LIFE WOLFALPS EU

FINAL INTERNATIONAL CONFERENCE

Book of Abstracts

LIFE WOLFALPS EU

LIFE18 NAT/IT/000972

Life

NATURA 2000

MUSE

LIFE WOLFALPS EU
FINAL INTERNATIONAL CONFERENCE
17-18 MAY 2024,
ITAS FORUM, TRENTO

POST- CONFERENCE
19 MAY 2024
MUSE - MUSEO DELLE SCIENZE

LIFE WolfAlps EU Final International Conference

Scientific Coordination:

Francesca Marucco and Laura Scillitani

Organized by MUSE- Science Museum of Trento

Organizing Committee:

Laura Scillitani, Carlo Maiolini, Alessandra Pallaveri, Elisabetta Filosi, Giulia Bombieri, Francesca Rossi, Maria Bertolini, Maria Vittoria Zucchelli

Book of abstracts

Edited by Laura Scillitani

Graphic design: Roberto Nova

We thank André Roveyaz e Francesco Guffanti for the cover picture

Recommended Citation:

Authors – *Title* – In: LIFE WolfAlps EU Final International Conference Book of Abstracts – Trento 17-18 May 2024 Page XX

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

LIFE WOLFALPS EU FINAL EVENT

INTERNATIONAL CONFERENCE. 17-18 MAY 2024

CONFERENCE AGENDA

FRIDAY 17 MAY 2024. ITAS FORUM, TRENTO, ITALY

14:00 -14:30
Greetings and conference opening

14:30 - 14:45
Coexistence in a LIFE perspective
Anita Fassio (CINEA)

14:45 -15:00
EU policy for wolf conservation and coexistence
Andrea Vettori (Head of Unit ENV D.3 Nature Conservation – European Commission, DG Environment)

15:00 - 15:30
Local stakeholder EU platforms on large carnivores: lessons learned
Valeria Salvatori (IEA – Institute of Applied Ecology, Italy)

15:30 -15:45
The LIFE WolfAlps EU project: past present and future
Francesca Marucco (DBIOS,University of Torino, Italy)

15:45 - 16:30
Transboundary Monitoring of the Wolf Alpine Population over 21 years and 7 countries
Francesca Marucco (DBIOS,University of Torino, Italy), **Nolwenn Drouet-Hoguet** and **Christophe Duchamp** (OFB-French Biodiversity Agency, France), **Hubert Potočnik** (University of Ljubljana, Slovenia), **Elisa Avanzinelli** (Maritime Alps Protected Areas, Italy), **Theresa Walter** and **Felix Knauer** (University of Veterinary Medicine, Vienna, Austria), **Ilka Reinhardt** (LUPUS Institute, Germany), **Fridolin Zimmermann** (KORA, Switzerland)

> COFFEE BREAK <

16:50 - 17:30
From emergency to collaboration - steps towards a better damage prevention system
Rok Černe (SFS-Slovenia Forest Service), **Arianna Menzano** (Maritime Alps Protected Areas, Italy), **Ricardo Simon** (OFB-French Biodiversity Agency, France), **Alice Buhagiar** (AREC HBLFA Raumberg-Gumpenstein, Austria)

17:30 -18:10
Evaluating the Relationship between Humans, Wolves and Prey: A Coordinated Study across 3 Countries
Ricardo Simon (OFB-French Biodiversity Agency, France), **Nives Pagon** (SFS-Slovenia Forest Service, Slovenia), **Valentina Ruco** (DBIOS, University of Torino, Italy) and **Luca Corlatti** (Stelvio National Park, ERSAF, Italy)

SPECIAL EVENING EVENT. MUSE

20:45 - 23:00
Yellowstone Wolves: Science, management and Coexistence in the World's First National Park
Douglas Smith (Senior wildlife biologist, Yellowstone National Park, USA) and **Luigi Boitani** (La Sapienza, University of Rome and LCIE -Large Carnivore Initiative for Europe)

SATURDAY 18 MAY 2024. ITAS FORUM, TRENTO

9:00 - 9:30

Wolf conservation and management in Italy: addressing current realities and navigating new challenges for coexistence with humans

Piero Genovesi and **Paola Aragno** (ISPRA - Italian Institute for Environmental Protection and Research, Italy)

9:30 - 9:40

Activities related to large carnivores within Alpine Convention - WISO working group

Rok Černe (SFS-Slovenia Forest Service, Slovenia)

10:00 - 10:20

Wolf-dog hybridization in the Italian Alpine Regions: new challenges, lessons learned in LWA-EU and issues

Serena Perrone (University of Torino, Italy), **Giovanni Maceli** (Liguria Region, Italy), **Iolanda Russo** (Piedmontese Apennines Protected Areas, Italy), **Luca Giunti** (Cottian Alps Protected Areas, Italy)

> COFFEE BREAK <

10:50 - 11:20

Illegal Poisoning: activities and tools to fight against this environmental crime with an international approach

Giancarlo Papitto (Arma dei Carabinieri - Command for Biodiversity and Parks Protection, Italy) **Theresa Walter** (University of Veterinary Medicine, Vienna, Austria)

11:20 - 11:50

A human shield protects golden jackals from wolves in their expansion across Europe

Nathan Ranc (French National Institute for Agriculture, Food, and Environment INRAE, France) and **Miha Krofel** (University of Ljubljana, Slovenia)

11:50 - 12:30

Preventing the extinction of the Dinaric lynx population and creation of a stepping stone population in the Alps

Anja Molinari (KORA-Switzerland) **Rok Černe** (SFS-Slovenia Forest Service, Slovenia)

12:30 - 13:00

Wild steps: turning large carnivores into resources for ecotourism

Irene Borgna (Maritime Alps Protected, Italy), **Elisabetta Rossi** (Lombardia Region, Italy) **Irena Kavčič** (University of Ljubljana, Slovenia)

> LUNCH BREAK <

14:00 - 14:50

The challenge of coexistence, an international look at policy and capacity

Alexandra Zimmermann (HWCC IUCN SPECIALIST GROUP and Oxford University, UK)

14:50 - 15:30

Experience compared: The Life Boreal Wolf project in Finland

Madeleine Nyman (Natural Resources Institute Finland Luke, Finland), **Mari Lily** (Finnish Wildlife Agency, Finland) and **Lina Ala-Kurikka** (Natural Resources Institute Finland Luke, Finland)

> COFFEE BREAK <

16:00 – 16:20

Exploring the imperative for stakeholder engagement in wolf management and conservation

Aleksandra Majić Skrbinšek (University of Ljubljana, Slovenia)

16:20 - 17:10

Communicating Coexistence: from Outreach to Public Involvement

Laura Scillitani (MUSE - Science museum of Trento, Italy), **Marta De Biaggi** (Maritime Alps Protected Areas, Italy), **Maja Sever** (SFS-Slovenia Forest Service, Slovenia), **Giulia Bombier**i (MUSE -Science museum of Trento, Italy), **Anna Crimella** (Eliante onlus and Lombardia Region, Italy), **Anna Sustersic** (ERSAF, Italy)

17:10 - 17:50

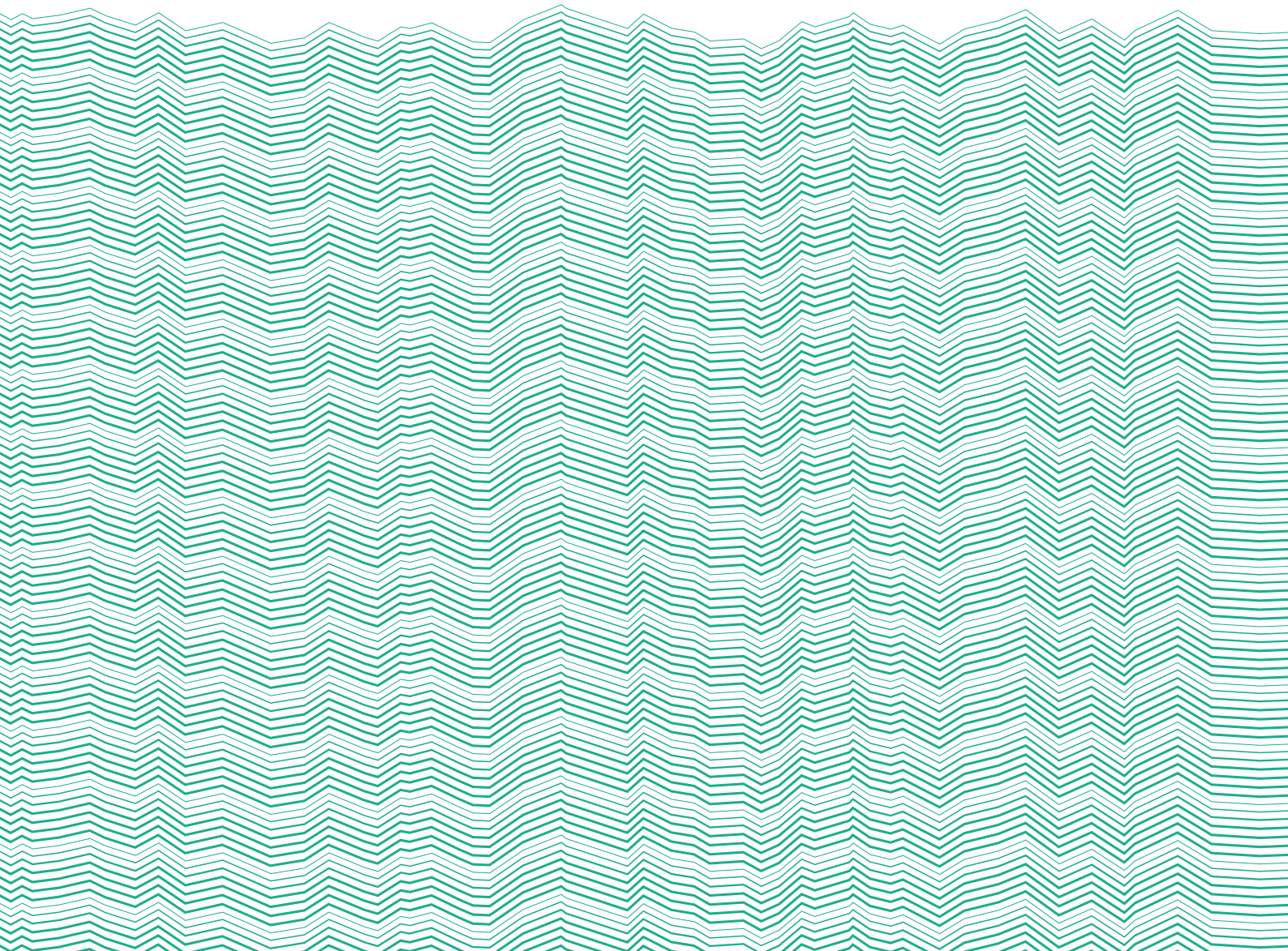
Promoting Coexistence Through Education and the Young Ranger program

Marta De Biaggi (Maritime Alps Protected Areas, Italy), **Irene Borgna** (Maritime Alps Protected Areas, Italy), **Laura Scillitani** (MUSE -Science museum of Trento, Italy), **Vesna Mihelič Oražem** (SFS-Slovenia Forest Service, Slovenia), **Rachel Berzin** (Mercantour National Park, France), **Manca Velkavrh** (University of Ljubljana, Slovenia), **Sabina Colturi** and **Elisa Iacona** (Stelvio National Park, ERSAF, Italy)

17:50 – 18:30

Conference wrap-up: conclusions and discussion

BOOK OF ABSTRACTS



LIFE lessons learnt for coexistence - Use of Damage Prevention Measures against large carnivores

Anita Fassio

LIFE Environment (Nature & Circular Economy), CINEA

LIFE is the only EU programme dedicated exclusively to the environment, nature and climate action, contributing to the objectives and targets of the European Green Deal. In the last 30 years, the projects financed by the LIFE Programme have made a real difference on our continent, protecting European biodiversity but not only. The LIFE WOLFALPS EU project is a very good example, it is an exceptionally ambitious project in that it was designed to improve wolf-human coexistence at the wolf Alpine population level, therefore covers the entire Alpine ecosystem.

Since 1992, 153 projects dealing with large carnivores were financed, 94 targeting the bear (Ursus arctos), 57 the wolf (Canis lupus), 31 the Iberian lynx (Lynx pardinus) and 13 the Eurasian lynx (Lynx lynx). The evolution of funding in time shows that the bear has received a more constant attention, and that the projects targeting the Iberian lynx where quite important in terms of budget. Larger projects on wolf are more recent (from 2010 onwards), but this is also the normal trend of all LIFE projects as applicants tend to design more ambitious, often transnational, longer and larger projects.

Based on the statistics, Italy is the country receiving most financing for wolf related activities in LIFE projects, followed by Romania and Portugal. Approx 58.5M EUR of EU funding were invested on the wolf in total. Concerning the bear, Spain, Italy and Greece are the countries that have received the highest percentage of the overall funding. Almost 67M EUR were invested on the bear in total.

In relation to damage prevention, fixed fences, electric fences, turbofladry fences and Livestock Guarding Dogs (LGDs) are the deterrents most widely used/tested in LIFE projects. Based on the results of finalised projects that have assessed the functional and/or perceived effectiveness of the measures adopted (e.g. LIFE Eurolargecarnivores, LIFE Coex, LIFE Dinalp Bear, LIFE MED-WOLF, LIFE OsoCourel and several others), the lessons learnt that can be drawn are:

1. Users should keep good record of attacks and damages
2. Support should be provided for the implementation of prevention measures (technical, financial, etc.):
    - Simply providing breeders with dogs without any further support can create additional problems. It essential to train users to properly position the electric fence and properly use and maintain them for maximum efficiency

- Good investigation of attacks to find weaknesses in the protection system is also important to adjust it and improve effectiveness

3. The use of a combination of methods increases effectiveness. E.g. electric fences and LGDs together deliver best results
4. Relationship building to increase trust and willingness to use the measures is important
5. Once adopted, measures should be applied region wide to avoid displacement of attacks
6. Governments should make available public aid or subsidies for the acquisition, maintenance or construction of prevention measures

In conclusion, there are no one-size-fits-all solutions. Livestock protection measures need to be designed, tailored and implemented in accordance with the local environmental characteristics and with the type of husbandry. The most effective way to do all this is through an active cooperation of all the relevant actors, including the concerned livestock breeders, hunters, the experts in protection measures, the wolf specialists and the relevant agriculture and nature authorities.

A lesson learnt for the LIFE Programme indicates the need for all projects dealing with large carnivores and damage prevention measures to report on impact and therefore systematically measure the functional effectiveness of the measures adopted. This is crucial for proper technical and policy feedback. Finally, a wealth of information and experience is already available and new projects should build on those.

EU policy on wolf 2024

Andrea Vettori

Head of Unit ENV D.3 Nature Conservation – European Commission, DG Environment

Wolves and other large carnivores are an essential element of our environment and common heritage, and their natural recovery is a success of the EU nature conservation policy. Ensuring a balanced coexistence between humans and large carnivores is a Commission's priority and the objective to achieve favourable conservation status of the species across the EU will remain a legal obligation.

The wolf is by far the protected large carnivore species that is associated to most socio-economic conflicts while showing, in most Member States, a very fast recovery both in terms of range and population. This is why, last December, the Commission presented a proposal for a Council Decision on the protection status of the wolf under the Bern Convention, which is a pre-requisite for any change in the EU rules that implement it.

The Commission proposal concerns the change of the legal protection status of the wolf under the Bern Convention, aiming to move it from Appendix II on "Strictly protected fauna species" to Appendix III on "Protected fauna species". The objective of the change is to provide national authorities with more flexibility in establishing and implementing the most appropriate management measures, while maintaining the obligations to address the relevant pressures and threats and conserve healthy wolf populations.

The Commission proposal largely corresponds to the position that the European Parliament expressed in its resolution of November 2022, and was made on the basis of the most up-to-date and comprehensive analysis of the situation of the wolf in the EU, published together with the proposal last December. The study confirmed how, after a long period of deliberate persecution which led to its extinction in most European countries, the wolf has achieved, in the latest couple of decades, a remarkable recovery.

With respect of the population of wolves, the in-depth analysis estimates a total of more than 20 000 wolves in the EU in 2023, which is significantly higher than the previously available estimates based on the reports submitted by the Member States under the Habitats Directive for the period 2013-2018. In 2023, breeding packs have been detected in 23 EU Member States, i.e. all mainland EU Member States except Luxembourg where wolf reproduction has not been reported yet. The return of the wolf and the expansion of its range is also associated to the increase of livestock depredations: at least 65,500 heads of livestock annually in the EU, with significant pressure at local level. Ten Member States have included support for targeted prevention measures in their new CAP Strategic Plans.

In terms of procedure, the Commission proposal for the Bern Convention is currently under discussions in the Council, which for the time being did not manage yet to find an agreement on it. The Commission will continue to provide its full assistance for a swift agreement on its proposal. If the proposal is agreed by Member States, the EU will table the amendment proposal at the next meeting of the Standing Committee of the Bern Convention at the end of 2024. If agreed by two thirds of the contracting parties of the Convention, this amendment would allow the Commission to consider how to align the EU legislation to the revised protection status of the wolf under the Convention.

Regardless of the adoption of the proposal, we need to continue working on coexistence with the wolf, as well as with the other protected large carnivores. Coexistence requires engagement and investments in prevention measures and livestock protection; technical assistance and advice for farmers and shepherds; damage compensation payments; information; dialogue with and involvement of all stakeholders; targeted use of lethal control to address specific issues; prevention and management of bold wolves; monitoring and data collection. The Commission will step up its efforts to support the competent authorities and stakeholders with finding and implementing suitable coexistence solutions.

Local stakeholder EU platforms on large carnivores: lessons learned

Valeria Salvatori

IEA Institute of Applied Ecology, Italy

Social conflicts around large carnivores are increasing both in numbers and range in Europe, often expanding into human-modified and agricultural landscapes. Beyond economic losses caused by damages to livestock and agriculture, other issues involve a variety of sectors, touching on elements rooted in social conditions and identity, and affected by traditional practices, contemporary events and political settings. To improve dialogue in conflictual situations, as part of a European project promoted by the European Parliament, we assessed the practical implementation of participatory processes in three sample areas in Europe where wolves and bears have recently been increasingly impacting human activities.

The project areas are the Province of Ávila (Region of Castile and Leon, Spain), the province of Grosseto (Tuscany Region, Italy), Harghita county (Romania), the Natural Parc of Vercors in the French Alps, the Luneburg Heatn (Lower Saxony, Germany) and Sweden (both at local and national scales), which were identified as reporting particularly high levels of conflict and characterized by discontent and disagreement between interest groups resulting in a stalemate. After an intensive knowledge gathering phase, we supported the co-production of intervention plans seen by stakeholders as improving current conditions, while accounting for the different points of view and expectations. Although the level of implementation of the project varied in the different areas according to the contribution and engagement of the involved parties, overall our results demonstrate that collaboration among different and generally contrasting groups is possible. Even in situations where large carnivore impacts were seen as unsatisfactorily managed for many years, people were still willing and eager to be involved in alternative discussion processes hoping this would lead to concrete solutions.

Assuming that participatory processes lead to improved large carnivore management, we foresaw three intermediate steps in our theory of change: 1. Decreased tension, 2. Collaboration and 3. Commitment (Fig. 1).

An important and common highlight among the study areas was that all the management interventions agreed upon shared the general scope of improving the conditions of the groups most impacted by large carnivores.

Proposed management solutions spanned from a set of practical tools to mitigate the material impact caused by large carnivores (e.g., implementation of damage prevention measures), to normative proposals that needed wider political support (e.g., regulations for damage compensation and tourism activities).

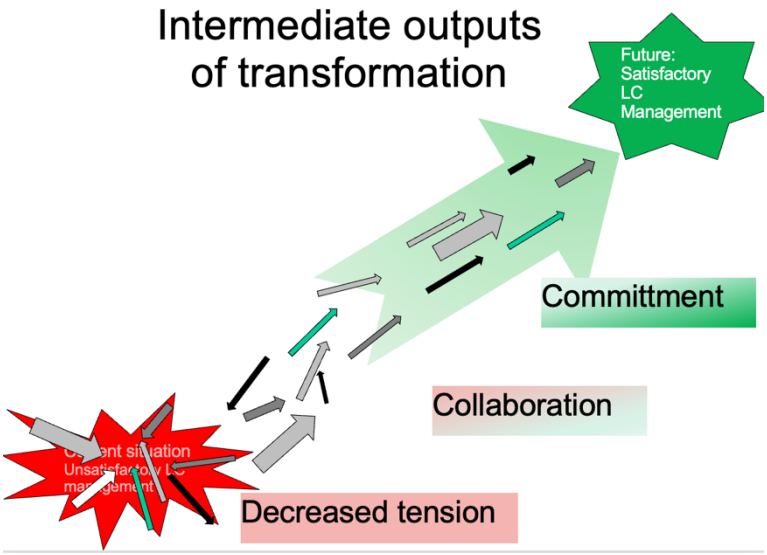


Figure 1. The theory of change used for the implementation of the participatory processes in the six intervention areas. In the assumption that participatory processes would lead to improved large carnivore management we envisaged 3 intermediate steps that would help us reach the ultimate goal

The intermediate objectives were assessed by a set of indicators (tab. 1)

Tab. 1 The three intermediate objectives and the indicators used to assess whether they were achieved through the multi-step process of facilitation. Steps used are explained in Salvatori et al., 2021.

Intermediate objective	**Indicators**
Decreased Tension	Inclusivity – all parties involved
	High quality facilitation, relationship improved
	Willingness to be there
Collaboration	Increased trust
	Willingness to compromise
	Capacity to contribute
Committment	Shared decisions
	Improved technical quality
	Satisfactory implementation

In all areas the need for clearer, reliable and more accessible information on the status of the large carnivores was identified, along with the need to have a more balanced approach by the media when dealing with issues related to large carnivores. We recorded a general willingness of all stakeholders to contribute, resulting in a series of pilot interventions that were

jointly developed. However, we received limited to no support from local and central authorities, with whom dialogue was otherwise always sought for, both before and during the process. The direct involvement and support of competent authorities, as well as the upscaling of this process at larger administrative and social scales remain important challenges. The work highlights the similarities and differences between the processes and actions of the various stakeholder groups across different areas. A common factor is the active participation of interested parties, even those that were initially skeptical and expressed the most extreme and negative attitudes towards large carnivores.

The process also shows the importance of building trust and supporting dialogue for knowledge co- production and mitigation of conflicts between stakeholders, and that controversial environmental issues have the potential to trigger a meaningful dialogue about broader societal issues.

The transboundary evaluation of the wolf alpine population over 21 years and 7 countries

Francesca Marucco[1]*, Ilka Reinhardt[2,3], Elisa Avanzinelli[4], Fridolin Zimmermann [5,6], Hubert Potočnik[7], Theresa Walter[8], Felix Knauer[8], Nolwenn Drouet-Hoguet[9] and Christophe Duchamp[9]

[1] University of Turin, DBIOS - Department of Life Sciences and Systems Biology

[2] LUPUS - German Institute for Wolf Monitoring and ResearchGermany

[3] Goethe-University Frankfurt am Main, Department of Biological Sciences, 60438 Frankfurt, Germany;

[4] Centro Grandi Carnivori, Maritime Alps Protected Areas, Italy

[5] KORA - Carnivore Ecology and Wildlife Management, Switzerland

[6] University of Lausanne, Department of Ecology and Evolution, Biophore, Switzerland

[7] University of Ljubljana, Biotechnical Faculty, Department of Biology, Slovenia

[8] Conservation Medicine Unit, University of Veterinary Medicine Vienna,Austria

[9] Office Français de la Biodiversité, Department of Research and Expertise, France

Wolves have large spatial requirements and their expansion in Europe is occurring over national boundaries, hence the need to develop monitoring programs at the population level. Wolves in the Alps are defined as a functional population and management unit. The range of this wolf alpine population now covers 7 countries: Italy, France, Austria, Switzerland, Slovenia, Liechtenstein and Germany, making the development of a joint and coordinated monitoring program particularly challenging. In the framework of the Wolf Alpine Group (WAG), researchers developed uniform criteria for the assessment and interpretation of field data collected in the frame of different national monitoring programs. This standardization allowed for data comparability across borders and the joint evaluation of distribution and consistency at population level. We documented the increase in the number of wolf reproductive units (packs and pairs) over 21 years, from 1 in 1993-1994 up to 243 units in 2020-2021, and examined the pattern of expansion over the Alps. This long-term and large-scale approach is a successful example of transboundary monitoring of a large carnivore population that, despite administrative fragmentation, provides robust indexes of population size and distribution that are of relevance for wolf conservation and management at the transnational alpine scale.

More information at: Marucco, F.; Reinhardt, I.; Avanzinelli, E.; Zimmermann, F.; Manz, R.; Potocnik, H.; Cerne, R.; Rauer, G.; Walter, T.; Knauer, F.; Chapron, G. and C. Duchamp (2023). Transboundary Monitoring of the Wolf Alpine Population over 21 Years and Seven Countries. Animals 13, 3551. https://doi.org/10.3390/ani13223551

From emergency to collaboration – steps towards a better damage prevention system

Tomaž Berce[1], Rok Černe[1], Arianna Menzano[2], Ricardo N. Simon[3], Alice Buhagiar[4]

[1] SFS-Slovenia Forest Service, Slovenia

[2] Maritime Alps Protected Areas, Italy, Italy

[3] Office Français de la Biodiversité, Department of Research and Expertise, France

[4] AREC HBLFA Raumberg-Gumpenstein, Austria

Introduction

Outdoor livestock husbandry is the economic activity on which wolf presence causes the greatest negative impact. Consequently, as wolves expand their ranges throughout the Alps, conflicts with farmers are bound to increase, especially in those places where livestock management is no longer adapted to their presence, making livestock very vulnerable to depredations. Most damages occur in areas of recent wolf recolonization where over time livestock management has evolved in the absence of large predators and hence does not include any prevention measures or defense strategies from wolf attacks. The economic loss and the psychological and social hardship experienced by farmers leads to local intense conflicts, resulting in one of the biggest threats to wolf conservation in the Alps. This situation is particularly evident where preventive measures aren't used or aren't correctly implemented. In addition, the presence of the wolf is also becoming important in some areas of the plains and hills of north-western Italy where human density is greater and the type of livestock management is in part different from that of the mountains.

Reducing the impact of wolf depredation on domestic livestock to economically and socially tolerable levels, through the identification and adoption of prevention systems and the adaptation of breeding systems to the renewed presence of the wolf, is a strategic priority action in order to allow the wolf long-term conservation in the Alpine territory, while guaranteeing the maintenance and development of traditional economic activities.

At the beginning of the LIFE WolfAlps EU Project an International Alpine report on the evaluation of the preventive strategies used in the Alps has been produced in connection with the WISO platform of the Alpine Convention (https://www.lifewolfalps.eu/wp-content/uploads/2022/09/A2_Del_Report_Prevention-of-damages-caused-by-large-carnivores-in-the-Alps.pdf). In the document both the damages caused by large carnivores and the damage prevention measures adopted were described at each Alpine Country level, with the ultimate goal of giving general recommendation and defining best practices for livestock protection in the Alps. Solutions tried in different Alpine contexts have proven that a variety of possibilities are available to reduce the occurrence of damages caused by large carnivores on livestock. Furthermore, experiences from other projects (LIFE DINALP BEAR, LIFE SloWolf, …) have shown that the presence of project staff to assist breeders in using prevention systems and taking prompt action in case of attacks is fundamental so that breeders do not feel abandoned by the Institutions.

One of the main "prevention activities" within the LIFE Project was the creation of a new effective first aid approach to facilitate direct and immediate contact with breeders in areas of wolf presence: the Wolf Prevention Intervention Units (WPIUs).

The WPIUs operate on the basis of a shared international protocol (https://www.lifewolfalps.eu/wp-content/uploads/2021/04/A2_Deliverable_WPIUs_Operating_Strategy.pdf) which constitutes the best practices for prevention strategies to be followed over the Alps. Furthermore, to guarantee uniformity of approach, coordination and to solve problems a group of four WPIU national coordinators have been identified (one per country). The WPIUs have been created in all Countries of the LIFE project and they are composed of trained operators with different backgrounds and qualifications, so as to have a multidisciplinary qualified staff and approach. They give farmers case-by-case advices and support to improve prevention strategies based on successful experiences and best practices, but they also give administrative assistance, information on available funds for prevention and compensation, suggestions on the correct socialization of LGDs, ... But the most important thing is that they assist farmers directly in the field, in close collaboration with them, with a participatory approach.

More than 1500 interventions occurred in 3 years of activity, demonstrating the satisfaction of the breeders.

Assisting farmers and taking prompt actions in case of wolf attacks is essential to reduce conflicts and economic impacts on livestock husbandry.

Challenges

The return of wolves in the alpine area represents a big change and a challenge for people living in the Alps. The challenges are the greatest among farmers who can face severe economic losses due to depredations caused by wolves on livestock. The fast-spreading population induces the need for sustainable and effective solutions to support livestock breeders.

In terms of damage prevention there are many challenges that are similar throughout the entire alpine region regardless of the country. The presence of a large carnivore, regardless of the population size, can affect the agricultural practices of people. At the same time, the implementation of preventive measures may be limited due to different farming practices. Here we mention the most the most commonly detected challenges:

- Farming practices and acceptance of damage prevention measures

Factors such as type and size of farms (and herds), type of animals, etc. affect the implementation of damage prevention systems. Combining these factors with demanding topographic conditions - steep and rocky terrain, remote pastures, etc. makes it nearly impossible to find general solutions. In such environments, working with people is crucial for finding feasible solutions and for the acceptance of preventive measures.

- Supporting schemes

Damage prevention activities impose an additional burden for livestock breeders. Here the sup-

porting mechanism both for purchasing preventive equipment (electric fences) or livestock guarding dogs and for the extra work-load (or hiring a shephder) that farmers face are crucial for the implementation of damage prevention measures. In the absence of such schemes and funds to support livestock breeders, due to national or regional policies, it is very hard to achieve long-term results in the field.

- Evaluation of preventive systems

The evaluation of preventive measures set in the field is probably the most important factor that affects the effectiveness of the implemented measures. The major challenge represents the implementation of an evaluation and controlling system in the field as it is rarely done in the alpine countries, mainly due to lack of trained personnel and funds for its implementation. When implemented, the controlling system has to be combined with on-the-ground consultancy in order to build a relationship of trust between expert personnel and livestock breeders.

The above mentioned challenges seem to be similar throughout different regions. This is why it is important to apply communication and collaboration between countries to obtain a broader range of feasible solutions to the same challenges.

Solutions

When considering the best solutions and practices across the Alpine area, we faced several political problems. First, the situation in each country is different, with some being especially negative towards wolves. Secondly, we experienced a deep fragmentation even within the same State. In some cases, each Region or Federal State had a different law or approach, especially regarding livestock protection and compensations for the losses. In addition, each group of interest had its own view and negotiations were not always effective.

For these reasons, a generalized solution is not possible, but some measures are common between all or most of the partners.

We identified three key pillars that are fundamental for the continuance of the work led by the project until now.

1. *Communication*

When wolves return to an area, they come with a long history of misconceptions and prejudices. The primary need was to debunk the wrong perceptions. In order to do that, it was necessary to spread a more truthful knowledge by disseminating scientific data and findings. Another key action was to create a space of active listening for the stakeholders. They presented their personal struggle, as they felt unheard and judged instead of understood. To create an open relationship it was a major task for the project. Negotiation was the key to achieve that.

2. *Adaptability*

As the wolves´ behaviour change, so do we. In order to be effective, the prevention methods must be constantly adapting to each terrain and situation and they need to be checked up regularly. In

some areas, wolves are shifting from sheep to cattle. In addition, as livestock is very well protected at night, they might start preying during daytime. We need to be very flexible in order to avoid predation.

3. *Education and training*

The WPIU units are being constantly trained in order to respond to predations and to actively talking to the stakeholders. Farmers, breeders and shepherds also needed to be educated with how to properly use and fix the preventive measures. Some partners also implemented coordinated field visits to spread knowledge with the public.

Findings:

Farmers and breeders rely on each other. When one of them starts using the prevention methods and they work, others will probably act the same. They have built a relationship of trust that was also necessary for the project.

As previously stated, the roles of education and adaptability were fundamental.

Lastly, the use of technology was included. Drones, GPS collars for livestock and guarding dogs and thermal infrared images were developed. In the future, as technology advances, we might have even better methods. Nonetheless, we should still rely on the more classical methods as they have always been very effective.

The future

The most pressing challenge for the protection of livestock against wolf depredation in the Alps is to increase breeder and shepherd trust that non-lethal preventive measures are effective - i.e., that they do work - and efficient - i.e., that they are not excessively expensive, particularly given the availability of public funds to help cover material and human cost. Closely associated with this first challenge is to ensure the proper use of preventive measures: if not correctly set up, preventive measures are more likely to fail and hence discredit their effectiveness in the eyes of breeders and shepherds. As previously indicated, however, installing and maintaining preventive measures must be done on a case-by-case basis, as the combination of flock composition, husbandry practices and constraints, landscape features, etc. means that every case is unique. For such tailored advice to be available and relevant, financial and human resources need to be secured over the long term. Qualified personnel need years of training and experience, yet often workers move on due to short-term funding, poor pay, long hours and better prospects elsewhere. But in any case, technical support and funding also need to be provided to flocks other than sheep and goats, as depredation on cattle and other domestic animals is increasing in the Alps. We also need to learn how to protect livestock in hilly, relatively low-lying areas as wolves expand into this type of habitat where human density is much greater. Wolves can also learn to avoid well-guarded flocks during the night and start attacking flocks during the daytime, when keeping livestock contained in fences is not an option in mountainous environments.

Take home messages

Yet these numerous challenges should not prevent us from keeping in mind that non-lethal preventive measures do work if used properly. We and others can prove it. Yet doing so is rarely if ever easy, zero depredation is an unrealistic goal and no one solution fits all. Solutions, in plural, are much more likely to emerge when people with different expertise - shepherds, breeders, biologists, ethologists, etc. - pool their knowledge and experience and work together. For this to happen, however, trust, a rare commodity that is hard to gain and maintain, is paramount. Disagreements about the place of wolves and human activities in our landscapes are unavoidable over the short term, but this is no excuse for not acting on what we all agree on: livestock need to be protected from wolf depredation.

Evaluating the Relationship between Humans, Wolves and Prey: A Coordinated Study across 3 Countries

Ricardo N. Simon[1], Valentina Ruco[2], Luca Corlatti[3] and Nives Pagon[4]

[1] OFB-French Biodiversity Agency, France, France

[2] University of Turin, DBIOS - Department of Life Sciences and Systems Biology

[3] Stelvio National Park-Lombardia, ERSAF, Italy

[4] SFS-Slovenia Forest Service, Slovenia

The effects of predators on prey are at the core of their ecological role in the environment. Changes to ecosystems correlated with the return of wolves and their impact on wild ungulates in particular have received widespread attention. Yet most studies on the subject have been conducted in protected areas where the impact of human activities is reduced, or at least of a different nature, than in anthropogenic landscapes such as the Alps where human effects are ubiquitous and strong. In this context, an international team of the LIFE WolfAlps EU project has implemented a collaborative study aiming to better understand how wild ungulates, and particularly deer, use habitat in space and time in response to human disturbance and hunting risk, as well as predation by wolves. Hunters, a key stakeholder group in the management and conservation of wolves, have been implicated in every step of the study. Two main methods – GPS collaring and camera trapping – were deployed in four study sites across the Alps: the Bauges hunting and wildlife reserve in France, Pesio Valley in the Italian Maritime Alps, Valfuva Valley in Stelvio national park, Italy, and Jelovica Plateau in Slovenia (Fig. 1).

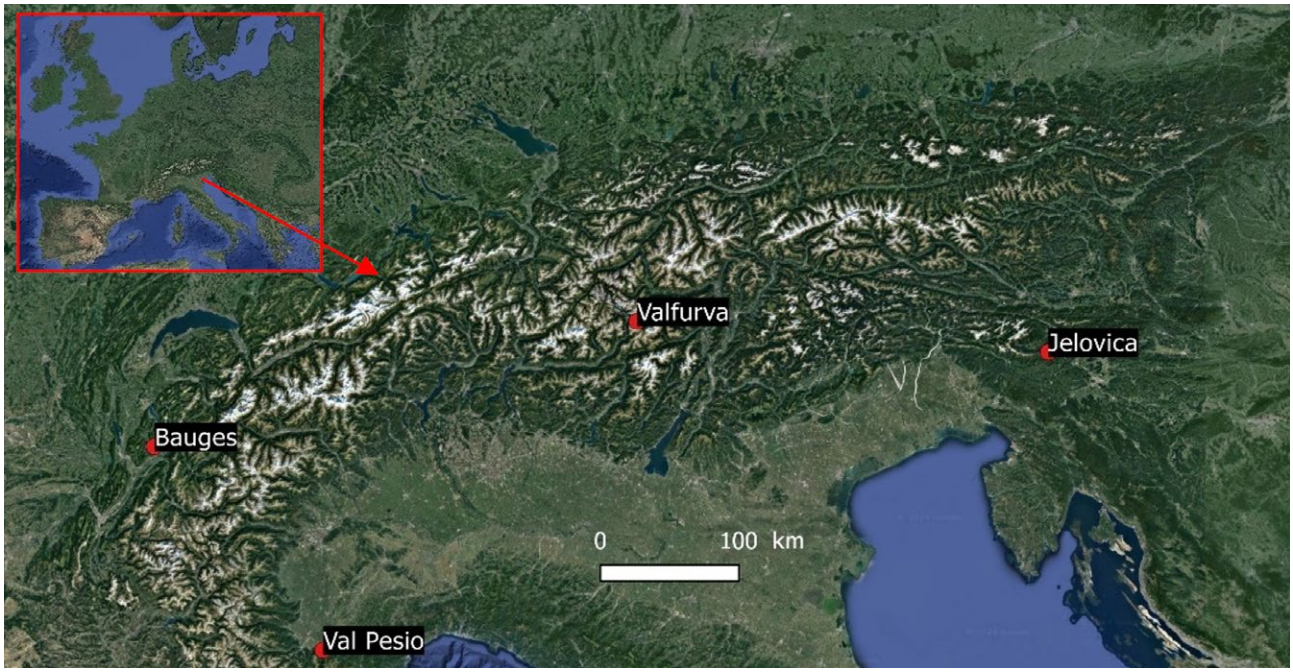


Figure 1. Study sites across the Alps for the predator-prey-human study (action C3) of the LIFE WolfAlps EU project.

Roe and red deer were captured using baited box traps, corrals and by darting, and then equipped with GPS collars on site (Fig 2). Wolves were also captured in Slovenia using foothold traps and released with a GPS collar.

Figure 2. Roe deer buck being equipped with a telemetry collar in February 2021 on Jelovica plateau in Slovenia. Photo: Andraž Valcl.

Resource selection functions were then built using the locations of 45 roe deer captured and collared in three of the above four sites characterized by varying intensities of human disturbance, hunting risk and wolf presence. Preliminary results suggest that during the day, roe deer preferred forest and steep areas while remaining relatively distant from roads and paths (Fig. 3). They also avoided areas of high hunting risk – defined as locations where a relatively high number of wild ungulates were shot by hunters –, but approached buildings in such circumstances. During the night, we found the opposite pattern: roe deer were close to paths, further away from buildings and selected for open and flat habitat, as well as areas of high hunting risk (Fig. 3). As hunting occurs mostly during the day, roe deer could use such areas during the night with little risk. However, these preliminary results also revealed strong inter-individual and inter-site variability in the habitat selection of roe deer.

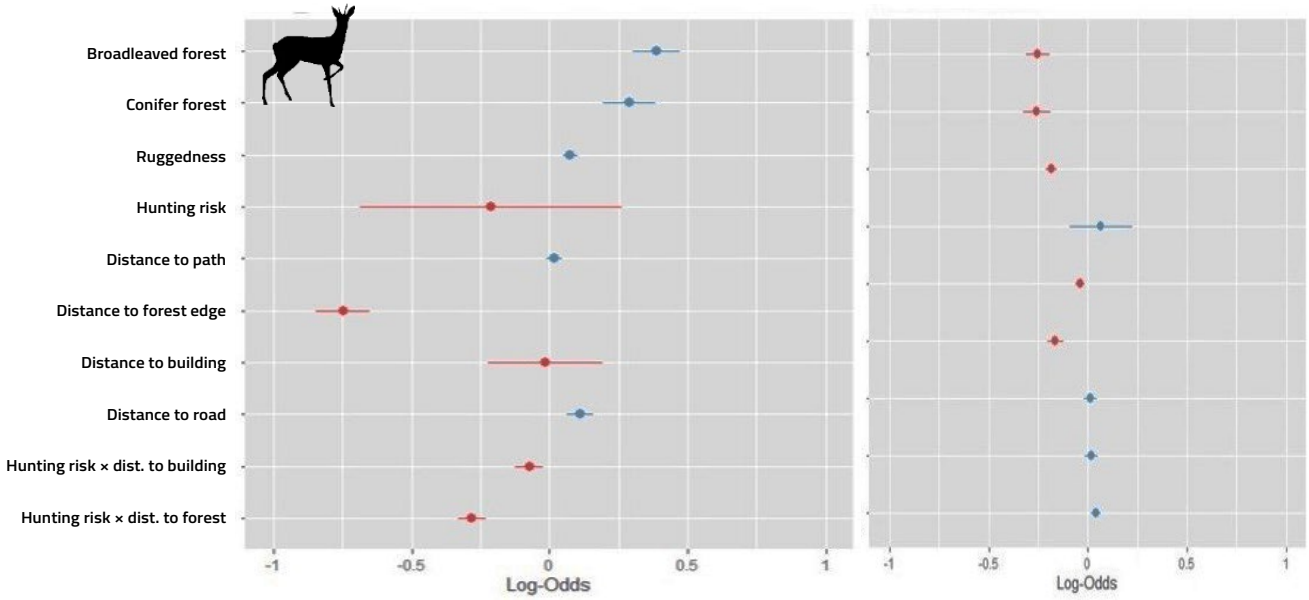


Figure 3. Habitat selection (log of selection odds) by roe deer during the day (left) and night (right) in the Alps. Positive values in the horizontal, X-axis, mean roe deer selection for higher values of the covariable of interest, whereas negative values mean roe deer selection for lower values. Zero means absence of selection. Bars represent 95% confidence intervals.

The data available on wolf presence appear too coarse to allow for the inclusion of the effects of the predator on the habitat selection of roe deer at the scale of the home range. Nevertheless, in parallel to the analysis of habitat selection by roe deer, camera traps have also been deployed in three of the four study sites. Preliminary results obtained in Stelvio national park bear on a key methodological question: compared to GPS data, to what extent can camera traps be used to study the habitat selection of predators and prey? Seven male and 13 female red deer were hence captured and collared in this study site, while 50 camera traps were installed across the area. Results show a general concordance of camera traps and GPS collars to characterize the habitat selection of females, but less so for males (Fig. 4). This finding might however be due to the relatively small number of males equipped with GPS collars. Results are sufficiently promising in any case to warrant further investigation.

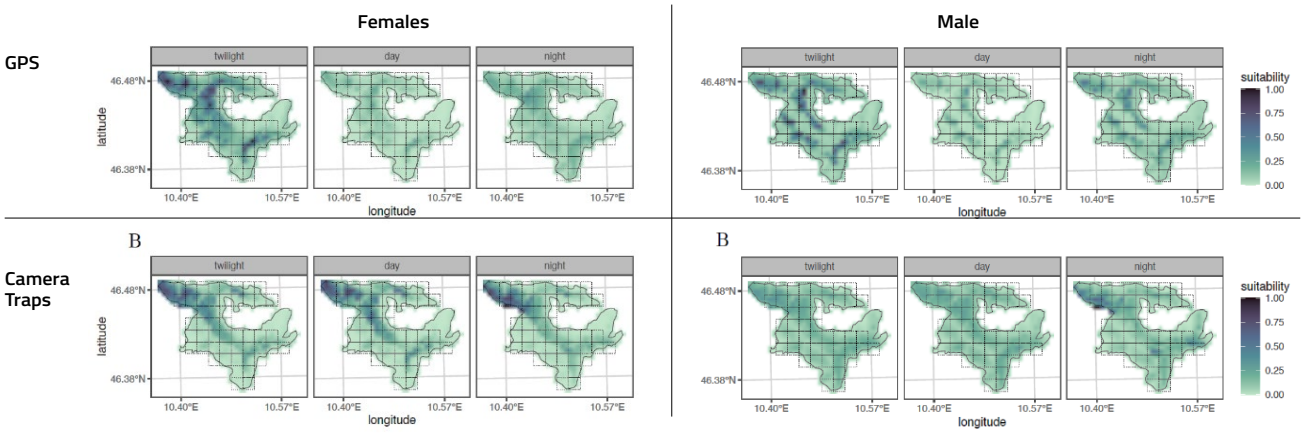


Figure 4. Comparison of the habitat suitability for females and males of red deer in Stelvio national park, Italy, using GPS and camera trap data.

Whatever the methods used, we have only just begun to scratch the surface of how predators and prey interact in highly anthropogenic landscapes such as the Alps. Yet these efforts are needed to better inform management and foster the coexistence between people and large predators such as wolves.

Wolf conservation and management in Italy: addressing current realities and navigating new challenges for coexistence with humans

Piero Genovesi and Paola Aragno

ISPRA, Institute for Environmental Protection and Research (Italy)

In the late 70s the wolf was almost extinct in Central Europe and a few hundreds were left in Italy. Subsequently, environmental changes, full protection (since 1971), as well as a much more positive attitude of Italians, led to a rapid population increase in the country over the years. In 2020-21, ISPRA, in collaboration with the LIFE Wolf Alps EU project, under the mandate of the Ministry of the Environment, coordinated the first nationwide survey, conducted simultaneously and using standardized methods, which led to the first estimate of the Italian wolf population.

In the peninsula, the survey applied two types of sampling: extensive sampling, conducted in 449 cells of 10x10 km, which allowed the estimation of the distribution through an occupancy model, and intensive sampling, carried out in 11 sample areas of 30x30 km cells, where the data collected were analyzed using a SECR model. The integration of the two models led to the estimate of the peninsular population size. In the context of the Alpine regions, all cells where the species had been present in the previous survey were extensively sampled, and the distribution was obtained from the set of cells with actual presence. Extensive sampling involved the cells where a pack had been present in the last survey, and here too, a SECR model was used to estimate density and population size. This was the first survey for estimating the distribution and abundance of an animal population conducted on a national scale in Italy and Europe. The realization of this sampling effort was made possible by the creation of a network of more than 3,000 operators belonging to public entities and volunteer associations. The size of the Italian wolf population in 2020-21 was 3,501 wolves (2,949 – 3,945) (Gervasi et al, 2024).

Today the species is found in every type of environment, including the vast flat area of the Po Valley and the coastal areas throughout the country, which are heavily influenced by human activity. This has led to an increase in the species' impact on human activities (Fig.1, Gervasi et al, 2021; 2022) as well as the emergence of new conflicts. The sharing of space between humans and wolves in a country with such a high population density as Italy (196 inhabitants/km² in Italy, 125 inhabitants/km² on average in the EU) is increasing. Wolves are increasingly being spotted in urban areas, and there are several cases of wolves that frequent these areas regularly (Fig. 2).

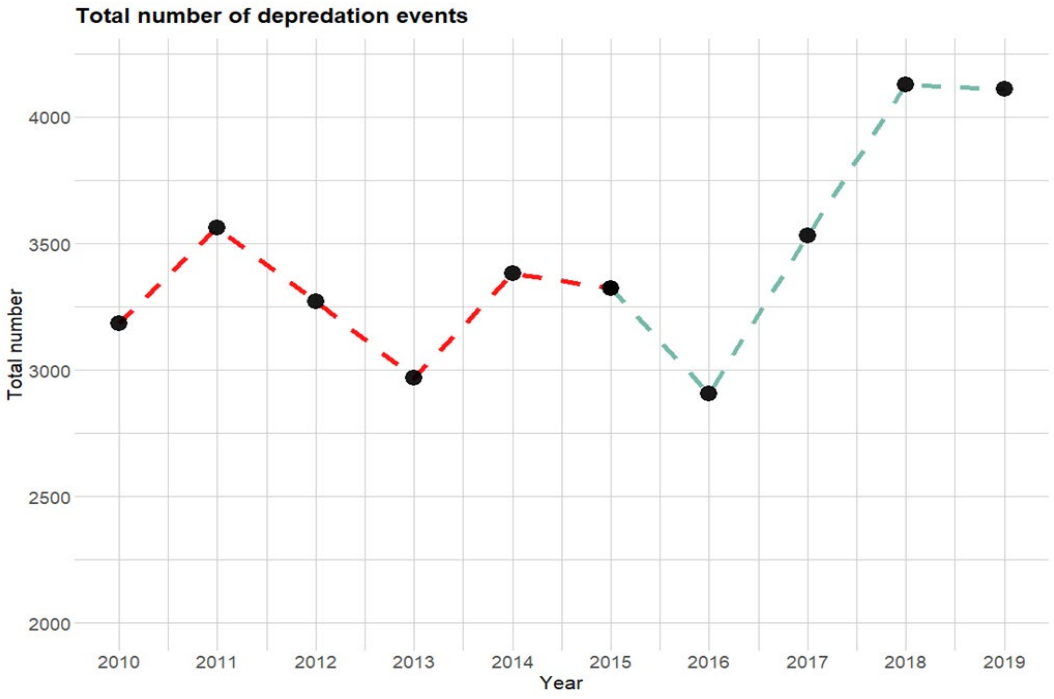


Fig.1 Total number of predation on livestock events recorded in Italy over the years (Gervasi et al, 2021; 2022)

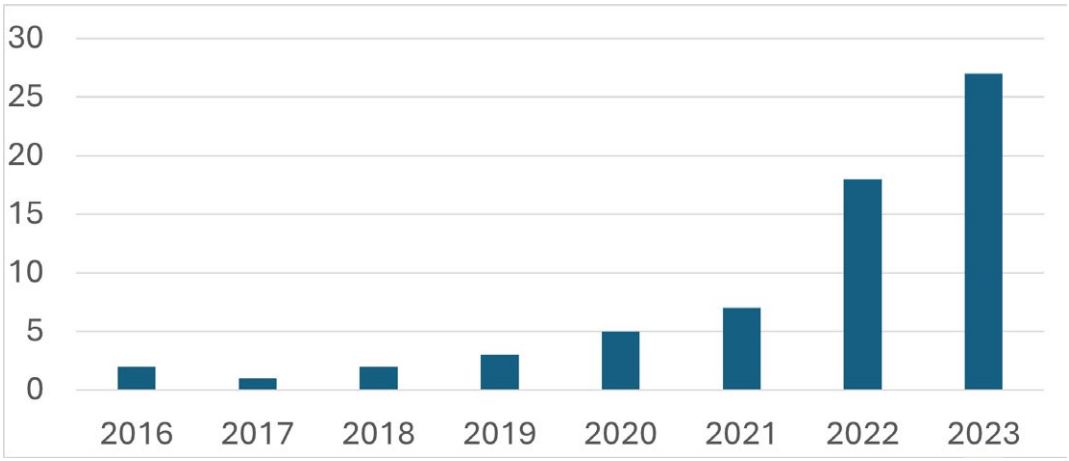


Fig. 2 Number of Cases of bold wolves or wolves in urbanized context reported to ISPRA over the years

In Italy the wolf is a protected species under European legislation (Habitat Directive, implemented in Italy by DPR 357/97) and national legislation (L. 157/92). The law prohibits disturbance, capture, and killing. Italian law assigns the task of managing populations (monitoring and action for conservation and coexistence humans-wildlife) to the Regions and Autonomous Provinces. The measures provided by the regulation to promote coexistence between humans and wolves include compensation for damages suffered, the use of prevention tools, and as a last resort, and in particular cases, the removal of individuals in derogation of the imposed prohibitions. Derogations (authorized

by MASE or by the Presidents of the Autonomous Provinces/Regions for Trento, Bolzano, and Valle d'Aosta, based on a mandatory but non-binding opinion of ISPRA) can be granted if:

1. **Demonstration of one or more of the reasons listed in Article 16(1)(a)–(e) of the Habitat Directive** (e.g., severe damage, risk to human safety);
2. **Absence of a satisfactory alternative**; (e.g., attempted damage prevention measures; aversive conditioning);
3. **Verification that the derogation is not detrimental to the maintenance of populations at a favorable conservation status.**

In Italy, despite being one of the European countries with the highest number of wolves, there is still a segment of society that advocates for strict protection of the species. This contrasts with those who, affected by the predator's presence due to the impacts it causes or the fear generated by its increasing proximity to humans, would like to see an effective population control.

The last action plan for the conservation of the species in Italy dates back to 2005. At that time, following decisions taken at the political level, the use of derogations was excluded. Since 2015, an updated version of the plan has been under discussion at the State-Region Conference. Agreement among Regions has not yet been reached, initially due to whether to introduce the use of derogations and subsequently on the level of autonomy to be granted to the Regions and Autonomous Provinces in applying them.

Recently, 4 removals have been authorized, 2 in the Autonomous Province of Trento to prevent severe damage and 2 to protect public safety. Only the latter 2 were actually enforced, by capturing 2 individuals that had shown aggressive behavior towards people, biting them, and confining them in permanent captivity. In the first cases, ISPRA applied an experimental procedure that involved identifying minimum quantitative criteria for the severity of damage and applied prevention that must be met, defined based on local data. Currently, ISPRA, based on the most recent national data, is working on defining criteria that can be applied at the national level. For the management of the phenomenon of bold wolves or urban wolves, the criteria identified by the Policy Support Statements of the Large Carnivore Initiative for Europe (LCIE) - Management of bold wolves have been applied until today in Italy. In this document, wolf behaviors are ranked according to an increasing degree of confidence, which implies an increase in danger (Linnell et al, 2002; Penteriani et al, 2016). In the Italian context, there are numerous cases of wolves that frequently visit urban areas (*urban dweller*; Bateman & Fleming, 2012), often preying on pets, although they cannot be strictly defined as confident towards humans. ISPRA is defining a protocol in which predation on pets and the habitual presence in cities are considered potentially dangerous behaviors and therefore to be excluded, resorting if necessary to the removal of individuals. In recent years, there have been 2 cases of urban wolves for which translocation was used as a management strategy. This was effective, as reports from the inhabited area from which they were removed ceased, and the wolves did not reappear elsewhere.

References

Bateman P.W., Feming P.A., 2012. Big city life: carnivores in urban environments. Journal of Zoology, Volume 287, Issue 1, 2012, Pages: 1-80 https://doi.org/10.1111/j.1469-7998.2011.00887.x

European Commission, 2021. Documento di orientamento sulla rigorosa tutela delle specie animali di interesse comunitario ai sensi della direttiva Habitat. Comunicazione della Commissione 2021/C 496/01.

Gervasi, V., Aragno, P., Salvatori, V., Caniglia, R., De Angelis, D., Fabbri, E., La Morgia, V., Marucco, F., Velli, E., & Genovesi, P. (2024). Estimating distribution and abundance of wide-ranging species with integrated spatial models: Opportunities revealed by the first wolf assessment in south-central Italy. Ecology and Evolution, 14, e11285. https://doi.org/10.1002/ece3.11285

Gervasi, V., Salvatori, V., Catullo, G., & Ciucci, P. (2021). Assessing trends in wolf impact on livestock through verified claims in historical vs. recent areas of occurrence in Italy. European Journal of Wildlife Research, 67, 82.

Gervasi, V., Zingaro, M., Aragno, P., Genovesi, P., & Salvatori, V. (2022). Stima dell'impatto del lupo sulle attività zootecniche in Italia. Analisi del periodo 2015–2019. ISPRA. Report for the Italian Ministry of the Environment. (In Italian).

Linnell, J.D.C., Løe, J., Okarma, H., Blancos, J.C., Andersone, Z., Valdmann, H., Balciauskas, L., Promberger, C., Brainerd, S., Wabakken, P., Kojola, I., Andersen, R., Liberg, O., Sand, H., Solberg, E.J., Pedersen, H.C., Boitani, L. & Breitenmoser, U. (2002) The fear of wolves: a review of wolf attacks on humans. Norwegian Institute for Nature Research Oppdragsmelding, 731, 1-65.

Penteriani, V., Delgado, M., Pinchera, F. et al. Human behaviour can trigger large carnivore attacks in developed countries. Sci Rep 6, 20552 (2016). https://doi.org/10.1038/srep20552

Alpine Convention - WISO working group

Rok Černe

Chair of the WISO working group

The main objective of the Large Carnivores, Wild Ungulates, and Society Working Group (WISO), set up by the X Alpine Conference in 2009, is to find solutions for managing large carnivores and wild ungulates harmoniously with society through an integrated approach. The Working Group goes beyond a strictly ecological perspective and aims to consider economic and social aspects in a balanced manner. It is the only official group in the Alps where managers and responsible persons from the ministries regularly meet to discuss the management of large carnivores.

Key outputs of the Working Group include recommendations and guidelines for the management of bears, wolves, and lynxes in the Alps; reviews of the use of CAP and other damage prevention measures in the Alpine countries; and a study of landscape connectivity in the Alps for large carnivores and ungulates. During the meetings, different management approaches for large carnivore management in the Alpine countries (France, Italy, Switzerland, Lichtenstein, Germany, Austria, Slovenia) are regularly discussed.

Wolf-dog hybridization in the Italian Alpine Regions:
New challenges, lessons learned in LWA EU and issues

Serena Perrone[1], Gianni Maceli[2], Iolanda Russo[3], Luca Giunti[4], Elisa Ramassa[4], Francesca Marucco[1]

[1] University of Turin, DBIOS - Department of Life Sciences and Systems Biology

[2] Liguria Region, Italy

[3] Piedmontese Apennines Protected Areas, Italy

[4] Cottian Alps Protected Areas, Italy

Anthropogenic wolf-dog hybridization poses a significant threat to European wolf populations. In line with Recommendation 173/2014 of the Berne Convention, LIFE Wolfalps EU identified hybridization as one of the seven main threats to be addressed during the 5 years of project. These planned measures were focused on the Ligurian-Piedmontese Apennine ecological Corridor, a high-risk hybridization area due to its proximity to the Northern Apennine, where hybridization is present. As a genetic flow from this area towards the Apennine Corridor was likely, the Project planned interventions in Liguria, where suspected hybrids had likely existed prior to the project, and also in the nearby Piedmont Apennines. Unlike the Apennines, no hybrid wolves had ever been detected in the Alpine context in the framework of previous monitoring campaigns.

Intensive surveillance and genetic monitoring in 2020-2021 revealed four hybrid packs: two in the Apennine Corridor and two unexpectedly in the alpine context (Julian Alps and Cottian Alps) (Fig. 1) . Consequently, despite initial plans to focus interventions in the Apennine Corridor, the project also addressed hybridization in the Cottian Alps. This necessitated reallocating resources and additional coordination to early mitigate the hybridization threat.

Due to the lack of regulation on wolf-dog hybridization control in Italy, a management strategy was developed for the Italian Alpine Regions. This strategy, resulting from discussions among national, regional, and local institutions under ISPRA's supervision, led to the "*Guidelines for the management of wolf-dog hybrids in the Alpine regions*". It focuses on reproductive inhibition by capturing, sterilizing, and GPS-collaring hybrids before re-insert them back into the original capture areas, and proposes a rational process to request the authorization to the Environmental Ministry (on advice of ISPRA). Implementation required training intervention teams comprising technicians, trappers, rangers, and veterinarians. The Wolf Apennine Center (WAC) trained teams for the Apennine Corridor, while UNITO-DBIOS trained new personnel for the Cottian Alps, creating a multidisciplinary task force to ensure long-term expertise in the Piemonte and Liguria regions beyond the project's end.

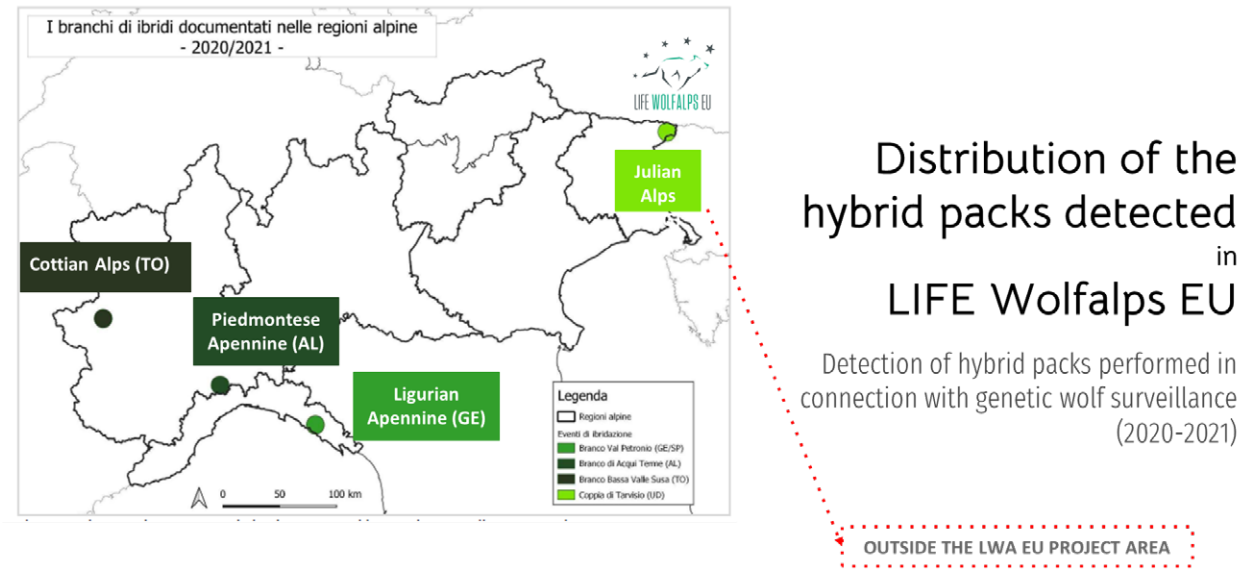


Figure 1. Map extracted from the Deliverable "La popolazione di lupo nelle regioni alpine italiane 2020/2021 - con evoluzione dal 1996 al 2021" (Marucco et al. 2022)

In the Liguria Region evidence of hybridization was suggested by anomalous phenotypes in three areas before the LIFE Wolfalps EU project began.

The Petronio Valley, in eastern Genoa, was chosen as the primary intervention site, because of the detection in 2018 of a breeding pair made-up of a white socks wild-type male and a black coated female. In May 2022, supported by WAC' staff, a young hybrid female, with a peculiar coat (Fig. 2) was trapped, sterilized, GPS-collared, and reinserted in the wild. Despite extensive monitoring, its signal vanished in February 2023. In October 2023, a 5-month-old wolf with mange was captured, then genetically identified as belonging to the wild wolf population, and therefore released after recovery. The project›s expertise gained in Liguria in this task also facilitated the rescue of injured wolves, then released with GPS-collar, creating long term expertise.

Figure 2. Hybrid female captured in Liguria Region in May 2022. (Photo credits: Regione Liguria)

The Appennine Piemontese Protected Areas (APAP) addressed the management of a hybrid pack in the Piedmont Apennine Corridor, identified in 2021, consisting of a wild-type alpha male and a hybrid white-coated alpha female. Supported by WAC staff, APAP conducted stakeholders involvement in participatory procedures and performed the local interventions, despite challenges from African Swine Fever. An agreement with Alessandria Province facilitated these actions, requiring additional training and stringent safety measures. In February 2023, a 3-year-old wild-type female from a neighboring pack was captured and early released with a GPS collar, providing valuable data. In September 2023, the aging alpha male of the hybrid pack (wild-type) was captured and GPS-collared. Monitoring revealed insights into pack dynamics, including the replacement and turnover of the dominant pair. The hybrid pack was no longer detected.

Figure 3. Pictures of the individuals captured during the interventions performed in the Piedmontese Apennine Corridor. A - 3-year-old wild-type female from a neighboring pack captured in February 2023; B - Alpha male of the hybrid pack (wild-type) captured in September 2023 (Photo credits: PANTE-Wolf Appennine Centre)

In the Cottian Alps, although no interventions were initially planned, addressing wolf-dog hybridization was deemed imperative. APAC, in collaboration with Città Metropolitana Torino and the University of Torino, formed a multidisciplinary task-force to perform local interventions in Torino province. In October 2022, they captured in the Lower Susa Valley a young male, offspring of an introgressed pack, founded by a wild-type female and a blond male (the blond male came from the Piedmontese Apennine hybrid pack). The wolf was sterilized by the CANC (University of Turin Unconventional Animals Center), GPS-collared, and released. Unfortunately, the collar ceased functioning after five months. In 2023, a second hybrid pack was detected in the Upper Susa Valley (with the same origin as the Lower Susa Valley one). Further interventions led to the capture, sterilization, and GPS-collaring of another hybrid male, whose monitoring is still ongoing, documenting its reintegration into its original pack.

Figure 4. Detection and interventions of hybridization in the Cottian Alps. A - Alpha hybrid male detected in the Cottian Alps (Photo Credits: APAC); B - Trained capture team at work (Photo Credits: APAC); C and D - Surgical sterilization provided by CANC and installation of the GPS-Collar by University of Torino. (Photo Credits: Prof. Giuseppe Quaranta, CANC)

The LIFE Wolfalps EU project has yielded significant insights into wolf-dog hybridization, a recent threat to the Alpine wolf population. *Key outcomes* include the development of managerial expertise within public bodies, fostering long-term sustainability and adaptability. This was achieved through the formation of local multidisciplinary task-forces, involving public Institutions (e.g. Parks, Regions, and University), operating in collaboration with ISPRA. The tools and equipment provided for interventions will remain useful beyond the project, and a specific awareness campaign was conducted to educate the public on hybridization issues in the Alps. Additionally, the guidelines produced in the project fill gaps in the poorly regulated legal framework, offering best practices tailored for the Alpine Regions. This process also integrated hybrid detection into routine surveillance activities.

However, some *lessons learned* can be highlighted. Implementing hybrid management locally is feasible but demands significant coordination, economic resources, and personnel. Early intervention is crucial for effectiveness, though large-scale application remains challenging.

Key outcomes and *lessons learned* can be framed in a SWOT analysis for the «Management of Hybridization in the Italian Alpine Regions» (Fig. 5). Strengths include capacity building and the establishment of effective cooperative networks and enduring resources (i.e. *key outcomes*). Weaknesses involve the high resource demand and limited large-scale impact (i.e. *lessons learned*).

Threats include lack of comprehensive regulatory policies, weak management of free-ranging dogs, and hybridization hotspots in the Northern Apennine, posing potential genetic flow risks. Conversely, *opportunities* lie in a possible wolf management plan in Italy, potential funding for new projects, improved regulations for free-ranging and feral dogs, and advancements in genetic detection techniques.

Overall, the project has provided a robust framework and valuable experience for future efforts in managing wolf-dog hybridization in the Alps, providing sustainable best practices in view of the Alpine wolf population' conservation.

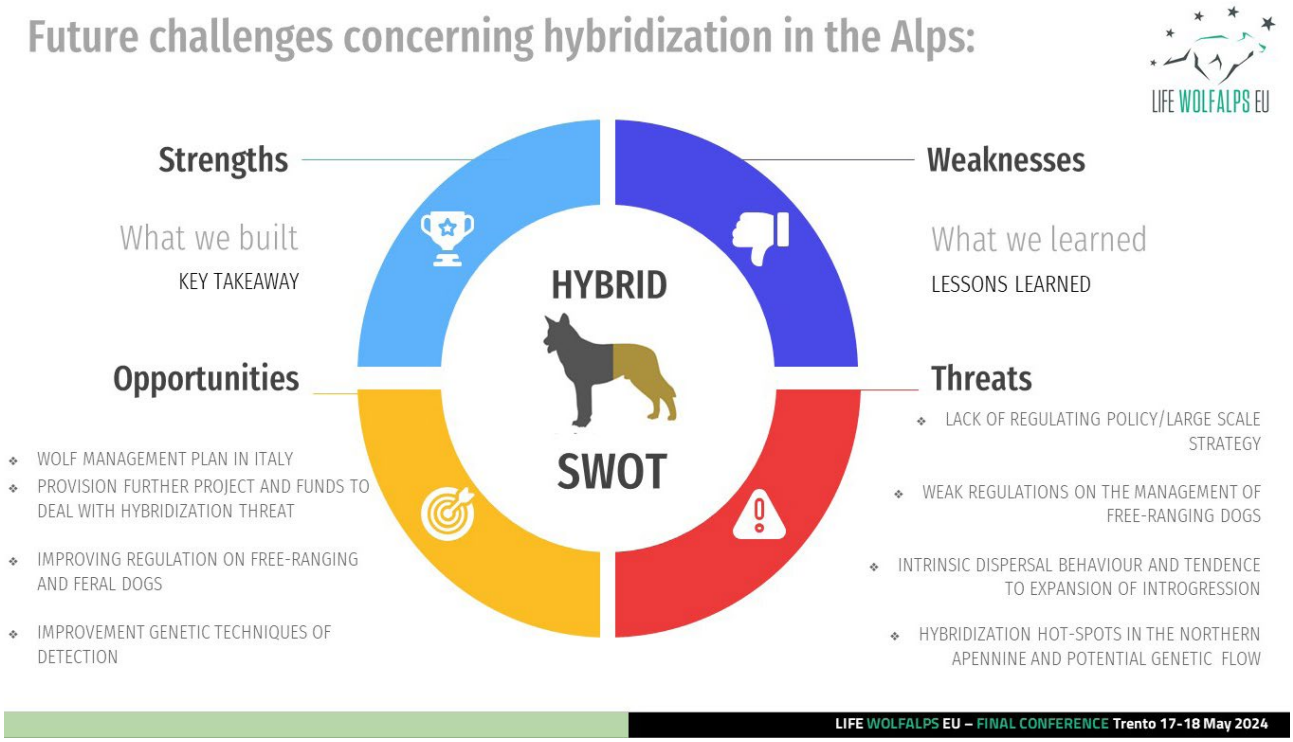


Figure 5. Key outcomes and lessons learned, opportunities and threats for the «Management of Hybridization in the Italian Alpine Regions» framed in a SWOT analysis.

Illegal Poisoning: activities and tools to fight against this environmental crime with an international approach

Giancarlo Papitto[1] and Theresa Walter[2]

[1] Arma dei Carabinieri - Command for Biodiversity and Parks Protection, Italy

[2] Conservation Medicine Unit, University of Veterinary Medicine Vienna, Austria

Despite the positive trend of the alpine population, the wolf is still threatened by illegal killing, a current and problematic phenomenon. The most insidious and harmful killing method also for ecosystems is the use of poison that is a global illegal phenomenon present in many Countries of Europe. The use of poison causes target victims (generally dogs, cats and wild carnivores such as foxes, wolves and bears and birds of prey) and "collateral" victims, such as scavenger species. The fight against the use of poison has progressively increased over the last years and has improved thanks to the possibility of using a special "tool": the Anti-poison Dog Unit (APDU). Within the LIFE Wolf Alps EU project a total of 7 new APDUs have been created and trained in Italy and Austria and are definitely operative and irreplaceable elements .

As a support tool for fighting against poaching and poisoning of wolves whitin the LIFE WolfAlps EU Project an "Operating Strategy" has been produced. The key elements of the strategy are based on "Who" (psychological and behavioral profile of poisoner) "When" (seasonality of killing)" and "Where" (critical areas).

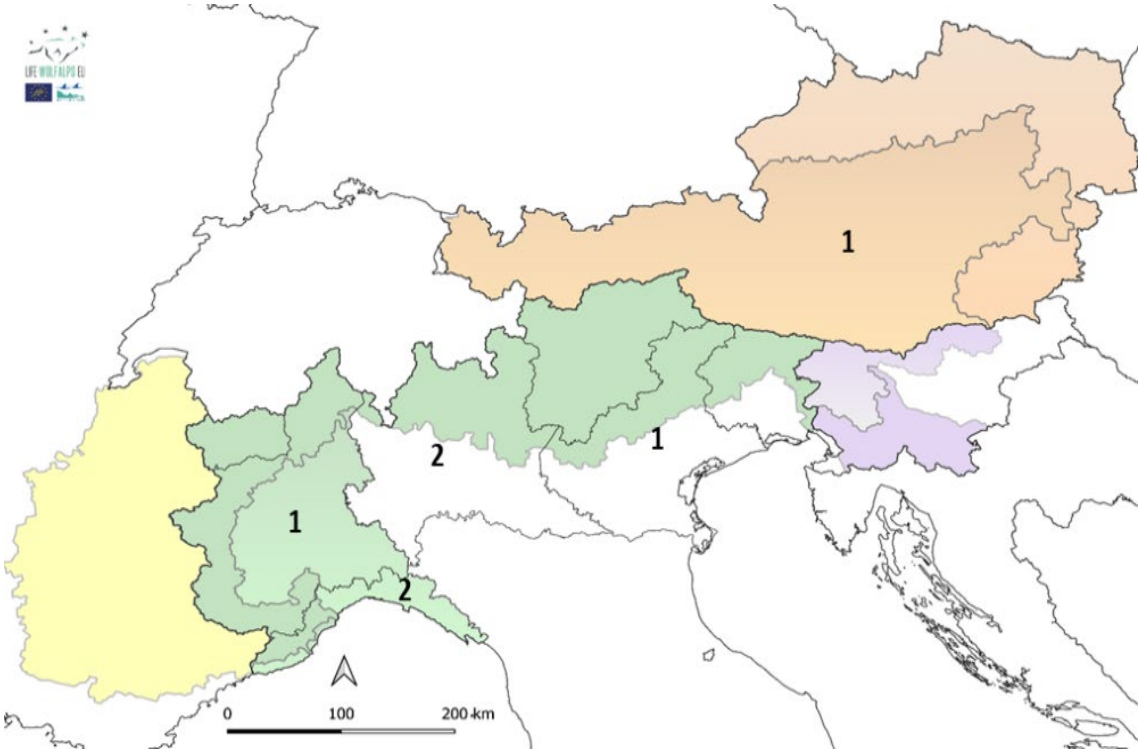


Figure 1. 7 new Anti-Poisoning Dog Units established in Wolf Alps EU

A human shield protects golden jackals from wolves in their expansion across Europe.

Nathan Ranc[1] and Miha Krofel[2]

[1] French National Institute for Agriculture, Food, and Environment INRAE, France

[2] University of Ljubljana, Biotechnical Faculty, Department of Biology, Slovenia

The direct effects of human-induced climate change and land-use modifications on species distributions globally are well documented. In contrast, the impact of biotic interactions and how human activities modify these interactions are largely neglected. This study leverages the ongoing, continental-scale spread of a generalist mesocarnivore, the golden jackal (*Canis aureus*, hereafter referred to as the jackal), to assess how human-modified biotic interactions affect the large-scale distribution of species. Jackals, native to Europe, were initially restricted to small areas along the Mediterranean and Black Sea coasts. The jackals' rapid expansion across Europe, which really started during the mid-20th century, represents one of the most notable range shifts among native mammals observed globally. Previous research suggests that the jackals' expansion may be triggered by the human-induced decline of an apex predator, the grey wolf (*Canis lupus*, hereafter referred to as the wolf), which was once widespread across Europe. This phenomenon is broadly known as mesopredator release. Other studies suggest that factors such as global warming, land-use changes, anthropogenic food availability, and changes in wildlife management and policy might have driven the species' expansion. Our research uses a unique transnational dataset of acoustic jackal surveys to dissect the ecological and human-related factors driving jackal expansion in Europe. These insights are then used to predict potential future colonization and assess the large-scale consequences of human-mediated interspecies interactions.

We conducted bioacoustic surveys to detect territorial jackal groups at 9094 calling stations across 13 countries across the species distribution in Europe. The data were analyzed using a generalized mixed effects model, which included biologically plausible predictors of jackal group presence and detectability. We found that the presence of territorial jackals was influenced by five key ecological variables and the distance from their pre-1500 distribution. Wolf presence was the most critical ecological variable affecting the likelihood of jackal presence. Jackals were more likely to be present in areas where wolves were absent, supporting the mesopredator-release hypothesis, which suggests that the decline of wolves in Europe may indeed have triggered the jackals' expansion. Additionally, human presence altered this biotic interaction; proximity to human development reduced the wolves' impact on jackals. Where wolves were absent, jackals tended to avoid human development presumably to reduce mortality risk from humans. Conversely, where wolves were permanently present, jackals were found closer to human developments, likely to avoid predation by wolves. Three key environmental variables also influenced jackal presence:

shorter snow cover duration, heterogeneous environments with low to intermediate forest cover, and proximity to water bodies. Finally, after controlling for all environmental covariates, jackal probability of presence decreased significantly with distance from the pre-1500 distribution, suggesting the species is not yet at equilibrium in large tracts of the continent and that future expansion should be expected. Future efforts should strive to evaluate the contribution of anthropogenic food resources to jackal distribution and density, as well as how human subsidies could mediate wolf-jackal interactions.

Overall, our findings indicate that the ongoing recovery of wolves throughout Europe could significantly limit the future expansion of jackals. It is reasonable to expect that the wolves' constraint on jackals will depend on wolf management practices and will be most pronounced where wolves can establish stable packs.

Reinforcement of the Dinaric Lynx Population and Creation of a Stepping Stone in the Alps

Rok Černe[1], Anja Molinari-Jobin[2], Miha Krofel[3], Urša Fležar, Maja Sever[1], Tilen Hvala[1,4], Vesna Oražem[1], Maruša Prostor[1], Aleš Pičulin[1], Matej Bartol[1], Tomaž Skrbinšekl[3], Aleksandra Majič Skrbinšekl[3], Paolo Molinari[2], Matija Stergar[1], Hubert Potočnikl[3], Jakub Kubala[4], Mihai Pop[5], Teodora Sin[5], Andrea Gazolla[5], Tomislav Gomerčič[6], Ivana Selanec[7], Ira Topličanec[6], Magda Sindičić[6]

[1] Slovenia Forest Service

[2] Progetto Lince Italia

[3] University of Ljubljana, Biotechnical faculty

[4] Hunters Association of Slovenia

[6] Faculty of Veterinary Medicine University of Zagreb, Croatia

[7] Association Biom

Prior to the start of the LIFE Lynx project in 2017, the Dinaric-SE Alpine lynx population was at the risk of extinction. The SE Alpine region had no reproduction and was functionally extinct. The Dinaric part of the population was experiencing a significant reduction of vitality. However, a collaborative international effort from Slovenia, Croatia, Italy, Romania, and Slovakia saved the population by translocating new individuals into the Dinaric part of the population and creating a stepping stone unit in the Alpine region of Slovenia. In total 20 animals from the Carpathian Mountains and two from Switzerland were translocated since 2019. Of those, 12 were released in the Dinaric mountains and 10 in the Alps. Four animals released in the Alps in Italy were translocated within the ULyCA 2 project.

The LIFE Lynx project's success is driven by strong stakeholder involvement and international collaboration. The achievements are a result of close collaboration among the forestry service, universities, hunters associations, local hunting clubs, protected areas, local communities, NGOs, and responsible ministries.

Additional activities of the project involved intensive monitoring of the population, first protection of ecological corridors for large carnivores and wild ungulates movement in Slovenia, active collaboration with the police for prevention of illegal killing, taking the effect of lynx predation into account in ungulate management plans in Slovenia and preparation of national strategic documents in Croatia, Slovenia and Italy. All of those was backed-up by intensive informational and educational campaign.

It is essential to recognize that this project's impact extends beyond securing the Dinaric-SE Alpine lynx population. The project set a precedent for successful conservation efforts by prioritizing practical involvement and close collaboration among different parties locally, nationally and internationally. By emphasizing these key factors, the project demonstrated that successful conservation efforts can be achieved when institutions, stakeholders, and countries work together towards a common goal.

Lynx reinforcement in the South-eastern Alps

Anja Molinari-Jobin and Paolo Molinari

Progetto Lince Italia, Tarvisio, Italy

Since the 1970s, several countries in Central Europe have made substantial efforts to reintroduce the lynx. With ups and downs, the felid managed to recolonise part of the lost territories, only to encounter a new crisis at the beginning of the new Millenium. This time the cause was mainly a biological problem, genetic to be precise: the number of individuals used for the reintroduction projects in the 1970s had been too few and so, over time, the problem of inbreeding became imminent. Especially in the Dinaric Mountains population, where only six individuals were released in 1973, the inbreeding coefficient reached a higher level than between brother-sister matings.

As a consequence, no further lynx immigrated into the south-eastern Alps. To prevent the extinction of lynx in the south-eastern Alps, the ULyCA (Urgent Lynx Conservation Action) project was implemented in 2013. Two individuals of Swiss origin were released in the Tarvisio Forest in a project carried out by the Region of Friuli Venezia Giulia and the Corpo Forestale dello Stato in collaboration with Progetto Lince Italia. The beneficial effect in the population trend, also thanks to a documented breeding event, was immediate. However, it was not longlasting. This was why a new, broader and international project, the LIFE Lynx (www.lifelynx.eu) was launched.

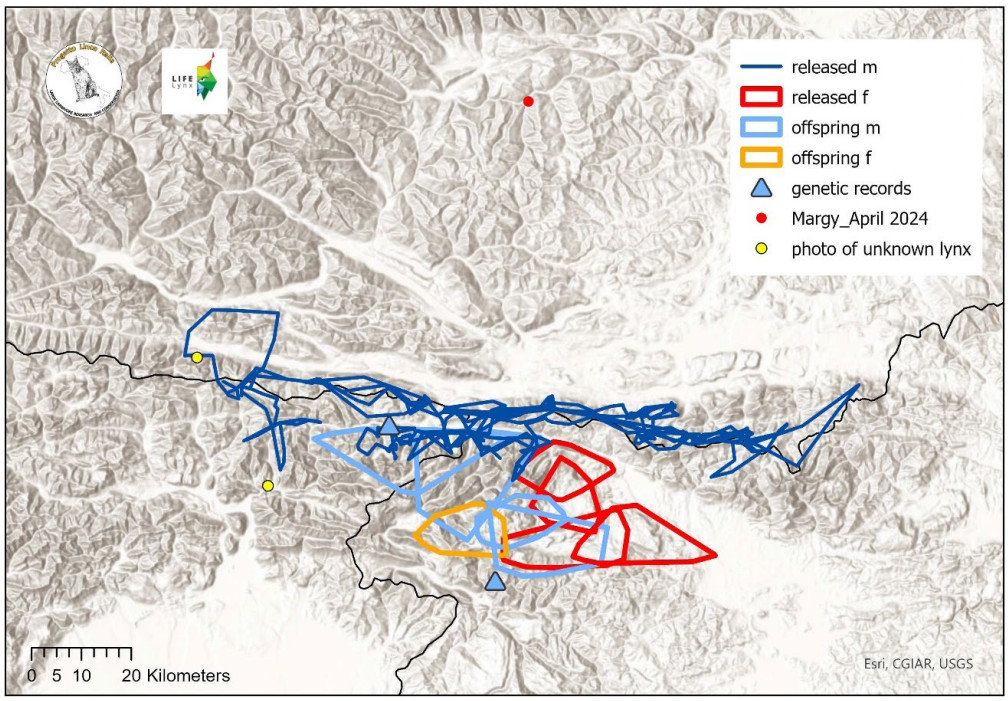


Figure 1. Situation of lynx in the south-eastern Alps in 2023.

One important objective of LIFE Lynx was to create a stepping-stone population in the south-eastern Alps to facilitate the expansion of the Dinaric population northwards and bring the isolated Alpine subpopulations closer together. Between 2021 and 2023, six lynx from Romania and Slovakia were released in the Slovenian Julian Alps. In 2021, also the ULyCA-project was reactivated with the Carabinieri Forestali as lead partner and the Region of Friuli Venezia Giulia, WWF and four hunting associations of Friuli Venezia Giulia teamed up to work towards their common goal. This led to the release of five lynx in the Italian South-eastern Alps, 30 km west of the stepping stone population created within the LIFE Lynx project.

Presently, the south-eastern Alpine lynx population consists of at least six males and six females. In the short-term, the negative population trend in the south-eastern Alps has been reversed. However, the population is still very small and highly dependent on the fate of single individuals. Connectivity between the South-eastern Alps and Dinaric Mountains will be crucial for the vitality of both populations.

Wild steps: turning large carnivores into resources for ecotourism

Irene Borgna[1], Elisabetta Rossi[2] and Irena Kavčič[3]

[1] Maritime Alps Protected Areas, Italy

[2] Lombardia Region, Italy

[3] University of Ljubljana, Biotechnical Faculty, Department of Biology, Slovenia

Ecotourism is generally defined as low-carbon footprint, responsible travel to natural areas that supports local communities, raises awareness through information and interpretation, involves education and interpretation, creates incentives to protect the landscape, and supports the conservation of wildlife and biodiversity.

Large carnivores are making their comeback to many parts of Europe where they became extinct. Where large carnivores return, conflicts generate and can increase to the point where they become one of the main ongoing threats to large carnivore conservation. Healthy ecosystems provide us with many ecological services that are essential for our survival (from clean water to soil fertility). Large carnivores, by keeping ecosystems in balance and in good health limiting the expansion of prey species, indirectly provide us with ecological services. One of more tangible benefits they provide is wildlife ecotourism.

In the LIFE WolfAlps EU project, we used the wolf's undeniable charisma toward the urban public to create ecotourism programmes that support the conservation of wolves and other large carnivores by increasing tolerance within local communities. Large carnivores presence attractsnature tourists and wildlife photographers, creates interesting wildlife-related products, increases the value of an area, and generates income for locals. Moreover, ecotourism can increase public awareness about the species, educate visitors about proper behaviour, coexistence and promote species conservation. It's a win-win situation, under certain conditions.

Ecotourism activities were developed using a step-by-step approach. Initially, we developed shared guidelines (available in 5 languages) to prevent negative impacts of tourism activities on wolves and their habitat. They were prepared through a consultation process with wolf conservation experts, moreover the document was also reviewed by LCIE group With these guidelines, we raised awareness of tourism operators through targeted training sessions. More than 615 tourism operators were reached. Once we trained the guides, we organized various excursions, including one-day winter hikes to spot wolf signs of presence (more than 90 up to now, with more than 2100 involved), summer hikes to alpine pastures, and more extensive trekking trips with overnight stays. Additionally, we tried new ways to promote coexistence, such as organizing a thematic art camp in Slovenia, a region where large carnivores have long been present. In Lombardy, a new area of

recolonization, ecotourism offered a great opportunity to spread knowledge on wolf and its return. Thanks to the direct involvement of 4 regional Parks and 1 national park, 152 nature guides were trained and 53 ecotourism events were organized, including one day summer or winter hikes, 2-3 days trekking, local festivals and theatrical experiences, reaching more than 1.000 participants. One day visits to alpine pastures that use prevention methods were greatly appreciated and were an opportunity to discuss about damage prevention measures directly with the livestock breeders and taste local products, with a local economic return for breeders involved.

Charismatic species such as wolves, bears, and lynx can also be used for branding and labeling of products and services. In Slovenia, the project built upon the bear friendly label, developed within LIFE DINALP BEAR project. The label has two main objectives:

i.) It connects and promotes product, tourism and service providers that use practices aimed at improving coexistence with protected species of large carnivores and ii.) spreads positive messages about large carnivores and coexistence measures. The label was designed to award practices used by local people that contribute to coexistence with large carnivores, which include effective protection of livestock, development of responsible tourism programs and active promotion of large carnivore conservation in the local area.

Based on these experiences, Ecoesistenza talking label was developed in Italy.The efforts of smaller producers, ecotourism operators, and accommodation facilities have been highlighted through the website Ecoesistenza.it. These individuals and organizations play a crucial role in disseminating information and safeguarding the territory, ensuring sustainable coexistence.The ECOESISTENZA talking label is a user-friendly tool created as part of the LIFE WolfAlps EU EU project to highlight and promote the work of those who live and work in areas where large carnivores are present. Their capillary work of information, custodianship, and guardianship of the territory is the true everyday' agents of coexistence' in the field. They are the ones who will continue their valuable work after the end of the project, and their role is invaluable.

Through the Ecoesistenza.it website, we made visible the silent effort of smaller producers, ecotourism operators, and accommodation facilities. The idea is to draw a map to give visibility to those who, of all the actors in an area, choose to support coexistence with wild animals. The ECOESISTENZA talking label is equipped with a QR code on products, shop windows, playbills, and other materials that allows people to discover with a click the stories of commitment to the coexistence of producers, artisans, and tourism professionals.

All operators and producers who join the large carnivore friendly initiatives commit themselves to supporting coexistence with their activities in the field: farmers by effectively protecting their livestock and property, tour guides by nurturing respect for the environment and wildlife , local craftsman byr conveying correct information to visitors to the area through their products and services.

Through their efforts we are slowly building up a large carnivore friendly community that becomes more aware of benefits provided by the presence of large carnivores, paving the way for a more balanced relationship between humans and wolves.

"The challenge of coexistence: an international look at policy and capacity"

Alexandra Zimmermann

Chair, IUCN SSC Human-Wildlife Conflict & Coexistence Specialist Group

Human-wildlife conflict is a rapidly growing and serious concern for biodiversity conservation worldwide. To find solutions to human-wildlife conflict, first we have to reframe the issue itself and understand it as first and foremost a conflict between different stakeholders *about* wildlife. Although the problem is triggered by a negative interaction between animals and humans, it is only when different groups of people interact negatively with each other that it becomes a conflict. For this reason, the IUCN SSC Human-Wildlife Conflict & Coexistence Specialist Group defines human-wildlife conflict as *"...struggles that emerge when the presence or behaviour of wildlife poses actual or perceived, direct and recurring threat to human interests or needs, leading to disagreements between groups of people and negative impacts on people and/or wildlife*".

Resolving human-wildlife conflicts therefore is impossible without resolving disputes and differences between stakeholders. However, the nature and extent of these disputes can vary greatly, some solvable with practical measures (e.g. fencing) while others are so deeply polarised that they seem completely intractable. One model that helps make sense of these variations is the *Levels of conflict* tool, which builds on peacebuilding insights and describes three levels: Level 1 conflicts are disputes over damages such as crop or livestock loss, yet typically involve relatively high tolerance of the blamed species. In level 2 conflicts, there is an accumulation of tense history, underlying resentment, and a sense of injustice among at least one of the parties. Level 3 conflicts are deep-rooted and intertwined with the identities of the parties involved, leading to polarised divisions, mistrust, and clashing values and beliefs.

In recognition that human-wildlife conflicts are increasingly common and progress in resolving these has become more challenging, the IUCN SSC Human-Wildlife Conflict & Coexistence Specialist Group works to gather and provide knowledge resources, facilitate collaboration and interdisciplinary working, build capacity, develop guidance, and engage actively with policy. To this end in 2020 we published the *IUCN Position Statement on Human-Wildlife Conflict* which urges governments, non-governmental organizations, researchers, practitioners, community leaders, environmental agencies and others to ensure that efforts to manage human-wildlife conflicts are pursued through well-informed, holistic, and collaborative processes that take into account underlying social, cultural and economic contexts.

Given the global extent and urgency, high-level integration into policy, capacity and in implementation is also needed. In December 2022, the Parties to the Convention of Biological Diversity adopt-

ed the new Kunming-Montreal Global Biodiversity Framework which is the first time that a major international policy includes human-wildlife conflict in Target 4: which calls on states to ''Ensure urgent management actions to halt human-induced extinction of known threatened species...., *and effectively manage human-wildlife interactions to minimize human-wildlife conflict for coexistence*.''

To monitor progress towards the targets, the Parties also adopted the draft Monitoring Framework for the Global Biodiversity Framework. The indicator for HWC is included as a component indicator, with the following wording: "*Trends in effective and sustainable management of human-wildlife conflict and coexistence"*. As the institution for convening the development of this indicator, we have coordinated efforts over the last year via an open Working Group. In order to capture the complexity of HWC, we recommended that an accurate and meaningful method for measuring and monitoring HWC would need to include three essential elements: 1) incidences of negative impacts or encounters on people and wildlife, 2) social, cultural, and political willingness to coexist with wildlife, and 3) quality of processes of dialogue, engagement, policy and capacity.

Meanwhile the *IUCN SSC Guidelines on Human-Wildlife Conflict and Coexistence*, published in 2023, provide essential foundations and principles for good practice, with clear, practical guidance on how best to manage conflicts and enable coexistence with wildlife. They are based on five *Principles* and a *Checklist for Good Practice* focusing on approaches and tools for analysis and decision making, and are not limited to any particular species or region of the world. The Guidelines are available in English, French, Portuguese, Spanish and Russian, with German, Arabic and Chinese versions forthcoming. Several governments have already begun integrating the five Principles and other aspects of these guidelines into their human-wildlife conflict national policy developments.

In order to achieve coexistence among people and between people and wildlife, we encourage stakeholders and parties to keep working together, at all scales, across disciplines, sectors, boundaries, and to engage actively with policy to connect science and good practice.

Experience compared: The LIFE BOREALWOLF project in Finland.

Madeleine Nyman[1], Mari Lyly[2] and Iina Ala-Kurikka[1]

[1] Natural Resource Institute Finland

[2] The Finnish Wildlife Agency

Finland has forest coverage of 75 % and average density of inhabitants of just 18.3 persons/km², with much of habitation concentrated in major southern cities. Sheep production includes some 120 00 animals in the whole country. These numbers would suggest good capacity to accommodate the populations of wolf (estimate of *390-444 in November 2022*), wolverine, lynx, and bear. However, challenges still exist, especially with the wolf.

There are human-wolf encounters especially in rural areas, but also in the more densely habitat regions. People experience fear for their safety, e.g., in recreational activities. Hunting with dogs is a popular hobby but also produces services for the society. Risk for depredation is highest in far-working breeds. Livestock rearing suffers depredation in many areas, especially with free-ranging sheep and in new wolf territories, where preventive measures are lacking.

Finland is striving to reach a favourable conservation status for the wolf population. From the 1990's, the population has shown an average annual increase of 10 %, but the growth has not been smooth (figure 1). Instead, it has been sensitive to outer phenomena and pressures, such as legal processes and hunting policy decisions. In addition, few territories in the central parts of the country and the high turnover in eastern areas likely promote to low latitudinal dispersal, resulting in genetical differentiation between eastern and western parts of the population.

To address the challenges of wolf management, the LIFE BOREALWOLF project was launched in 2019. Its key aim is to enhance the overall long-term status of wolf and maintain the long-term population viability of the species in Finland, e.g., via increased acceptance. We want to mitigate the negative effects from wolf via developing management tools, supporting preventive measures against depredation, enhancing DNA-monitoring, increasing public outreach and development of collaboration with stakeholders.

The project used a logical framework using threats as a starting point, followed by the project actions and the outcome (Figure 2). Nine major risks were assessed and prioritized according to probability and level of risk. In addition, a proactive mitigation plan was developed for each risk.

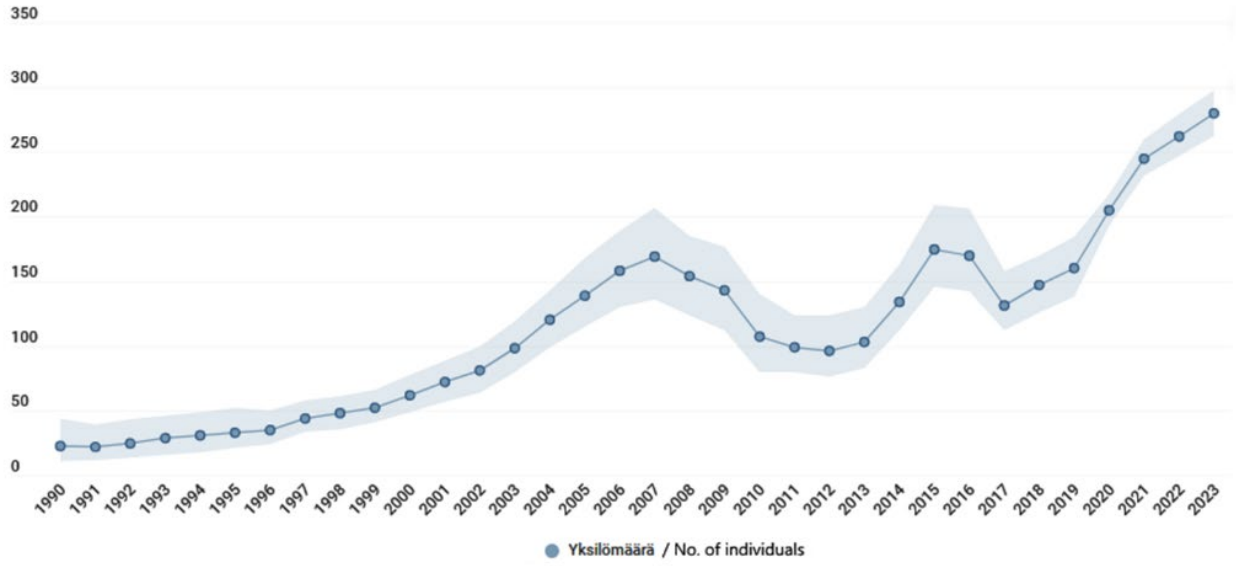


Figure 1. The Wolf population growth has not been smooth but rather altered with decisions and events in the society. The official wolf population size is reported annually in March (291–331).

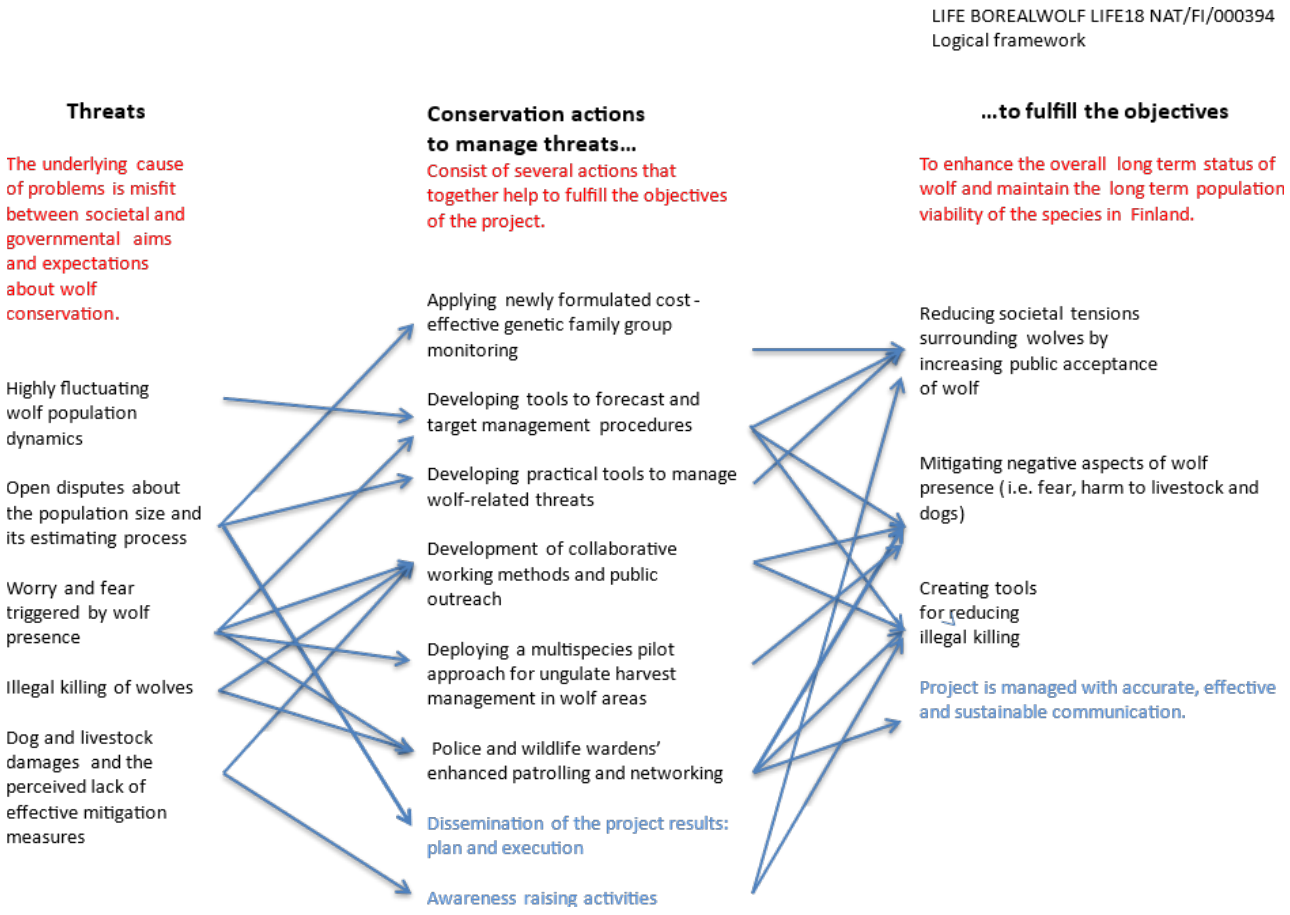


Figure 2. The logical framework of the LIFE BOREALWOLF project, using threats as a starting point, followed by the project actions and finally the outcome of the project.

The risks were reassessed each year, and the mitigation actions were updated. Figure 3 shows the development of the risks during the project. Some risks have remained on the same level while others have changed. As an example, the highest risk for the success of the project and also for the national wolf conservation and management was the "institutional misfit", i.e., a mistrust on the governmental bodies and their operations by the civil society, but also amongst the governmental bodies. It has remained on the highest level throughout the project, and substantial efforts has been put into mitigating this threat.

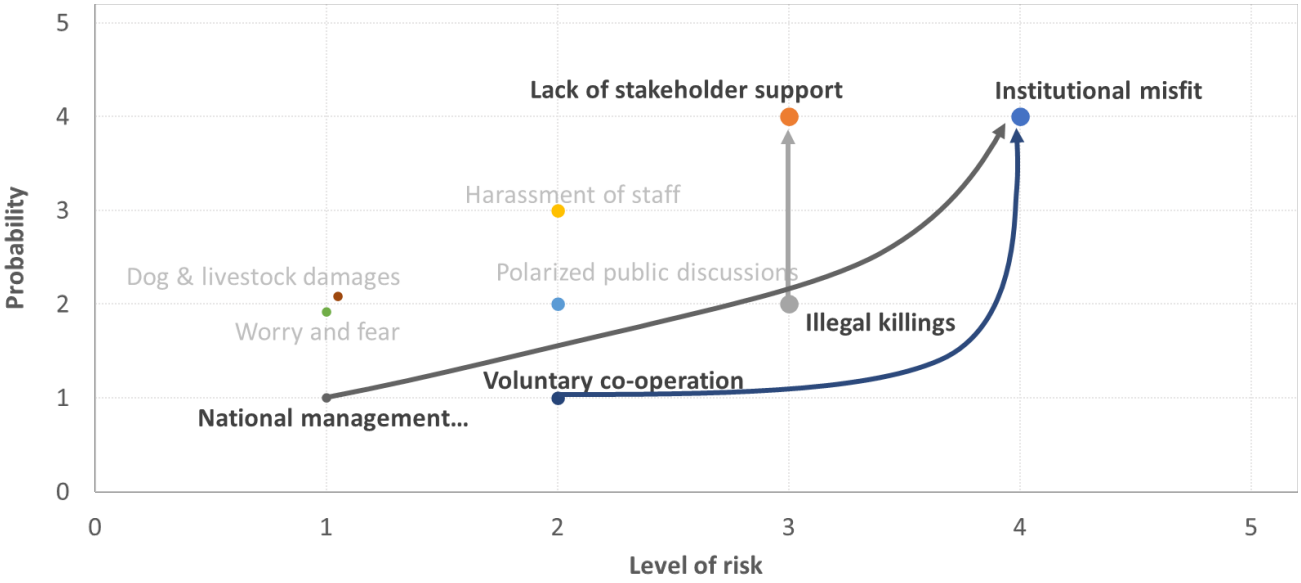


Figure 3. Expected risks related to project implementation and mitigation.

Through the risk and mitigation assessments, the project has evaluated the best approaches and tools for mitigating the human-wolf conflict in Finland. The most important lessons learned are:

1. Local presence of staff. It pays out to allocate resources for communication and face-to-face or "ground-level" work, as it increases the perceived transparency, and helps to create trust and to build long-lasting collaboration.
2. Resilient management. There is a strong need for trust building towards the administration. Trust is vital for mitigating institutional misfit and reshaping attitudes. It also helps to assure continuous collaboration with stakeholders and volunteers through any "rough patches".
3. Stewardship: As a form of actively supporting and motivating people to keep them involved and engaged. Resources, tools, and platforms are provided for the civil society as a part of the management. People, who are involved and engaged, are committed to the shared management goals.

Communicating Coexistence: from Outreach to Public Involvement

Laura Scillitani[1], Marta De Biaggi[2], Maja Sever[3], Giulia Bombieri[1], Anna Crimella[4], Anna Sustersic[5]

[1] MUSE - Science museum of Trento, Italy

[2] Maritime Alps Protected Areas, Italy

[3] SFS- Slovenia Forest Service, Slovenia

[4] Eliante onlus and Lombardia Region, Italy

[5] ERSAF, Italy

Awareness and communication are crucial in conservation biology for promoting human-wildlife co-existence and reducing conflicts. *Coexistence* is a term that has now entered our vocabulary but it was not so when the LIFE WolfAlps EU project began. Still, the term coexistence generates confusion, and it is necessary to work on communicating exactly what it means. In fact, coexistence doesn't imply that all people must have a positive view of the wolf or be happy with its presence. Coexistence encompasses all nuances of human-animal interactions, including conflicts, it is a "dynamic but sustainable state in which humans and large carnivores co-adapt to living in shared landscapes where human interactions with carnivores are governed by effective institutions that ensure long-term carnivore population persistence, social legitimacy, and tolerable levels of risk" (Carter and Linnell, 2016). Possible interactions must be managed, beginning with adequate information.

In the LIFE WolfAlps EU project, which deals with the coexistence of wolves and human activities, we worked on three levels in parallel: dissemination of information, dialogue and collaboration to find solutions. It is important to work at 360 degrees on several messages, developing a communication strategy that is not just focused on dissemination but mainly on involvement, experimentation, and creation of different products with different communication targets. Obviously, being a large-scale project, it is necessary to work on a general reference framework at the international level, which aims at promoting awareness and encouraging participation, but this must be declined on a national and also local scale because of the differences in sensitivity to the issue due to local cultures and habits.

Outreach

In our case, outreach has been a matter of disseminating project results, informing and, in fact, raising awareness on the issue, and helping people develop an informed opinion. Communication about wolves and large carnivores is complex due to people's differing perspectives about them. The wolf has always played a role in our culture, superstitions, fairy tales, legends, books, and films: it is an extremely stereotyped animal in our imagination. On the one hand, it is the ferocious beast; on the other, it is the symbol

of an unspoilt and perfect nature. The wolf, the real animal, is neither! Conflicting stereotypes are also echoed by extremely polarised and opposing visions of society. Most people actually either aren't interested in the topic, or they don't have a clear opinion and knowledge and would like to get an idea. The presence of opposite poles generates confusion and difficulties in finding objective information.

Also for this reason, over the years public events on wolves and coexistence always attracted a large audience. Up to now, 198 public events have been carried out in the project area, reaching about 23,700 people. The project's webpage and socials have a constantly increasing number of followers and visitors (up to now: 13,700 followers on Facebook, 4,000 on Instagram, 5300 newsletter subscribers, and 230,000 unique visits to the project website). This large participation indicates that people want to know more about the wolf subject and request informative events to learn more about the subject and, of course, in some cases, to make criticisms in person.It is important to remember that communication must not be a simple top-down exercise but also, above all, listening and dialoguing. Listening to people is essential and helps to define information campaigns. For example, from the constant request for information on how to behave in case of the presence of or encounter with wolves, ad hoc information campaigns were realized.

Experimenting with new languages is also important and allows to reach new audiences, as we did with the immersive exhibition "Through the eyes of the wolf", which tries to tell the story of coexistence from the point of view of a young wolf in dispersion, passing through anthropized places. To combine storytelling and scientific dissemination, a similar experiment was used to produce a podcast (in Italian) that aims to raise knowledge on wolf behavioural ecology and life history. Another crucial factor for the effectiveness of a communication campaign for coexistence, and in general for nature conservation, is collaboration and networking with other LIFE projects, but also with NGO, associations and even enterprises: this is the case of Lupus in Bufala, the debunking manual created with Facta News, or the Kamishibai and the Italian illustrated children's book, or the Art camps realized in Slovenia that lead to the publication of a illustrated book.

Effective outreach requires engaging with the media, interacting with journalists (so far 9 workshops have been realized and 256 journalists attended), including being available for interviews with journalists. It is also crucial to monitor media coverage and scrutinize how information is presented. We do this by collecting all the wolf-themed articles published in the project areas, so far, more than 4.700 articles have been collected. The press review was done also in the previous LIFE WolfAlps project. Extrapolating from the LIFE Wolfalps Eu data referring to the Italian press review and comparing it with the data collected in 2013-2018 demonstrate that the wolf appears much more in the press in the latest years, but also there is a significant increase in articles with a neutral tone of voice. At the same time, positive tone articles have decreased, but so have the negative ones, even if by less. An increase in neutral tone communication is a piece of good news, because it means that there is a tendency toward more objective communication, although there is still work to do to decrease the extreme news (both negative and positive).

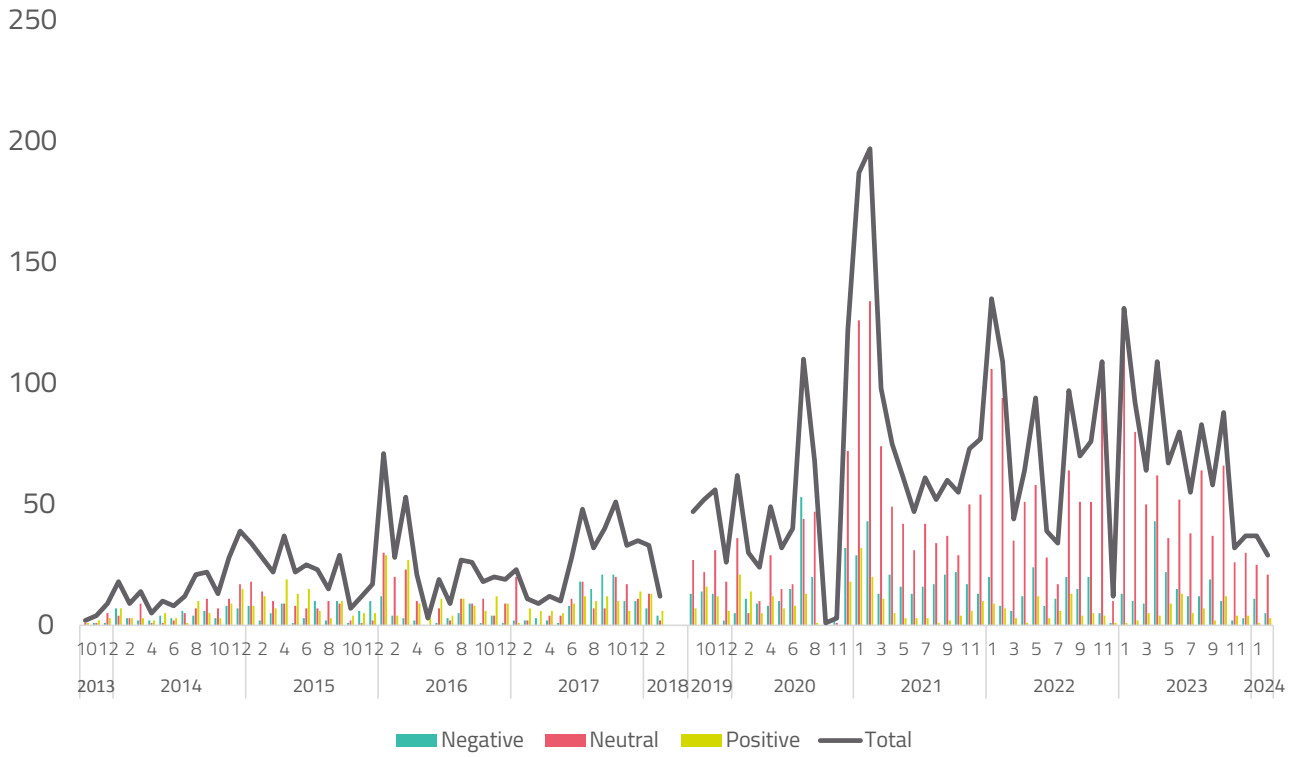


Figure 1. Number of articles about wolf collected through the press review in Life WOLFALPS (2013-2018) and LIFE WolfAlps EU (2019 -2024)

Engagement: platforms and meetings

In the previous LIFE WOLFALPS project, the human dimension survey showed that people with more knowledge about wolf biology and population status tend to support wolf conservation more. This was cross-cutting, but it especially seems important for the general public, farmers and mountaineers. However, the reality is much more complex than that. There are many individual and social factors that shape the attitude toward wolves and coexistence with them. Public engagement and dialogue play a crucial role when dealing with coexistence. Engaging stakeholders is essential for achieving more sustainable, long-term and inclusive decision-making processes, including efforts to reduce or mitigate the negative impacts of conflicts (Young et al. 2023).

A substantial part of the communication we carried out in the LIFE WolfAlps EU project was focused on involvement, dialogue, and interaction with the public. In particular, it is crucial to identify the stakeholders, i.e., individuals or groups that may affect or be affected by the presence of the wolf. In the frame of the LIFE WolfAlps EU project, the identified key stakeholders are farmers, hunters, and environmentalists.

We did this through thematic platforms and stakeholder meetings tailored for each stakeholder. So far, 33 thematic platform dialogue meetings and 112 meetings have been realized, reaching over 1,200 people. In the LWA EU project, every thematic platform is composed of at least 3 stakeholder workshops to promote discussion.

Let's see some examples of how platforms worked.

In Slovenia, thematic platforms were organized to discuss national documents for wolf management together with interested stakeholders - representatives of all major stakeholder groups (from farmers, hunters to NGOs, governmental institutions and researchers, ...). At two events main challenges and possible solutions were collected and later on (as long as it was possible) included in a draft version of the Strategy and Action plan, which were prepared and sent to the Ministry responsible for preparation of the final documents.

In Lombardy Region, the engagement of stakeholders was conducted starting from platforms in which all SHs' categories were involved (breeders, hunters, public bodies, park managers, environmental associations, ...), and then focused on homogeneous categories, in particular breeders and hunters. The main objective, in an Alpine context recently colonized by the wolf, was to be able on the one hand to transmit truthful information, and on the other to initiate forms of dialogue and involvement based on listening to concerns, addressing and managing the existing conflict to arrive at shared improvement actions for coexistence. For this purpose, 4 different stakeholder platforms and 6 thematic platforms were organized, in order to reach the most local level possible. To better manage the conflict, all the meetings were managed by a facilitator, as well as by the technicians involved, who proposed methods and tools that allowed the expression of all the participants as much as possible, bringing out the different points of view present at the meetings (not just the most well-known ones) and avoided arguments as much as possible. All the meetings were organized so that the participants had the perception of participating in a two-way exchange, coming to feel like protagonists of a necessary change in their territory.

To reach the main categories of stakeholder affected by the wolf issue and its recent return to Lombardy, Ersaf organised 16 meetings in different parts of Lombardy. The aim of the meetings was to provide practical information, specific to each category, on the wolf in terms of biology/ethology, current and historical distribution in Italy, but above all on the consequences of its return and practical tools to manage coexistence. Point of interest in this initiative was to understand what the mood and disposition towards the wolf might be in a situation in which the wolf's presence had not yet manifested its full potential, in terms of damage and perception. In order to explore this last aspect, questionnaires were drawn up, specific to each category, which were administered before the start of the meetings, asking participants to fill them in before the experts intervened (Total of 276 questionnaries collected on a total of 354 partecipants). The results showed a climate of relative openness towards the wolf, certainly due to a lack of knowledge of the wolf and its impact, but also, probably, to the success of previous communication actions carried out in the area.

Engagement: the stewardship program

The Stewardship Program of the LIFE WolfAlps EU project was created to go beyond the more classical engagement approaches through meetings and platforms, and aims to experiment new ways of engaging stakeholders who want to interact with the project in terms of ideas, knowledge

building, and pilot actions. Through the Program the project has made available time and resources to experiment with novel collaborations with stakeholder groups that are external to the project and are interested in remaining so, not least because they may have divergent viewpoints. This is because we believe that differing viewpoints can be a strength rather than a weakness in developing better models of wolf-human coexistence in the Alps.

The concept of Stewardship has been applied with several nuances, and can be summarized as follows: "the responsible use (including conservation) of natural resources that takes into account, in a comprehensive and balanced way, the interests of society, future generations and other species, as well as private needs, accepting a responsibility to society" (Worrell and Appleby, 2000). The concept applied to wolf conservation implies that the wolf is to be considered everyone's business and, thus, all stakeholders have to take part into its conservation and management, primarily the stakeholder categories most affected by its presence: farmers, hunters and environmentalists. These are the categories identified by the project as "key" in wolf conservation and management, although there is a greater number of stakeholders who play important roles in this topic.

In the LIFE WolfAlps EU project, therefore, the Steward is that stakeholder who decides to get involved and actively interact with the project. In the controversial issue of human-wolf coexistence, each Steward is different and there are many ways to "take part" and "be responsible." Just as coexistence is fluid and dynamic, so is stewardship, co-design, care, and participation in seeking solutions to share spaces with wolves. Main goals of the Program are 1) build a network of stakeholders and project partners interested in taking action (even after the project), 2) collect and share points of views, ideas and best practices, 3) create and develop concrete actions and good practices to improve coexistence, and 4) experiment new ways of engagement in general.

We engaged 29 Stewards who contributed to develop and amplify many of the project lines, ranging from wolf monitoring to education and communication. Stewards helped the project improve and share its messages while benefiting from the project network, expertise and resources to develop new ideas for coexistence and take part into wolf management and conservation.

In the Stewardship Program Booklet, which is the final product of the action, we summarized meanings, working steps, benefits and achievements but also challenges and lessons learned from this engagement experience.

Promoting coexistence through Education and the Young Ranger program

Marta De Biaggi[1], Laura Scillitani[2], Vesna Mihelič Oražem[3], Rachel Berzins[4], Irene Borgna[1], Manca Velkavrh[5], Sabina Colturi[6] and Elisa Iacona[6]

[1] Maritime Alps Protected Areas, Italy

[2] MUSE - Science museum of Trento, Italy

[3] SFS- Slovenia Forest Service, Slovenia

[4] Mercantour National Park, France

[5] University of Ljubljana, Biotechnical Faculty, Department of Biology, Slovenia

[6] Stelvio National Park-Lombardia, ERSAF, Italy

Education, based on solid knowledge, should be like a window which helps to expand our horizons and develop critical thinking. The natural environment is an open-air educational laboratory. Through an active, cross-curricular and emotional approach it is possible to develop interconnected concepts on biodiversity and human-nature relations. And this is the very essence of outdoor education. Moreover, learning is a lifelong process that needs to be stimulated. This is why, with the LIFE WolfAlps EU project with this action we chose to address all school levels, teachers and nature guides.

Stimulating curiosity is central to education and learning, and the wolf is without a doubt one of the most attractive and fascinating animals that has struck the imagination of humans from the earliest times. The wolf has, therefore, become an engaging topic to help meet a wide variety of science, social studies, arts, and physical education objectives and standards. Park staff and external collaborators have created several educational programmes and toolkits that were very well received by teachers and students, beyond our expectations, also outside the project's borders: summer schools and training for teachers and students, experts in the classroom, roleplay and debate, "A wolf in a backpack" tool kit, l'Albero dei lupi kamishibai theatre, Wolfquiz, the book I lupi delle Alpi.

Let's give some numbers: 14 partners involved, 2200 kids from nursery to high school reached plus from additional activities, 630 university students, 706 teachers trained, 80 workshops for kids, 9 conferences for University students, 19 teachers training courses, 4 summer schools. This is just to show the great interest generated by these initiatives across the Alps and beyond. These encouraging results have given a new input to the educational sectors of the parks involved, so that several of them included the didactic packages in their annual offer to schools. And we all need to consider that these important results were reached despite the difficulties caused by the pandemic that brought a sudden shutdown of the activities for a long time.

As an example, in Slovenia, we have reached more than 1000 kids from kindergarten to high school

with educational activities based on our research knowledge and experience from previous projects. The main focus has been on a student-centered approach involving hands-on activities. The aim was therefore on carrying out activities in a changed learning environment (i.e. visiting a forest), experiential learning (e.g. through working with biological materials and replicas), problem-solving (DNA extraction test), and art to influence also the emotional component and interest to learn. In addition to the delivery of educational workshops, we have also developed a toolkit for educators, which includes both activity ideas and teaching materials, such as replicas of large carnivore skulls, footprints and scats. The purpose of the kit is to facilitate the work of educators in order to ensure that students are actively engaged in learning.

We involved livestock breeders to present their first-hand experiences of coexistence with wolves at secondary schools. The presentations were followed by a role-playing game. This approach was intended to give students an insight and experience into the multidimensionality of stakeholder dialogue, which is a key part of wolf management and conservation. The key purpose of this approach is to promote the development of students' social competences, so that later in their careers as relevant stakeholders they will be able to openly discuss such issues. The key goal is to establish tolerance among the younger generations. Tolerance is an innate psychological trait, as well as a liberal attitude, which is more present among younger people, and also a learned skill, due to which its development can be changed during the education process. We are currently analyzing the aforementioned approach using a role-playing game, and the data obtained will serve as a guideline for planning future communication and educational activities in this area.

The Stelvio National Park in Lombardy, Italy, has invested many human resources in bringing the difficult issue of man-wolf coexistence to the attention of young people. The use of the kamishibai for children from 3 to 6 years old seemed the best way to provide children with scientific information through the narrative form; the high school students, after an informative day, met a breeder who has coexisted with the wolf for years, and then went on an excursion in the territories where sheep farming and the wolf are in conflict. Students were very interested in the shepherd's life and the techniques he used to protect his livestock from wolf predation.

In France, every year, the Mercantour National Park welcomes several hundred thousand tourists, with the highest numbers in summer. Summer is also the season when flocks of sheep are brought into the mountains by farmers and shepherds to graze all summer long. Hikers and tourists come from all over France, and don't always know the mountain environment well.

To raise awareness among tourists, the park recruits 6 pastoral mediators each year to meet them on hiking trails, in mountain refuges and tourist offices, to talk about pastoralism, why there are sheep flocks and impressive livestock guarding dogs (LGDs) nearby. To animate these discussions and workshops, the park has created a special wolf in the back pack.

The backpack contains 6 games to inform tourists about the different species of dogs, to recognize LGD from herding dogs and especially know how to behave in front of them, what to do and what not to do in case of an encounter.

Another game has been created to show that a mountain is a place to share between wildlife, leisure (hiking, mountain biking) and professional activities (sheep farming, wildlife monitoring). The idea is to respect each other's activities and needs and learn to live together in a shared space.

Every year over 5,000 people are reached by these pastoral mediators. Better informed tourists about the mountain environment and its issues at stake will promote coexistence and avoid conflicts particularly with LGDs, as they will know what gestures and behavior to adopt.

The Young Ranger program

There is strong scientific evidence that environmental education - understood as both a transfer of scientific knowledge and an empathetic and emotional experience in contact with the natural environment - is an effective tool in support of conservation biology.

If we can teach people about wildlife, they will be touched. Humans only want to save things they love.

The Young Ranger program is inspired by the popular Junior Ranger program, which networks the protected areas of the American National Park Service. The program is aimed at kids between the ages of 7 and 12 visiting nature parks and other access points and aims to train them in curiosity and empathy about the natural world by passing on in the meantime some important scientific concepts through play and active exploration of the surroundings.

The main tool of the program, shared by all the partners of the program, is an activity booklet dedicated to the wolf, where, however, the wolf is mainly the picklock to open the door of curiosity and talk about biodiversity and coexistence.

To gain the Young Ranger badge, the kids need to visit one of the Protected Areas, museums or wildlife centres of the Young Ranger Network. The first time the visitor will receive an activity booklet to complete and a "passpark", a kind of park passport where you can collect the stamps of the protected areas you have visited. Once completed the booklet the kid will receive the Young Ranger badge and the park stamp. A true Young Ranger doesn't stop: Some protected areas (the ones coloured blue on the map) have, in addition to the booklet, special posters with games to complete that will take the kids on a discovery tour of the special rocks, animals and plants of each area.

9000 Kids have been actively involved all over the Alps (5000 were expected) in the framework of the Young Ranger Program (Action C8), becoming "biodiversity conservation ambassadors". The initiative has aroused great interest, in fact the Parks/Museums/Wildlife areas participating in the program are currently 39, 10 more than initially expected, 90 events to involve local kids were already achieved (90 are additional) and 56 Young Ranger celebration days have been realized (12 expected, 44 additional).

The success met by the YR program together with the implementation of a school version of the program by APAM grants its continuation also after the end of the project providing sustainability to the project.

The Young Ranger program was an opportunity to renew already strong cross-border ties, including through the synergy between EUROPARC's Junior Ranger program and LIFE's Young Ranger

program. In example, the sinergy between the two programs allowed to carry out activities in Triglav National Park targeting youngsters living in the national park or its immediate surroundings.

The Stelvio National Park in Lombardy, Italy, conducted activities for children aged 6 to 11 aimed to deconstruct the idea of the bad-good wolf handed down by our culture and to promote understanding of the biological and ecological characteristics of the wolf.

The activities for students aged 11 to 13 took part in interactive classroom lessons during which they actively learnt the basics of good and lasting coexistence with the wolf.

The LIFE WOLFALPS EU project works to improve coexistence between the wolfand the people who live and work in the Alps and the Ligurian-Piedmontese Apennines by building and implementing shared solutions together with stakeholders to ensure the long-term conservation of the wolf in the Alps and along the Apennine corridor. LIFE WOLFALPS EU operates throughout the Alps and the Ligurian-Piedmontese Apennines, involving twenty Italian, Slovenian, French and Austrian partners and dozens of Institutions and associations that support the project.

This conference was realized with the financial contribution of the LIFE Programme, financial instrument of the European Union.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

rtners

Pa

Aree Protette Alpi Marittime

Aree Protette Alpi Cozie

Aree Protette Appennino Piemontese

Aree Protette dell'Ossola

UNIVERSITÀ DEGLI STUDI DI TORINO

TORINO METROPOLI
Città metropolitana di Torino

eurac research

MUSE

OFB
OFFICE FRANÇAIS DE LA BIODIVERSITÉ

DOLOMITI BELLUNESI
PARCO NAZIONALE

HBLFA
Raumberg-Gumpenstein
Landwirtschaft

REGIONE LIGURIA

Regione Lombardia

ERSAF
ENTE REGIONALE PER I SERVIZI ALL'AGRICOLTURA E ALLE FORESTE

Parc national du Mercantour

Région Autonome Vallée d'Aoste
Regione Autonoma Valle d'Aosta

ZAVOD za GOZDOVE SLOVENIJE

Univerza v Ljubljani

vetmeduni

o-financers

C

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA OKOLJE IN PROSTOR

Fondazione Capellino

FONDATION PRINCE ALBERT II DE MONACO

PRÉFET DE LA RÉGION AUVERGNE-

Federal Ministry
Republic of Austria
Climate Action, Environment, Energy, Mobility, Innovation and Technology

FONDATION FRANÇOIS SOMMER