III.TusnadEcoBear conf

Book of Abstracts

22-23 October 2024
Bãile Tuşnad
Romania

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III. TusnadEcoBear Conference

22 - 23 October 2024
Hotel O3Zone, Aleea Sfânta Ana 2
Băile Tușnad 535100, Romania

Welcome Address

A conference about people and bears, about coexistence.

The aim of the conference is to bring together a variety of views, competences and experiences from various experts from Europe and beyond, on the topic of human-large carnivore coexistence. The discussions shall foster the generation of practical and viable solutions for reducing human-wildlife conflicts in human dominated landscapes. The conference seeks to identify the current level of knowledge regarding the management of brown bear populations across Europe, as well as best and negative practices. The interaction between key international experts and young participants is highly encouraged in order to build capacity in terms of coping with future challenges (including the ones derived from climate change).

The conference is organised as part of the CERV project (101146879) "Coexisting with bears - Conservation needs Conversation!" funded by the European Union and implemented with the support of the ProjectBag Association (Destination Management Unit - Băile Tușnad and Surroundings), Mayor's Office of Băile Tușnad and WWF-Romania. The conference is supported by the Nature FIRST project (101060954), which has received funding from the European Union's Horizon Europe research and innovation program.

Respectfully,

TusnadEcoBear Team

CERV COEXISTENCE – PROJECT SUMMARY

"Coexisting with bears – Conservation needs Conversation!" (GA-Nr. 101146879)

Across EU member states, large-carnivore management is becoming increasingly challenging as both human safety and the conservation of wildlife populations have to be considered. There is a lack of a clear long-term vision for achieving and maintaining coexistence between humans and bears in many Eastern European countries, where human-bear conflicts are frequent. Rural communities are those actually affected and often ignored by the state authorities and other relevant stakeholders when it comes to establishing and implementing coexistence management plans. Therefore this project aims to foster participatory decision-making and collaborative management among the key stakeholders from 3 pilot countries (Romania, Bulgaria, Hungary) under the umbrella of academic knowledge and guidance (Austria) while promoting and ensuring active community engagement (local/regional community and general public) to provide guidelines for sustainable coexistence plans that go beyond changing political positions of local and state authorities. Thus, the project seeks to foster a sense of ownership and shared responsibility for brown bear conservation. Special attention will be paid to youth education and engagement to increase understanding, knowledge about human-bear conflict and the species management, while building empathy and support for bears in the upcoming decision-making generation. At present, policy debates and decision-making processes around coexistence with bears are conducted with a poor share of democratic/intercultural competence in traditionally patriarchal societies, thus the project targets the pro-active participation of marginalized groups such as women and ethnic and religious minorities. Lessons learned and best practices will be shared at the national and European levels and it will make sure that activities implemented remain operative and efficient after the project ends. This project contributes substantially to the implementation of EU and national policies.

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/cerv

Project financed by the European Union. The views and opinions expressed are entirely those of the authors and do not necessarily reflect the views of the European Union, which cannot be held responsible for them. CONSENT FOR THE PROCESSING OF PERSONAL DATA The operators of personal data are: Association WWF Romania and Association Cutia de Proiecte – Project Bag in partnership with Băile Tușnad City Hall. The purpose of the processing: conducting and promoting the project entitled "Coexistence with bears - Conservation needs conversation!", monitoring the fulfillment of its objectives, implementing, managing and monitoring the non-refundable financing contract, reporting the results and submitting the supporting documents for achieving the object of the non-refundable financing contract , carrying out quantitative and qualitative studies in order to evaluate the effects and impact of the project. Transfer of personal data: These personal data between data operators and third parties can be transmitted within the European Economic Area, especially on the territory of Romania, Belgium, Hungary, Bulgaria, Austria. In addition, these personal data may be transferred to the following categories of persons: financier, evaluators and/or auditors on the occasion of the controls carried out by them at the request of the financier, tax authorities and other public authorities in case of a potential control on their part. I understand and agree that I will not receive any monetary or other compensation for these photos/videos or recordings. The policy regarding the processing of personal data can be consulted at: https://gdpr.eu/

Nature FIRST

Nature FIRST focuses on biodiversity monitoring, tackling key challenges such as 1) enabling near real-time monitoring, 2) detecting changes and trends early, and 3) turning predictions into timely, actionable interventions.

We achieve this by combining remote sensing technologies (both satellite-based and on-site) with environmental forensics, which extracts insights from field evidence. This helps us uncover cause-effect relations and prevent wildlife and environmental crimes. By integrating these sciences into digital twins—virtual copies of ecosystems—we shift from periodic mapping to real-time monitoring, enabling proactive interventions based on forecasted trends.

We are testing this approach in four nature reserves across five countries: Ancares-Courel (Spain), Danube Delta (Romania), Maramures Transboundary Area (Romania/Ukraine), and Stara Planina Mountain (Bulgaria). These sites, home to vulnerable species like bears and wolves and iconic species like pelicans and sturgeons, face common challenges such as habitat loss, fires, human-wildlife conflicts, and poaching.

Nature FIRST is pioneering the use of digital twin technology for conservation. Our solutions are available early in the project, and we encourage Natura 2000 managers, researchers, policy-makers, and other stakeholders to reach out for more information.

In alignment with the Tusnad EcoBear Conference, which addresses human-large carnivore coexistence, Nature FIRST supports this event to strengthen conservation efforts and promote strategies for reducing human-wildlife conflicts.

Learn more about the project on our website:

https://www.naturefirst.info/

Nature FIRST is a Research and Innovation (RIA) from HORIZON-CL6-2021-BIODIV-01-02 Call (grant agreement number: 101060954) that has received €4 538 348.75 EU Contribution.

Program

III.TusnadEcoBearConf *,**

Monday – 21 October

18:00 **Welcome (Hotel O3Zone, "Ion Creangă" conference room)**
18:00 - 19:30 **Documentary - Bears Uncovered: Crisis**
Discussion with the director: Ovidiu Stancu (Hotel O3Zone, "Petőfi Sándor" conference room)

Tuesday – 22 October

8:00 - 09:30 **Registration (Hotel O3Zone, "Mihai Eminescu" conference room)**
09:30 - 10:00 **Conference opening and introduction (EN/RO)**

Session 1 – Fostering ecological connectivity

10:00 - 10:25	***Cristian Papp: Can ecological connectivity support human-large carnivore coexistence?***
10:25 - 10:50	***Bogdan Sulică: Bear conflicts mitigation on 78.000 hectares***
10:50 - 11:05	Marius Costin Nistorescu: Bears don't cross here
11:05 - 11:20	László Demeter: Spatial coverage of the Natura 2000 network and site management effects on bear conservation in the Eastern Carpathians

Session 2 – Wildlife forensics

11:20 - 11:50	***Claire Gwinnett: Sherlock Holmes and the Bear Poaching Case***

11:50 - 12:30 **Coffee break**

Session 3 – Integrating technology in conflict reduction

12:30 - 13:00	**Boris Hinojo: Habitat mapping and its contribution to human-bear coexistence in the Băile Tușnad region, Romania**
13:00 - 13:20	Jan Kees Schakel: Caught in the Camera Trap: Navigating the myriad of options
13:20 - 13:35	Cosmin-Andrei Conțu: RO-BEAR: Monitor and report bear sightings
13:35 - 13:50	Albin Ahmeti: A species conservation simulation system based on knowledge graph for brown bear movement prediction
13:50 - 14:05	Jan Kees Schakel: Bear Habitat Suitability Maps: Introduction of a novel and cost-effective mapping approach

14:05 - 15:30 **Lunch break** ***

Session 3A – Developing bear-smart communities

15:30 - 16:00	**Michal Haring: Bear resistant solutions in Slovakia**
16:00 - 16:15	Alexandra Sallay-Moșoi: Technical overview of the bear-smart community of Băile Tușnad, Romania
16:15 - 16:30	Robin Rigg: Sharing knowledge and experience of living with bears
16:30 - 16:45	Mihai I. Pop: Bear in Mind the System. Policy vs. Politics in Romania
16:45 - 17:00	Levente Dósa: Human and bear interaction on the Csomád volcano. A brief history and 2024 follow up
17:00 - 17:15	Júlia Janka Faller: Assessing market dynamics and financial constraints in relation to data-driven biodiversity monitoring: Insights from the Horizon Europe Nature FIRST Project
17:15 - 17:30	Cristian Valeriu Maloș: Coexistence through sustainable outdoor activities

Session 4 – Posters

17:30 - 17:40 María Párraga: Improving key food resources and preventing winter conflicts for Cantabrian brown bear under climate change scenarios

17:40 - 17:50 Ilya Acosta-Pankov: Human-bear conflict recorded with the Cluey app in a pilot site: A preliminary study on the brown bear (*Ursus arctos*) in Bulgaria

17:50 - 18:00 Vladimir Todorov: Human disturbance to the brown bear (*Ursus arctos*) winter dens

18:00 - 19:30 Panel discussion - From Conflict to Coexistence: The Role of advanced technology in preventing human-wildlife conflicts (Hotel O3Zone, "Petőfi Sándor" conference room)

Participants:

Barna Tánczos (Former Minister Minister of Environment, Water and Forests in Romania)
Zsolt Butyka (Mayor of Băile Tușnad)
Cristian Papp (Bear Expert & Team Leader WWF Romania)
Jan-Kees Schakel (Founder of Sensing Clues)
Rebekka Stutz (Moderation & Impact Facilitator Sensing Clues)

19:30 Reception and wine-tasting with Somelier Robert-Claudiu Bentea ***
(Hotel O3Zone, "Mihai Eminescu" conference room)

Wednesday – 23 October

8:00 - 09:30 Registration (Hotel O3Zone, "Mihai Eminescu" conference room)

Session 3B – Developing bear-smart communities

09:30 - 10:00 **Anna Davison: The human-bear conflict radar: a digital twin to monitor and predict conflicts with brown bear (*Ursus arctos*) in Bulgaria**

10:00 - 10:15 Aleksandar Dutsov: Human-bear conflict in a depopulating mountain region – social and environmental factors

10:15 - 10:30 Romana Uhrinová: Carnivore tracking project: a way to coexistence with large carnivores via a volunteer involvement

10:30 - 10:45 László Gál: The garbage bears of Băile Tușnad. A study of habituation in Romanian brown bears

10:45 - 11:00 Claudiu Olenici: Empowering wildlife conservation: The NGO's role in supporting authorities with a feasible, complementary response and awareness system - prototype

11:00 - 11:30 **Dávid Sütő, Alexandra Sallay-Moșoi: Modern misbeliefs about large carnivores influencing human-wildlife conflict**

11:30 - 12:00 Coffee break

Session 4A – Managing human-large carnivore conflicts

12:00 - 12:30 **Robin Rigg: Bear attacks on humans: patterns, drivers and prevention**

12:30 - 12:45 Nick Thorpe: Reporting and misreporting bears

12:45 - 13:00 Roman Cherepanyn: Structure and dynamics of conflicts with large carnivores in the Ukrainian Carpathians

13:00 - 13:30 **Jenny Anne Glikman: Human-bear coexistence and protected areas in Central-Appennines**

13:30 - 13:45 Andra-Claudia Neagu: Insufficient scientific evidence hinders large carnivore management in Romania

13:45 - 14:00 Thomas Paulic: Hunting principles for contributing to sustainable management and conservation of large carnivores in countries with high human-wildlife conflicts

14:00 - 14:15 Niki Voumvoulaki: Bear – motorways conflicts in Greece. Operational and maintenance challenges in Egnatia Odos S.A. case

14:15 - 15:45 Lunch break ***

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15:45 - 16:15	**Tibor Hartel: Human-bear conflicts in Romania: social polarization and conservation challenges**
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16:30 - 16:45	Vukan Lavadinović: Attitudes of Serbian hunters toward large carnivores
16:45 - 17:00	Andrea Sólyom: The bears' appearance in a regional and a national newspaper in the first half of 2024
17:00 - 17:15	Radu Mot: Preventing and combating poaching – conclusions and recommendations after the implementation of the LIFE Connect Carpathians project
17:15 - 17:30	Silvia Borlea: Updated permeability and infrastructure conflict map of Romania
17:30 - 17:45	Horea-Emil Petrehuș: The importance of human management in the natural areal of Romania
17:45 - 18:00	Laurent Schley: The return of the wolf: lucky stroke or surplus to requirements?
18:00 - 19:30	**Documentary - Bears Uncovered: Solutions.** Discussion with the director: Ovidiu Stancu (Hotel O3Zone, "Petőfi Sándor" conference room)

19:30 Reception (Hotel O3Zone, "Mihai Eminescu" conference room) ***

* *Prior registration is recommended, but you can also register on-site.*
** *Simultaneous interpretation will be provided during the conference in Romanian, Hungarian, and English.*
*** *The lunch and the reception are provided by the organisers for the conference presenters and invited guests.*

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Tuesday 22 October
Session 1: Fostering ecological connectivity

Can ecological connectivity support human-large carnivore coexistence?

22 Oct 2024 10:00

Cristian Papp [1,2*], Călin Ardelean [1], Ioana Ismail [1]

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Over a quarter of the world's mammal species face the risk of extinction, primarily due to habitat loss and degradation—key drivers of global biodiversity decline. Habitat fragmentation, a direct result of various factors such as transport infrastructure development, intensive agriculture, land use changes, urbanization, pollution, and climate change, exacerbates this issue. To mitigate the impacts of habitat fragmentation on large carnivores, comprehensive ecological connectivity studies are critical, with findings needing to be integrated into spatial planning processes. Ecological corridors, while essential for maintaining biodiversity and facilitating wildlife movement, can also increase the potential for human-wildlife conflicts, particularly when these corridors are blocked or bottle-necked near human settlements (such as the case of Baile Tusnad area). When wildlife need to use narrow or obstructed passages in a human dominated landscape, the likelihood of encounters with humans rises, leading to increased conflict. These interactions may involve large carnivores or other species, which can result in threats to both human safety and wildlife survival. Ecological connectivity is growing in importance as global environmental changes accelerate. This presentation underscores its significance for large carnivores, focusing on three key areas: (1) tools and technologies for identifying and monitoring ecological corridors, (2) ecological restoration efforts to enhance connectivity, and (3) the necessity of stakeholder collaboration to maintain and improve these connections. These elements are explored within the framework of the ForestConnect project, implemented in Romania's Apuseni and Maramureș Mountains. Preliminary results from the project include the development of a methodology for corridor identification, ecological restoration of degraded pastures to enhance food sources for brown bears, and the planting of fruit trees in hunting grounds to support wildlife. Ensuring ecological connectivity is a fundamental aspect of large carnivore conservation and requires the commitment and collaboration of all relevant stakeholders. Ecological corridors must be carefully managed and protected to avoid unnecessary human-wildlife conflicts and allow for genetic flow and other vital requirements for wildlife.

Bear conflicts mitigation on 78.000 hectares

22 Oct 2024 10:25

Bogdan Sulică [1], Laviniu Terciu [2], Barbara Promberger [3], Ruben Iosif [3], Sebastian Mastahac [3]

[1] Carpathia Forest District, Calea Feldioarei 27, Brașov, Romania
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Carpathia Forest District Association, GTS Păpușa Leaota Hunting Association, Piatra Craiului Făgăraș Conservation Hunting Association are managing 5 hunting concessions in Argeș County, Făgăraș and Leaota Mountains. The main purposes of management are to maintain in favourable conservation status the large carnivores species, to prevent and mitigate conflicts between bears and humans from local communities Rucăr, Dragoslavele, Stoenești, Lerești, Valea Mare Pravăț, Cetățeni, Bughea de Sus. The management activities are implemented with the suport of the Carpathia Conservation Foundation (environmental NGO), on different levels like: ensuring mainly non-intervention management in forests owned by the foundation and Carpathia partners in the hunting concessions to ensure maximum habitat carry capacity for wildlife; support in detailed scientific research on bear and wolf populations abundance, densities; creation and update of data base about problem bears to support interventions; implement experimental automatic bear detection camera traps and connected repellent devices; operate a Farm with 20 caws and 100 sheep to be donated every year to farmers (enhance the official compensation system in case of caws and sheep killed by bears and wolfs).The hunting concessions teams are implementing special measures to ensure optimal conditions for wildlife existence in the managed areas and to mitigate conflicts: there is no hunting of red dear and roe dears in place; boars are hunted only in and around building and farm areas to decrease damages made to hayfields and crops; two main intervention teams are in place and operate 24 hours/7 days round based on OUG 81/2021 in 6 communes (contracts with local authorities); electric fences offered to farmers (on going system for multiplying the effects); slaughter wastes collection and incineration process implemented in partnership with Rucar community; operating the early warning camera trap systems, termo vision drones, tranquilising weapons, bear cages, Karelian dogs trained for chasing the bears, use of online reporting apps and dash boards; extreme cases of bear eliminations are operated mostly based on genetic confirmation of multiple attacks performed by the bears (OUG 81/2021 interventions but also prevention quotas).

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22 Oct
2024
10:50

Bears don't cross here

Cristina Băncilă, Silvia Borlea, Alexandra Doba, Marius Nistorescu*
EPC Consultanță de mediu, Calea Floreasca 60, București, Romania

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The review focuses on the adequacy with which ecological connectivity, particularly for large mammals, is addressed in environmental studies. For this purpose, the studies developed in Romania for the main transport infrastructure projects of the last 5 years were analyzed. The results of the analysis indicate a low level of consideration of ecological connectivity both in infrastructure design and in environmental impact assessment studies. There is a reduced capacity to identify and formulate measures to avoid/reduce fragmentation and, in general, a reluctance to propose ambitious defragmentation measures. Although the necessary European funding is available, Romania has missed most of the opportunities to build infrastucture that allows for ecological permeability and does not interrupt ecological connectivity. The consequence of this approach will be that of accentuating human-wildlife conflicts both within settlements and in terms of traffic safety.

Spatial coverage of the Natura 2000 network and site management effects on bear conservation in the Eastern Carpathians

22 Oct 2024 11:05

László Demeter

National Agency for Protected Areas, Harghita County Department, Libertății Square, number 5, 4th floor/422, Miercurea Ciuc, Romania

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I present an analysis of the spatial coverage of the Natura 2000 network and an overview of conservation measures implemented in Natura 2000 sites in relation to bear conservation needs in the Eastern Carpathians. This geographical area has the highest density of brown bear in Europe and one of the highest worldwide. Geographical and human land use factors make the Eastern Carpathians very suitable for this species. The relief is relatively gentle and transitions to lower hilly and extensively used countryside, that assures food resources and also shelter in different seasons. The higher mountainous areas act as main wintering areas, but also main feeding sites from the middle of the summer to autumn, billberry (*Vaccinium myrtillus*), raspberry (*Rubus idaeus*), and beech nuts (*Fagus sylvatica*) being some of the most important "mountain food sources". The hilly Subcarpathians offer autumn fruits and acorn of Quercus species, but also a much higher level of human presence. The main direction of the mountain range is roughly north-south while the surrounding Subcarpathians are situated perpendicular to this main axis, in an east-west direction. The wide volcanic plateaus of the volcanic mountain range offer an excellent connectivity towards Southern Transylvania. The existing Natura 2000 network dedicated to bear conservation is highly fragmented. There are a few large continuous SCI-s/SAC-s covering parts of mountain ranges: the Rodnei-Maramureș complex, the Călimani-Gurghiului complex and Putna-Vrancea complex, Bucegi-Piatra Craiului complex but only one area where the east-west connectivity is partially assured: the Gurghului-Valea Nirajului complex. Many sites are small or very small compared to the spatial ecology of the species. Within sites, while there are many deficiencies, Natura 2000 site management (management plans, environment impact and adequate assessment procedures) offer many direct or indirect benefits for bear conservation, from the protection of habitat structure to lowering the levels of disturbance. Very large gaps remain in terms of the east-vest / or mountain-lower land connectivity of the protected area network.

Tuesday 22 October
Session 2: Wildlife forensics

Sherlock Holmes and the Bear Poaching Case

22 Oct 2024 10:20

Claire Gwinnett

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Wildlife crime is a global challenge, causing negative effects to biodiversity, society and the economy. But one weapon in our armoury to tackle this problem is forensic science. For many people, forensic science means TV criminals, magnifying glasses and Sherlock Holmes! But this science is more than this; it combines both simple and sophisticated techniques, in a robust manner, suitable for the conclusions to be of high enough quality for the courts of law. Forensic scientists rely on fundamental principles and a specific ways of thinking and acting to answer key questions in a case; this 'forensic' mindset starts at the crime scene and extends to the courts. These forensic approaches and behaviors are paramount for anyone investigating crime, including wildlife crimes such as bear poaching. By understanding how to effectively detect, recover and interpret evidence found in wildlife crime cases, the what, when, where and how of a crime can be identified. This in turn, provides intelligence information which can identify and prosecute suspects. Ultimately, with the effective use of forensic science in place, this becomes a deterrent to those who would commit these crimes. This presentation aims to explain the potential power of forensic science for investigating bear poaching cases and that having a 'forensic mindset' is important for anyone who may be involved in bear conservation.

Tuesday 22 October
Session 3: Integrating technology in conflict reduction

Habitat mapping and its contribution to human-bear coexistence in the Băile Tușnad region, Romania

22 Oct 2024 12:30

Yago Alonso [1], Federico Cheda [1], Marco Rubinos [1], Boris Hinojo [1*], Alexandra Sallay-Moșoi [2,3], Nándor Erős [2,4], Cristian Papp [2,4]

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Knowing the distribution of habitats and their dynamics of change in natural areas plays a fundamental role in the conservation and management of wild species dependent on them. In this work, we present the preliminary results of our technological developments to automate the generation of habitat maps and monitor habitat changes, applied in the Romanian region of Băile Tușnad, a special area of coexistence between humans and bears. We generated a habitat mapping model of the region, and additionally, we have run a habitat change detection tool. We have applied a combination of remote sensing and AI technologies, combined with geospatial analysis and local expert knowledge, to produce the habitat map of approximately 11,000 hectares, including the detection of habitat changes over the last 3 years. The study identified 15 relevant habitat classes (EUNIS classification), including key habitats for the brown bear such as montane beech forests (G3.1), mixed coniferous and broadleaf forests (G4.6), and boreal spruce forests (G5.2) which provide essential shelter, food sources, and also serve as movement corridors. This work is carried out by WWF-Romania and 3edata as part of the Horizon Europe Nature-FIRST project and will be used in the development of a digital twin model of the brown bear. The integration of local knowledge, field data, freely available satellite imagery from Copernicus services, and GIS capabilities, simplifies the generation of habitat maps and their monitoring, supporting the development of evidence-based strategies to improve human-bear coexistence. The methods and results of this work offer a valuable framework that could be applied to other regions in Europe as a cost-effective method to track habitat changes that could potentially affect the conservation of brown bears, as well as the coexistence with this species.

Caught in the Camera Trap: Navigating the myriad of options

22 Oct 2024 13:00

Jan Kees Schakel

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Wildlife camera traps are an important data collection instrument for conservationists. Their applications are manifold, including the detection of the presence of (rare) species; identification of species, individuals, and home ranges; estimation of population sizes; monitoring species in numbers, time and space; and the early detection of human-wildlife conflicts and the subsequent initiation of preventive action. The breakthrough of Artificial Intelligence (AI) has led to a myriad of solutions to identify and count species. From a practitioner perspective, however, it is not always easy to find a solution that meets their various needs. Based on desktop research, we provide an overview of known solutions, their strengths and their weaknesses. Based on our experience in helping practitioners to make an informed choice, we structure the most important criteria. The outcome is a decision tree that helps practitioners to articulate their needs and guide them through the ever-growing myriad of camera-trap solutions.

RO-BEAR: Monitor and report bear sightings

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22 Oct 2024 13:20

Bear sightings in populated or frequented areas pose a significant challenge for public safety and wildlife management. The RO-BEAR application addresses this issue by providing a user-friendly platform that enables users to report and track bear or other wildlife encounters in real time. This tool is particularly useful for hikers, rural residents, and environmental organizations, contributing to a safer and more informed community. The RO-BEAR app allows users to view or add markers on an interactive map, reporting sightings of bears, dogs, snakes, wolves, and other potential dangers. Each report includes the coordinates of the sighting, along with details like the date and a brief description of the encounter. The app contains features such as a voting system (upvote or downvote) for reports and support for the English language. It also contains an informative section with recommendations from Salvamont Romania. RO-BEAR aims to improve public safety and wildlife conservation through real-time reports and educational material, making it a useful tool for anyone frequenting bear-prone areas.

A species conservation simulation system based on knowledge graph for brown bear movement prediction

22 Oct 2024 13:35

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Species conservation, particularly for the brown bear, presents significant challenges. These challenges are typically addressed at local or regional levels through best practices aimed at minimizing human-wildlife conflicts, such as the installation of fences or the removal of problematic bears. In this talk, we model the potential location of identified bears using a knowledge-driven approach based on Knowledge Graphs (KGs). KGs offer a rich data structure that integrates, connects, and harmonizes diverse and disparate data sources, in a way that enables semantic understanding and logical reasoning capabilities. As part of the Nature FIRST research project, we have developed the Nature First KG, a knowledge graph designed to support biodiversity conservation by linking data on species, habitats, and Natura 2000 sites. Additionally, the KG connects ecosystem basemaps produced within the Nature FIRST—map layers that encode information on habitats, elevation, slope, and other ecological or environmental factors—alongside the Brown Bear Habitat Suitability Index, a weighting scheme that evaluates habitat suitability based on these features. Therefore, the information about the distribution of factors as well as the preference of the bear on the factors is contained in the Nature First KG. Using this infrastructure, we have built simulations to predict brown bear trajectories. The simulation is based on generating a large number of random points and tracking their future trajectories. The simulation is probabilistic, i.e. the next step in the trajectory of each bear is modelled as an event with multiple outcomes, the probability of each outcome is influenced by the Brown Bear Habitat Suitability Index.

Bear Habitat Suitability Maps: Introduction of a novel and cost-effective mapping approach

22 Oct 2024 13:50

Jan Kees Schakel [1*], Koen de Koning [2], Melanie Arp [1]

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We present a novel mapping approach to produce accurate predictions of suitable bear habitat on a high spatial resolution with relatively few volunteer field observations. The resulting bear habitat suitability map (bear HSM) is an important instrument for conservationists to identify core areas that need protection; to identify areas that are suitable for the reintroduction of endangered species; and to foster ecological landscape connectivity. In addition, the Bear HSM is an important ingredient for the development of the digital twins (see Abstract: The human-bear conflict radar). Our approach overcomes known problems in the creation and maintenance of HSMs, such as the lack of data, high costs, the need for carefully planned sampling designs and expert knowledge, and the lack of (access to) historical records. Moreover, as citizen science data and tracking data can be used to automatically update the HSM, it is able to capture seasonal variations in habitat requirements, species' responses to habitat management, and longer term habitat changes due to anthropogenic pressures and climate change. Continuous data collection by citizen scientists allows for monitoring gradual changes in the actual usage of the various habitats. This in turn facilitates adaptive management and reduces the resources needed to make well-informed conservation decisions. In conclusion, modern means and data collection approaches bring cost-effective habitat suitability mapping within reach of almost every nature conservation organisation.

Tuesday 22 October
Session 3A: Developing bear-smart communities

Bear resistant solutions in Slovakia

22 Oct 2024 15:30

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The distribution, quantity and quality of food sources influence trophic relationships, but also other behavioral characteristics of opportunistic omnivores, including bears. The brown bear (*Ursus arctos*) is an opportunistic omnivore that uses diverse trophic resources and large home ranges to satisfy its energy needs. The availability of high-caloric food of anthropogenic origin affects the food strategy of bears and reduces the consumption of natural food. However, the change in trophic relationships naturally also affects the spatio-temporal activity of bears that stay near the preferred food sources. By effectively managing and securing waste in and around towns and villages, the likelihood of brown bears venturing into human-inhabited areas can be significantly reduced. This proactive measure not only minimizes bear encounters near dwellings, but also prevents the development of bears exhibiting altered behavior—specifically, a diminished fear of humans. Reducing the presence of brown bears in the urban areas of cities and towns will enhance the local population's capacity to coexist with this species, recognizing it as a vital component of our environment and natural heritage. By minimizing human-bear encounters in urban spaces, communities are more likely to develop a greater tolerance and appreciation for the brown bear, fostering a balanced relationship that supports both public safety and wildlife conservation efforts. The Poprad district in the north of Slovakia has successfully achieved its goal of reducing the presence of brown bears near human settlements. Today, this region serves as a model for how preventive measures can enhance coexistence between people and bears within shared territories. Through proactive management strategies, this area demonstrates the effectiveness of reducing human-bear conflicts while fostering a harmonious relationship between local communities and wildlife.

Technical overview of the bear-smart community of Băile Tușnad, Romania

22 Oct 2024 16:00

Alexandra Sallay-Moșoi [1,2*], László Gál [2,3], Nándor Erős [1,3], Cristian Papp [1,3]

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As people increasingly share landscapes with large carnivores, their interactions result in damage to property and livestock, to human injuries and even deaths. Conflicts between humans and bears are common in many Eastern European countries, but there is no clear long-term strategy for managing these conflicts. With this background, WWF Romania, in partnership with the Baile Tusnad Town Hall and other key stakeholders, launched a project in 2022 that aims to improve human-bear coexistence in the conflict-prone Baile Tusnad area and to establish the first bear-smart community in Romania. The project seeks to develop a sustainable coexistence plan based on wildlife-smart principles, ensuring its effectiveness beyond the project's conclusion. A significant aspect of the initiative is focused on monitoring human-habituated brown bears that frequently enter the town, posing risks both to human safety and to the bears, which may face lethal removal as a result. Little is known about drivers and the process of human-habituation (hh)/food-conditioning (fc) in brown bears in Romania. In the first years of the project (2023-2024), we therefore GPS-collared four bears and deployed photo traps at wildlife feeding sites, in cooperation with local hunting management units. The collected data through wildlife-smart technology is provided to the local intervention team, supporting rapid and efficient interventions. In the framework of our collaboration within the EU Horizon project "NatureFirst", we provide the photo images to recognition softwares to improve machine learning models for automatic species detection and identification. Further, we also mapped the habitat types in the area of interest, which will form an integral part of further statistical and spatial analyses. The data collected within this study will be analysed using AI algorithms to create early warning signals with the potential to reduce human–bear conflicts and predict when and where future conflicts may occur. This is crucial in terms of optimising the investment of resources, as well as to implement the most appropriate solutions to keep the community and bears safe. The data will also contribute to research on bear behaviour, population dynamics and habitat use, informing strategic management decisions and enhancing understanding of bear ecology.

22 Oct
2024
16:15

Sharing knowledge and experience of living with bears

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The number of bears in Europe is increasing, and bears are recolonising areas where they were absent for decades or centuries. Local communities, authorities and visitors are concerned about threats to property, lives and livelihoods. Experience and know-how gained from living with bears elsewhere, as well as new approaches to preventing damage and mitigating conflict, can contribute to finding workable solutions for coexistence. Carnivore Damage Prevention News (CDPnews) is a professional newsletter created in response to the challenges and opportunities of living with carnivores. It brings together diverse people and interests, sharing knowledge worldwide of the broad range of existing adaptation strategies and encouraging constructive dialogue and practical innovation. While many initiatives deal with damage prevention on a local or regional level, their results are not always accessible more widely. Smaller studies and those with negative findings, as when interventions fail to produce desired outcomes, often go unpublished, even though much can be learned from them. CDPnews was established to fill such gaps by improving the exchange of information and experience across traditional disciplinary boundaries and facilitating collaboration among interest groups and individuals. More than 200 articles have been published in CDPnews since its launch in 2000. Coverage is global and a variety of carnivorans are included. Issue 12 (2016) focused on projects dealing with bears in Europe. More recent work on brown bears was presented in issue 27 (2023), including the example of Băile Tușnad's 'bear smart' community, along with articles on sloth bear–human coexistence in India and Asiatic black bear management in Japan. Content ranges from original research to reviews of best practice, evaluating new tools, presenting projects, interviews, perspectives and opinions. Besides technical and biological aspects of damage prevention, human dimensions are addressed through topics such as stakeholder involvement, dialogue platforms, husbandry systems and traditions. Financial mechanisms and other matters of policy and legislation are also featured. The target readership includes not only researchers but also non-scientists dealing with wildlife-related conflicts. In addition to downloading whole issues as pdfs, readers can now browse through CDPnews online and use tags to search for individual articles throughout the entire back catalogue via a new website at https://cdpnews.net.

Bear in Mind the System. Policy vs. Politics in Romania

22 Oct 2024 16:30

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Social perceptions of interactions with brown bears are dynamic and are constantly constructed and deconstructed under the influence of cultural and governance systems. Values, perceptions, and narratives play a crucial role in shaping brown bears and/or wildlife policies and governance systems, which, in turn, influence societal behaviors towards bears. However, what occurs when policies are absent? Are political decisions alone sufficient? Through an analysis of archived documents and interviews with practitioners, we demonstrate that in Romania, 40 years of policy absence coupled with heavy political intervention led to shifts in perceptions and narratives, but these changes were only temporary. In the long term, societal memory remains trapped in a cycle of unresolved issues.

Human and bear interaction on the Csomád volcano. A brief history and 2024 follow up

22 Oct 2024 16:45

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Saint Anna Lake and Mohos Peat Bog along with Tusnádfürdő (Băile Tușnad) and Bálványosfürdő (Băile Bálványos) are important tourism places and hotspots for human-bear interaction. Csomád (Ciomatu) is the youngest volcano of the Carpathian Mountains. Its craters are the home of the only volcanic crater lake in Central Eastern Europe and a peat bog. The twin craters with water bodies are a rarity worldwide, making Csomád one of Romania's most valuable natural treasures and a very important tourist attraction in Transylvania and especially in Szeklerland. The area is favorable habitat for several species, especially for the brown bear. Since the 1980s the craters are nature preserves (botanical, geological and landscape protection) and since 2007 are included in the Natura 2000 network. Lake Saint Anna is the only crater lake in continental Europe located in a fully intact caldera, formed in the younger crater at the end of the Ice Age. Today the lake covers an area of nearly 20 hectares and is 7.2 meters deep, offering a stunning view and bathing/drinking place for bears. The Mohos Peat Bog is a large oligotrophic bog formed in the older crater, from an ancient crater lake and offers habitat for many relict plant species. The 80 hectares of taiga-type area rich in fruiting vegetation, particularly blueberries, lingonberries and cranberries. Extensive pastures and forests are around the bog and the lake, offering plenty of food and shelter for bears all year round. For humans the area is very important as well. For centuries it was a pilgrimage place and later a must-see attraction. Along with the mass tourism, it became a popular bathing and picnic spot, often with thousands of people on the lakeshore. During this period, countless bear-human interactions took place, often resulting in particularly dangerous situations and also several attacks. In 2019, the administration of the area was taken over by the Pro Szent Anna Association in partnership with the landowner's commonage. Visiting hours were introduced, picnicking was banned, all the open bins were removed and three bearproof garbage collection points were installed. The parking and camping area is surrounded with wire fence equipped with 3 rows of electric fence in operation from end of winter until end of autumn, 24/7. Two habituated adult female bears with 5 cubs were relocated in 2019 and one with 3 cubs in 2022. As a result, the number of bear encounters and sightings in the craters has been significantly reduced. The summer of 2024 was the least eventful season in years.

Assessing market dynamics and financial constraints in relation to data-driven biodiversity monitoring: Insights from the Horizon Europe Nature FIRST Project

22 Oct 2024 17:00

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As part of the Horizon Europe project "Forensic Intelligence and Remote Sensing Technologies for Nature Conservation" (Nature FIRST), we investigate the market characteristics, challenges, and opportunities for the adoption and implementation of a tool suite for data-driven biodiversity monitoring in Europe, with a focus on funding, affordability, and scalability. Drawing on a secondary literature review and insights from field-site stakeholders, including targeted interviews with Bulgarian decision-makers, our research identifies financial constraints as a major barrier to conducting extensive, frequent, and long-term biodiversity monitoring. Insufficient and unstable funding, along with short-term funding cycles, hinder protected areas' ability to implement monitoring methods in a scalable and long-term way. In Nature FIRST, we are actively investigating the potential of state-of-the-art, data-driven monitoring methodologies to enhance cost efficiency. Our ongoing research seeks to evaluate whether these approaches can successfully automate repetitive manual tasks and optimise the use of expert knowledge, ultimately alleviating the constraints imposed by financial limitations. The findings of market research highlight a significant gap in business planning within conservation projects, as current initiatives often fail to integrate financial sustainability into their frameworks. This gap limits the practical uptake of innovative monitoring solutions, even when they are technically viable. The study advocates for a stronger emphasis on business planning and market-oriented strategies within conservation research to ensure that new solutions are both accessible and sustainable for protected areas. By developing more viable business models and securing long-term funding mechanisms, biodiversity monitoring initiatives can achieve greater impact and adoption across Europe.

Coexistence through sustainable outdoor activities

22 Oct 2024 17:15

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In recent years, Romania's growing bear population has led to an increase in human-bear encounters and conflicts, prompting calls for population control. At the same time, the number of mountain sport enthusiasts, particularly trail runners, has risen, with many participating in races or running individually in bear habitats. Despite the risk, runners remain largely undeterred, as bear attacks on them are rare. The study aims to analyze trail runners' perception of bear presence, with the goal of managing the risk of human-bear interactions during running competitions and in areas frequented by both runners and bears. The questionnaire (created with contingent valuation method) includes questions about fear levels, previous experiences with bears, knowledge of their behavior, and safety measures adopted. The methods included the collection of GPS data on individual running routes and areas frequented by runners, the collection of data on bear distribution in the same areas (tracks). We analyzed the overlap between runner routes and bear presence to identify critical points, and the correlation of questionnaire data with spatial data to identify factors influencing fear perception and the actual risk of encounters. We used statistical techniques to analyze the data and formulate relevant conclusions. The expected outcomes include a detailed report on trail runners' perception, providing a clear understanding of their fear levels and influencing factors, identification of high-risk human-bear interaction zones, management recommendations for race organizers and authorities to mitigate these risks, suggestions for safe routes and preventive measures for runners, as well as conservation proposals to balance runner safety with the protection of the bear population. The study will provide valuable insights into risk perception and contribute to the development of effective strategies for managing human-bear interactions, while ensuring both species conservation and the safety of mountain sport practitioners.

Tuesday 22 October
Session 4: Posters

Improving key food resources and preventing winter conflicts for Cantabrian brown bear under climate change scenarios

22 Oct
2024
17:30

María Párraga *, Guillermo Palomero

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Different climate prediction models and the Intergovernmental Panel for Climate Change forecast a 15% decrease in rainfall and an increase of up to 4°C in temperature in the Cantabrian Mountains by the end of the century. It appears that global warming favours the situation of bears hibernating less, or even not at all. In parallel, human outdoor recreational activities are also increasing, especially in winter as a consequence of the warmer. This convergence of presence may increase the possibility of bear encounters with humans. Furthermore, changes in feeding patterns associated with climate change have already been noted in the Cantabrian mountains over the past few decades. The LIFE Bears with Future (LIFE19 NAT/ES/000913, funded by the European Union's LIFE program) aims to improve the adaptability of the brown bear to climate change in the Cantabrian Mountains allowing the achievement of a Favourable Conservation Status of the species in the medium and long term, with an ecosystem-based approach, promoting best practices and solutions that favour the expansion of bear trophic resources and the prevention of human-bear conflicts. Since its beginning in 2020, the project has signed 24 agreements with sectoral organizations and landowners. It has carried out an intensive information campaign, which has involved the creation of 5 thematic infographics for specific groups, publications in specialist magazines, 70 meetings with more than 2,300 participants, the production of an animated video translated into several languages. The project has garnered hundreds of media impacts and social media mentions, as well as undertaken various actions to disseminate good practices for visiting bear territories. In addition, more than 100,000 fruit trees on 115 ha and 9,000 chestnut trees on 22 ha have been planted following scientific criteria in climate change scenarios. The project involves experts from several universities and research centres for the scientific monitoring of the actions in order to evaluate their results and to propose good practices for field and office forestry management. The project, which ends next year, is also currently working on transferring its lessons learned and replicating them to other brown bear populations in similar environmental contexts.

Human-bear conflict recorded with the Cluey app in a pilot site: a preliminary study on the brown bear (*Ursus arctos*) in Bulgaria

22 Oct 2024 17:40

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Human-wildlife conflict, particularly concerning human-bear interactions, poses a growing challenge in the management of protected species. This situation is especially evident in Bulgaria, where bear populations overlap with human settlements. Understanding the scope and locations of these conflicts is vital for effective prevention and mitigation strategies. Under the Nature FIRST project, a test territory encompassing the central Stara Planina region—Bulgaria's bear population hotspot—was established. This territory includes the Central Balkan National Park, Bulgarka Nature Park, and state-managed hunting and forestry areas. Variations in land management practices across these areas impact data collection on conflict events. In terms of the tools developed within the framework of the project, we utilized the Cluey Data Collector mobile application to gather both official data and unofficial reports of human-bear conflicts, verified by our team. These reports include instances of property damage and bears entering settlements. This platform as well as the accompanying tools Focus and Wildcat enabled us to assess the frequency and distribution of conflicts, revealing distinct hotspots. Results were summarized and visualized through maps illustrating conflict hotspots for 2023 (92 registered conflicts) and 2024 (11 registered conflicts). A significant difference in conflict patterns between the two years is apparent, which warrants further investigation of potential contributing factors.

Human disturbance to the brown bear (*Ursus arctos*) winter dens

22 Oct 2024 17:50

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The brown bear has settled in hard-to-reach and remote areas in Europe due to the human-dominated territories. In Bulgaria, the species inhabits most of the high mountains, and the areas for wintering are, as a rule, quiet and remote. Conflict can also be expressed when humans encroach on bears' core territories, not just when bears close the distance to humans. Disturbance near core habitats and maternity dens could cause additional stress to individuals, which may be critical for pregnant females. The study area covers two of the mountains in Bulgaria inhabited by the highest density of bears in the country, Stara Planina mountain and the Rhodopes. Camera traps were placed at 24 bear dens to track the wintering of the bears (4 in the Rhodopes and 20 in Stara Planina) for over two years. During the study period, five camera traps disappeared with signs of human intervention in place. People passing in front of two of the monitored dens were also registered. The bear's hibernation is a sensitive process that can easily be disturbed. Human visits to the den areas may force the animals to leave them. Disappearance of cameras and recorded human presence could be considered as high disturbance and these stress events may influence the selection of dens, especially by pregnant females. Management measures should be undertaken to limit human presence in areas with a high concentration of suitable den sites.

Wednesday 23 October
Session 3B: Developing bear-smart communities

The human-bear conflict radar: a digital twin to monitor and predict conflicts with brown bear (*Ursus arctos*) in Bulgaria

23 Oct 2024 9:30

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We present the first iteration and ongoing development of a pioneering digital twin prototype for monitoring and predicting human conflict with brown bears (*Ursus arctos*) in near real-time. Digital twins are defined as digital versions of real-world systems or processes which, through synchronisation with real-time data, reflect the behaviour of their physical counterpart. Therefore, they can be valuable tools to aid adaptive decision-making by providing up-to-date information, which is especially relevant in fast-paced and dynamic issues such as human-wildlife conflict. Within the Nature FIRST project, we applied the digital twin methodology to the human-bear conflict issue in Stara Planina, Bulgaria. The digital twin uses historic bear incident data, ranger tracking data and bear habitat suitability (see Abstract: Bear habitat suitability maps) to create of a conflict risk map alongside collared bear GPS data to calculate bear movement. The near real-time data on human-bear conflict incidents is supplied by the Bulgarian Academy of Sciences via the Cluey Data Collector app. Using this information, the bear digital twin produces a nowcast of the current risk of human-bear conflict and shows the last known locations of problem bears alongside a radius of potential future movement. We present the first version of the Human-Bear Conflict Radar which is currently being tested in the field, as well as planned improvements.

Human-bear conflict in a depopulating mountain region -– social and environmental factors

23 Oct
2024
10:00

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Rural depopulation, land abandonment and rewilding are key contextual factors of human-wildlife interactions in Europe nowadays. They are associated with decreased anthropogenic deterrents to carnivores leading to their encroachment closer to human settlements, negative perceptions and conflicts. Understanding the causes and dynamics of these conflicts is crucial for ensuring coexistence and conserving carnivore populations. A significant increase in bear-caused damage in Bulgaria has been observed over the last few years. The current study focuses on one of the human-bear conflict hotspots in Bulgaria - the Rhodope region, to investigate the relative importance of environmental and socio-demographic factors involved in their occurrence. Multiple linear regression was used using demographic and spatial variables to investigate which are the environmental and socio-demographic factors influencing the conflict within the constituent municipalities, while MaxEnt and GLM models were used to map high-risk areas for conflict using land use type and elevation layers. We predicted that rural exodus with the associated land abandonment would play a large role. As suspected analysis identified the percentage of human population decline as one of the primary correlates of conflict leading to a decrease in anthropogenic deterrents for bears (and other wildlife), while attractants like fruit and nut orchards are still present. Land use types characterised by the low-intensity of anthropogenic activity were found to account for the highest number of bear damages by MaxEnt and GLM models. Although most damages occur around the mean regional elevation (characterised by a mosaic landscape of mixed and broadleaf forest, pastures and sparsely populated human communities), incidences on both higher and lower elevation show an increase within the study period (2004-2022), potentially due to unsupervised grazing on higher elevation and diminished anthropogenic deterrents around settlements on lower elevation. The rising trend of bear damage in recent years has serious implications for the local perceptions toward the species and the trust in the institutional capacity. Our results, spanning data from 2004-2022 highlight the alarming pattern of conflict intensification in increasingly depopulating and marginalised areas, which poses risk to human livelihoods, sense of security and support for conservation actions due to expanding urbanisation in Bulgaria, Europe and worldwide.

Carnivore Tracking Project: a way to coexistence with large carnivores via a volunteer involvment

23 Oct 2024 10:15

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The Carnivore Tracking Project is focused on the involvement of volunteers collecting tracks and other signs of wolf, lynx, and bear presence in Czech Republic. The recovery of these large carnivores in the European human-dominated landscape poses a challenge for successful coexistence and the ability of human society to tolerate charismatic, keystone species in forest ecosystems but also species that are the source of many conflicts on a local level, especially in areas with a high density of livestock. The project aims to (1) protect large carnivores against poaching (2) collect reliable data on their occurrence and (3) involve local people in the data collection and educate them in nonformal ways. Data collected by citizen scientists in the last decade have been used in many studies published by top-ranked scientific journals. The outputs have also made significant tracks also in local media, in discussions with local stakeholders and contributed to the science-based decisions by regional authorities.

The garbage bears of Băile Tușnad. A study of habitation in Romanian brown bears

23 Oct 2024 10:30

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Habituation in wild animals can be the root of several conflicting situations and might create a general negative perspective of these animals in the eyes of people. When a wild animal becomes dependent on human-derived food, dangerous situations can emerge, which affect both the animal and humans. The brown bear (*Ursus arctos*) is a controversial species in Romania, because they are protected, but can also cause multiple incidents with livestock, crops or even humans. In our study, we aimed to reveal the factors and their extent which facilitate bear presence in the town of Băile Tușnad and to what extent. Using city surveillance cameras, we analyzed bear behaviour and their connection to electric fences and the presence of garbage in the town to better understand which factors should be eliminated or altered to improve the safety of bears and citizens in the area. We hypothesised that the frequent bear visits at the garbage bin islands are connected to the presence of garbage and inadequate protection measures. According to our results, garbage affected the presence of bears in the town, and as the visits progressed, the time they spent displaying fearful behaviour such as hesitating before entering the bin islands or supervising their surroundings while foraging decreased. Considering our results, the bears of Băile Tușnad showed signs of food conditioning, but also an increased tolerance, which in the long run could be a precursor to habituation.

Empowering wildlife conservation: The NGO's role in supporting authorities with a feasible, complementary response and awareness system - prototype

23 Oct 2024 10:45

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Human-large carnivore coexistence, particularly in regions like Romania, has become a growing concern due to the rising frequency of human-bear interactions. These encounters pose risks to both humans and wildlife, highlighting the need for efficient systems to manage conflicts and inform authorities in real-time. This research aims to provide a solution by leveraging modern technology to enhance communication and decision-making in human-wildlife conflict scenarios. The platform developed in this study focuses on managing bear sightings and environmental incidents across regions in Romania where human-wildlife interactions are frequent. Key modules include a VoIP call/dispatch system for communication, a chatbot for automated reporting, and a Geographic Information System (GIS) for location tracking. Using VoIP communication, GIS-based tracking, and AI-driven decision-making tools, the system processes reports of bear sightings, evaluates the risk level, and sends real-time information to local authorities. Citizens and field agents can report sightings through mobile apps, and once data is collected, it is automatically forwarded to the relevant authorities. NGOs, while not involved in direct interventions, play a key role in facilitating the flow of information and supporting authorities by ensuring the timely delivery of critical data. The platform has demonstrated improvements in response times and coordination between local authorities, wildlife experts, and NGOs. Early trials have shown that the system enhances decision-making by providing real-time GPS data and automating reporting, leading to more effective conflict mitigation. In particular, the automated reporting tools have improved the communication chain, ensuring that authorities receive accurate and actionable information promptly. This platform provides a scalable and practical solution for managing human-wildlife conflicts, focusing on the role of NGOs in supporting authorities. Future developments should aim the extension of system's capabilities to include other species and broader environmental applications.

Modern misbeliefs about large carnivores influencing human-wildlife conflict

23 Oct 2024 11:00

Dávid Sütő [1*], Alexandra Sallay-Moșoi [2, 3]

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Misbeliefs about large carnivores often stem from myths, misunderstandings, or lack of accurate information. The cognitive background of misbeliefs about large carnivores in the context of human-wildlife conflict is deeply rooted in evolutionary psychology, cultural history, and modern social dynamics. These misbeliefs often stem from innate cognitive biases, emotional responses, and learned associations that influence how humans perceive and react to large predators. We will present some key factors contributing to these beliefs and their cognitive solutions. Using current examples, we present existing misconceptions and compare these statements for their veracity based on scientific background. This presentation aims to address both the cognitive biases and cultural factors that drive misbeliefs, fostering a more balanced and informed understanding of large carnivores in the context of human-wildlife conflict.

Wednesday 23 October
Session 4A: Managing human-large carnivore conflicts

Bear attacks on humans: patterns, drivers and prevention

23 Oct 2024 12:00

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Bear attacks are relatively rare events, but recent cases have heightened safety concerns and renewed debate about bear protection and management. In Slovakia, unusual incidents in March 2024 led to enactment of legislation facilitating removal of 'problem' bears near human settlements. I studied bear attacks during the previous 25 years to clarify their characteristics and possible causes. Since the 1990s I have maintained a database of bear-caused human injuries in Slovakia using verified reports, official records and testimony of victims, witnesses and investigators. For this study I considered cases in 1999–2023. I discarded 6 uncorroborated reports and 20 incidents that did not meet the definition of an attack, i.e. "intentional contact by a bear resulting in human injury". This produced a dataset of 97 attacks, which was analyzed using descriptive and inferential statistics. Attacks occurred in every month of the year, more often at weekends than on weekdays, with peaks in March and June–August. A total of 108 people were injured, with 1 (89%) or 2 (11%) per attack. Injuries ranged from minor to severe including 1 fatality. Victims were predominantly adult (97%) and male (88%). Most were alone (66%) or with 1 other person (22%). Attacks typically occurred in response to sudden encounters, often involving females with cubs ($\geq$30% of cases). I found no evidence of predatory attacks and few injuries occurred in proximity to villages or towns. Known 'problem bears' were implicated in only 7% of attacks, all in 2001–2010. Attack frequency increased from 1.6/year in 1999–2003 to 6.8/year in 2019–2023. For hunting-related, work-related and foraging activities, the rate of injurious events reflected long-term bear population growth whereas the increase in attacks on people engaged in recreation outpaced rising bear numbers. Public and government attention has focused on bear occurrence near settlements, but the evidence does not support this being a driver of recent attacks. Frequency seems to be linked to encounter rates, which can increase as a result of bear population growth, more human presence in areas with bears or activities with a higher level of risk (jogging in bear habitats, photographing bears). Where bears and people share landscapes, it may not be possible to eliminate attacks entirely. However, the likelihood of injury can be reduced through knowing how to avoid, or respond appropriately to, encounters with bears.

Reporting and misreporting bears

23 Oct 2024 12:30

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The media shape how the public sees bears - as lovable, exotic parts of the landscape, as a threat to livestock and humans, or as something else. In my presentation, I will touch on the first two, and explore the third: what role do bears really play in our mountains and forests, and how can the media play a constructive role in the public debate? A serious debate is urgently needed, so central and local governments can take sensible decisions on the basis of facts, not emotions. I will also touch on our attitudes to wilderness: what it is, how much is left, and how much space we as a society are willing to grant it.

Structure and dynamics of conflicts with large carnivores in the Ukrainian Carpathians

23 Oct 2024 12:45

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Conflicts between large carnivores and humans are common in the Carpathians. Stakeholder attention to the study and management of conflicts has increased significantly worldwide. But in Ukraine, the topic of the coexistence of humans and large arnivores, as well as the consequences of such interaction, has not received enough attention. We have focused only on conflicts between farmers/beekeepers and large arnivores (*Canis lupus* – grey wolf, *Ursus arctos* – brown bear, *Lynx lynx* – Eurasian lynx) in the Ukrainian Carpathians in this analysis. The following model territories were: Verkhovyna, Nadvirna, Kalush, and Kolomyia districts of the Ivano-Frankivsk region; Rakhiv, Khust, and Tyachiv districts of the Zakarpattia region; Stryi district of the Lviv region. 115 locations were selected (91 farms and 24 apiaries). An annual survey method focusing on the types, locations and consequences of conflicts was implemented from 2018 to 2023. The data were processed in Excel, a package of online programs from the Sensing Clues platform and ESRI ArcGIS Pro 3.2.2 license software. In 2018, 51.64% of farmers faced wolf attacks on their livestock, in 2023 – 6.59%. In 2018, 16.48% of farmers faced lynx attacks on their livestock, in 2023 – 2.20%. In 2018, 15.38% of farmers faced bear attacks on their livestock, in 2023 – 2.20%. In 2018, the share of conflicts in apiaries with a bear was 29.16%, in 2023 – 16.77%. In 2018, wolves killed/injured 225 domestic animals, in 2023 – 16; in 2018, lynxes killed/injured 27 domestic animals, in 2023 – 4; in 2018, bears killed/injured 38 domestic animals, destroyed 107 beehives, in 2023 – 2 domestic animals, 13 beehives. The structure and dynamics of conflicts between large carnivores and farmers/beekeepers on model territories in the Ukrainian Carpathians from 2018 to 2023 have been established. The number and negative consequences of conflicts between large carnivores and farmers/beekeepers are decreasing, which probably is related to the increasing use of electric fences for conflict prevention (from 0 in 2018 to 23.08% in 2023 among researched farmers and from 0 in 2018 to 75% in 2023 among researched beekeepers) and the increasing of the pastoral dogs to protect livestock among farmers, who do not have conflicts with large carnivores and use dogs against large carnivore attacks (from 3.29% in 2018 to 20.88% in 2023).

Human-bear coexistence and protected areas in Central-Appennines

23 Oct 2024 13:00

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In the Central Apennines (Italy), the conservation of the Apennine brown bear (*Ursus arctos marsicanus*) is linked to several factors, one of which is its expansion outside protected areas, particularly the Abruzzo Lazio and Molise National Park, where most individuals are concentrated. To promote this expansion, the LIFE Bear-Smart Corridors project (https://rewilding-apennines.com/life-bear-smart-corridors) was launched in 2021, aiming to improve conditions for dispersing bears between protected areas, and to encourage coexistence with humans to live alongside them. One of the objectives of the project was to involve people; for this reason, the first step was to understand the perspective of different stakeholders. Specifically, 50 qualitative interviews were conducted, and 90 questionnaires were administered to farmers, beekeepers, members of environmental NGOs, employees of protected areas, and local administrators. The research covered various topics, such as: relationships among stakeholders, perceptions related to the presence and effectiveness of prevention measures and compensation, people's interest in participating in the creation of bear-smart communities, and perceptions related to conflict. Based on the collected data, we aim to explore differences in perceptions and positions among various stakeholders, contingent on their location inside or outside protected areas, their category, and their role in these issues: NGOs, managing authorities, local politicians. The study shows how different management of compensation and prevention measures inside and outside the national park can influence people's perceptions. Moreover, it highlights the crucial role of NGOs, particularly outside protected areas, in disseminating and supporting coexistence tools. Furthermore, while perception of conflict is generally low, improving trust among stakeholders and towards the project processes is essential. These data emphasize the need to tailor coexistence projects and tools to the specificities of the territory.

Insufficient scientific evidence hinders large carnivore management in Romania

23 Oct 2024 13:30

Andra-Claudia Neagu [1*], Laurentiu Rozylowicz [2]

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Human-wildlife conflicts are constantly increasing due to growing competition for territory and resources. Romania hosts the largest population of European brown bears (*Ursus arctos arctos*) and gray wolves (*Canis lupus*) in Europe. Due to the rapid anthropization of the landscape, human-large carnivore interactions are increasingly common in Romania. These species are protected under the European Habitats Directive, thusly, wildlife management aims to maintain and continue their favorable conservation status. Therefore, evidence-based management and conservation actions are central in preventing conflicts and achieving coexistence. This research aims to contribute to increasing the effectiveness of large carnivore management by (1) assessing the alignment of the conservation actions enforced in Romanian protected areas management plans by comparing these actions with evidence-based actions; (2) analyzing the perceptions of the local population regarding the national management actions of the European brown bear and gray wolf; and (3) exploring how the interaction with large carnivores influences the perception of the local population regarding the management actions applied. The results indicate that most enforced actions do not display convincing evidence base to support their effectiveness, many of which still have unknown outcomes on conservation efforts. Moreover, the application of an opinion survey exposed a low tolerance level among people, particularly towards European brown bears, and an openness towards hunting as a solution. Research also revealed a lack of confidence in the decisions made by the authorities among people living in areas with large carnivores. This study contributes to large carnivores' protection in Romania by aiding protected areas administrators to identify conservation actions with proven effectiveness while simultaneously considering local needs.

Hunting principles for contributing to sustainable management and conservation of large carnivores in countries with high human-wildlife conflicts

23 Oct 2024 13:45

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In regions where human-wildlife conflicts are prevalent, establishing clear hunting principles is crucial for the sustainable management and conservation of large carnivores. Drawing on insights from CIC's expert members and global research, this presentation focuses on developing guidelines and best practices that integrate hunting as a tool for maintaining balanced carnivore populations, reducing livestock depredation, and minimizing the risk of attacks on humans. In Europe, where large carnivores are reclaiming their historic ranges, regulated hunting can help mitigate these conflicts while also fostering public support for conservation efforts. Additionally, it is important to keep hunters engaged in a positive and productive manner, ensuring that their involvement continues to contribute to long-term conservation goals. These principles are designed to create a framework that balances the needs of conservation with the realities of human-wildlife interactions, ensuring long-term coexistence.

Bear -– motorways conflicts in Greece. Operational and maintenance challenges in Egnatia Odos S.A. case

23 Oct
2024
14:00

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Infrastructure construction and operation companies are often facing problems with animal-vehicle collisions, which may result to human loss, animal loss and car damage, often with legal implications. These collisions are the result of the intersection of a linear/transport infrastructure and a “green corridor”, used by domestic animals or wildlife species as Brown bear. EGNATIA ODOS S.A. is a Greek State company that is involved in construction, operation and maintenance of a motorway network of 1.000 km. Throughout its operation, it has faced the problem of crossing protection areas or protected species’ habitats in many occasions, especially large carnivores. Some issues were addressed during the design phase of the project, others had to be dealt during construction or operation. Whatever the case, there have been followed specific steps, sometimes successful and others not, to address environmental obligations for wildlife protection deriving from the environmental terms of the project, or to address animal-vehicle collisions. The company’s participation to LIFE SAFE CROSSING project has given the opportunity to get involved deeper in the discussion of “how to solve the problem of animal-vehicle collision” and to seek for solutions especially for the Brown bear considered as a Priority Species. Our experience from the project and in general the company’s history in this area, shows that the “conflict of interest” between the wildlife protection agencies and the transportation companies can turn into interdisciplinary cooperation. The road companies should get familiar with possible solutions/measures, to avoid animal-vehicle collisions, bearing in mind that the problem is usually transmitted from place to place, due to the dynamics of wildlife species populations. Therefore, it is important to cooperate interdisciplinary, to train people and spread policy tools, handbooks and good practices and change the mentality in everyday maintenance practices, steps that are not always a matter of cost. From the point of view of EU bodies, funding mechanisms should be provided, especially for already existing infrastructures’ improvement, to deal with changes of wildlife populations and animal behaviors.

Wednesday 23 October
Session 4B: Managing human-large carnivore conflicts

Human-bear conflicts in Romania: social polarization and conservation challenges

23 Oct 2024 15:45

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The conservation of large carnivores in human-shaped landscapes is not a simple procedural issue but rather a wicked, complex problem, often marked by social conflicts and dilemmas. These conflicts and dilemmas typically arise from differing visions, agendas, interests, and experiences regarding large carnivores. Understanding these social conflicts and dilemmas, whether manifested or latent, and identifying morally, economically and legally acceptable compromises for navigating them is as important as understanding the biology, ecology, conservation status, and the impacts caused by large carnivores. In the first part of my talk I will present key hypotheses explaining the increasing human-bear encounters in Romania. This will be followed by a short overview of societal reactions to these increased encounters, focusing on policy makers (politicians), newspapers and conservationists. At least two critical junctures were of key importance in shaping the social dimensions of bear conservation: one which resulted in the hunting ban in 2016 and one which resulted in reintroduction of hunting in the summer of 2024. These junctures highlight how policy shifts can exacerbate social tensions, making it harder to find consensus on effective conservation strategies. As society becomes increasingly polarized, the focus often shifts from long-term solutions to reactive measures, further entrenching the problem. Transdisciplinary approaches and the „bright spots" could be way forward but the premises for these are only rarely fulfilled. One notable exception is represented by Băile Tușnad, where a highly effective community of practice was able to generate positive results even in short term.

Human-bear coexistence in the Cantabrian Mountains: prevention and mitigation of conflicts

23 Oct
2024
16:15

José Vicente Lopez-Bao [1*], María Párraga [2], Noa González [2], Guillermo Palomero [2]

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In the last decades, the Cantabrian brown bear population is experiencing a population recovery and expansion process. Still, the population is not at favourable conservation status and it is listed as endangered under the Spanish law. New conservation challenges are arising from this new scenario, among which is the effective mitigation of potential negative human-bear interactions, such as in the case of bears approaching human settlements, which may influence perceptions of sharing the landscape with this species. In particular, the presence of bears within or in close proximity to human settlements, and the potential for cases of individuals with extreme habituation or conditioned to anthropogenic food sources, such as garbage, are recurring concerns emerging in public debates about sharing the landscape with the species and the future of bear conservation. Under the LIFE Human Bear Coex (Project 101113624– LIFE22-NAT-ES-LIFE) we aim to mitigate potential conflicts between humans and brown bears within or around human settlements. The project is focused on preventing and reducing negative human-bear interactions in key municipalities within the high-density bear area in the western side of the Cantabrian Mountains, across Asturias and Castilla y León. Several strategies are implemented, including the use of electric fences and scaring devices to protect livestock and other potential attractants for bears, such as fruit trees, maintaining and cleaning areas around villages to reduce the risk of unexpected human-bear encounters, planting of fruit trees away from villages, installing bear-proof garbage containers, capture and radio-tracking of bears approaching human settlements, creation and training of local conflict prevention teams, public information campaigns aimed at increasing understanding of bear behavior and promoting tolerance toward their presence, and the support for socioeconomic development in these municipalities linked to a positive image of bears. By combining the participation of municipalities and local communities with the above-mentioned strategies, the LIFE Human Bear Coex is intended to set a precedent involving municipalities for managing human-bear coexistence. Replicating successful strategies in other bear-inhabited regions across Europe will contribute to the wider adoption of good practices, favouring human-bear coexistence scenarios.

Attitudes of serbian hunters toward large carnivores

23 Oct 2024 16:30

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Serbian hunting legislation recognizes five autochthonous large carnivore species, of which the wolf (*Canis lupus*), jackal (*Canis aureus*), and fox (*Vulpes vulpes*) are managed as game species. The other two species, the bear (*Ursus arctos*) and lynx (*Lynx lynx*), are strictly protected. Official data on wildlife abundance indicate that the number of large carnivore species in Serbia is increasing, although bear and lynx populations are notably below their habitat potentials. The conservation and management of large carnivores heavily depend on coexistence with humans, particularly on attitudes toward their presence and tolerance for potential damages caused by these species. In this study, we collected national-level attitudes of serbian hunters toward several large carnivore species to identify their potential support for conservation efforts. The response rate was 86%, with a total of 335 hunters participating out of 390 selected for the survey. Results indicate a mixed attitude toward different species. The bear and wolf received the most positive responses from hunters, with 54% and 53%, respectively. The lynx is favored by 47% of respondents, in contrast to the jackal, which is favored by only 5% of hunters. Although the majority of hunters are willing to support conservation efforts for the bear and lynx, it is uncertain if they are aware of all the challenges involved. Two-thirds of hunters are satisfied with the wolf's abundance, while 15% would like to increase its numbers, compared to 2% of respondents who would like to see more jackals and 9% who are satisfied with the current status. Findings suggest that serbian hunters base their attitudes toward large carnivores on various factors but, in general, would support the conservation of charismatic species such as the bear, lynx, and wolf.

The bears' appearance in a regional and a national newspaper in the first half of 2024

23 Oct 2024 16:45

Andrea Sólyom

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This paper analyzed 142 articles from a selected regional Hungarian and 32 articles from a national Romanian daily newspaper between January and June 2024, using both quantitative and qualitative methods. We endeavoured to compare the present results with our previous media research conducted from June to November 2019. Based on our prior field knowledge and our everyday experience, we assumed that the media presence of the bear-human conflict would intensify as a voter-activation tool during the campaign period leading up to the 9th of June local and European Parliament elections. We did not reach a completely clear conclusion in this respect. The majority of the articles on Székelyhon are focused on communities in Harghita County, with frequent reports of bear sightings in different areas of Miercurea Ciuc, as well as in the districts of Odorheiu Secuiesc, Târgu Mures, and Cristuru Secuiesc. The majority of the content on both Székelyhon and adevarul.ro consists of local news and reports. Approximately two-thirds of the titles and nearly three-quarters of the pictures on Székelyhon maintain a neutral stance, reflecting a similar impartiality in about half of the titles and photos on adevarul.ro. It is worth noting that close to one-third of the titles on Székelyhon and 40% of those on Adevărul are considered fear-inducing, a tactic often used in journalism to boost readership, in line with findings from international research. In the competition for readers' attention, the publication also includes video footage in every fourth article about bears, as indicated in the title. The prevalent theme in the articles revolves around bear sightings in the area, with more than half of the articles found in Székelyhon and over a third in Adevărul. In Székelyhon, there is a notable abundance of summary articles, often featuring statistics on the number of Ro-alert notifications received in Harghita County in 2024 on a weekly, monthly, or longer basis. These notifications are automatically sent to residents following 112 emergency calls. The articles also reference previous cases and reports. Over the analyzed six-month period, in Harghita County, there were 211 such notifications, with a weekly high of 26. The regional Hungarian newspaper also frequently covers stories of bear relocation, and shooting incidents, and both analyzed daily channels publish details about attacks on humans.

Preventing and combating poaching – conclusions and recommendations after the implementation of the LIFE Connect Carpathians project

23 Oct 2024 17:00

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The LIFE Connect Carpathians project (LIFE12NAT/UK/OO1068 / 2013-2019) aimed to secure the functionality of the ecological corridor linking the Western Carpathians (Apuseni Mountains) to the Southern Carpathians in Romania, having bear and wolf as target-species. This landscape is under pressure from a wide range of factors, including poaching, therefore we are presenting the project's approach on addressing poaching: the risk analysis, development of plans to prevent and combat poaching and we are discussing our conclusions and recommendations regarding efficiency, success indicators, interactions with different stakeholders and their perceptions. The Apuseni-Southern Carpathian Corridor is one of the key ecological corridors for large carnivores within the Carpathian Range. The project focused on 17 Natura 2000 sites overlapping with the corridor and designated to form a coherent regional ecological network. One of the project's actions being implemented was the establishing and demonstrating enforcement patrols to detect and prevent poaching. Within the project, the Romanian Gendarmerie created two specialist mountain units with the equipment, skills and knowledge to conduct anti-poaching patrols throughout the project area. To support patrolling, the anti-poaching units were provided with customised, all-terrain vehicles, surveillance equipment and field equipment. Two new Gendarme bases were built in the central region of the Corridor, enabling greater coverage for anti-poaching patrols. During the first stage of the project the Gendarmerie units were trained by Zarand and Fauna and Flora International's rangers and introduced to the specific of the area. In parallel, introductory discussions with stakeholders were conducted to present the aim of the project. Later on, in selected key zones we conducted pilot risk assessments and developed anti-poaching action plans including preventive and reactive activities. The further implementation of these activities was done by Gendarmerie either independently or in partnership with project partners or local hunting managers. The results of the anti-poaching activities were assessed based on Gendarmerie's activity-reports, but also as feedback from stakeholders and indirect or anecdotal information. We learned that poaching of large carnivores and their prey are being triggered by different reasons like food resource, retaliation, trophy, commercial, but could be also accidental and involves usage of snares, guns, poison, and dogs. Unfortunately, responsible authorities and hunting managers often do not have the resources to conduct anti-poaching patrols and poachers often go undetected and are thus able to operate with minimal risk of prosecution and conviction. Working in partnership with the project's Intervention Team rangers, hunting managers and other responsible authorities, the Gendarmerie's anti-poaching units sanctioned 379 wildlife crimes, issuing a total of €37,285 in fines. Although, the illicit nature of poaching makes it challenging to monitor the impact of the anti-poaching activities, surveys indicate benefits thanks to patrols, with anecdotal feedback suggesting that communities are mostly pleased to have the Gendarmerie operating in the area. The demonstrative implementation during the project could be considered a success. However, the most important would be for the lessons learned to inform future fit-for-purpose structures responding to the wide spectrum of poaching. A Practical Guidelines to address poaching was developed based on the project results, and may be use as a reference for future efforts.

Updated permeability and infrastructure conflict map of Romania

23 Oct 2024 17:15

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In the last 30 years, Romania has been preoccupied with the development of road infrastructure, as a driver for increasing economic development. During this period, conflicts between the need to develop road infrastructure and the nature conservation have occurred periodically. Attempts to map these conflicts have been done before, the most recent of which dates from 2008, when a map was elaborated showing a first identification of ecological corridors and the existing barriers from that time. However, in the intervening years several developments have occurred. The analysis was aimed at updating the existing map, by integrating newer research, as well as new information on road infrastructure proposals. This resulted in a new, updated map showing the conflicts between the ecological network and the new proposed infrastructure, as well as the outstanding issues related to connectivity in relation to road infrastructure. The main conclusion of the analysis is that the number of barriers has increased, compared to 2008, and that there is still a significant need for defragmentation measures to be implemented in Romania.

The importance of human management in the natural areal of Romania

23 Oct
2024
17:30

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The last 34 years is represented in Romania by extreme actions regarding the management of natural resources. A proper management which means collaboration and connectivity between the authorities and NGOs is completely absent. In this "problematic medium" illegal logging on poaching flourished. Until this day we don't have a national plan that is commonly accepted and understood by the Romanians and obviously nature and local communities suffer. Is human management necessary? How areas with zero interventions from human have to look like? How can local communities live in wild environment exist without destroying them? The involvement of E.U. mandatory? These are questions that need answers quickly. Our association in the last 20 years of research, especially in the Romanian Carpathians gathered a lot of data which can result in solution and common accepted management. Our goal it's to discuss and analyze at this symposium the subjects approached above and to conclude in immediate and concrete actions.

The return of the wolf: lucky stroke or surplus to requirements?

23 Oct 2024 17:45

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In Luxembourg, wolves were officially eradicated in 1893. Following their protection in the European Union by the Habitats Directive in 1992, the species started to recolonize formerly lost territory, to the extent that it is now present in nearly every European country. But how to deal with the challenge of the (potential) return of a large carnivore species? This presentation explains the strategy in relation to the return of the grey wolf from the perspective of a country with one of the highest human population densities in mainland Europe, where wolves had been absent for more than a century. The main pillars of this approach are: 1.) the establishment of an action and management plan together with representations of all main stakeholders (relevant government departments, landowners, farmers, livestock breeders, hunters, conservation NGOs, etc.; 2.) the establishment of subsidies for damage prevention measures as well as damage compensation schemes; 3.) the launch of a large public awareness campaign, including public talks, regular press releases and social media presence; 4.) an objective, transparent and evidence-based communication in case of wolf presence being detected; and 5.) in case of predation events on livestock, swift reactivity and presence in the field to assess the situation and help the concerned breeder.

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