Tracking large carnivores and tackling communication challenges

Summary of an Alfred Toepfer Natural Heritage Scholarship



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Alfred Toepfer Natural Heritage Scholarship

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Introduction

This summary only reflects a very subjective view of the author. The Europarc Federation, Alfred Toepfer Stiftung E. V. S. and the respected national park directorates are not responsible for any use that may be made of the information it contains.

Personal motivation on the Scholarship

I have applied for the Alfred Toepfer Natural Heritage Scholarships to widen my knowledge on Large Carnivore (LC) co-existence and local involvement abroad. I graduated from Szent István University (<u>SZIU</u>), where I studied wildlife management (BSc and MSc). I received my PhD on carnivore monitoring methods in 2017 during my work at the International Council For Game and Wildlife Conservation (<u>CIC</u>). After one year working in this sustainable use and hunting related INGO I decided to move to <u>WWF Hungary</u>, where I became the project coordinator of the Large Carnivore Conservation Programme. Here, finally I could meet with various stakeholders and based on certain consensuses we can try to implement good practices.

Fortunately, I have some experience in research (SZIU), hunting (CIC) and nature conservation (WWF) related fields, which makes it easier to liaise among different stakeholder groups. The multidisciplinary approach that I follow and the openness towards stakeholders are far from enough.

Large carnivore populations in Hungary started to increase but we don't have a sound nationwide monitoring method. We also lack the knowledge to speak with credibility about certain questions. It's hard to speak honestly about damage mitigation measure if one has not experienced in real life how these techniques work. I firmly believe that there are certain measures that can be put in place in order to mitigate Human-Carnivore conflicts, but without personal experiences stakeholders would hardly believe in me.

Experiencing how Italian (*Alpi Marittime*) or Transylvanian (*Cheile Bicazului-Hăşmaş*) sheep herders found the way to co-exist with relatively high wolf and bear population densities, or finding out how Slovakian (*Cerová vrchovina, Malá Fatra*) conservation experts

carry out their long standing monitoring on LC species can help me to be more credible in the eyes of researchers, livestock keepers and hunters.

Based on the scholarship I have received immediate benefits both for Hungarian national parks (*Bükk*) and the people living in those parks. Thanks to the Alfred Toepfer Natural Heritage Scholarship I have also started a youtube channel (<u>Notes From the Field</u>), where my study trip can be followed by anyone through interviews with local stakeholders.

My main interest with the study trip is to find out how can people co-exist with large carnivores. For this, I believe that two things have high importance:

1. Clear scientific data (based on regular and reliable monitoring), and

2. Sensitization of stakeholder towards carnivores, as well as developing consensuses among stakeholders and conservation actors.

These goals were investigated during my study trips with personal interviews and fieldwork.

Professional relevance of the Scholarship

Estimated numbers both for wolves (*Canis lupus*) and brown bears (*Ursus arctos*) in Europe are about 17.000 individuals and trends seem to continue increasing [1, 2]. Eurasian lynx (*Lynx lynx*) population estimation gives us a rough number of 9.000 individuals. After these carnivores were persecuted to extinction prior to World War II in most parts of our continent [3], last decades where symbolized by a rapid recolonization of the wolf and other species into areas where its natural occurrence had fall into oblivion. Despite the fact that these landscapes have already been seriously altered by humans [4], environmental awareness and protective legislation towards large carnivores is leading to its fast expansion and, at least, one common feature across the different European countries: carnivore return provokes opposite opinions in society.

The ecological need for large prey and expansive habitats often puts these species in competition with stakeholders for livestock and with hunters for game. On the other side, defenders of the carnivores feel their recolonization as a success of well managed habitats and a reason of national pride. However, and in contrast to large protected areas found in

other continents, the human-dominated European landscape is marked by fragmented natural spaces where large carnivores can and have to coexist with humans [5]. Such Coexistence scenario has to involve not only a reduction of damages but also an increase of public tolerance [6] that should be reached first by bringing accurate information to society and especially to those people directly affected by the presence of wolves.

Large carnivores generate both, costs and benefits [7, 8]. Costs, mainly associated with livestock losses and other rural activities, can be easily evaluated on a local scale because they are captured in a normal economical market. In contrast, benefits occur normally on a broader range where profits from nature for human civilization are often difficult if not impossible to asses [7]. There is a need to balance cost and potential benefits for human-dominated ecosystems living with wolves [9] in order to create a consistent and acceptable management plan for both, conflict mitigation and successful wolf conservation.

In favour of a factual analysis of wolves' positive and negative impact, the popularisation of unreliable opinions and theories should be replaced by current ecological knowledge [10]. Currently, media pressure around this predator is already partly responsible for maintaining the negative image that decades ago was achieved with story tales. At the same time, the widespread benefits associated with wolves often remain unclear [9] or are unrealistically exaggerated in society.

Ecosystem services are often difficult to determine since beneficial effects deriving from nature frequently do not correspond to a direct measurable economical profit. Large carnivores' ecosystem services can vary widely.

"Existence" value. Although there are difficulties in evaluating the economic value of such an ethical question, the simple presence of this charismatic species should be taken as a conservation value itself [7]. Many people proudly revere carnivores and consider their presence as an indicator of well managed habitats. Especially nowadays, where World's biodiversity decline has become a serious and powerful topic to society, the existence of these species in our ecosystems represent a significant natural and historical legacy that should be preserved [11].

Tourism. Wolves, as other emblematic large carnivores, host a measurable value of "non-consumptive" tourism [7]. For example, wolf-watching tours in Yellowstone NP are estimated to produce an average income of \$35 million per year [9]. Even though a European scenario for large carnivore related exploration outside of an enclosed National Park can appear challenging, further steps should be taken in the direction of photographic and recreational tourism as a direct source of economical income.

Biodiversity. It is known that predators, by their ecological nature, have an immediate impact on their main prey and consequently on all their underlying trophic levels. In this context, large carnivores "eat in favour of nature", whose effect starts with their predation on ungulates. The reduction of cervids densities will often lead to a recovery of vegetation and changes in the dynamics of elemental processes [9, 12]. Especially the restored plant community in riparian zones will promote new habitats from which insect, bird and other mammal populations can profit and consequently the extensive biotic and abiotic effects related to them.

Deer behaviour. Because of the loss of their natural predator, deer behaviour has shifted to open areas where grazing is easily accessible. This is not only affecting directly the plant community whose productivity is drastically reduced by ungulates feeding on young sprouts, but has also a significant effect on pastoralism [13]. In this context, the so called "ecology of fear" caused by carnivores, especially wolves on cervids dynamics can have an even stronger effect than the predation itself [14]. Still higher financial compensations in North America and Europe are invested in damage caused by deer than wolfs predation on livestock [14, 15]. On the other hand, hunter groups are often opposed to the conservation of large carnivores because their predatory nature puts them in direct competition for game. Nevertheless, and despite hunting efforts, deer population numbers without predation are increasing consistently across Europe [17, 18]. In contrast to hunters, large carnivores are hunting all year-around and many times away from human access points [9]. Additionally, hunters are frequently prone to selective shooting of valuable individuals while carnivores' prey selection is mainly shifted towards vulnerable animals such as weak, sick or young

individuals [19] thereby contributing to a healthy structured deer population from which also hunters can benefit.

Plant communities. Due to the predatory effect, carnivores' limitation of deer density will allow the natural flourishment of young plants in open grasslands and riparian areas [20]. The restoration of a functioning plant community might create new habitats permitting on one hand, the establishment of natural insects, birds and other mammals groups [21] and, on the other hand, a long-term reforestation effect with hardwood trees [20] from which ecosystems and humans can take an advantage.

Riparian restoration. The suppressed riparian vegetation by herbivore browsing has a direct impact on rivers' morphology and functioning thereby reducing also the plant and animal diversity linked to it. By limiting deer's overgrazing, carnivores, especially wolves indirectly contribute to the growth of riparian trees [22] increasing the quality of the environment for aquatic related plants and animals. First, the cooling effect of trees on shadowed streams provides adequate climatic and cover conditions for fish, amphibian and insect communities as well as for other mammals, e.g. the beaver (*Castor fiber*), whose engineering role in certain riparian ecosystems is showed to be beneficial for underlying trophic levels [22, 23]. Second, the reduced bank erosion given by the riparian tree community will enhance water quality and flood control [9, 21] hence offering multiple beneficial effects on aquatic and terrestrial ecosystems.

Invasive species. The extent to how carnivores can control the spread of invasive species in the European community remains unclear. In Australian's ecosystems for example, a large body of research has found the positive predation effect of apex carnivore dingo (*Canis lupus dingo*) on the invasive mesopredator red fox (*Vulpes vulpes*) therefore contributing to the recovery of native small-sized mammals [8, 12]. However, to our knowledge no research has found predation of wolves on some of our most common invasive species such as the Raccoon (*Procyon lotor*) or the

Raccoon dog (*Nyctereutes procyonoides*) therefore leaving his role as large carnivore on "mesopredator release" an open question to respond with further research.

Scavengers. Predators also show a great impact to nutrient cycling by enhancing scavenger diversity. Large carnivores do not always fully consume their prey and sometimes abandon the carcass to reduce the risk and energy of defending it [9, 25]. This biomass will be used by other groups of animals (e.g. carrion beetles, hawks, eagles...) and by decomposers such as bacteria and fungi who will transform this food source into inorganic matter that will enrich the soil thereby closing a natural food cycle that promotes a healthy and functioning ecosystem [25, 26].

Disease regulation. Carnivores, preying often on sick animals, reduce on one hand infection possibilities inside prey populations and indirectly reduce the impact of diseases on domesticated species [27]. In this context, livestock can benefit from the presence of wolves in the extent of limiting ungulates densities and the possible spillover effects of diseases to them. For example many researchers support the maintenance of viable wolf populations in Canada in order to mitigate the transmission of bovine tuberculosis (*Mycobacterium bovis*) from wild ungulates to domestic livestock. Predation on sick ungulates can therefore lead to an economically sustainable agriculture and contribute to humans' and animal's health [28].

Locations

I have chosen Italy (Alpi Marittime Natural Park) as my first place to learn more about local involvement and co-existing with LC species, especially wolves.

The two following locations (Slovakia: Malá Fatra National Park, Lanscape Protected Area Cerová vrchovina) have been chosen to find out more about monitoring methods. At these locations wolf and bear populations are stable or increasing and data collection with different techniques has a long history in Slovakia.

My third destination was Transylvania (Romania). The Carpathian Mountains is a stronghold for LC species. Approximately 40% of Europe's brown bear population lives in this one country. Most of them in Hargitha County, where **Cheile Bicazului-Hăşmaş National Park**, my penultimate stop, is located. Romanian people have a long standing relationship with bears, which has its ups-and-downs but co-existing, nevertheless, is necessary and long standing between them. I wanted to know how they have achieved high bear population densities, while urbanization and human population were also skyrocketed.

My last stop was **Bükk National Park**, where one of the two wolf populations can be found in Hungary. In these forests, migrant individuals of bears occur every now and then and lynx also has a stabile presence. With increasing wolf densities, conflicts also have increased.

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Contact person	Position	Location	Main focus	Secondary focus	Stay
Irene Borgna	Communiction Officer	Alpi Marittime Natural Park	Co-existence best practices with wolves.	Visiting locals with personal experience with large carnivores.	May (2019)
Michal Kalas	Director	Malá Fatra National Park	Monitoring methods on wolves and bears, visiting suitable habitats, comparing habitats between HU and SK.	Visiting WWF SK (Jergus Tesak) to map future cooperation possibilities.	Summer (2019)
Csaba Balazs	Zoological officer	LPA Cerová vrchovina	Monitoring methods on wolves and bears.	Mapping connectivity between HU and SK, addressing bi-linqual locals.	Summer (2019)
Barna Hegyi	Director	Parcul Național Cheile Bicazului- Hășmaș	Co-existence best practices with bears, local involvement.	Visiting Lake Sfanta Ana (Dósa Elek Levente), mapping bear proof equipment.	Autumn (2019)
Peter Gombkoto	Chief zoological office r	Bükk National Park Directorate	Sharing experience from previous study trips, visiting wolf and lynx habitats.	Organizing possible workshop/conference on coexistence.	Winter (2020)

Parco Naturale Alpi Marittime (*Tengeri Alpok Natúrpark*)

The main part of the Park is Valle Gesso with the villages of Valdieri and Entracque. The other side of the protected area is in Valle Vermenagna, and the upper Val Grande. I have spent two weeks in between the above mentioned villages near to the Wildlife Centre "Uomini e lupi" ("Men and Wolves") in the national park's headquarters (Casermette).

The Wildlife Centre is a unique place with an exceptional structure and well-thought system. The Centre offers to visitors the opportunity to better discover the wolf, its biology, ecology, and behaviour. With this a way opens for them to form a conscious opinion about this large carnivore. The Centre also creates an attraction that can become a valid alternative to forms of mountain tourism characterized by a high environmental impact: like, skiing facilities. Therefore, the wolf can prove itself as an opportunity for the local economy. The Centre consists of two parts. One is in Entracque and the other one is in Casermette. They linked to each other with a touristic trail, which has several dissemination information boards on the wolf. If one would walk through the trail he or she would end up in Casermette or Entracque. The Casermette part of the Centre includes an enclosure of about 8 ha housing some specimens of the Italian wolf (Canis lupus italicus). They are individuals that could not live in the wilderness anymore, because they have suffered serious accidents - likely traffic accidents - or because they were born in captivity. The other part of the Centre, in Entracque, is about global and local wolf legends and mythology. One can virtually travel across the globe to find out what people think about wolves. The uniqueness in the Centre lies in the fact that these two parts are separated from each other, yet connected with a trail in the forest. This symbolizes that legends and biology are both important when we form our opinions about wolves.

I've learnt that Italy in general won many LIFE projects, in fact the European Union awarded the WolfAlps LIFE project with a Life Award during my stay. The Alpi Marittime Nature Park was the lead of this project. The project is about coordinated conservation actions in the Alpine regions of France, Italy and Slovenia, in order to minimise conflict among people and improve co-existence. This involved protecting livestock with prevention measure. The project also worked on increasing the tolerance level of hunters, shepherds and local communities. As a result, the number of wolf packs doubled in the Alpine pilot region and the species increased its range by 2000 km.

I managed to have discussions both with the livestock keepers and nature park personnel. Click for the videos to listen **Irene's**, **James's** and **Michele's** opinion on wolves:



Chránená krajinná oblasť Cerová vrchovina (Csereshegység Tájvédelmi Körzet)

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The Protected Landscape Area was established in 1989. Cerová vrchovina is one of the 14 protected landscape areas in Slovakia. It is situated in the Cerová vrchovina Mountains, part of the Western Carpathians, in southern Slovakia. It is in the Rimavská Sobota, Poltár and Lučenec districts. From south the Hungarian border is the end of the Landscape Area. The area is 167 km² of mountains, it excludes all urban areas, except Hajnáčka and Šiatorská Bukovinka villages. The highest hills are Karanč (729 m) and Šiatoroš (660 m).

I have visited Cerová vrchovina in the late summer period. Most of my days were on field. With the Landscape Area crew we managed to visit several camera traps and collect occurrence data of large carnivores based on indirect signs (eg. scat, track). This location is of uttermost importance for the Hungarian large carnivore population since the green corridors of Cerová vrchovina are connecting the populations of the Bükk mountains. Without this connection the genetic segregation would lead to a probable decrease of the Hungarian large carnivore populations (Source-Sink Theory). Many professionals at the Landscape Area are currently working on locating these green corridors because of a highway plan that can potential cut the two country's large carnivore populations if it is planned poorly.

I was discussing co-existence and connection related topics with **Csaba** and **Gyula** in the Cerová vrchovina Protected Landscape Area. Click for the videos:





Národný park Malá Fatra (Kis-Fátra Nemzeti Park)

Malá Fatra is the westernmost Slovak high mountains. It is situated between Nitrianske Pravno, Strečno and Zázrivá. The park consists of two parts separated by the river Váh: Lúčanská Malá Fatra and Krivánska Malá Fatra. The Krivánska part of the Malá Fatra Mountains was designated as a Protected Landscape Area in 1967, later it became a National Park. The park is 226 km² with many unique species, and with one of the highest brown bear abundance in Europe. The highest peak is Veľký Kriváň (1709 m). Other important peaks are

Veľký Rozsutec (1610 m), Malý Rozsutec (1343 m), and Malý Kriváň (1671 m). The forest mostly consists of pines, oaks and beech but in the higher regions precious dwarf pinewoods can be seen. The administration of the National Park seats in Varín.

I have spent about a week in the headquarters of the park in Varín. For a few days we were visiting Sramková and Mincol strictly protected forest reserves. We were looking for potential bear den sites, since I have arrived about a two months earlier then the bears start to look for these sites. When we have found a potential den site (eg. cave) we have installed a camera to see potential future bear movement around the site. We have found several field signs as a proof for high bear densities. A live catching trap was also checked for captured individuals, but only the camera has recorded a bear sniffing around the trap. The most important topics that came up were the tourist-bear co-existence, the high numbers of traffic incidents and bear abundance monitoring.

Related to the abundance monitoring, genetic sampling is frequently done in the national park. The heteroyzgosity of the bear samples collected for years in the park ranged from 0.63 to 0.73. This mtDNA diversity revealed relatively high levels of genetic variation comparable to Scandinavian or North America brown bears. The non-invasive tracking of bears also revealed that the bear censuses based on visual observations and track signs are probably overestimated.

Habitat fragmentation caused by transportation infrastructure is an issue of growing concern worldwide and this can affect landscape permeability for brown bears too. National Park researchers found that the traffic volume with distance to forest and grassland were the most influential factors in bear selection of road–crossing sites.

Throughout 10 years long period (2007-2017) national park employees found out that bear mother's litter size is about two cubs and the average bear density is 16 (4-28) individuals/100 km² in the park.



Photos from left to right, top to bottom: (1) large metal live catching trap for capturing brown bears, (2) bear den with last year's nesting material inside, (3) bear tracks, (4) bear claw prints on deadwood, (5) bear print on the side of the trap, (6) a young bear recently killed in a traffic accident.

Video footage of the bear, hanging around the live catching trap. We couldn't capture it during my stay in the National park:

Parcul Național Cheile Bicazului-Hășmaș (Békásszoros-Nagyhagymás Nemzeti Park)

The Cheile Bicazului-Hăşmaş (Bicaz Gorges and Hăşmaş Mountains) National Park is located in Eastern Romania (Transylvania, in Neamţ and Harghita counties). The park administration is located in Izvorul Mureşului, where I have stayed for about two weeks during my study trip. The park's most important features and touristic attractions are the Cheile Bicazului (Békás-szoros) and Lacu Roşu (Gyilkos-tó). The park is ~6500 ha, and divided into two zones: a special conservation zone (78%), and a protection zone (22%).

This part of the Carpathian Mountains is very diverse, with 1147 superior plant species. Many of their forest are pure spruce forests but there are beech and oak forests on the mountain slopes. At higher elevation the vegetation is sub-alpine. The fauna of the park is very rich in rare and endangered species. Beside many invertebrates, we can find the "classic" Carpathian species in high densities, such as the wallcreeper (*Tichodroma muraria*), rock bunting (*Emberiza cia*), raven (*Corvus corax*), Capercallie (*Tetrao urogallus*), Ural owl (*Strix uralensis*), and all three large carnivores, the bear (*Ursus arctos*), the Eurasian lynx (*Lynx lynx*), and the grey wolf (*Canis lupus*).

During my stay I had the chance to observe bears in the wild at feeding sites, but I was lucky enough to see a cub in urban environment too. Despite all the media attention, people got used to this phenomenon. Everyone I talked to, told me that bears can be annoying and often dangerous, but it has always been like this. Only that with the Internet and media accessibility everybody knows about this now. Beside my stay at the National Park, I managed to talk about co-existence issues with a professor at the Babeş-Bolyai University (Cluj-Napoca). To ease communication among different stakeholder groups, participative large carnivore platform was established in a bear county. The aim is first to stakeholders try to understand each other, then they can focus on concrete problem solving.

At Lake Sfanta Ana I gathered information on tourist-bear coexistence. This was a useful part of my journey not only because I received an insight on technical details of fences and electric fences, but also because I could actually see how prevention measure lower the cases of human-bear conflicts. When I first visited Lake Sfanta Ana a few years ago, bears were everywhere, even during the daytime and even mothers with cubs. During my study trip in autumn I have seen no bear around the lake, but also no barbecuing tourist or trash. Bear safety bins were established, problem individuals were captured and trash collection is regular, as well as using bear spray as aversion equipment. Camping and barbecuing is forbidden now.



Photos from left to right, top to bottom: (1) sign at Lake Sfanta Ana, (2) bear safety bin attacked by a bear in vain, (3) "Bátor" ("Brave"), the kuvasz, livestock guarding dog at the national parks headquarters, (4) view at the bear country (Eastern Carpathians).

Click to see our discussion on human-bear co-existence at Lake Sfanta Ana with Levente:



Bükk National Park (Bükki Nemzeti Park)

Bükk National Park is a national park in the Bükk Mountains near Miskolc (northern Hungary). Founded in 1976, it became the third national park in the country. It is approximately 430 km², mostly forested area. In these forested areas there not only large carnivores (all three species, although in low densities), but ninety species of nesting birds, some considered endangered.

During my stay I was in Eger at the national park's headquarters. Together with the NP employees we have started to organise a regional livestock damage prevention conference. This study trip was exceptionally good for further collaboration. We have managed to visit several livestock keepers at Pálháza, Bercel and Domaháza. Beside conference organization and networking with shepherds we were doing regular monitoring with the national parks zoological officer. This was a good opportunity to gather field experience that can be shared in WWF Hungary's environmental education programme (see pictures below).

After some discussion with national park personnel we came to the conclusion that all previous study trips shared one common methodology, which is the **participative approach**. This is about a fundamental fact of listening to others. Sounds easy, however it's often hard to implement on a daily basis. Our conference will be organized jointly with Sheep and Goat Breeders National Association and with Bükk National Park Directorate. This is going to be the first step to establish a trust-based participatory network with different stakeholder groups (eg. conservationists, livestock keepers) in this region.



Photos from left to right, top to bottom: (1) roe deer, (2) wild boar, (3) dog, (4) wolf.



Photos from left to right, top to bottom: (1) fox, (2) wildcat, (3) badger, (4) red deer.

Discussion

During my study trips from May, 2019 to February, 2020 I have visited four countries and spent time on approximately 20-25 different locations. Many hours were spent on the field. For me, the most important thing was to meet and network with experienced and open-minded people whom were willing to share their knowledge.

My main finding was that we can only achieve a relatively and dynamically peaceful coexistence with the help of several stakeholder groups. In order to do this we need to invite everybody for a joint work, in order to reach our common goal: **co-existing with our natural environment and protecting human livelihoods**. Based on the study trips the following points can ease the way into **participatory approaches**:

Deep understanding of different stakeholder groups. Take your time, grab a beer, start a campfire and have a honest discussion with whom you actually want to work with in the long run. Even if he or she has a different mind-set than you!

Personalizing more than one stakeholder can often help. Beside nature conservation learn about hunters and shepherds. Even better: be one of them!

There is no such thing as "the" ranger, "the" hunter or "the" shepherd. There are people with their own agenda. Listen to it, understand it, work with it!

> When you are done, you are not done. Regular communication with stakeholders is of a key importance. Share your results, be transparent!

Find a common ground. The most controversial topics are often not the best for ice-breakers. There must be something you can work together with other stakeholders!

Establish a trust-based working environment with your stakeholders.

Click for more interviews with stakeholders about large carnivore co-existence and humanwildlife conflicts. The channel was established thanks to the Alfred Toepfer Natural heritage Scholarship:

Rom the FIELD ALDO LEOPOLD 'Only the mountain has lived long enough to listen objectively to the howl of the wolf.'

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