CGG was planned with a balanced composition of 35 people drawn from conservationist organisations (10), researchers and experts (7), hunters (2), farmers (8 men and 2 women), and professional agrarian organisations (2), representing different positions and interests. The group was completed with six facilitators from the Entretantos Foundation to mediate and support the group. The group started work in spring 2016, with one-day meetings complemented with online working (mostly through online forms and collaborative documents). So far eight meetings have been held, each attended by 18 to 25 people (Figs. 5 and 6).

The mission of the CGG consists of developing the background to facilitate alternatives promoting long-term coexistence between extensive livestock farming and wild wolf populations. It is a strong commitment for the group's members, coming out of their personal and collective comfort zones around wolf issues, to adopt a position of dialogue out of bravery and generosity. The vision of the group is a committed, highly skilled and expert think tank, sympathetic and sensitive to the reality of people dealing with conflict on a daily basis. The group should generate analysis, debate and reflection, while diagnosing the current situation and developing viable solutions. The long-term target of the CGG is to produce agreements promoting compatibility between extensive farming and wild populations of Iberian wolves in a way that can be both useful and trustworthy. This target is formulated out of preconceived ideas, based on respect to people (whether they are involved in farming, tourism, conservation or research) and displaying a solid scientific foundation in their proposals and solutions.

The roadmap of the group is also a task performed within the process. In the first stage, the develop-



Fig. 5 Public presentation of the Campo Grande Grupo at the Royal Botanic Garden of Madrid. (Photo: Fundación Entretantos)

ment of this roadmap, there was a desire among CGG members to supplement the group's composition, seeking more voices committed to finding solutions rather than complaints, moans and claims. However, the main idea was always to reach an agreement that could be presented to both sides of the conflict, technically viable and socially acceptable suggestions that may help to overcome the state of confrontation. However, reaching agreements from such different points of view is not at all easy. The group needed to prepare itself for a long and probing dialogue, dealing with different, often deep-rooted positions. Professional facilitation and training were key at this point to establish a friendly scenario where dialogue was meant to develop. Before tackling the most conflicted issues, it was helpful firstly to analyse the situation together and build a shared scenario, setting aside the most toxic and powerful constraints.

These preparatory tasks were important for the group dynamics, as they helped to build trust and empathy among all participants. The work included identifying and mapping the complete set of actors involved, trying to address the complex relationships between them. In the second stage, the group analysed different discourses with a clear task in mind: to identify and catalogue stereotypes, red lines and constraints, addressed to the actual situation of social conflict. Using the outcomes of these analyses, the CGG then started to deconstruct and dismantle myths and clichés, while identifying good practices already existent in the field that could be the basis for new ideas and solutions suitable for both sides. These ideas would establish a common ground,



Fig. 6 Meeting in Valladolid July 17. (Photo: Fundación Entretantos)

boosting the interest of both sides whilst securing the dialogue.

5. Analysing the conflict

Testimonies gathered in the diagnostic phase were included in a Social Perception Report, distributed to all CGG members and establishing a baseline of conflict-related discourses, acknowledging the diversity of stakeholders and approaches. The testimonies were fundamental for the group to analyse different discourses related to the conflict and typifying the diversity of interests and actors. The most notable outcomes of this analysis were the above-mentioned symbolic power of the wolf, with various contrasting characteristics attributed to the animal by both sides of the conflict. The second conclusion was the neat polarisation of the conflict into two sides, displayed not from an objective basis but from the perception of others as opponents. The group also established the need for more reliable assessment of data about wolf attacks on livestock, resultant damages and their claims. Improved availability and accessibility of scientific data and research outcomes, along with greater transparency, emerged as key demands for properly assessing the situation in the field.

The result of these analyses was a list of the main topics related to the conflict:

1. Symbolic role of the wolf;
2. Polarisation in two neat fronts;
3. Accountability of attacks;
4. Vision about compatibility between livestock and wolves;

5. The impact of economics: damages, benefits, compensations, etc.;
6. Pastoralist management systems and prevention measures;
7. Wolf population control;
8. Population data and census;
9. Land planning related aspects;
10. The role of mass media;
11. A vision of the future.

This list formed the basis for planning dialogue sessions, designed to discuss each topic in detail in an effort to draw conclusions and make specific proposals. The topic list was started by exploring questions about the development of the conflict, for instance the symbolic treatment of the animal or polarisation of the debate into two sides, not supported by objective reasons but rather from perceiving, both individually and collectively, all other positions as confrontational. The question of coexistence was raised from different perspectives: the compatibility between wolves and livestock, pastoralist management systems, measures to prevent predation, etc. (Fig. 7). Other sets of topics focused on economic aspects such as damage, benefits and compensation, also embedded in the complex matrix of rural activity, including tourism, hunting and agriculture.



Fig. 7 Damage prevention measures, such as guardian dogs are a common source of dissensus. (Photo: Fundación Entretantos)

The group agreed to discuss technical issues, including the accuracy and reliability of data, both ecological (population status, wolf movements) and concerning attacks (number, losses, damages), the need to control wolf populations or possible alternatives and the importance of land planning and land management to address the conflict. The topic list also included some transversal issues, such as the role of the

media, including their influence on public opinion. Finally, the last topic was a vision of the future and realistic possibilities of solving, or at least de-escalating, the conflict.

6. Preconceptions, stereotypes and clichés

Systematic compilation of different social discourses is a key to elucidate the main fields of interest but also first step in identifying and analysing clichés. Common statements and stereotypes, far from contributing to smoothing conflicts, are often the main arguments supporting extreme positions and confrontation. Such clichés are often preconceptions, repeated over and over again by either side, held as true without need for corroboration, fed to the press and media, written-up in leaflets and used to promote their positions. These clichés often state an extreme positioning, a response to the other side’s aggression, whilst giving feedback to the conflict in a never-ending positive loop.

Mediation also focuses in a critical analysis of clichés as a way to facilitate dialogue and understanding between sides. This work starts on extreme headlines, e.g.: “farmers lie about the attacks”, “cohabitation is impossible”, “conservationists are urbanites and do not want farmers in the countryside”, “most attacks are performed by feral dogs”, “Common Agricultural Policies are already paying for coexistence with wolves”, etc. These arguments are often heard in interviews or read in headlines. The first list of clichés came from interviews during the initial assessment stage. The CGG has analysed the origin of these clichés, discussed the pertinent facts and elaborated alternative, better-informed sentences. This work was done during two sessions deconstructing each of the stereotypes. The mechanism was simple: the facilitation team presented each cliché to the group, the people affected by the cliché explained their position and how the stereotype was prejudicial or harmful. Facts and research around the topic were presented if necessary. Finally, after the discussion, the group reached an agreement on how the current topic should be addressed to avoid inaccurate statements and discrimination (Table 1). The goal of this work is providing solid arguments, acting as levers to assimilate, deconstruct and deactivate mantra-like clichés, deeply embedded in the collective mind of the sectors involved.

Table 1. Outline of cliché analysis performed by the Campo Grande Group.

Cliché	Origin	Analysis	Proposal
The countryside is better without livestock (or people).	Some conservationists and rewilding advocates make such statements.	The Spanish countryside has been grazed since the Neolithic and this should continue.	Show interest in keeping shepherds in the countryside, support coexistence, agroecology and high-quality products.
Academics and conservationists know nothing about how things really work.	Farmers think only people living with them in the countryside know how to deal with their environment.	Scientific fieldwork is difficult and underrated.	Promote participatory science, increase efforts to disseminate results. Scientists and farmers should get to know each other.
Farmers are greedy, conservationists are greedy scientists are cheap sell-outs.	Everybody thinks that their enemy is only interested in money.	Neither farmers, conservationists or scientists make a lot of money from their work.	Focus on professionalism, quality and relevance of each agent involved.
Farmers are careless and they cheat.	Some conservationists think that compensation is paid to cheaters and preventive measures will solve the problem.	Compensation barely pays for direct costs, it does not cover indirect costs (e.g. stress, disturbance).	Design and implement better compensation tools, promote better preventive measures.
Nobody cares about us (farmers).	Farmers feel victimised, that conservationists and other agents do not care about their pain and struggle.	Conservation groups are starting to understand the importance of High Nature Value farming.	Help conservationists valorise the contribution of pastoralism to biodiversity, promote mutual understanding.
Wolf-watching is going to be a lifesaver for rural economies.	Some conservationists think that specialised tourism could be an alternative to traditional farming.	Wolf-watching is growing but only in certain areas and cannot be a global alternative to farming.	Consider tourism as a complementary activity, involve farmers and their activities in tourism packages, redistribute revenues.
The wolf is an excuse to manipulate farmers.	Conservationists think that wolf predation on livestock is not a major issue and farmers are manipulated to focus on it.	Farmers are aware of other problems they face, but predation makes the situation very difficult for some of them.	Distinguish predation from other issues, avoid disrespecting farmers and misusing the conflict for other interests.
The wolf is an icon of a vibrant natural world.	The great charisma of the wolf makes it a powerful image, but in Spain wolves live in human-dominated landscapes.	Communities suffering attacks consider it painful to be confronted by such imagery.	Keep symbols out of the conflict.

7. Red lines: constraints, blockages and dissension

After addressing clichés, the CGG focused on analysing dissension and blockage. There are some strong topics on which neither side is willing to back down, obstructing any possible solution to the conflict. An analysis was presented to the group in another internal document, describing these blockages and classifying them in seven categories. This analysis also established red lines: positions that the different sectors will not cross, highlighting the main points of conflict escalation and polarisation of discourses. The seven categories were:

1. Damage assessment;
2. Damage reduction and prevention measures;
3. Economic tools for damage compensation;
4. Wolf population control;
5. Census and scientific knowledge of the species and its territories;
6. Legal status of the wolf;
7. Wolf-related tourism.

These topics fuelled the main debates inside the GCG and, eventually, facilitated the first agreements achieved by the group. The outcomes of these discussions also provided feedback to the previous stages, generating dialogue dynamics that soon led to

more agreements and to show clearly the red lines: points where agreement was impossible (at least for now). By this point, the group had achieved sufficient agreement to establish a strong basis for addressing the conflict and enough confidence to keep debating (Fig. 8). The main dynamic of the group was strong and stable, and the results were solid.

8. Proposals, action, future

In August 2018 the Campo Grande Group achieved a second milestone: releasing a *Declaration of the Campo Grande Group*² (CGG, 2018), including the main agreements together with their nuances and degree of consensus (not always complete) to address each of the blockages and red lines. All participants individually signed the Declaration, which is now in the process of being discussed and endorsed by organisations. Participants in the Declaration were allowed by the group to freely choose their signature as individuals or organisations. However, their commitment is to deliver, discuss and advocate for the Declaration to be endorsed or, at least, accepted, by the main stakeholder organisations (Fig. 9).

The main outcomes of this work, besides actually reaching the first set of agreements displayed in the document, are truly related to the quality of the participatory process itself. Clearly, the most significant

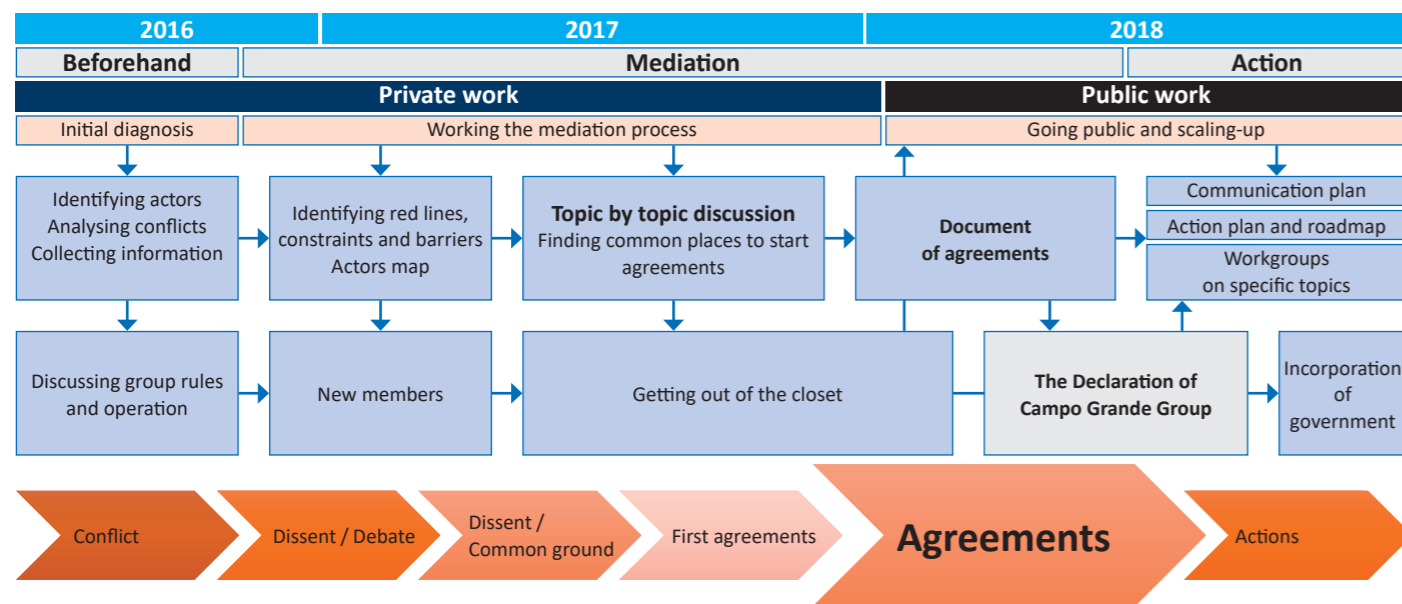


Fig.8 Operation of the Campo Grande Group.

(Source: Fundación Entretantos)

² The Declaration can be downloaded from the Campo Grande Group website. The direct link for the English version is: http://www.grupocampogrande.org/wp-content/uploads/2018/10/DeclaracionGCG_v3_eng.pdf



Fig. 9 Poster advertising of the final meeting, February 2019.

advance is that the parties involved in the conflict have been able to debate freely, in a climate of respect, mutual trust, and with a will to solve the problem. Moreover, the formulation and public presentation of the Declaration shows that it is possible to reach viable agreements between heavily confronted sides in such a polarised conflict. Everyone involved in the dialogue has modified his

or her initial position to reach consensus and provide a basis for progress. The greatest innovation displayed by this initiative is creating a secure environment for dialogue and negotiation. The availability of such a safe place is the foundation for designing specific management measures and overcoming the constraints arising in the course of its implementation.

After releasing the Declaration, the CGG started a communication campaign to disseminate both the document and the participatory methodology behind it. The group has also set in motion new lines of work, including development of new practical initiatives that could contribute to improving the main proposals. Three workgroups are in charge of three different lines of work, considered instrumental for conflict resolution: declaration of damages, damage assessment protocols and management measures. A fourth group is entrusted to analyse and compare regional governmental wolf management plans, suggesting specific amendments to improve their usefulness as well as coherence both among the plans and with CGG proposals. The CGG is organising this work by designing an Action Plan, complemented by a Communication Plan.

The social mediation initiative is facing a major challenge in going public on dialogue and negotiation between conflicted sides. Establishing a website for the group (www.grupocampogrande.org) was a great step forward. As part of the process of going public, in February 2019 the CGG held a workshop which was attended by more than 80 guests from the whole spectrum of stakeholders' organisations. This included a presentation supported by an interactive theatre, dialogue between parties and public debates, with the outcomes to be displayed on the website.

The group is now prepared to incorporate government bodies and other stakeholders that were not part of the initial stages. The involvement of government agencies (at both regional and national levels) is key to the continued development of the group. They were not involved in the early stages of the group in order to avoid focusing the debate on what the government should do. After the first agreements, their participation is essential to achieve concrete measures for improvement, and the group is aware of this fact. The facilitation team has already initiated contact with some key government bodies to assess their potential role and participation in the group. In any case, the freedom, trust and generosity displayed by all participants have proven to be instrumental in its success, demonstrating that, through a properly facilitated process, it is possible to reach agreement between pastoralists and other stakeholders. The next steps will include replication of the process at the local level in different areas, when we will see if the approach is also suitable in less controlled environments dealing directly with wolf attacks.

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Perspective

EVALUATION OF PREVENTION MEASURES

CAN ASSESSMENT OF DAMAGE PREVENTION BE STANDARDISED?

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1. Introduction

Non-lethal methods of preventing damage are commonly advocated as alternatives to culling predators (e.g. Treves et al., 2016). Although often perceived by users, managers and advocates as beneficial, several recent reviews have concluded that there are surprisingly few examples of their effectiveness being demonstrated scientifically (van Eeden et al., 2018a; Eklund et al., 2017; Miller et al., 2016). This is not to say that preventive measures do not work, but rather that they are not often adequately tested. To help address this deficiency, there is a need to develop more rigorous and consistent approaches to assessment and evaluation (van Eeden et al., 2018b).

In order to share practical experience and ideas, a workshop on the *Evaluation of Damage Prevention Measures* was held at Polo Universitario, Grosseto

(Italy) on 8th November 2017 as part of the final conference of the LIFE MedWolf project (LIFE11 NAT/IT/069). The workshop was hosted by the Province of Grosseto in collaboration with the Institute of Applied Ecology in Rome, Grupo Lobo (Portugal), AGRIDEA (Switzerland) and the Slovak Wildlife Society (Slovakia). It was attended by 36 managers, researchers and practitioners including project partners and members of the Carnivore Damage Prevention Working Group¹.

The workshop was divided into two sessions: the first focused on livestock guarding dogs (LGDs) and the second on fencing (electrified and non-electrified). Introductory presentations set the context and outlined methods of assessment used in several case studies. This was followed by discussions on how eval-

uation could be standardised across different contexts to develop reliable, scientifically-based methodologies. Workshop participants also visited sheep farms participating in the LIFE MedWolf project in order to get farmers' perspectives on assessing the success (and failure) of damage mitigation measures.

2. Examples of LGD evaluation

A set of three components defined 40 years ago (Coppinger and Coppinger, 1980) still form the most common framework for assessing LGD behaviour. Attentive dogs accompany and stay close to their flocks, following their movements. Protective LGDs react adequately to strange situations and interrupt predator attacks. Trustworthiness refers to the absence of disruptive or harmful behaviours towards livestock, with the most appropriate behaviours being submission and social investigation (Lorenz and Coppinger, 1986). Presentations in the first session of the workshop showed several examples of how the effectiveness of LGDs has been assessed in different environments, based on these three components but also using a variety of other criteria and sampling protocols.

Grupo Lobo's LGD Programme, which has been running since 1996, has distributed around 600 dogs to livestock farmers in Portugal. The project follows a three-pronged approach to assessment: level of damage, dog behaviour and owner satisfaction (see Ribeiro and Petrucci-Fonseca, 2005 in *CDPnews* issue 9 and Ribeiro et al., 2017 in issue 15). Livestock losses are compared at the same farm before and after the introduction of LGDs, with neighbouring flocks/herds and control flocks/herds without LGDs. Attentiveness (e.g. proximity and orientation toward the flock) and trustworthiness (social/agonistic interactions with the livestock) are assessed by researchers through direct observation. Several different regimes have been used: instantaneous sampling (every minute during the whole grazing period), continuous observation (e.g. 30 minutes in the middle of grazing or when the dog is with livestock in the stable or when moving to/from the stable) as well as the sampling protocols of Coppinger et al. (1983). Behavioural data are used to investigate the influence of environmental variables (habitat, husbandry) and dog characteristics (breed, sex) on LGD performance. Evaluation of protectiveness is usually based on alertness/activity and reaction to unfamiliar people and animals (e.g. other



(Photos: Robin Rigg and Daniel Mettler)

dogs, wildlife), which are used as proxies for protectiveness against predators. This is because interactions with predators are relatively infrequent events that are unlikely to occur during formal sampling periods. Shepherds' ratings of dogs are therefore also collected and compared with behavioural assessments.

The Protection of Livestock and Conservation of Large Carnivores Project in Slovakia used several different metrics to evaluate LGDs (see Rigg, 2005 in *CDPnews* issue 8). Pup behaviour and interactions with sheep were measured with focal observation protocols (4–6 hours of continuous monitoring every two months plus occasional longer sessions, some using night vision equipment). As the conditions in which they were tested often varied, a researcher also scored dogs on the basis of several outcome ratings, such as the degree to which good practice guidelines for raising LGDs were followed and the extent to

¹ An international platform connecting researchers and managers to facilitate discussion and collaboration on damage prevention measures, with a particular emphasis on the evaluation process.

which a dog became integrated into the flock (bonded to sheep and regularly accompanied them during grazing). This had to be done by the same researcher in all cases to ensure consistency but had the advantage of facilitating comparison between farms as well as investigating possible connections between the environment in which LGDs were raised and their subsequent performance (Rigg, 2004). Protectiveness was tested by filming LGD responses to simulated predator attacks. Shepherds' descriptions of encounters between LGDs and wildlife were also recorded. In addition, losses reported by shepherds and livestock owners were compared at trial farms versus a control group of other farms in the same regions (Rigg et al., 2011).

The Georgian Carnivore Conservation Project conducted a baseline survey of human-carnivore conflict which relied largely on livestock owners' and shepherds' reports of losses to predators and their perceptions of LGD effectiveness (see Rigg et al., 2017 in *CDPnews* issue 15). Data were gathered using a semi-structured face-to-face interview protocol (Rigg and Sillero-Zubiri, 2010). When possible, reports of damage were corroborated through site inspections, wolf monitoring by telemetry, scat content analysis, etc. During subsequent trials aimed at improving the effectiveness of LGDs, a monitoring plan was developed consisting of puppy aptitude tests, focal observations based on a partial ethogram of dog behaviour and observer outcome scores, adapted from those used in Slovakia (Rigg, 2012).

The LIFE WolfAlps project (LIFE12NAT/IT/000807) gathered data for evaluating LGD vigilance strategies, movement patterns and interactions with herders/livestock in the southwestern Alps using a combination of direct observations and tracking devices. The "vigilance attitude" (attentiveness) of LGDs was evaluated based on the sum of behaviours identified in an ethogram (Abrantes, 1997) and quantified using focal and scan sampling designs to assess interactions and distance between LGDs and herders, if present, and livestock during the daytime. GPS dataloggers were used to determine the average proximity of LGDs to night-time enclosures and differences between dog home ranges at night versus during the day. Moreover, this method was used to test differences between LGDs protecting cattle versus sheep. All evaluated LGDs were within the home ranges of three wolf packs monitored by snow tracking, non-invasive

genetic sampling and camera trapping. For each pack, reproduction was confirmed with howling techniques so that researchers could investigate variation in LGD attentiveness with distance from wolf core areas. The presence of shepherds was also recorded to assess their impact on LGD performance.

Although not presented during the workshop, there is an example of LGD evaluation from the LIFE MedWolf project (Zingaro et al., 2017). One of this project's actions was to place LGDs at farms in Grosseto and monitor them to evaluate their behaviour and protectiveness toward livestock. Along with the "classic" approach of direct observations described above, GPS pet collars were tested for assessing the spatial and temporal association between LGDs and sheep in the absence of a shepherd as a measure of attentiveness. Thanks to satellite locations, it was possible to quantify two parameters: average dog-sheep distance and overlap between the movement ranges of sheep and dogs using volume of intersection (Seidel, 1992) and utilization distribution overlap indices (Fieberg and Kochanny, 2005). It was also possible to investigate how several environmental variables and dog characteristics can influence both distance and overlap. To obtain information about interactions among LGDs in the same flock, the aforementioned measurements were repeated with pairs of dogs instead of dog-sheep pairings. In addition, it was proposed that GPS pet collars could be used as a tool to help farmers manage LGDs, limiting accidents and conflicts with neighbours. Using the mobile application of the GPS devices, farmers were able to check the position of their dogs and flock at any time and to make a coarse but real-time assessment of LGD attentiveness.

3. Examples of fencing evaluation

The second session of the workshop began with a presentation from AGRIDEA on trials with two captive wolf packs to investigate their behaviour when approaching different types of electrified fences, whether they crossed them and how (www.protectiondestroupeaux.ch). Wolf behaviour at fences was monitored 24-hours a day with a camera system (see Lüthi et al., 2017 in *CDPnews* issue 13). Using the same approaches, further experiments were conducted in autumn 2017 with a third wolf pack at the Sainte-Croix Animal Park (Rhodes, France).

The goal of this second phase was to enlarge the data base, confirm or relativize previous results and address additional questions. When considering standardised methods to measure and compare fence effectiveness, an interesting outcome of the study was that several differences were observed among the three captive wolf packs in their behaviour and ways of approaching fences. For example, while digging under a 2-wire fence was very frequent in one pack, this behaviour was much less pronounced in the second pack and almost absent in the third. Given the fact that the wolf is a species with a high capacity for individual learning, these differences are not surprising and should be taken into consideration when evaluating wolf behaviour towards fences in the wild or when comparing data from different regions and countries.

Installation of permanent metal-wire fences at selected sheep farms in Grosseto within the LIFE MedWolf project provided an opportunity to measure the efficacy of this type of fencing systematically in 2014–2017. Three complementary approaches were adopted. The first was an epidemiological study design based on comparison of a treatment group versus a control group. The treatment group contained farms that received fences and the control group consisted of other farms randomly selected within a radius of 5 km from treatment farms and with a comparable number of sheep ($\pm 50\%$). Numbers of wolf attacks and livestock killed were compared between the two groups

throughout one year in order to cover all different phases of the annual life cycle of the wolf (e.g. breeding, pup-raising) which were expected to influence the rate of predation on livestock. The second approach was an ex ante/ex post design, in which numbers of predation incidents were compared before and after installation of fencing. Farms were monitored for an average of 629 days (range: 327–1,021) before fence installation and 739 days (347–1,041) after. The number of attacks and the number of animals killed during each monitoring period was standardised by dividing them by the cumulative number of days per farm included in the period. Finally, a questionnaire was used to assess farmers' satisfaction with the fencing.

4. Barriers and potential solutions to standardised assessment

Workshop participants identified several possible barriers to developing standardised procedures for evaluating the effectiveness of damage prevention measures. Researchers and practitioners often lack the resources needed (time, funding, appropriate sample sizes, technical expertise and/or methodologies) to carry out rigorous and reliable evaluation. To demonstrate a reduction in damage, losses should be compared not only with those suffered at the same farm prior to intervention (before-after comparison) but most importantly with similar farms not using





the particular preventive measure (treatment versus control). Damage levels are often influenced by other variables, such as weather, habitat, predator populations and husbandry practices. It can therefore be problematic to find control farms which are comparable. There may also be difficulties obtaining reliable data on attacks and losses as these can be hard to verify.

Attentiveness of LGDs is a key behavioural component that can be readily assessed by direct observation in relation to livestock and shepherds, if present (Coppinger et al., 1983). However, direct observation is impaired by darkness, bad weather conditions, complex terrain and thick vegetation, while the presence of observers may influence the behaviour of LGDs. Gathering positional data using GPS collars (e.g. Zingarò et al., 2017) is potentially a better alternative.

Protectiveness and trustworthiness can be assessed by researchers using observation protocols and ethograms but as these behaviours tend to occur less frequently and can be difficult to observe they may not be registered during short sampling periods. Episodic events of untrustworthiness can happen when dogs are not supervised, thus making it difficult to confirm their involvement in incidents of injured or killed livestock. On the other hand, attempts by predators to attack livestock, successfully repelled by LGDs, might go undetected, particularly if they occur during the night or in densely vegetated areas (Landry et al., 2014). Some studies have used experimental tests to simulate approaches of predators (e.g. Kinka and Young, 2018; Rigg, 2004). In Switzerland, adult LGDs are put through a series of behaviour tests to assess their reactions towards an unfamiliar person or dog, while with or without the flock, and to the approach of a remotely controlled wild boar dummy (Pfister and Nienhuis, 2017).

Typically, shepherds spend far more time than researchers with their animals and so can provide val-

uable insight on LGD performance and behavioural issues via questionnaires or interviews. However, such reports may be subjective and prone to observer bias. In Georgia, for example, shepherds and sheep owners frequently perceived LGDs differently from dog breeders and their ratings of dogs did not correspond to reports of losses to predators (Rigg et al., 2017). In Portugal, while owners' ratings of LGD behaviour were found to correlate with observational data, they were not available for all flocks as some were not shepherded. In addition, some studies have also assessed owner satisfaction, which may relate to other factors besides prevention of losses, such as perceived benefit versus cost and possible conflicts with neighbours due to use of LGDs.

Farms vary and individual LGDs therefore work in different environments. Differing confounding variables both within and between projects/areas are problematic to ensure comparison of like with like. This difficulty cannot be overcome simply by removing LGDs from the conditions in which they normally work and testing them in a standardised environment (e.g. excluding all other dogs), because different dogs will thereby experience different degrees of novelty (e.g. some dogs are used to work alone while others are usually with other LGDs).

Fencing might appear to be simpler to assess than LGDs, but it is not merely a question of checking technical parameters such as electrification, grounding and spacing between wires. To find out if a fence is correctly built and with sufficient electrical power is very often not only a problem of resources but also a lack of reliable standards. Confounders (external variables) may obscure comparison of treatment (fence) versus control (no fence) groups and, as with LGDs, difficulties may arise when gathering and verifying data to determine whether numbers of attacks or losses differ between groups. Experimental study de-

signs and statistical analyses make assumptions, some of which may be violated when assessing the efficacy of preventive measures on working farms. These assumptions include:

- Damage levels are reported accurately;
- Preventive measures are installed correctly and well maintained;
- There is no change over time in the control group;
- There is no difference in data collection between treatment and control groups.

5. Conclusions and recommendations

Before we can assess whether a particular measure is effective, we must first define what we mean by “success”. What makes a good livestock guarding dog or predator-exclusion fence? The most important question for farmers and politicians is likely to be: do they reduce damage? Thus, methods and quality of data used for comparing damage levels with versus without prevention measures should be improved as much as possible. As discussed above, these types of comparisons are not always straightforward in the field. Instead, researchers have often assessed proxies such as dog behaviour, assuming that a “good” dog “works”. This approach also has difficulties. Moreover, besides technical evaluations, it is important to take the views of end-users (farmers) into account, as ultimately they are the people who should be satisfied. Thus, thorough evaluation probably requires a combination of different methods.

Participants of the workshop in Grosseto agreed that the “traditional” categories used to assess LGD behaviour (attentive, trustworthy and protective) still provide a relevant and useful framework, but other behaviours that may cause management problems are becoming increasingly relevant (e.g. aggression towards unfamiliar people and dogs, chasing vehicles or wildlife). There is a need to standardise the definition and measurement of LGD performance outcomes and to develop specific tests (replicating common, relevant situations) that can be used in different settings. New and developing technologies such as GPS collars, night vision equipment, infrared cameras and cameras mounted on collars or drones can provide additional sources of data to supplement, or in some cases replace, the time-consuming, labour-intensive work needed to collect sufficient behavioural observations.



In practice, money and time are often constraining resources. In order to become standardised, experimental approaches and test protocols must be replicable, efficient and affordable. While lengthy and intensive observations provide detailed information regarding dog ethology and performance, results should be calibrated with simpler, cheaper methods to provide a lowest common denominator that can be compared across studies. It is important to develop methodologies and instruments that can be used in different contexts, allowing valid comparisons between contrasting farms and geographic areas. A relatively simple step in this direction could be the definition of a set of common questions to be used in questionnaires or interviews assessing owner satisfaction and perception of dog performance. The reliability of this approach should be verified through the establishment of correlations between scores of LGD behavioural components, damage analysis and owner satisfaction ratings.

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Short communication

FROM CONFLICT TO COLLABORATION IMPROVING COEXISTENCE OF PEOPLE AND LARGE CARNIVORES

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1. Introduction

For centuries, large carnivores were hunted and persecuted to such an extent that they were eradicated from much of their original habitats in Europe. Changes in land use, habitat improvement and increasing prey populations, supported by legal protection in many countries, are allowing large carnivores to return to parts of their former range.

While the ongoing recovery of large carnivores in Europe is seen by many as a great conservation success (Chapron et al., 2014), considerable challenges have also arisen. Large carnivores can have a variety of impacts on human activities and livelihoods, resulting in conflicts among different stakeholders including farmers, hunters, local authorities, protected area staff and environmentalists. To mitigate these effects, national governments in many countries have implemented damage prevention measures and/or compensation schemes (Linnell and Cretois, 2018).

Working side-by-side with farmers and providing direct support might not always be achievable by governmental organisations and this is where other organisations such as protected area administrations and non-governmental organisations (NGOs) can play important roles. Two events organised by the Europarc Federation in 2018 offered opportunities to

share experience and improve understanding of the issues and provided inspiring examples of how people can work together to achieve better coexistence with large carnivores.

2. Strategies for better coexistence

On 27th March 2018 the Europarc Federation in cooperation with the EU Platform on Coexistence between People and Large Carnivores¹ hosted a webinar entitled *Large Carnivores: strategies for a better coexistence*. Over 150 participants took part from across the globe. Valeria Salvatori, who is a member of the



Large Carnivore Initiative for Europe (www.lcie.org) as well as serving on the CDPnews editorial team, set the scene by summarising the current situation of large carnivores in Europe and introducing the work of the EU Platform. There then followed two case studies of governmental and non-governmental initiatives to support farmers and improve coexistence.

The first case study described state support for farmers and beekeepers in Estonia, where the wolf (*Canis lupus*), brown bear (*Ursus arctos*) and lynx (*Lynx lynx*) are relatively common. Damage to domestic animals (mainly sheep but occasionally also dogs, goats, cattle and horses) as well as apiaries is the main cause of human-carnivore conflicts. To reduce conflict and build tolerance, since 2009 the Environmental Board has run a programme of damage prevention measures alongside a compensation scheme. The main priorities are to improve husbandry practices, to (re) introduce different preventive measures, to improve farmers' responsibility and training, and to inform and educate the general community. A manual describing various prevention measures has been published and widely distributed among farmers (Talvi, 2014). The state subsidises 50% of the costs of effective preventive measures such as electric fences, night enclosures and livestock guarding dogs (LGDs).

The second case study illustrated how a non-governmental organisation has worked successfully with livestock producers in the province of Grosseto, Italy, to reduce the impact of wolf depredation. DifesAttiva, whose members are local farmers, was created within the EU-funded LIFE MedWolf project with the goals of establishing a network for exchanging and managing LGDs, promoting the use of preventive measures

and promoting local agricultural products and activities. More details can be found in a pdf which is available on the Europarc website² along with the other presentations, links to participating organisations and a full recording of the webinar.

3. Effective communication

As predator populations continue to recover in many parts of Europe, fear and misunderstanding among communities are growing. Addressing negative perceptions is a great challenge to all national governments and other organisations working with large carnivores. One of the main difficulties is to overcome communication barriers between different stakeholders. Antagonism is frequently a result of the fact that each group simply wants to push forward its own agenda, without listening to others. The media also play a role, influencing feelings towards large carnivores, and should be taken into account as an important stakeholder. There is a clear need to provide guidelines and expertise on how to establish constructive dialogue and improve the communication skills of professionals.

The Europarc Conference held in the Cairngorms National Park, Scotland, from 18th to 21st September 2018 included a workshop³ on *Fear versus facts: effective communication*, a means to improve coexistence with large carnivores in protected areas. Organised in collaboration with the EU Platform for Coexistence between People and Large Carnivores, the workshop brought together large carnivore experts and protected area professionals to share experience and find solutions to ensure constructive dialogue and build acceptance of large carnivores amongst local communities. Several case studies were presented⁴, including the work of the Campo Grande Group in Spain (see the article on page 15 of this issue of CDPnews).

Problems related to coexistence with large carnivores are complex and therefore inevitably require complex responses: simplified messages are often counterproductive. For this reason, the first step is to ensure that all parties acknowledge the existence of a problem, which has to be clearly identified and defined. Bringing stakeholders together and giving them a chance to speak and share their views is essential, although a moderator is usually needed to keep the group focused and functioning.

Workshop participants identified several strategies to mediate discussions and manage conflicts:

1. Analyse and plan

It is crucial to develop good communication processes and plans in advance. What will be the key outputs of working sessions? Who are the most relevant stakeholders? Which tools can be used to engage them? Answering these questions will contribute to make messages more consistent and effective. Communication is a complex process and needs to have a clear purpose in order to contribute to finding solutions.

2. Adapt to the audience

It is important to 'speak the language' of stakeholders in order to be able to relate to them, build bridges and find room for agreement.

3. A neutral agent in the room

Achieving acceptable solutions to divisive issues requires negotiation and compromise. For this, it is highly recommended to involve professional mediators and facilitators.

4. Promote knowledge sharing

Provide learning exchanges and site visits to build mutual understanding and trust. Solutions from elsewhere can be explored and discussed to understand how others are doing it.

5. Be open to different perspectives

It is important to consider the issue from different points of view. Develop active listening skills with stakeholders, try to understand their needs and stimulate healthy sharing of ideas and perspectives.

6. Don't forget the human dimension

Put an emphasis on people and show activities that can be undertaken to solve their problems. Take emotions into account, but without forgetting facts and data.

7. Create a friendly environment

Different stakeholders should get to know each other: create opportunities to overcome personal barriers. They need to find pleasure in each other's company: music, food, fire and drinks are important ingredients.

8. Identify key persons

It is very useful to identify people within each stakeholder group who can help to mediate and spread positive messages among their colleagues. On the other hand, it is also crucial to identify and work directly with those who incite negative feelings (e.g. by spreading disruptive news, inflaming people or misrepresenting the views of the group as a whole).

Europarc organises a webinar every year with the EU Platform to share best practice and regularly shares updates, tools and case studies to support protected area managers⁵.



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¹ http://ec.europa.eu/environment/nature/conservation/species/carnivores/coexistence_platform.htm

² <https://www.europarc.org/webinar-coexistence-large-carnivores/>

³ <https://www.europarc.org/news/2018/10/fear-versus-facts-effective-communication-for-coexistence-with-large-carnivores/>

⁴ <https://www.europarc.org/workshop-presentations-2018/>

⁵ <https://www.europarc.org/knowledge-hub/large-carnivores/>

Project

ENCOSH

ENHANCING COEXISTENCE THROUGH SHARING

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<https://encosh.org/en/>

1. Definition of the project

1.1 Context

People in diverse environments have to deal with similar problems related to wildlife, such as carnivores attacking their livestock or herbivores raiding crops. Numerous approaches to dealing with these issues have been tried around the world, for example warning systems, scare devices, guard animals, fences and damage compensation schemes. There is rarely a single solution and it is often necessary to combine several measures in order to address negative interactions between humans and wildlife effectively. Many actions implemented locally might be applicable elsewhere if stakeholders were aware of them. However, published information is often unavailable, incomplete or unintelligible to stakeholders. There is thus an opportunity to inspire and empower people to better cope and coexist with wildlife through information sharing.

1.2 Scope

The ENCOSH project, ENhancing COexistence through SHaring, is a collaborative project set up by the HISA Association (www.hisaproject.org) aiming to establish an online platform to facilitate exchange of knowledge, skills and experience among stakeholders around the world. The platform targets anyone seeking to prevent, reduce or offset the impact on livelihoods of wild mammals, in particular large carnivores, ungulates, elephants and primates, as well

as for those who are willing to share their experience and expertise. It aims to become a worldwide tool to promote capacity building and international solidarity among people and organizations confronted with similar challenges in order to enhance human-wildlife coexistence.

1.3 Objectives

The main objectives of ENCOSH are:

1. To establish an international network of diverse stakeholders directly or indirectly involved in issues of coexistence with mammalian carnivores, herbivores and primates;
2. To promote sharing of knowledge, skills and experience of any initiatives supporting sustainable coexistence with these animals;
3. To enhance stakeholders' capacity to cope with local coexistence issues.

1.4 Design and features

The international exchange platform developed by HISA is intended to complement other projects fostering information exchange, such as the People and Wildlife Initiative (www.wildcru.org)¹, the IUCN SSC Human-Wildlife Conflict Task Force (www.hwctf.org)² and the LIFE EuroLargeCarnivores project (www.eurolargecarnivores.eu)³. EN-

COSH is innovative in its collaborative approach, which seeks to:

- Connect stakeholders with diverse and complementary knowledge and expertise (e.g. herders, managers, researchers, politicians, consultants) belonging to various organizations dealing with different animal species globally;
- Foster collaboration and co-development of the platform for and by a team representative of this international network, adapted to the needs and expectations of stakeholders.

The platform will consist of several features:

- A worldwide database of local initiatives addressing human-wildlife coexistence issues, easily accessible to users through search filters and menus;
- Practical instructions to help people adapt and apply solutions in their own local situation, notably with technical guidance for each initiative presenting key information on its implementation and use. Authors will be asked to share available information about the effectiveness and efficiency of each initiative, in order to underline the pros and cons for different socio-ecological contexts. Other supporting information will include testimonies and tutorial videos based on field experience.
- A free pedagogical platform presenting information in an accessible and intelligible format: popularized and illustrated information with multiple language versions. The platform will initially be available in English, French and Spanish. Other languages may be added later according to stakeholders' stated needs and support. Pictograms will be used for general information as far as possible.
- Through the collaborative approach of ENCOSH, users will be encouraged to act as mediators, notably to spread information to the illiterate or those with limited or no Internet access. An updated version of the platform, which does not require Internet access, will also be developed.

ENCOSH is a participatory project: beneficiaries are involved in its development. They can contribute in three ways:

1. co-developing the platform to ensure that the format is tailored to their needs and preferences;
2. co-creating new technical sheets (guidance) to present initiatives on the platform; and
3. testing new initiatives and sharing feedback from their own experience.

A review of literature and other existing tools and media (e.g. *Carnivore Damage Prevention News*) will also be considered in order to improve and optimize the ENCOSH platform. As it grows, we expect the platform to produce a 'snowball effect' on a worldwide scale (export/import of initiatives and local adaptations) and support self-sufficiency of beneficiaries in the long-term (decision-making, self-training and setting up their own initiatives).

2. Implementation and results

The project began in June 2015 and is being implemented in four main phases, each with respective tasks and outcomes as detailed below.

2.1 Preliminary work

The first phase of the project (till September 2016) mainly aimed at assessing the expected benefits of the ENCOSH platform for a wide variety of stakeholders' objectives and issues and contributed to the project design before implementation of the platform. A pilot study was realized in the Alps, where livestock farming is challenged by the return of wolves.

The main tasks realized were:

- Networking and meeting with various stakeholders in the Alps (France, Switzerland and Italy) to discuss and exchange ideas for the project;
- Preparation of videos that illustrate diverse local initiatives in the Alps to include on the platform (a full documentary on YouTube⁴ and an example of a web documentary of a local initiative).

The preliminary phase concluded with the elaboration of a thorough strategic plan to define and implement the project.

2.2 Prototype

The objective of the second phase (October 2016 to June 2017) was to obtain the basic requirements to create a platform prototype:

- Reviewing extant initiatives worldwide that contribute to human-wildlife coexistence, mainly through research papers, a literature review and Internet search tagging key words (e.g. livestock protection, human-wildlife conflict, coexistence, deterrent, etc.), in both French and English;
- Designing a model technical sheet to present key



Fig. 1 Participative workshop held in Montpellier, France, in June 2017 to enhance the development of the prototype and platform. (Photo: HISA)

information on local initiatives to be included on the platform;

- Holding a workshop in Montpellier in June 2017 (Fig. 1) with project managers, researchers, students and experts in the management of human-wildlife conflict and/or creation of collaborative tools. Participants were invited to share their experience in dealing with coexistence issues as well as their particular skills, e.g. development and design of collaborative platforms.

This phase resulted in the creation of an international database of local initiatives dealing with issues related to wild mammals. A prototype platform was developed including examples of technical sheets de-

scribing local initiatives. Detailed recommendations aiming to develop the first version of the platform were also collected.

2.3 Developing the platform

Building on the prototype, we began developing a first free version of the platform from July 2017 through a collaborative approach:

- Creating a website to introduce the project to various stakeholders worldwide and collect their feedback;
- Establishing a group of active and motivated members to contribute to the co-creation of the platform, including researchers, managers, hunters, herders, mediators and independent consultants;
- Co-development of the platform in collaboration with a webmaster: after exchanges and validation of the main components among active group members between October 2018 and March 2019, development started in March 2019 and is finalized by July 2019.
- Preparation of web documentaries by the ENCOSH project coordinator supported by association members. The first videos concerned local initiatives in South America (e.g. Night Guards, “felid-proof” electric fencing) and will be added to the platform as examples.

Feedback was mainly collated from the group of active members (see above) to co-create the platform step by step. By the end of this activity, we expect to

have established a first version of the platform appropriate and adapted to our target users (Fig. 2).

2.4 Operation and expansion

Beginning in 2019, we aim to expand the platform by increasing the number of members and included initiatives by:

- Promoting the platform to local stakeholders through dissemination of documents to existing networks, publications in journals and radio broadcasts;
- Enhancing the platform to facilitate its use and increase its audience worldwide;
- Encouraging members to become active users (e.g. creating technical guidelines for their own initiatives based on an online template and providing feedback about their experience of adopting initiatives presented on the platform);
- Preparing more web documentaries to illustrate local initiatives that contribute to tackling issues of coexistence with large carnivores and other mammals.

We expect this phase to result in the platform be-

ing used by an increasing diversity of local stakeholders leading to more knowledge, skills and experience shared among stakeholders worldwide. The platform will include: a contact list of stakeholders involved in the project, details of all the initiatives included on the platform, printable technical sheets of existing initiatives and downloadable videos or web documentaries illustrating local initiatives.

We are currently searching for funding to secure development of the project (translation, maintenance of the platform, workshops, etc.). The coordinator, responsible for animation of the platform and fundraising, is supported by a group of active members to co-create and populate the first version of the platform, which should become more or less autonomous in the long-term thanks to participatory involvement. The HISA team, composed of volunteer experts in wildlife management or human-wildlife interactions (managers, engineers, researchers, reporters), will provide continuous support for improving the platform, contacting more experts and stakeholders worldwide and searching for funds to maintain the current coordination of the tool in the long term.

Acknowledgements

The authors warmly thank Jade (www.jade-rs.com) for providing and adapting a first collaborative platform which was essential to allow ENCOSH active group members to work together on the co-creation of an advanced tool. We also thank the Greentech Foundation (www.greentech.fr/en) that mainly supported the funding of the second phase of the project. We are grateful to the Agence Française de la Biodiversité (AFB) for supporting the coordination, development and maintenance of the platform and the realization of web-documentaries, especially in Latin America. Finally, our thanks go to all stakeholders motivated to be involved in the project in order to improve the platform format and content.

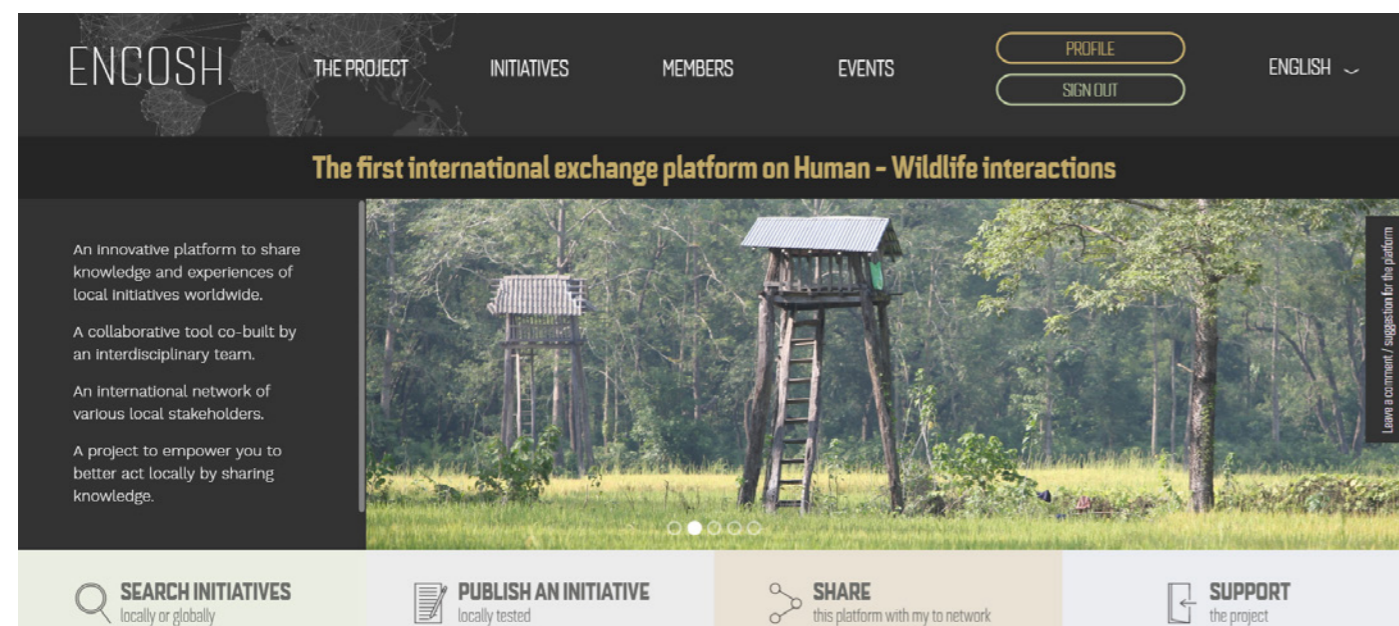


Fig. 2. Homepage of the platform under development.

¹ <https://www.wildcru.org/research/people-and-wildlife-initiative/>

² <http://www.hwctf.org/resources/document-library>

³ <https://www.eurolargecarnivores.eu/en/>

⁴ <https://www.youtube.com/watch?v=qQCLr4K1fv0>

TALKING WITH PEOPLE

EFFECTIVE COMMUNICATION AND COLLABORATION WITH COMMUNITIES



Seth Wilson

NRCC Research Associate and Slovenia Forest Service

Contact: swilson@bigsky.net

As an American conservation biologist based in Missoula, Montana, I had always dreamed about working internationally. As fortune would grant, during 2015–2016, my family and I had the chance to live and work in Slovenia. Sovereign since 1991 and a member of the European Union, Slovenia provides critically important habitat for several large carnivore populations in central and southeastern Europe. In 2015, I was invited by the Slovenia Forest Service to act as a technical advisor to the LIFE DinAlp Bear project – a five-year effort that seeks to manage and conserve brown bears (*Ursus arctos*) as one large population across Slovenia, Croatia, Austria and Italy¹. A major aspect of the work entails reducing human-bear conflict with local communities and improving prospects for bears to recolonize the southeastern Alps from the Dinaric Mountains of Slovenia and Croatia.

One of the most rewarding aspects of my work in Slovenia was the receptivity and interest from my Slovenian colleagues to learn how to better engage with local people and communities for bear conservation. In Slovenia, my sense is that there is great opportunity for grass-roots, bottom up conservation, particularly in a post-communist environment where there is an appetite for more local control in decision making. This became clear when I started my major project: *A Guidebook to Human-Carnivore Conflict: Strategies and Tips for Effective Communication and Collaboration with Communities*².

Since Slovenian Damage Inspectors were an important audience for the guidebook, it of course made sense to solicit their input and to ask them what skills they needed to improve. Over the course of the project, I interviewed dozens of inspectors and felt like their engagement, excitement and interest in the

book was emblematic of a new change occurring in Slovenia – the growing appetite for a participatory democracy and an engaged citizenry.

The guidebook was a pleasure to write and I have presented it at formal meetings with hundreds of Slovenia Forest Service personnel, to Croatian bear damage inspectors and to carnivore managers in Italy.

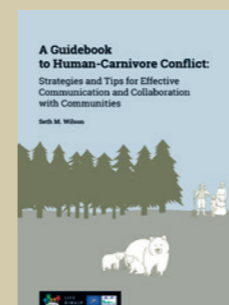
The guidebook offers new tools and innovative approaches for field-level practitioners who want to conserve and manage brown bears and wolves that inhabit human-modified landscapes. Additionally, it offers practical tips for effective communication and proven strategies for building partnerships and collaborations with people who live with large carnivores. One of the most important facets to large carnivore conservation is to develop positive working relationships among wildlife managers, local communities and other stakeholders whose collaborations are fundamental for addressing, reducing and preventing human-carnivore conflict in a meaningful way.

My book targets those who inspect damage by large carnivores and those who directly manage these challenging animals, but many lessons from the guide can be used by NGO personnel and others who are engaged more broadly in nature conservation. For those on the front line of carnivore conservation, my hope is that the guidebook prepares them in their critically important roles as wildlife ambassadors by providing communication skills and knowledge to work with a diversity of stakeholders. Ultimately, this guide will prepare the reader to engage with communities using a participatory approach that bridges theory and practice in a clear and understandable manner.

¹ <http://dinalpbear.eu/home-page-1/>

² http://dinalpbear.eu/wp-content/uploads/ENGLISH_Guidebook_Seth_Wilson_WEB2.pdf

BOOKS



A Guidebook to Human-Carnivore Conflict

Strategies and Tips for Effective Communication and Collaboration with Communities

Author: Seth M. Wilson

Edited: Slovenia Forest Service, 2016

Language: English

ISBN 978-961-6605-26-7

Publisher's description

The guidebook offers new tools and innovative approaches for field-level practitioners who want to conserve and manage brown bears and wolves that inhabit human-modified landscapes. The guide offers practical tips for effective communication and proven strategies for building partnerships and collaborations with the people who live with large carnivores. A core message found throughout the guidebook is that positive working relationships among wildlife managers, local communities, and other stakeholders are fundamental for addressing, reducing, and preventing human-carnivore conflict in a meaningful way.



The Wolf

Author: Jean-Marc Landry

Edited: Delachaux et Niestlé

Language: French 2017

ISBN 978-2603024539

Publisher's description

The first animal to be domesticated, long before livestock, the wolf remains relatively unknown, and is the object of many preconceived ideas. Neither angel nor demon, the wolf seeks to live in an environment whose balance has been deeply disturbed by man. The purpose of this book is to present the wolf in all objectivity in order to allow everyone to form an opinion. The author thus draws a very detailed portrait of this canine, transmitting in particular the latest advances in our knowledge of the wolf: the most recent data on the evolution of the species through the ages, previously unpublished information on African wolves, a new vision of the notion of hierarchy within a pack, innovative observations on the role of the group in raising young, crucial elements for the protection of herds, etc. So, for or against the wolf? Rather than choosing a side, the author argues for a third way, respectful of natural balances and human interests.



Wolf, lynx and bear in the cultural landscape

Conflicts, opportunities, solutions in dealing with large predators

Author: Marco Heurich

Edited: Ulmer Verlag, 2019

Language: German

ISBN 978-3-8186-0505-6

Publisher's description

The return of large carnivores is associated with numerous problems and conflicts. Even though they are spreading into areas that were once part of their distribution, during the intervening period these areas have changed dramatically. As there are no large wilderness areas left in central Europe, predators often live in close proximity with humans, so conflicts are inevitable. Furthermore, authorities, farmers and hunters are insufficiently prepared for the return of large carnivores. They need to gain experience in how to deal with such animals in our heavily modified landscapes and new structures for effective wildlife management have to be put in place.

Numerous questions arise from this situation: Can large predators live in a landscape dominated by humans? What is their influence on prey and ecosystems? Which problems and conflicts should be anticipated and how can they be solved? Are these animals dangerous and do we have to intervene to protect humans and livestock? What is the current legal situation and what are the options for action?

This book explores all these questions and leading experts from Germany, Austria and Switzerland provide a comprehensive overview of the state of knowledge on the biology and ecology as well as the management of the wolf, lynx and bear. They present the challenges that we face and illustrate pragmatic solutions that allow coexistence of humans and wildlife with as little conflict as possible.



Large carnivore conservation and management *Human dimensions*

Author: Tasos Hovardas
Publisher: Earthscan from Routledge
2018
ISBN: 978-1-13-803999-5

Review

In recent years it has become widely recognised by professionals that mitigating human–carnivore conflicts is not simply a question of applying technical fixes to prevent or reduce damage. Reflecting this, a new volume has been added to Routledge’s Earthscan Studies in Natural Resource Management (<http://www.routledge.com/books/series/ECNRM>) entitled *Large Carnivore Conservation and Management: Human Dimensions*. As the editor and expert on the topic, Tasos Hovardas, writes in his introduction: “Stakeholder perceptions are not formed just by their interactions with large carnivores, but by stakeholder interaction”.

Human Dimensions follows the pattern of previous books in the Earthscan series, which include a wide range of inter-disciplinary approaches to natural resource management, integrating perspectives from both social and natural sciences. Some of the case studies included, such as the stalled initiative to reintroduce lynx to the UK, remain unfinished, reflecting the sometimes messy, open-ended nature of striving to reconcile conflicting positions. As Hovardas notes, “Stakeholders need to interact in disagreement and explore possible points of convergence. They need to come to terms even if total consensus will never be achievable.” This book provides insights and suggestions into how this might be approached in a variety of contexts.

The publisher’s description indicates that *Human Dimensions* is an academic book, not a field handbook. As such, several chapters are rather more esoteric than practical. Nevertheless, it addresses issues likely to be encountered by anyone involved in human–carnivore conflicts and is therefore of relevance to readers of *CDPnews*. At around €100 for the hardcover edition, the price may be prohibitive for many, although a cheaper e-book edition is available to purchase or rent.

Publisher’s description

Large carnivores include iconic species such as bears, wolves and big cats. Their habitats are increasingly being shared with humans, and there is a growing number of examples of human–carnivore coexistence as well as conflict. Next to population dynamics of large carnivores, there are considerable attitude shifts towards these species worldwide with multiple implications.

This book argues and demonstrates why human dimensions of relationships to large carnivores are crucial for their successful conservation and management. It provides an overview of theoretical and methodological perspectives, heterogeneity in stakeholder perceptions and behaviour as well as developments in decision making, stakeholder involvement, policy and governance informed by human dimensions of large carnivore conservation and management. The scope is international, with detailed examples and case studies from Europe, North and South America, Central and South Asia, as well as debates of the challenges faced by urbanization, agricultural expansion, national parks and protected areas. The main species covered include bears, wolves, lynx, and leopards.

The book provides a novel perspective for advanced students, researchers and professionals in ecology and conservation, wildlife management,

ABSTRACTS OF SCIENTIFIC ARTICLES

MANAGEMENT TOOLS TO REDUCE CARNIVORE-LIVESTOCK CONFLICTS: CURRENT GAP AND FUTURE CHALLENGES

Darío Moreira-Arce, Carolina S. Ugarte, Francisco Zorondo-Rodríguez, Javier A. Simonetti

Rangeland Ecology & Management:
May 2018

<https://www.sciencedirect.com/science/article/pii/S1550742418300290?via%3Dihub>

Predation on domestic animals by carnivores is a persistent problem wherever carnivores and livestock co-occur. A wide range of management tools to reduce predation has been invoked. However, the evidence of their effectiveness is still limited for a broader range of species and conditions. Using a global analysis of domestic animal predation by native carnivores under a “before–after/control–impact” framework, we assessed the effectiveness of management techniques used to reduce domestic animal predation identifying knowledge gaps and research needs. We reviewed 291 predation cases in 149 studies published between 1990 and 2017 involving 47 carnivores. Lethal control is the most common method to reduce predation in comparison with nonlethal techniques. Yet the effectiveness of both approaches remains poorly evaluated (30.1% of study cases) and largely based on producers’ perceptions (70% of cases where effectiveness was evaluated). Lethal control and night confinement of domestic animals would have no effect on reducing predation, whereas the use of livestock-guarding dogs, fencing, or herdsman may significantly reduce domestic animal losses. When the effectiveness of each technique to reduce predation was assessed by large and mesocarnivores, fencing significantly reduced predation of domestic animals by the former. Despite little scientifically published material, our findings indicate lethal control would have no effect in reducing animal predation by native carnivores when compared with nonlethal techniques. Our study also indicates the effectiveness may vary depending on the type of carnivore involved in the conflict with livestock activity. The use of an evidence-based framework to measure and assess the differential effectiveness of nonlethal techniques and the use of complementary tools at different spatial and temporal scales must be research priorities to prevent livestock predation while promoting the conservation of carnivores in production-oriented lands as encouraged by the Convention of Biological Diversity.

PATTERNS OF BROWN BEAR DAMAGES ON APIARIES AND MANAGEMENT RECOMMENDATIONS IN THE CANTABRIAN MOUNTAINS, SPAIN

Javier Naves, Andrés Ordiz, Alberto Fernández-Gil, Vincenzo Penteriani, María del Mar Delgado, et al.

PLoS ONE: November 2018

<https://doi.org/10.1371/journal.pone.0206733>

Large carnivores are often persecuted due to conflict with human activities, making their conservation in human-modified landscapes very challenging. Conflict-related scenarios are increasing worldwide, due to the expansion of human activities or to the recovery of carnivore populations. In general, brown bears *Ursus arctos* avoid humans and their settlements, but they may use some areas close to people or human infrastructures. Bear damages in human-modified landscapes may be related to the availability of food resources of human origin, such as beehives. However, the association of damage events with factors that may predispose bears to cause damages has rarely been investigated. We investigated bear damages to apiaries in the Cantabrian Mountains (Spain), an area with relatively high density of bears. We included spatial, temporal and environmental factors and damage prevention measures in our analyses, as factors that may influence the occurrence and intensity of damages. In 2006–2008, we located 61 apiaries, which included 435 beehives damaged in the study area (346 km²). The probability of an apiary being attacked was positively related to both the intensity of the damage suffered the year before and the distance to the nearest damaged apiary, and negatively related to the number of prevention measures employed as well as the intensity of the damage suffered by the nearest damage apiary. The intensity of damage to apiaries was positively related to the size of the apiary and to vegetation cover in the surroundings, and negatively related to the number of human settlements. Minimizing the occurrence of bear damages to apiaries seems feasible by applying and maintaining proper prevention measures, especially before an attack occurs and selecting appropriate locations for beehives (e.g. away from forest areas). This applies to areas currently occupied by bears, and to neighbouring areas where dispersing individuals may expand their range.

CARNIVORE-LIVESTOCK CONFLICTS IN CHILE: EVIDENCE AND METHODS FOR MITIGATION

Valeska Rodriguez,
Daniela A. Poo-Muñoz,
Luis E. Escobar, Francisca Astorga,
Gonzalo Medina-Vogel

Human-Wildlife Interactions:
Spring 2019

<https://doi.org/10.26076/djnz-sx73>

Human population growth and habitat loss have exacerbated human-wildlife conflicts worldwide. We explored trends in human-wildlife conflicts (HWCs) in Chile using scientific and official reports to identify areas and species with higher risk of conflicts and tools available for their prevention and mitigation. The puma (*Puma concolor*) was considered the most frequent predator; however, fox (*Lycalopex* spp.) and free-ranging or feral dog (*Canis lupus familiaris*) attacks were also common. Our results suggest that the magnitude of puma conflicts may be overestimated. Domestic sheep (*Ovis* spp.) and poultry (Galliformes) were the most common species preyed. Livestock losses were widespread across Chile but were highest in San Jose de Maipo, located in central Chile, and Cochrane, La Unión, and Lago Verde in south Chile municipalities. Livestock guardian dogs and the livestock insurance, as a part of the Agriculture Insurance of Chile, were identified as the most promising tools to mitigate HWCs, short- and mid-term, respectively. However, longer-term strategies should focus on improving livestock management through extension (i.e., farmer education) programs for local communities. In Chile, HWCs negatively impact small farmers and wild carnivore populations. An interinstitutional and interdisciplinary strategy integrating input from government and nongovernmental organizations, farmers, and academia is needed to achieve effective carnivore conservation in the long-term.

SPATIAL ASSOCIATIONS OF LIVESTOCK GUARDIAN DOGS AND DOMESTIC SHEEP

Julie Young, John P- Draper,
Daniel Kinka

Human-Wildlife Interactions:
Spring 2019

<https://doi.org/10.26076/frv4-jx12>

Livestock guardian dogs (*Canis lupus familiaris*; LGDs) have been used for centuries to protect livestock, primarily domestic sheep (*Ovis aries*), from depredation by large carnivores. While previous studies have shown their efficacy, the mechanisms in which LGDs protect livestock have largely remained unstudied. Livestock guardian dogs are often considered to be effective only if they remain in spatial proximity to the livestock they are protecting. We determined space use of LGDs relative to domestic sheep on open-range grazing allotments used by working ranches in the Rocky Mountains area of the northwest United States between August 2012 and October 2016. We determined dynamic space use, measured as proximity of LGDs to domestic sheep, and evaluated if this metric differed by breed, sex, or age. The LGDs and sheep were fitted with global positioning system transmitters to obtain location data that were subsequently compared by the above traits using multiple mixed-effect linear models. We found no differences in proximity to sheep on open range among LGDs for any of the 3 traits. Overall, we did find a temporal effect in that all of the LGDs studied were closer to sheep in early morning hours when sheep moved the shortest distances and predators are most likely to be active. These results suggest any of the breeds tested, along with sex or age of these LGD breeds, will remain in proximity to sheep when properly bonded.

CARNIVORE CONSERVATION NEEDS EVIDENCE-BASED LIVESTOCK PROTECTION

Lily M. van Eeden, Ann Eklund,
Jennifer R. B. Miller, José Vicente
López-Bao, et al.

PLoS Biology: September, 2018

<https://doi.org/10.1371/journal.pbio.2005577>

Carnivore predation on livestock often leads people to retaliate. Persecution by humans has contributed strongly to global endangerment of carnivores. Preventing livestock losses would help to achieve three goals common to many human societies: preserve nature, protect animal welfare, and safeguard human livelihoods. Between 2016 and 2018, four independent reviews evaluated >40 years of research on lethal and nonlethal interventions for reducing predation on livestock. From 114 studies, we find a striking conclusion: scarce quantitative comparisons of interventions and scarce comparisons against experimental controls preclude strong inference about the effectiveness of methods. For wise investment of public resources in protecting livestock and carnivores, evidence of effectiveness should be a prerequisite to policy making or large-scale funding of any method or, at a minimum, should be measured during implementation. An appropriate evidence base is needed, and we recommend a coalition of scientists and managers be formed to establish and encourage use of consistent standards in future experimental evaluations.

SIZE, SHAPE AND MAINTENANCE MATTER: A CRITICAL APPRAISAL OF A GLOBAL CARNIVORE CONFLICT MITIGATION STRATEGY – LIVESTOCK PROTECTION KRAALS IN NORTHERN BOTSWANA

Florian J. Weise, Matthew W. Hayward,
Rocky Casillas Aguirre, Mathata Tomeletso,
Phemelo Gadimang, et al.

Biological Conservation:
September 2018

<https://doi.org/10.1016/j.biocon.2018.06.023>

Fortified kraals are predator-proof enclosures designed to protect livestock at night. Globally, they show great promise in reducing depredation by carnivores, thus promoting co-existence with people. Their efficacy depends on effectiveness, durability, regular use, owner satisfaction, cost-efficiency, and design. We monitored 32 fortified kraals for 18 months in a high conflict area in northern Botswana (n = 427 kraal months) where lions (*Panthera leo*) frequently kill cattle. Monthly kraal use was 60% and was significantly influenced by kraal type, age, and shape. When used and maintained, kraals stopped livestock depredation. Due to poor maintenance, however, kraal age had a significant, negative influence on kraal use and effectiveness, compromising sustainability and cost-effectiveness. Fortified kraals built by a non-governmental organisation cost US\$ 1322.36 per unit (n = 20) and mitigated a mean annual loss of \$187.32. This suggests cost-recuperation after 7.0 years, or 2.3 times longer than observed kraal lifetime. Conversely, owner-built replicates cost \$579.90 per unit (n = 4), recuperating investment after 3.1 years. Owner satisfaction was significantly higher for fortified kraals when compared with traditional kraals. However, owners of fortified kraals did not kraal their cattle more frequently than owners of traditional kraals. Regionally, the mean annual kraaling rate for 29 GPS-monitored cattle herds (n = 3360 nights) was 40%, leaving cattle vulnerable to depredation, and highlighting the importance of promoting vigilant herding together with kraaling to prevent losses. This combination could reduce regional livestock losses by 80%, or >\$38,000 annually, however, kraal fortification alone does not provide a blanket solution to carnivore conflicts in Africa's agro-pastoral landscapes.

EFFECTIVENESS OF A LED FLASHLIGHT TECHNIQUE IN REDUCING LIVESTOCK DEPREDATION BY LIONS (*PANTHERA LEO*) AROUND NAIROBI NATIONAL PARK, KENYA

Francis Lesilau, Myrthe Fonck,
Maria Gatta, Charles Musyoki,
Maarten van 't Zelfde, et al.

PLoS ONE: January 2018

<https://doi.org/10.1371/journal.pone.0190898>

The global lion (*Panthera leo*) population decline is partly a result of retaliatory killing in response to livestock depredation. Nairobi National Park (NNP) is a small protected area in Kenya surrounded by a human-dominated landscape. Communities around the park use flashlights to deter lions from their livestock bomas. We investigated the response by lions to the installation of a LED flashlight technique during 2007–2016. We interviewed 80 owners of livestock bomas with flashlights (n = 43) and without (n = 37) flashlights in the surroundings of NNP and verified reported attacks on bomas against predation data over 10 years. The frequency of attacks on bomas equipped with flashlights was significantly lower compared to bomas without flashlights. We also found that after flashlight installation at livestock bomas, lion attacks took place further away from the park edge, towards areas where bomas without flashlights were still present. With increased numbers of flashlight installations at bomas in recent years, we further noticed a shift from nocturnal to more diurnal predation incidences. Our study shows that the LED flashlight technique is effective in reducing nocturnal livestock predation at bomas by lions. Long term studies on the effects as well as expansion of this technique into other communities around NNP are recommended.

GAMES AS TOOLS TO ADDRESS CONSERVATION CONFLICTS

Steve M. Redpath, Aidan Keane,
Henrik Andrén, Zachary Baynham-Herd,
Nils Bunnefeld, et al.

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Conservation conflicts represent complex multilayered problems that are challenging to study. We explore the utility of theoretical, experimental, and constructivist approaches to games to help to understand and manage these challenges. We show how these approaches can help to develop theory, understand patterns in conflict, and highlight potentially effective management solutions. The choice of approach should be guided by the research question and by whether the focus is on testing hypotheses, predicting behaviour, or engaging stakeholders. Games provide an exciting opportunity to help to unravel the complexity in conflicts, while researchers need an awareness of the limitations and ethical constraints involved. Given the opportunities, this field will benefit from greater investment and development.

MEET THE EDITORS



Robin Rigg is a zoologist focused on large carnivore management, ecology and coexistence with people. He has over 20 years' experience of implementing and evaluating damage prevention measures. He is a member of the IUCN Bear Specialist Group's Human-Bear Conflict expert team, the Large Carnivore Initiative for Europe and the Slovak Wildlife Society. He has studied at the universities of Cambridge, Aberdeen and Ljubljana and wrote his Masters thesis on livestock guarding dogs.

Daniel Mettler studied philosophy and economics. He worked for several years as a shepherd and created the Centre for Livestock Damage Prevention for Switzerland at AGRIDEA. He has published several articles, technical papers and guidelines on protection measures. He is currently responsible for a variety of topics including regional development in mountain areas and the management of alpine pastures.



Silvia Ribeiro is a biologist at Grupo Lobo, Portugal, with extensive experience in conflict mitigation, particularly the use of livestock guarding dogs to prevent damage by wolves. She has trained in animal welfare and her Masters in ethology focused on the ontogeny of social preferences in livestock guarding dogs. She is currently concluding her PhD on physiological aspects of canine social attachment.

Micha Herdtfelder is a trained mediator and specialist in human dimensions of wildlife. He is head of the large carnivore working group at the Forest Research Institute in Baden-Wuerttemberg, Germany. He promotes fact-based, trust-building communication between stakeholders in order to find viable solutions for coexistence with carnivores, including damage prevention. He studied geocology in Karlsruhe, focusing on wildlife ecology and hunting techniques, and wrote his PhD thesis on Eurasian lynx.



Valeria Salvatori is a conservation biologist who has focused her work on carnivore ecology and management for the last 20 years. She is a member of the Large Carnivore Initiative for Europe and has led LIFE projects aimed at mitigating the impacts of large carnivores on agricultural production. She gained her Masters degree at Sapienza University, Rome, on the ecology of South American foxes and her PhD at Southampton University on habitat suitability assessment for wolves, bears and lynx in the Carpathian mountains.

UPCOMING EVENTS

Human-Wildlife Interactions: Coming from both sides

1st October 2019 in Berlin, Germany

Workshop organized within the conference Wildlife Research and Conservation 2019 (WRC2019).

For details see: <http://www.izw-berlin.de/workshop-human-wildlife-interactions.html>

Canine Science Conference

18th to 20th October 2019 in Phoenix, Arizona, USA

For details see: <https://clivewynne.wixsite.com/caninescience2019>

Livestock Protection in the Alpine Region

21st to 23rd January 2020 in Salzburg, Austria

This international conference is organized by the EU Platform on Coexistence Between People and Large Carnivores, the European Landowners Organization, the German Association of Professional Shepherds and AGRIDEA (Swiss Centre for Agricultural Extension and Rural Development).

29th Vertebrate Pest Conference

1st to 5th March, 2020 in Santa Barbara, California, USA

For details see: <http://www.vpconference.org/>

Human-Wildlife Conflict and Coexistence

1st to 3rd April 2020 in Oxford, UK

The Call for Contributions is open until 4th October.

For details see: www.hwccconference.org

NEXT ISSUE

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