Wolves Across Borders

International Conference on Wolf Ecology & Management

WOLVES ACROSS BORDERS

Hotel De Werelt

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www.wolvesacrossborders.com

Parallel Presentations

Parallel presentations are thematic sessions featuring oral presentations of research papers. Organized around specific topics, these sessions run concurrently and offer an opportunity for in-depth discussion, scholarly exchange, and peer feedback in a focused academic setting.

Presentation abstracts are organized per day and theme, each with a specific color.

WOLVES ACROSS BORDERS

Parallel Presentations

Theme: Behavioural dynamics

Monday 16:00 - 16:20

LIVE

Can experience explain inter-territorial variation in wolf dietary response to ungulates abundance?

Cecilia Di Bernardi

Affiliation

Co-authors: Loan Selina Zumbach, Camilla Wikenros, Mikael Åkesson, Håkan Sand

Wolves (Canis lupus) are returning in vast parts of their former ranges in Europe and are expanding into landscapes highly managed by humans and characterized by diverse wild ungulate communities. In Scandinavia, the wolf population has recently expanded from south-central areas dominated by moose (Alces alces) and roe deer (Capreolus capreolus) to multi-ungulate prey systems in southern Sweden. Here, there are higher abundances of alternative wild ungulate prey such as wild boar (Sus scrofa), fallow deer (Dama dama), and red deer (Cervus elaphus). We investigated how the feeding behaviour of an expanding wolf population responds to spatial gradients of varying ungulate abundance and composition.

We analysed the prey composition of wolf scat samples (n = 1564) collected in Sweden during 2012-2022 within the genetic monitoring of the wolf population. The diet profiles obtained through diagnostic PCR with species-specific markers were associated with the genetically identified wolf individuals. This allowed us to link dietary information with detailed knowledge on wolf individuals and associated territories derived from the long-term wolf monitoring. We observed a positive dietary response of wolves to increasing abundances of the three alternative ungulate species. The use of red deer by wolves was proportional to its local abundance, while wild boar and fallow deer were overall under-consumed compared to their local abundance. Importantly, we observed a high inter-territorial variation in wolf dietary response that was only partially explained by the local abundance of prey. This result suggests that other factors such as learning and individual preferences of wolves may be important. Therefore, we are exploring the role of wolf intrinsic covariates such as their social status (member of pair or pack) and the time since territory establishment, which may both affect the wolf hunting experience and success on different prey species. We will also include a covariate representing the ungulate community in the natal territory of the territorial adults in order to test for the potential influence of early-life learning experience.

Parallel Presentations

Theme: Behavioural dynamics

Monday 16:20 - 16:40

LIVE

Voyageurs Wolf Project: insights from a decade of research in northern Minnesota, USA

Joseph K. Bump

Affiliation

Co-authors: Thomas D. Gable, Austin T. Homkes

Since 2015 we have led a field-based research and outreach effort to better understand and share the summer ecology of wolves along the United States-Canadian border in north-central Minnesota, USA. This effort was coined the Voyageurs Wolf Project at the University of Minnesota to denote a sustained, collaborative study of the predation behavior, reproductive ecology, and functional role of wolves. This presentation will detail the key insights from this project to date, including wolf predation of beaver and fish, indirect effects of wolves on wetlands and forests, and how humans shape wolf predation. We will also share results from a collaboration with a cattle rancher on a ‘wolf-proof’ fencing effort and public commentary that informs the debate about the impact of wolves on deer. Lessons learned from our ‘field-to-phone’ social media presence will be detailed. Graphic art that profiles unique wolves studied by the project and artistic scientific posters will illustrate novel outreach and education efforts. Combined, these aspects address all conference themes and will demonstrate how we meet our goal of coupling cutting-edge, rigorous animal ecology research with highly effective broader impacts.

Parallel Presentations

Theme: Behavioural dynamics

Monday 16:40 - 17:00

LIVE

Linking individual and collective behaviours: Insights from wild Indian wolves

Adwait Mahesh Deshapande

Affiliation

Co-authors: Mihir Godbole, Tristan Walter, Iain Couzin

Social carnivores, including wolves, have captivated the attention of behavioural biologists as they live in complex societies and exhibit remarkable collective behaviours, such as coordinated hunting. However, quantitative scientific understanding of collective processes in social carnivores is significantly lacking, mainly due to the unavailability of fine-scale movement data. The data deficiency arises from the limitations in tracking, bio-logging and observing social carnivores. We aimed to bridge this gap in our knowledge by capitalising on a rare opportunity to study collective behaviours in a unique population of Indian wolves (Canis lupus pallipes). We collected drone-based videos of entire packs during group travels. Then, high-resolution geo-referenced trajectories of each individual from the videos were extracted using computer vision algorithms. We also attempted to automatically (using computer vision) identify individuals based on their fur patterns. Based on our trajectory data, we show how different individuals influence the collective movements of the pack during the daily group travels. Our quantitative results shed light on how individual social interactions influence the collective movement of the group across contexts in complex societies. Finally, our novel methods pave the way for non-invasive monitoring, tracking and study of social carnivores.

Parallel Presentations

Theme: Behavioural dynamics

Monday 17:00 - 17:20

LIVE

Wolves in the clouds: Climate and breeding phenology in Ethiopian wolves

Jorgelina Marino

Wildlife Conservation Research Unit (WildCRU). Department of Biology, University of Oxford, UK & The Ethiopian Wolf Conservation Programme

Co-authors: Karl Reiman, Elizabeth Preston, Alo Hussein & Claudio Sillero-Zubiri

Understanding the impact of climate on wild carnivores is crucial for anticipating their responses to rapid environmental changes. Carnivores living in extreme environments such as arid zones, high latitudes or high mountains, often exhibit specialised ecological traits and life histories shaped by climate. However, discerning the demographic consequences of climate change remains challenging, particularly where rapid changes in human land use may confound climatic effects. We explore this dynamic using a highly specialised Afroalpine predator as a case study. Drawing from three decades of long-term monitoring Ethiopian wolves (Canis simensis) in the Bale Mountains, we analyse breeding phenology and its climatic drivers. We found that earlier breeding was associated with increased rainfall and vegetation productivity during the wet season preceding the mating period, likely mediated by prey availability. Conversely, litter size remained largely uncorrelated to climatic variation. We examine whether these patterns indicate adaptive flexibility or early signs of climate change, and highlight the role of long-term studies in disentangling the multi-level impacts of climate in wild carnivore conservation.

Parallel Presentations

Theme: Behavioural dynamics

Monday 17:20 - 18:00

LIVE

How the temporal patterns of wolf predation during summer drive wolf population dynamics

Thomas D. Gable

Voyageurs Wolf Project/University of Minnesota

Co-authors: Sean M. Johnson-Bice, Austin T. Homkes, and Joseph K. Bump

In many southern boreal ecosystems across North America, wolves rely on white-tailed deer and beavers during summer (April to October), yet relatively little is known about wolf predation behavior, or what drives changes in their predation behavior during this period. During 2015-2024, we studied the summer predation behavior of more than 50 wolves by searching >43,000 clusters of GPS-locations and identifying >1,900 kills. We used this dataset to estimate monthly kill rates and biomass acquisition rates of beavers and deer (both fawns and adults), and monthly ambushing rates on beavers to understand how these metrics of predation change from April to October. Our work demonstrates how the temporal dynamics of wolf predation in a southern boreal ecosystem are driven by prey availability, resource pulses, wolf cohesion, and the energetic demands of growing wolf pups—factors that coalesce not only to influence kill rates of wolves but also the ambushing behavior of wolves, particularly during periods of reduced deer availability. We also demonstrate striking individual variation in the predation behavior of wolves, both in terms of kill rates and ambushing rates, with breeding wolves generally be more adept hunters than subordinate wolves. By estimating kill rates, biomass acquisition rates, and the energetic requirements of wolves and their pups, we show how wolf predation behavior ultimately drives wolf population dynamics by driving population parameters such as pup survival, territory size, and population density.

Monday 16:00 - 16:20

Identification of single nucleotide polymorphisms in 270 wolf genomes

Arkadiusz Dziech

Affiliation

Co-authors: Magda Mielczarek, Heliodor Wierzbicki

In recent years, with the development and cost reduction of next-generation sequencing, the possibilities to study whole genomes of many species have increased significantly. A similar situation has been observed for the wolf (Canis lupus). The implementation of genome-wide molecular markers, such as single nucleotide polymorphisms (SNPs), is also becoming increasingly common for this species, and their use allows for in-depth and detailed studies of the species at multiple levels of its biology (e.g. study of individual genes, hybridisation with other canids, population genetics, etc.).

This presentation outlines the methodology and results of my PhD project, which examined over 270 wolf genomes from Europe, North America and Asia. The main objective was to identify SNPs present in wolf genomes. To achieve such a goal, all genomes were screened for possible wolf-dog hybridisation to exclude individuals with recent mixed ancestry from further analysis. This approach minimises the risk of including SNPs of canine origin in the final set. SNPs obtained from the remaining individuals were then filtered to find those common to the species in different parts of its range and those that are specific to particular areas or populations.

This study resulted in a set of SNPs of wolf origin that can be used for further research on this species. It can be applied directly to further analyses, to design smaller SNP sets with a specific purpose in mind, and as a reference set for a bioinformatic pipeline of newly acquired data. In addition, information for data extracted from publicly available databases (such as average depth of coverage and whether genomes have signs of recent hybridisation with dogs) is also provided. The project also provides raw next-generation sequencing data of 15 Polish wolves, which will be publicly available for further research.

High diversity of grey wolf (Canis lupus) paternal lineages in central and eastern Europe

Maciej Szewczyk

Affiliation

Co-authors: Małgorzata Witek, Julia Sparzak, Gabiela Toka, Robert W. Mysłajek, Sabina Nowak, Sylwia Czarnomska et al.

The grey wolf (Canis lupus) is an iconic apex predator species that plays a key ecological role in many ecosystems and thus its ecology, behavior and genetics have been extensively studied. However, most genetic studies analyzed biparentally inherited autosomal markers or maternally inherited mtDNA. Analysis of paternally inherited Y chromosome markers should provide necessary complement to such studies, but previously these markers have been used mostly in local-scale research or wolf-dog hybridization studies. We aim to assess the diversity of wolf paternal lineages across Europe, with focus on populations that are currently dynamically expanding in human-dominated landscapes. We hypothesize that in continuous wolf range, this diversity is significantly higher than reported for isolated populations studied before. Moreover, as the results of some telemetric and genetic research on wolves suggest that dispersal in this species may be male biased, we hypothesize that wolf populations are less spatially structured on the level of paternally inherited markers compared to mtDNA and autosomal DNA, and that in recently recolonized areas, the number of founder individuals is higher for males than females.

Our preliminary results seem to support these hypotheses. In ca. 600 analyzed samples we have found nearly 30 Y-STR haplotypes, over 2.5 fold more than reported in previous studies restricted to smaller areas. Interestingly, in around 100 Polish samples analyzed, we detected 14 haplotypes, indicating that the diversity of paternal lineages significantly exceeds this of mtDNA lineages. Moreover, we found several haplotypes that are widespread over vast areas of central and eastern Europe, e.g. a haplotype shared between the Polish, northern Russian and Caucasus wolf populations, or another one present both in Balkan and Baltic populations. On the other hand, we have detected a peculiar group of closely related private haplotypes in Belarus, indicating presence of local genetic structure within the European Plain. To further explore this phenomenon, we developed a panel of Y-SNP markers that should provide better resolution and create a “phylogenetic backbone” allowing arrangement of Y-STR haplotypes into haplogroups. Our work should improve understanding of male-mediated gene flow in wolf populations and thus inform transboundary management.

Monday 16:40 - 17:00

Who are the wolves that make the difference?: Genetic reconstruction of wolf recolonization history in the Italian Alps

Francesca Rolle

Affiliation

Co-authors: K. Pilgrim, M.K. Schwartz, and F. Marucco

Maintaining a diverse genetic pool is crucial for animal populations to adapt to changing environments. Factors such as small population sizes, isolation, and limited gene flow lead to a loss of genetic diversity, which in turn can lead to inbreeding and inbreeding depression, the decrement in a population's vital rate. Given the strong correlation between genetic diversity and population fitness, evaluating an individual's genetic contribution to future generations and overall population dynamics is vital. This is especially important for species of ecological and social significance, such as carnivores, which, due to their high public and stakeholder interest, require detailed data and analysis to inform effective conservation plans.

To address this challenge, we described the recolonization process of the Italian Alpine wolf population using microsatellite genotyping and sex identification from 3547 non-invasive samples collected between 1998 and 2023. Long-term multigenerational pedigrees were reconstructed to track genetic diversity, spatial levels of heterozygosity, and inbreeding throughout the expansion process. We successfully genotyped 1766 individuals and observed an increasing trend in effective population size, reaching 168 (95% CI 137-210) in the west and 30 (95% CI 19-50) in the east of Italy in the last generation. Pedigree-based calculations of genetic contributions to future generations were used as estimates of reproductive values, where each wolf's contribution was determined by assessing relatedness with its descendants. This allowed individuals with the highest contribution and overall fitness to be identified. Additionally, we gained insights into the genetic population structure, including the genetic identification of immigrants and allelic differences. While inbreeding with close relatives was recorded in the Eastern Italian Alps, most reproductive wolves were unrelated, and, overall, the population was not considered inbred. Genetic diversity was maintained through social behavior, dispersal among packs, and immigration.

Our findings reveal genetic dynamics in an expanding wolf population within a densely human-populated European environment. Moreover, by tracking genetic contributions over time and gaining both individual and population-level genetic insights, we provide valuable ecological understanding and help inform effective conservation strategies.

Monday 17:00 - 17:20

Genetic admixture between Central European and Alpine wolf populations

Barbora Černá Bolfíková

Affiliation

Co-authors: Pavel Hulva, Sebastian Collet, Lucie Baránková, Kamila Valentová, Jana Šrutová, Harald Bauer et al.

The recovery and expansion of formerly isolated wolf populations in Europe raise questions about the nature of their interactions and future consequences for population viability and conservation. Will fragmented populations fuse or maintain a certain level of isolation with migration? Central Europe is suitable for obtaining empirical data in this field as it represents a ‘crossroad’ with the potential for contact among several phylogeographic lineages. In this study, non-invasive genetic samples obtained during population monitoring in the Bohemian and Bavarian Forest (BBF) mountain ranges in the Czech Republic and Germany (Bohemian Massif) were analysed at different neutral markers including mitochondrial sequence, nuclear autosomal microsatellites and gonosomal sex markers. Resultant genetic profiles were compared with reference data to study population ancestry. Both cluster analyses of microsatellite genotypes and syntopic occurrence of haplotypes HW01 and HW22 showed genetic admixture between Central European and Alpine populations. This represents secondary contact and interbreeding of formerly allopatric populations with different phylogeographic histories and distant expansion centres in different biomes in the Baltic region versus the Apennine peninsula and Alps. Moreover, the study describes the founding event and genealogy of this admixed deme, inhabiting intermediate environmental conditions compared to parental forms, and emphasises the role of protected areas as stepping stones in the range recolonization process in endangered large mammals.

Parallel Presentations

Theme: Wolves and Genetics

Monday 17:20 - 17:40

How can changes in the genetic health of wolf populations cascade to influence boreal forests?

Sarah R. Hoy
Affiliation
Co-authors: Rolf O. Peterson, John A. Vucetich

Increasing evidence suggests that large predators can trigger trophic cascades which impact species across multiple trophic levels. Our goal was to advance our understanding of trophic cascades in two main ways. First, to understand how trophic cascades are shaped by changes in the genetic health of predator populations. Second, to better understand how predator-induced changes in herbivore populations and browsing pressure affect the growth, survival and chemical properties of plants (carbon and nitrogen content). We used long-term data collected from the wolf and moose populations in Isle Royale National Park (USA) to assess how changes in the genetic health of the wolf population (associated with inbreeding) can cascade to impact the abundance and foraging behavior of their main prey, moose, and the trees that moose browse on.
We found evidence suggesting that:

1) Declines in the genetic health of the wolf population reduced the rate that wolves preyed on moose (predation rate).
2) As predation rate declined, moose abundance increased and moose browsed more on coniferous trees, especially balsam fir.
3) As moose browsing pressure increased, we observed declines in the annual growth and survival of balsam fir saplings - which are likely to have important impacts on forest succession and the total biomass and species composition of this boreal forest ecosystem.
4) As moose browsing pressure increased, we observed that fir foliage contained more nitrogen and less carbon. Preliminary data suggest these changes in nitrogen and carbon content may be due to fir saplings chemically defending themselves to deter further browsing, by producing alkaloids which can be acutely toxic to herbivores.

The broader significance of these results is indicated by recognizing that changes in the growth, survival and chemical properties of a common boreal forest species are likely to influence carbon and nitrogen cycling, and the amount of carbon stored within the ecosystem. Therefore, our work highlights how genetically-mediated-trophic-cascades involving wolves may affect large-scale ecosystem processes and highlights the importance of conserving wolf populations at densities high enough to preserve their genetic health.

Monday 17:40 - 18:00

The origin and spread of coat color anomalies in a highly inbred wolf population

Øystein Flagstad

Affiliation

Co-authors: Ylva Johanne Tabel Brovold, Georigia Ausilio, Petter Wabakken

The Scandinavian wolf population was re-established in the 1980s and -90s by three founders from the neighboring population in Finland and Russia. An additional four founders have over the last 15 years contributed to the gene pool. However, the population is still highly inbred and inbreeding depression has been documented. A peculiar character among Scandinavian wolves is pigmentation anomalies, often in the form of white tail tips, but sometimes also white legs or the lack of pigmentation on larger parts of the coat. In this study, we track the origin and spread of these coat color anomalies. We demonstrate that the anomalies are due to a recessive mutation in a coat color gene, spread into the population by one of the early founders. Possible fitness consequences are addressed and implications for conservation management are discussed. Our study is an illustrative showcase demonstrating how founders and immigrants carry a certain amount of rare recessive alleles with potentially negative fitness consequences. The associated characters, such as the lack of pigmentation in our case, are virtually never expressed in large source populations. In small and inbred recipient populations, however, deleterious recessive alleles can spread rapidly by successful immigrants and their offspring, inevitably leading to the expression of their associated characters.

Monday 16:00 - 16:20

Interactions between recolonizing wolves and mammal communities based on long-term camera-trapping data

Veronika Braunisch

Affiliation

Co-authors: Valentin Debons, Valeria Benz, Stefanie Roder, Maude Vernet, Hannes Vomsattel, Raphael Arlettaz

The return of large carnivores to the densely populated landscape of Central Europe leads to considerable conflicts with land users. To predict conflicts and develop evidence-based management strategies it is necessary to identify the main factors influencing recolonization dynamics in space and time and to quantify interactions with the existing mammal communities.

We collected camera trap data of large carnivores, their ungulate prey, as well as mesopredator species at 102 locations systematically distributed across the Canton of Valais, Switzerland. The time series starting in winter 2011-2012 covers the period of wolf reestablishment in this region. Cameras were set up during the winter season (November – March) and complemented with snow-tracking surveys of ungulates along 1km transects during the first four winters. Based on the camera trap data, daily trapping rates were calculated per species. In addition, ungulate abundance estimates per transect, corrected for species-specific detection probabilities, were used to model area-wide relative prey density and biomass. Based on these data, we analyzed interspecific relationships at two scales, the landscape (study region) and the local (camera-site) scale.

Across the study region the steep increase in wolf trapping rates over the years was paralleled by a decrease roe deer (Capreolus capreolus) and chamois (Rupicapra rupicapra) trapping rates, while those of red deer (Cervus elaphus) remained constant. Red deer density, followed by roe deer, was the main driver of wolf occurrence at the landscape scale, yet this pattern was no longer apparent at the camera-site scale. Also the landscape-scale trapping frequency of all mesopredator species decreased over time, which at first glance seems to confirm the mesopredator release theory. However, locally, only badger (Meles meles) occurrence was negatively related to wolf presence, while a positive relationship with red fox (Vulpes vulpes) suggests facilitation, probably due to an increased availability of carrion in the vicinity of wolves.

While these first results already indicate complex, scale-dependent interactions between wolves and other mammal species, we now aim to link these interactions and test for causal relationships in order to contribute to knowledge-based wildlife management and to an objectification of the associated social and political debate.

Monday 16:20 - 16:40

Influence of wolves on relative abundance and activity patterns of wild ungulates in human-influenced forested ecosystems

Kerrian Chauvière
Affiliation
Co-authors: Florin Kunz, Philippe Christe, Fridolin Zimmermann, and Nina Gerber

Predators influence the foraging behavior and population size of their prey through consumptive and non-consumptive effects. The strategies developed by prey in reaction to predation can indeed alter their fitness . However, in human-dominated ecosystems, these effects are challenging to observe. To assess the wolf's impact on ungulate populations in Switzerland, we aim to investigate how the predator's growing spatial distribution and its temporal activity affect the spatiotemporal distribution of ungulates. Additionally, we will include human presence data, as it can interfere with or even outweigh predators' effects on ecosystems.

Our study took place in the Swiss Jura Mountains and is based on eight years of camera-trap monitoring following the recolonization of the wolf in the area (2017-2024). Up to 72 sites per year were monitored across a 300 km^2 area overlapping with up to five pack territories.

We aim to investigate seasonal variations in relative abundances and diel activity patterns of four prey species (red deer Cervus elaphus, roe deer Capreolus capreolus, chamois Rupicapra rupicapra, and wild boar Sus scrofa) in relation to wolf (Canis lupus) and human presence. For analysis, we integrate temporal and spatial information in one comprehensive framework to simultaneously study the temporal and spatial overlap of different species. We use a Bayesian time-dependent observation model for camera trap data (Tomcat), as an innovative approach to analyze predator-prey interactions by simultaneously integrating both spatial and temporal information .

We expect that prey's relative abundance decreased while wolf population increased and that ungulates adjusted their activity pattern to minimize predation risks. Red deer, as the primary prey, are expected to undergo greater changes, because of the higher hunting pressure they face from wolves. We plan to compare predator effects between sites, but also at specific sites through the eight years of monitoring. With the latter, we expect to understand how ungulate populations progressively react toward the wolf's influence from the very beginning of its recolonization. Regarding human presence and activity, we expect it to also impact ungulates' spatiotemporal distribution, but unlike the wolf's influence, its effects should not increase over time, except for the COVID-19 period.

Monday 16:40 - 17:00

Comparing activity patterns of the Himalayan wolf with Himalayan marmots and kiangs in a high-altitude landscape

Antonio Sampedro Garrido

Affiliation

Co-authors: Geraldine Werhahn, Naresh Kusi

Himalayan wolves show unique adaptations to low oxygen levels at high altitudes. These wolves belong to a phylogenetically distinct clade whose main ecological characteristics should be analyzed separately from those of the Holarctic grey wolf. In this study, we utilized data collected from 48 camera trap stations covering an area of 336 km² between May 2022 and October 2023. Daily activity at each station was measured and standardized by adjusting the occurrence rates to 1000 functioning hours. We also applied an algorithm to distinguish between activity occurring during the day (between sunrise and sunset) and at night (between sunset and sunrise).

Our preliminary results reveal the annual activity patterns of the Himalayan wolf and Kiangs and Himalayan marmots, the primary prey of the wolves in the study area. Notably, certain wolf activity patterns during the warm seasons may be influenced by marmot activity ($t = 0.9643$, $df = 4$, p-value = 0.0019). During the late rearing season and early winter, the correlation between the activity of wolves and kiangs was non-significant ($t = 2.5265$, $df = 4$, p-value = 0.0649), in contrast to the total lack of correlation during the first six months of the year.

Our data suggest that the Himalayan wolf in the study area is predominantly diurnal, with no significant variation in activity across seasons. The harsh winter climate likely contributes to this consistent diurnal activity. However, during the warmer months, the preference for daylight activity may be influenced by prey availability, which aligns with the biological cycles of the wolf's primary prey. We observed seasonal variations in the wolf's daily activity, and these variations were compared with the activity patterns of its main prey species in the area, Himalayan marmots and kiangs.

Parallel Presentations

Theme: Species Interactions

Monday 17:00 - 17:20

Badgers and wolves: close encounters on the set

Pauline Arends

Affiliation

Co-authors: Geraldine Werhahn, Naresh Kusi

I have camera trap images of interactions between wolves and badgers on badger setts.
The images show how the wolves approach the badgers and the badgers' reaction.
The wolves belong to the pack Midden-Drenthe.
In the BE Hart van Drenthe, we monitor the badgers. On different sets, I have cameras 24 hours/day working over the last few years. So also from before the wolves came along. It might be interesting to see how the badgers react so far to the arrival of the wolf.

Monday 17:20 - 17:40

Niche differentiation within a sympatric population of Wolves and Golden Jackals in the Eastern Marmara Region of Türkiye

Melis Töke

Affiliation

Co-authors: Fatih Dikmen, David Blount, Josip Kusak

Habitat loss and fragmentation caused by human activities in natural landscapes significantly impact ecosystems. Increased human presence may cause large mammals to change their behavioral patterns. The first monitoring study was conducted in the northeastern part of the Samanlı Mountains in Sakarya to understand better the coexistence strategies of wolf and jackal populations and potential human-wildlife conflicts. The study area was chosen for its diverse wildlife and high level of human activity. Since fine-scale studies in Europe about wolf and jackal interactions are inadequate, this study provides important knowledge about their ecology. During the study, camera traps were used to monitor the area for 9 months, and 632 camera trap days were obtained. Twelve mammal species captured in camera traps along with wolves and jackals brown bears, red fox, roe and red deer, wild boar, wild cat, marten, badger, red squirrel, and wild hare were detected in the study area. Based on frequency data, it was determined that jackals were found to be the most dominant species and they avoid wolves, and wolves avoid humans. Since the detection rate of wolves and jackals was 0.04 and 0.6 respectively, jackals can be considered as a "weedy species". Roe deer and red deer, which are the main food sources of wolves, were observed very rarely. Kernel density estimations displayed a high temporal overlap between wolves and jackals and a low overlap between these two canid species and humans. Besides, wolves and jackals were mainly active during the night and humans showed diurnal activity in the region. Accordingly, the activity patterns of these two canid species are found to be negatively influenced by high human presence. We found that canids exhibit a trend of temporal avoidance by human presence. Sakarya, defined as a metropolitan city, is exposed to high human pressure due to logging, animal husbandry, and tourism activities and this high level of anthropogenic factors poses a threat to human-wildlife conflicts.

Wolf and jackal interaction patterns in Croatia

Dário Hipólito

Affiliation

Co-authors: Peter Haswell, Michael Schulte, Pavao Kusak, Josip Kusak

There are numerous examples of how the disappearance of apex predators has led to a simplification of food webs and an increase in mesopredators, which in turn has had a cascading effect on the entire ecosystem. On a continental scale, jackals and wolves are spreading into the interior of Europe and seem to coexist in the same areas. The jackal can be seen as the ecological equivalent of the coyote, sharing its range with the wolf but being subject to interspecific interference competition by the wolf, and, potentially, direct killing. The enemy constraint hypothesis would suggest that the jackal would be excluded from core wolf territories, yet it appears to be colonizing and surviving inside wolf territory. In North America, the coyote may sometimes coexist with wolves and adapt to wolf recolonization via behavioral changes, spatial and temporal partitioning. The ability of coyotes or jackals to co-occur with wolves may fluctuate with the intensity of wolf pressure. We tested the hypothesis that jackals use the same strategy when dispersing into wolf territory in Europe, and that the intensity of wolf presence (seasonality and disturbance) would affect jackal presence, behavioral adaptations, and density.
We studied activity pattern overlap of wolves and jackals alongside spatio-temporal variation in jackal abundance using camera traps in a wolf area in Croatia recently colonized by jackals. The cameras were active year-round in the Alpine and Mediterranean regions between April 2021 and March 2022 and recorded 563 and 857 independent events of wolves and jackals, respectively. The activity patterns of the species were compared and the selection of different times of day was analyzed. For jackal abundance , we examined three environmental variables and the intensity of wolf presence.
The overlap in the activity of wolves and jackals showed seasonal differences between denning and non-denning seasons, and between regions. In the Mediterranean region of Croatia with low wolf presence, the overlap of activity was higher than in the Alpine region.
The detectability of jackals was significantly higher in higher forests, further away from settlements and with a higher number of wolf events during the non-reproduction season. The detectability of jackals was significantly lower in higher forest cover, closer to settlements, and with a higher number of wolf events during the reproduction season.
The hypothesis that jackal abundance increases with increasing proximity to humans was not supported, however jackal abundance decreased with increasing wolf activity in the reproductive season. This suggests that wolf intensity may limit jackals but that settlements may not offer human shielding for jackals in Croatia. Further studies are needed that consider the presence of humans in wilder areas, the factors limiting wolf intensity, alongside fine scale spatio-temporal interactions between these predators. It will also be important to tease out the mechanisms driving the interaction patterns of wolves and jackals.

Parallel Presentations

Theme: Spatial Ecology

Monday 16:00 - 16:20

Wolf recolonization, ecology, and coexistence: comparison within and between North America and Europe

Jesse S. Lewis

Affiliation

Co-authors: Stewart Breck, Niccolò Fattorini, Andrés Ordiz Fernández, Francesco Ferretti, Oliver Keuling, Stephanie Kramer-Schadt et al.

Wolves are one of the most widely distributed large mammals in the northern hemisphere, whose populations continue to expand across North America and Europe due to conservation actions, natural recolonization, and societal values. Range expansion into regions of their historic range, which has been unoccupied for several decades to centuries, has led to predictable and unpredictable outcomes to ecosystems and people. Wolf recovery and its effects has exhibited similarities and differences between North America and Europe, which provides a learning opportunity to effectively conserve wolf populations across systems. In this study, we compared wolves between North America and Europe, as well as across countries and states, where we evaluated: 1. the distribution of wolves in relation to human activities, 2. the ecology of wolves and their effects on ecosystems, and 3. the challenges and future of wolf conservation and management given expanding wolf populations and increasing human-wolf interactions. Over the last three decades, wolves have increased their range in North America and Europe, including into landscapes altered by humans. Across continents, countries, and states, we summarize the areas that allow wolf hunting, the effects of wolves on livestock and native ungulates, and how conflicts are managed. For example, wolves can exert strong top-down forces on competitors, as well as prey. However, these top down effects can vary within and between continents due to myriad human factors. In particular, the absence/presence of livestock, prey availability, other carnivores, and varying management activities can either promote or hinder the potential for trophic cascades to occur in ecosystems. Other challenges, such as hybridization, also vary across systems. Ultimately, although expanding wolf populations is considered a conservation success story by many segments of the public, other groups of people are less supportive due to direct or indirect conflict with wolves. In order to promote wolf conservation and maximize public support, it is critical to address people's concerns with expanding wolf populations. There are outstanding opportunities for managers across systems in North America and Europe to share new technologies and create opportunities for cross cultural exchange of knowledge to best manage recovering carnivores globally.

Parallel Presentations

Theme: Spatial Ecology

Monday 16:20 - 16:40

Recovery of Gray Wolves in Wisconsin USA: from extirpation to coexistence

Adrian P. Wydeven

Affiliation

Gray wolves were killed off in Wisconsin in the late 1950s, at about the time my family immigrated from the Netherlands to Wisconsin. While I was in university in the 1970s, wolves began to slowly spread back into the state from a source population in Minnesota to the northwest. With protection of federal, state and tribal endangered species policies, as well as improved attitudes, wolves were able to return to a state that many thought was no longer wild enough to support such a large predator. In recent years the wolf population has grown to about 1,000 wolves. While risk of future extinction is low, wolves continue to provide challenges to wildlife conservation, including whether they need to continue to be listed as federal endangered species, or can be managed with more flexible state or tribal management. I will examine the growth of the Wisconsin wolf population and the conservation challenges they continue to face.

How to connect? Possible movement corridors for wolf packs in a human-impacted Swedish landscape

Anna C. Treydte

Affiliation

Co-authors: Johan Eriksson Myhrberg, Ronja Kraus

Globally, human-carnivore coexistence has been challenged by an ever-increasing land demand for human settlements, infrastructure, agriculture and industrial development. Particularly carnivore populations with often large home range requirements are strongly affected by a consecutive habitat decline and fragmentation. This habitat deterioration challenges interactions between sub-populations and threatens genetic diversity of the affected carnivore population. Yet, little is known on whether the Swedish wolf (Canis lupus) population can uphold regular exchanges between packs to maintain their genetic pool. Further, understanding habitat suitability and connectivity for wolf packs is essential for appropriate human-wolf conflict management in Sweden.

We wanted to quantify the impact of human presence on the connectivity of wolf home ranges and the landscape permeability for wolves in mid-Sweden, a highly human-dominated area. We used environmental information provided by the Swedish national land cover data including road networks, deforestation activities, pasture and open water locations. We added location data of wolf packs collected through the population monitoring project SKANDULV in Scandinavia. In addition, GPS locations of nine individual wolves were used for home range size and distribution estimates. We analysed this information using connectivity, least-cost paths, and corridor analyses in GIS.

Our preliminary data showed that about 56% of the study area was potentially suitable habitat for wolves, being rather evenly distributed throughout the landscape. The most suitable areas were located in the northwest, i.e., Dalarna and Värmland. Wolves preferred a rather shallow terrain with slopes between 2 and 9 degrees. Home range sizes varied on average between 260 km2 and 1200 km2. Inside estimated home ranges, forest was the dominant land cover type (47% - 62%), while the second most dominating land cover was exploited land (17% - 34%), highlighting potential areas of conflict. Our connectivity analysis showed 46 corridors through the landscape for wolf packs. We conclude that wolf packs were likely still able to interact and use the human-dominated landscape, although with sub-optimal connections. Home range composition of wolves agreed with our habitat suitability analyses. The connectivity analyses highlighted areas that should be monitored for conflicts and where mitigation / prevention measures should be focused on.

The use of spatial capture-recapture to improve environmental impact asssesments on wolves

Gonçalo Ferrão da Costa

Affiliation

Co-authors: Miguel Mascarenhas, Carlos Fonseca, Chris Sutherland

Wolves are elusive species, with vast home ranges and occurring at low densities, making challenging to study them and derive robust estimates of their ecological parameters. Wolf monitoring programs under environmental impact assessment (EIA) procedures should seek to derive objective and quantitative estimates of those parameters before the development of some infrastructure (the reference situation), monitor all the construction phase, and follow, at least, the first years of operation, to make inferences about cause-consequence relationships. This procedure, correctly done, will feed decision-making through an adaptative management process and help the development of preventive avoidance/mitigation measures at pre-construction and construction phases, corrective actions at operational phase and/or compensation measures to ensure species populational resilience.
However, most of the current wolf monitoring programs during EIA, despite the vast field effort often undertaken, rely mainly on naïve statistics like relative abundance indexes or absolute survey numbers to make direct assumptions about biological relevant parameters, disregarding the bias from the imperfect observational process. This can lead to incorrect evaluations, dispersion of resources and inconsequent conservation measures.
Here, we present a way to overcome present shortcomings by taking advantage of the spatial capture-recapture (SCR) framework, using wolf as a model species and an example of a three-year monitoring program. We show that, apart from the need of consistent genetic data to create individual information from geolocated scats collected on the field, there is little to change from the current wolf survey designs, rather than adjusting the analytical framework. Results include unbiased estimates for density, total abundance and space use, which are critical for a good impact assessment. Additionally, the direct inclusion of spatial covariates within the models, including the infrastructure under study, allow inferences about its effect on the species estimates.
Wolf monitoring programs are costly, involve a lot of human and material effort, and many times achieve little data. Making the most from the (few) data collected in the field is a responsibility for everyone involved, so that robust conclusions can be drawn to really help the overall EIA process and safeguard the target species.

Parallel Presentations

Theme: Spatial Ecology

Monday 17:20 - 17:40

Linking age and social status of wolves to vulnerability throughout the harvest season

Peter F. Rebholz

Affiliation

Co-authors: Lisette P. Waits, David E. Ausband

In cooperative breeding carnivores, the composition (i.e., the number of different sex and age classes) and size of a group are important influential factors in recruitment and group survival. Monitoring these parameters in remote populations through traditional approaches, such as radio-telemetry and direct observation has proven to be difficult and costly due to geographical obstacles, large home ranges, and less sampling opportunities for cryptic and elusive species. Understanding how mortality can affect groups of cooperative breeders like gray wolves (Canis lupus) is useful for informing management and conservation. Genetic monitoring can be an effective approach for acquiring such information when traditional methods are too costly or ineffective. We demonstrate a novel approach for using genetic data opportunistically collected from harvested wolves to genotype and estimate a minimum count of breeders harvested annually in Idaho, USA. We compared genotypes from tissue samples of harvested wolves to create an effective and replicative approach for identifying breeders and when they are likely to be harvested.

Monday 17:40 - 18:00

Uncovering the triggers of wolf fatigue: From sports science to wolf energetics

Ane Eriksen

Affiliation

Co-authors: Pablo Rozier-Delgado, Charlotte Lorand, Olivier Devineau, Anne Loison, Kristoffer Nordli, Baptiste Morel

Understanding the trade-offs faced by wildlife in human-dominated landscapes has been limited by the difficulty of estimating energetic costs and environmental and physiological constraints to movement. We demonstrate a novel approach to studying energetics and fatigue in wild wolves by applying methods from sports science to data from wolves equipped with GPS and accelerometer sensors within the Scandinavian Wolf Research Project.

Striated muscle tissues are shared throughout the animal kingdom, and so are fundamental muscle and locomotion properties. For instance, a hyperbolic relationship between the speed an individual can maintain and the duration of the effort has been observed in a large number of species. The asymptote of this relationship, namely the critical speed, represents an intensity threshold beyond which fatigue accumulates drastically. Critical speed shows a considerable inter-individual variability, driven physiological and biomechanical determinants. While critical speed is widely used in human sports performance models, it has unexploited potential for improving our understanding of costs and constraints in wildlife movement.

We present proof of concept and multiple applications for the use of accelerometery to study critical intensity and energetic expenditure in wild wolves. Variation in critical intensity both within and between individuals can serve as an indicator of physical condition, and can be related to factors such as age, health, and potentially even inbreeding level. Furthermore, by estimating individual-level critical speed from accelerometer data, we can identify when, where in the landscape, and under what circumstances wolves exceed sustainable activity levels (i.e. fatiguing efforts). Aided by field observations and acceleration-based behavioural classification algorithms we will investigate wolf activities that are likely associated with high intensity and energetic cost, such as the chasing and killing of prey and responding to direct human disturbance. By applying this tool on a highly active wildlife species such as the wolf, we can gain a new understanding of the energetic trade-offs and the physiological and environmental constraints impacting wolf movement in complex environments.

Parallel Presentations

Theme: Survival and Mortality

Monday 16:00 - 16:20

Anthropogenic and natural factors causing wolf mortality in Italy

Carmela Musto

Affiliation

Co-authors: Jacopo Cerri, Sarah Marshall-Pescini, Duccio Berzi, Francesca Ciuti, Alessandro Bianchi, Giuseppe Merialdi et al.

Over the past 40 years, the gray wolf (Canis lupus) has recolonized its historical range in Italy. While this has increased conflicts with human activities, spatiotemporal changes in wolf mortality, including direct and indirect persecution, are still poorly explored. This study aims to fill this gap by focusing on the Lombardy, Emilia-Romagna, Tuscany, Marche and Umbria regions, which host a significant percentage of the Italian wolf population.

Between 2011 and July 2024, 842 wolf carcasses were collected and subjected to necropsy. The main causes of death were collisions with vehicles (n = 523/62.1%), primary poisoning (n = 57/6.8%), secondary poisoning and contributing cause of death (n = 175/20.8%), gunshots (n = 63/7.5%), illegal killing in other ways (n = 7/0.8%) and unknown causes (n=73/8.7%). The percentage of wolves with signs attributable to illegal killing remained constant through time, with most of the persecution events occurring from September to March (80.9%).

Natural mortality involved a minority of cases (n = 87/10.3%), the animals with signs of intraspecific aggression increased from 1 subject in 2010 to 6 subjects in 2023, of note is the significant percentage (21.3%) of individuals that were positive for Sarcoptic mange.

Moreover, since 2021, seven wolves died due to Aujeszky's disease. Classic factors thought to be linked to wolf mortality such ad human population density and livestock presence did not predict illegal killings, however we found spatial clustering of such events. This could indicate that wolf persecution arises from different conflicts with human activities, beyond those with livestock herders.

Results relating to natural causes of death are also noteworthy, especially the increase in Aujeszky's disease transmitted from wild boar to wolves, becoming an example of how a prey species can control - through a disease - the density of the top predator. Finally, Sarcoptic mange is confirmed to be the main contributing cause of natural death in the wolf population we studied.

Our findings emphasize the need for standardized approaches to record and analyze wolves that are found dead in anthropized landscapes. Standardization will be crucial to monitor spatio-temporal changes in human-wolf relationship.

Parallel Presentations

Theme: Survival and Mortality

Monday 16:20 - 16:40

Road mortality of wolves in human-dominated landscapes in Poland

Sabina Nowak

Affiliation

Co-authors: Maciej Szewczyk, Radosław Sroga, Magdalena Bartoszewicz, Katarzyna Lesner, Michał Figura, Robert W. Mysłajek

The recovery of wolf population across human-dominated landscapes of central Europe coincides with an increasing mortality of wolves on roads, the level of which remains unknown. In Poland, where the species has been strictly protected since 1998, and its current range covers forests and mosaics of natural and human-modified areas, we opportunistically collected data on wolves hit by vehicles from 2002 to 2023, revealing their distribution, seasonal variation, sex and age structure, social status and road category at the kill site. We also conducted GIS analyses of habitats along the road and their impact on the risk of collision. Datasets from 20 wolves collared in 2014-2023 were used to assess the number of crosses per wolf per day, time of crosses and traffic on the road section, differences in road crossings between wolf age categories, and risk of being killed on the road. Within 20 years, we recorded 447 wolves struck by vehicles on roads, most of them in 2018-2023. Among road casualties with defined age classes, there were more adults (> 1 year, 69%) than juveniles (< 1 year). Adults were killed mainly in late autumn (41% of adults' mortality) and then in late winter (23%). Juveniles died on roads mostly in autumn, with 61% of pups' mortality. Mainly young (1-3 years) adult wolves were killed on roads (70%), much less (20%) wolves over 3 years old, and only 10% older than five years. The youngest road-killed pup was seven weeks old, but the most frequent were those of six and seven months old, making 36 % of all pups' deaths. Wolves mainly died on national (47%) and regional roads (29%). Most roadkills (78%) were found on road sections crossing forested areas, at least on one roadside (78%), where traffic was below 9.000 vehicles/per day. Wolves with GPS-GSM collars crossed roads on average 2.6 times per day (range 0.7 – 7.8), mainly during the night (88%) between 8 pm and 8 am. Our study results can help create solutions to reduce wildlife collisions and assess the impact of traffic on wolf populations.

Parallel Presentations

Theme: Survival and Mortality

Monday 16:40 - 17:00

Breeder turnover and its cascading effects on wolf pack structure

Peter Rebholz

Affiliation

Co-authors: David E. Ausband

Gray wolves (Canis lupus) in Idaho, USA, typically live in family groups comprising a breeding pair and several generations of offspring. Breeders can be particularly influential in such groups, dictating behaviors such as when and where to hunt, and monopolizing breeding opportunities. Studies have shown that breeder turnover can affect groups of wolves in profound ways, even leading to group disbandment. I show that most breeding pairs are together just a short time (2 years) but have increased pup survival in their groups when together for longer periods. Additionally, wolves who lose a mate quickly re-pair and can have as many as 5 mates in their lifetime. Harvest negatively influences pup survival and this is further exacerbated by the loss of breeding females in groups. Finally, breeder turnover affects dispersal decisions by mature, nonbreeders in groups. Most notably, their decisions are affected not only by their sex but by the sex of the breeder that was lost. Breeder turnover is a powerful force helping to drive wolf pack size and composition gray wolves.

Parallel Presentations

Theme: Survival and Mortality

Monday 17:00 - 17:20

Apparent survival of mated wolves across West-central Europe

Peter Sunde

Affiliation

Co-authors: Olivier Devineau, Martin Mayer, Barbora Cerna Bolfikova, Pavel Hulva, Hugh Jansman, Felix Knauer et al.

Survival rates of paired adults are of paramount importance for wolf population dynamics and ultimately whether local populations can be self-sustaining or even persist. Since 2000, breeding pairs of wolves have established over large parts of Central Europe, increasingly colonizing human-dominated landscapes. As wolves appear to adapt well to cultivated landscapes, regional and habitat specific survival rates of reproductively active individuals may become a key determinant for the final number of wolves in Central Europe and where they can live. Using a capture-mark-recapture analysis we analyzed apparent survival of more than 750 wolves, identified as mated territory owners based on genetic markers from six neighboring countries (Germany, Czech Republic, Austria, Belgium, The Netherlands, and Denmark). Predictors were regional divisions as well as landscape variables representing habitat availability (forest cover), human impact (road density, human footprint index), conflict potential (sheep density), sex and wolf population density. We present the results of this analysis and derive the extent to which different regions and landscapes can be considered as populations sources or sinks.

Parallel Presentations

Theme: Survival and Mortality

Monday 17:20 - 17:40

Patterns and determinants of mortality in grey wolves (Canis lupus)

Ana Morales-González & Héctor Ruíz-Villar

Affiliation

Co-authors: Maria Paniw, Eloy Revilla

Mortality is one of the main drivers of population dynamics, being particularly remarkable for large carnivores in scenarios with widespread human pressure. This is the case of the grey wolf (Canis lupus). The design and implementation of successful management and conservation strategies requires to understand the magnitude and variability of the different sources of mortality. Here, we review the patterns and determinants of mortality documented in the scientific literature (174 studies) for the species across its distribution range. Despite we found similar rates for North America and Europe (0.32 ± 0.17), the proportion wolves dying by the different human and natural causes significantly varied across these regions. For instance, the proportion of mortalities by illegal means and vehicle collisions, and by intraspecific strife and diseases were higher for Europe and North America, respectively. Although some differences may be partially explained by variations in methodological approaches, we showed that several individual, social and environmental (human and natural) factors determined mortality. For instance, human related factors (e.g. direct persecution and agricultural habitats) increased mortality, and group level factors (e.g. litter size and age of breeders) greatly determined pup mortality. Our study provides a critical appraisal of all information on wolf mortality to date, providing the baseline framework to advance in the conservation and management of arguably the most controversial species in the northern hemisphere.

Monday 17:40 - 18:00

Impact of wolf predation as well as environmental and anthropogenic factors on moose harvest in Scandinavia

Camilla Wikenros

Affiliation

Co-authors: Håkan Sand, Ane Eriksen, Petter Wabakken, Johan Månsson, Cecilia Di Bernardi, and Barbara Zimmermann

Management of ungulate populations to the desired density and/or demographic composition is challenging due to conflicting interests among stakeholders. We examined long-term moose (Alces alces) harvest data in two countries in northern Europe (Sweden and Norway) that share populations of wolves (Canis lupus) and moose. We tested how time since wolf establishment and variation in wolf territory density affected moose harvest density and age and sex composition of the harvested animals. We also tested how the presence of an additional large carnivore species (brown bear (Ursus arctos)), habitat composition, latitude, and infrastructure correlated with harvest density to further improve our understanding of the important factors for moose harvest yield. Hunters in Sweden reduced almost instantly their harvest of moose as a response to the establishment of wolves. Moose harvest density was reduced with up to 51% in areas with average wolf territory density compared to areas without wolves. Management actions were taken to reduce the total moose mortality as well as to maximize productivity in the population in response to increased wolf territory density. During the later years, however, harvest became decoupled from wolf territory density in several areas in an attempt to reduce local moose densities and with that moose browsing damage in young forest stands. Total moose harvest and the proportion of calves in the harvest were both positively correlated with the proportion of young forest in the area. Increased proportion of agricultural land was also linked to both increased total harvest and proportion of calves, likely because increased roe deer (Capreolus capreolus) densities re-directed wolf predation from moose towards roe deer. The total harvest was negatively related to increased brown bear density. Also, the location and characteristics of wind power establishments impacted on moose harvest. The ability to adjust to new conditions is key in wildlife management where conflicting societal objectives such as forestry and carnivore conservation should be balanced. Improved monitoring for individual hunting areas over time will be important for the understanding of how different ungulate populations are affected by various factors and for the desired management of wildlife populations shared across borders.

Parallel Presentations

Theme: Attitudes

Tuesday 11:00 - 11:20

LIVE

Navigating Socio-Ecological Dynamics: Changes in Human Attitudes and Wolf Management in Switzerland

Carolyn Schaltegger

Affiliation

Co-authors: Nina Gerber, Laura Andres, Vera Lucia Alessandrello, Manuela von Arx, Gabriele Cozzi, Arpat Ozgul, Dominik Behr

The recolonisation of human-dominated landscapes by wolves is fuelling ongoing public debates with diverging human attitudes at their centre. In December 2023, Switzerland legalised the proactive shooting of wolf packs, marking a significant policy shift with potential impacts on the wolf distribution in the Alps. Our study integrates data from nationwide surveys conducted in 2015 and 2023 to analyse changes in human attitudes and spatial distribution of wolves. Despite the wolves' range expansion and increasing damages to livestock in Switzerland, human attitude towards the species has generally improved between 2015 and 2023. Using Structural Equation Modelling (SEM), we identified that positive attitude towards wolves was influenced by perceived benefits of their presence, while negative attitude was associated with indirect experiences of livestock loss and fear, particularly in households with young children. Acceptance of wolves correlated with support for livestock protection measures and reliance on experts/science information, whereas negative attitude was linked to support for lethal management and reliance on social circles for information.

Further, with a spatial modelling approach we showed that socio-economic disparities between lowland and mountain areas were stronger predictors of human attitudes than proximity to wolves, depredation incidents, or livestock abundance. Additionally, we predicted potential human-wolf conflict areas by comparing habitat suitability for the wolf, human attitude, actual wolf occurrence, livestock abundance, depredation intensity, and existing livestock protection measures. This analysis identified current and future hotspots of human-wolf conflict and provided recommendations for adaptive management strategies. Our findings emphasise the need for a nuanced approach to wolf management that integrates public perception, personal experience, and effective communication strategies to address the complex socio-ecological dynamics of human-wolf interactions in Switzerland.

Media Attitudes Toward Wolves: The Role of Recolonization Phases, Pasture Seasons, and Proximity to Elections in the Italian Alpine Regions

Davide Ravaglia

University of Turin, Department of Life Sciences and Systems Biology

Co-authors: Guillaume Chapron, and Francesca Marucco

In the context of global biodiversity decline, certain species, such as the wolf (Canis lupus), are paradoxically reclaiming some of their historical habitats after being eradicated by humans. This is the case in Europe, where wolves are repopulating the human-exploited Alps. However, this conservation success is reigniting old human-wildlife conflicts. The successful conservation of controversial species somewhat depends on public acceptance, which can be challenging to assess but is reflected in - and influenced by - media coverage.

In this study, we conducted a longitudinal analysis (2014-2023) of provincial and national online news attitudes toward wolf conservation in the Italian Alpine regions. Northern Italy presents various stages of wolf recolonization, making it a perfect case study to explore the local dynamics of media attitudes. The attitudes of news articles were manually classified by 100 independent readers using a 5-point Likert scale, ranging from strongly negative to strongly positive. We then leveraged these classifications to train a neural network that filled in the gaps in the dataset, obtaining a total of over 4000 classified news. At last, we employed Bayesian hierarchical models to analyze factors influencing media attitude.

The analysis revealed shifts in media attitudes depending on the phase of wolf repopulation: while national news proved to be the most positive, at a local scale, areas with little-to-none wolf presence were the most positive, while regions with long-term wolf presence exhibited slightly negative attitudes and areas with recent recolonization were the most negative. Overall, positive attitudes toward wolf conservation declined over the study period. A novel finding of this study was the negative influence of the proximity of political elections, which we assessed while also considering the negative effect of the grazing season. These results enrich our understanding of the challenges this species faces in one of the most densely wolf-populated human-inhabited areas, highlighting the importance of monitoring the human dimension to ensure effective conservation. Additionally, the automated classification method developed could be employed in other countries with minimal or no need for fine-tuning, as its performance remained reliable when translating news into English.

Parallel Presentations

Theme: Attitudes

Tuesday 11:40 - 12:00

LIVE

Exploring the role of implicit and explicit attitudes in human-wolf coexistence

Svenja Capitain

Affiliation

Co-authors: Magdalena Boch, Gwendolyn Wirobski, Sarah Marshall-Pescini, Claus Lamm, Giulia Pedretti, Valeria Bevilacqua & Friederike Range

Understanding human attitudes towards wolves is essential for managing coexistence during wolves' recent recolonization in many European countries. While possible factors for the polarization around wolves have been identified, prior research relied almost entirely on self-report measures, which predominantly reflect explicit attitudes. Implicit attitudes, however, have been largely neglected. They influence behaviour outside awareness and have been central in the study of human ingroup-outgroup behaviour, stereotypes, and prejudice formation. Given the stereotypes and symbolisms attached to wolves in our culture and the possible behavioural predispositions we may have retained toward apex predators, we believe that understanding these implicit processes, their mechanisms, and origins is crucial for understanding and navigating the polarized dynamics. In this talk, we will present four studies on explicit and implicit attitude measures during the interaction with real and pictured wolves that may help to better understand our attitudes and behaviour towards wolves. Implicit attitudes were assessed via (psycho-)physiological (neural activity, heart rate, cortisol) and behavioural measures (body language, facial expressions, implicit attitude test), respectively. Dog stimuli were used as a comparison to assess effect specificity. In the first experiment, we used neuroimaging to compare participants' amygdala activation (as a proxy for an affective threat response) when viewing wolf or dog pictures to their explicit ratings of the pictures' threat levels. The findings revealed a divergence between explicit ratings and implicit neural responses: while wolves were explicitly rated as more threatening than dogs, the brain responses did not match this difference and suggested only minimal differences between species. In the second to fourth experiment, humans physically interacted with wolves and dogs, hand-raised and kept in similar ways. This allowed us to explore the relationship between direct experience and implicit attitudes, behaviour, and physiological reactions. First preliminary results indicate that implicit reactions to dogs and wolves differed even after years of positive daily experience with both species, with experience only mediating the ratio of positive and negative facial expressions towards the species. These first insights show that investigating implicit alongside explicit attitudes holds great promise in helping us better understand the human dimension and polarisation around wolves.

Parallel Presentations

Theme: Attitudes

Tuesday 12:00 - 12:20

LIVE

Age-Defying Conservation: Cogeneration from Boomers to Zoomers

Cassiopeia Camara
Affiliation

Ready to shake things up in wolf conservation? Let’s dive into how cogeneration—an exciting strategy that brings together different generations—can transform the way we protect wolves and the environment.

Cogeneration offers a fantastic opportunity to tackle the polarization and debates often seen in wolf conservation. Imagine blending the wisdom of seasoned pros with the fresh ideas of younger advocates! By understanding and addressing what matters to each generation, we can smooth out conflicts and boost communication. This approach lets us harness the best of both worlds to create a stronger, united front for wolf protection.

The friction around wolves usually boils down to misunderstandings and clashing values. But by bridging these generational divides through cogeneration, we can improve how we talk about wolves, reduce disagreements, and get more people involved. This strategy not only brings us together but also amps up our efforts in conservation.
So, what’s cogeneration all about? Join me to discover more.

Parallel Presentations

Theme: Co-existence

Tuesday 11:00 - 11:20

Voices from the Mountains: Using in-person interviews to understand livestock farmers' attitudes on wolves and wolf management in the Italian Alps

Ronja Kraus

Affiliation

Co-authors: Farina Sooth, Erica von Essen, Anna Sustersic, Anna Treydte

Media coverage and political discussions have highlighted concerns among the local human population regarding the return of wolves (Canis lupus) to the central Alps. As the Alps are a highly diverse and, in parts, intensively used region, various interests of agriculture, forestry, conservation, and tourism converge and often collide. The presence of such interests and the resulting region- and stakeholder-specific conflicts make it difficult to find solutions for a sustainable human-wolf coexistence. Reaching these on-the-ground actors is important in locating the lived realities of conflict. However, research often relies on online surveys or snowball sampling methods, that are unable to target a specific land user group, e.g., livestock breeders, and at the same time allow for a quantitative assessment based on a randomly selected sample of respondents.

In this study, we aimed to identify the challenges livestock farmers face regarding wolf management in their respective regions and set those into relation to spatio-temporal conflict occurrence. We conducted personal interviews with 70 livestock farmers in Trentino and Lombardy, northern Italy, in and close to Stelvio National Park, between June 2023 and June 2024. We developed a semi-structured questionnaire to explore topics related to farming practices, experiences with wolves and compensation processes after attacks, people's attitudes toward wolves, wolf management, and livestock protection measures.

In a unique contribution to spatio-temporalize wolf conflict, we further applied participatory mapping of pasture use to contextualize our survey results within the spatial landscape. This involved overlaying the abovementioned data on other landscape characteristics such as terrain, vegetation structure, anthropogenic landscape features, and livestock depredation events.

In the first part of our presentation, we will highlight preliminary findings from our quantitative analysis that underline the necessity of locally specific wolf management concepts. The second part will focus on discussing the challenges and opportunities we, as female researchers from abroad and not part of the local farming community, encountered during data collection on the wolf topic, followed by some recommendations based on our experiences.

Parallel Presentations

Theme: Co-existence

Tuesday 11:20 - 11:40

Insights of coexistence between humans and wolves: a case study from Tandoureh National Park in Iran

Nima Badelu

Affiliation

Co-authors: Kaveh Hobeali, Modaser Teymori,Mohammad Sadegh Farhadiniai

Tandoureh National Park, located in the northeast of Iran within the Kopet Dag mountain range, is one of the country’s most critical conservation areas, home to large carnivores such as the Persian leopard (Panthera pardus tulliana) and the gray wolf (Canis lupus). The high density of leopards inside the park has led to the near absence of wolves in the park's core, pushing wolf activities to the park's borders, where they come into greater conflict with human settlements and livestock. This predator competition, combined with concentrated wildlife populations inside the park, has resulted in a significant disparity in livestock depredation events between wolves and leopards. Our survey documented 183 livestock losses during 70 wolf attacks across 23 villages, compared to only 29 attacks attributed to leopards. This demonstrates that wolves are responsible for 6.3 times more successful depredation events than leopards, underlining their predominant role in livestock losses. Out of 57 respondents, more than 80% expressed negative attitudes toward wolves, with 29 people (50.88%) reporting a strong dislike for the species. Notably, 14.04% indicated they would kill wolves immediately following an attack, and 19.30% said they would kill a wolf if attacks became frequent. The increasing human-wildlife conflict at the edges of Tandoureh National Park highlights the need to extend conservation efforts beyond protected area borders. Fragmentation of protected areas reduces focus on wildlife conservation in surrounding regions, intensifying conflicts. To improve wolf conservation and mitigate conflicts, it is essential to expand protective measures outside the park, implement continuous community education programs, and establish comprehensive livestock insurance schemes. Additionally, having committed herders and well-trained guard dogs can significantly reduce livestock losses. Timely and widespread vaccination of livestock not only helps prevent disease transmission but also boosts wildlife populations by keeping them healthy. This reduction in disease and livestock losses eases the financial burden on herders and lessens their resentment towards wolves, as the economic impact of predation becomes less significant.

Parallel Presentations

Theme: Co-existence

Tuesday 11:40 - 12:00

Perspectives of traditional Himalayan communities on fostering coexistence with Himalayan wolf and snow leopard

Naresh Kusi

Affiliation

Co-authors: Claudio Sillero-Zubiri, David W. Macdonald, Paul J. Johnson, and Geraldine Werhahn

The Himalayan wolf (Canis lupus chanco) and snow leopard (Panthera uncia) are found in the Nepalese Himalayas where conservation efforts target the latter but not the former. We conducted semi-structured questionnaire surveys of 71 residents in Upper Humla, Upper Dolpa, and Kanchenjunga Conservation Area (KCA) during 2014–2016 to understand people's knowledge, perceptions, attitudes and interactions with these two carnivores. We fitted a cumulative link mixed model to predict Likert scale ordinal responses from a series of Generalized Linear Mixed Models. Overall, attitudes were more positive toward snow leopards than wolves. Livestock depredation was the main predictor of the general negative attitude toward wolves (Estimate =−1.30873; p= .029866) but there was no evidence for an effect for snow leopards (Estimate =−0.3640; p= .631446). Agro-pastoralists had more negative attitudes than respondents with other occupations toward both carnivores and men had more positive attitudes than women. Among our study areas, respondents in the community-owned KCA had the most positive attitudes. Our findings illustrate the need to reduce human–carnivore conflict through a combined approach of education, mitigation, and economic cost-sharing with respectful engagement of local communities. Specifically, to encourage more villagers to participate in livestock insurance schemes, they should be improved by including all large carnivores and adjusting compensation to the market value of a young replacement of the depredated livestock type. Carnivore conservation interventions should target the whole predator guild to achieve long-term success and to protect the Himalayan ecosystem at large.

Parallel Presentations

Theme: Co-existence

Tuesday 12:00 - 12:20

It takes a village: thanks to inclusive conservation, an NGO implemented a successful livestock protection program in Switzerland

Jérémie Moulin

Organisation Pour la Protection des Alpages (OPPAL),Val de Bagnes, Switzerland

Co-authors: Elise Say-Sallaz

Wolf attacks have a significant impact on pastoral communities, disrupting income and raising herd management costs, while also causing psychological and emotional stress for farmers and shepherds. This situation exacerbates socio-political tensions and impedes the development of sustainable coexistence strategies.

Since 2021, the Swiss association OPPAL has been addressing these challenges by mobilizing hundreds of people annually to support shepherds and increase human presence on mountain pastures. OPPAL's unique approach involves building an "inclusive conservation" model, focusing on collective intelligence among all stakeholders involved (NGOs, authorities, society, farmers, shepherds, etc.).
The organization recruits volunteers and young civilists completing their national service, who receive specialized training to prepare them for their missions. When farmers experiencing wolf attacks request assistance, these trained volunteers and civilists are deployed in pairs at night to monitor vulnerable herds using advanced surveillance and deterrent equipment, such as thermal vision binoculars. OPPAL supports various types of livestock, including sheep, goats, and young cattle.
The organization operates on a cooperative model, where farmers or government herd protection officers reach out to OPPAL, ensuring that support is provided in a collaborative and mutually agreed manner. The organization often requires farmers to adapt their working methods; this fieldwork is carried out in collaboration with the authorities, and enables them to monitor and support these changes. Furthermore, OPPAL also partners with NGOs like WWF to create a comprehensive protection model.

Since its inception, OPPAL has grown significantly, with volunteer numbers increasing from 186 in 2021 to over 450 volunteers and 25 civilists in 2024. This expansion has led to over 22,000 hours of herd monitoring in 2024 alone. The organization has built strong partnerships with authorities and received an increasing number of support requests from farmers. Despite the emotional strain on farmers and the generally supportive stance of volunteers towards wolves, monthly and annual reviews show high satisfaction among all parties. OPPAL's model brings together individuals from diverse socio-professional backgrounds, fostering a rich exchange of perspectives. Remarkably, over 50,000 hours of surveillance over four years have resulted in zero successful wolf attacks during OPPAL missions, demonstrating the effectiveness of its approach.

Tuesday 11:00 - 11:20

Wolves as sentinels of farmers’ compliance with sanitary regulations in Poland

Robert W. Mysłajek

Affiliation

Co-authors: Weronika Baranowska, Michał Figura, Maciej Szewczyk, Sabina Nowak

Carcasses of farm animals, if not properly utilized, may be a source of viral, bacterial, and parasitological diseases harming humans, as well as wild and domestic animals. Furthermore, carcass deposition near human settlements may attract wildlife and escalate conflicts. Therefore, monitoring farmers’ compliance with sanitary laws is instrumental in sustaining long-term human-wildlife coexistence. We illustrate the sentinel potential of wolves, analyzing their scats’ content and using GPS tracking to assess farmers’ compliance with EU sanitary regulations regarding the utilization of carcasses of livestock and poultry. We performed a systematic review of all papers focused on the wolf diet based on scat analysis in forests and additionally collected and analyzed the content of wolf scats from human-dominated landscapes (23 study areas, >5700 scats) to reveal the share of domestic animals in the wolf diet across habitat gradient in Poland. Furthermore, we followed 23 wolves equipped with GPS-GSM collars to reveal the species, locations, and sources of domestic animals they consumed. We also installed camera traps near two poultry farms to obtain detailed data on the wolf's presence in dumps where carcasses were deposited. We revealed that in Poland, domestic animals comprised, on average 3.3% of consumed biomass (range 0-14.2%). The amount of domestic animals in the wolf’s diet is not, however, correlated with the area of farmlands within study areas. We revealed that collared wolves can find and forage on carcasses of livestock illegally dumped in forests and marshlands surrounding forests. Wolves were able to dig up farm animal carcasses buried in earthen pits. We also observed that wolves, especially young individuals, may regularly visit the vicinities of poultry farms, forage on the remains of illegally dumped birds, and rest on manure piles, which causes severe dermatosis and lowers their fitness. Our study shows the potential of GPS-tagged wolves as sentinels for monitoring farmers’ compliance with sanitary laws.

Parallel Presentations

Theme: Farmers

Tuesday 11:20 - 11:40

Fences and Shepherds Are Just the Start: Navigating the Complex Challenges of Implementing Livestock Protection Measures

Julia Stauder

Affiliation

Co-authors: Weronika Baranowska, Michał Figura, Maciej Szewczyk, Sabina Nowak

The resurgence of wolves in the Alps has triggered multifaceted conflicts and introduced significant challenges that necessitate intervention on political, social, administrative, and technical fronts. Effective stakeholder engagement is essential to mitigate these conflicts. Over the past five years, the European LIFEstockProtect project has engaged in comprehensive collaboration with livestock farmers and shepherds in the German-speaking Alps, specifically South Tyrol, Austria, and Bavaria, at various levels—from actors on the ground to high-level decision-makers and stakeholder representatives.
In these regions, the rejection of protection measures is prevalent, with increasing demands for wolf-free zones. Face to face interactions with farmers and shepherds have yielded valuable insights into their social dynamics, internal conflicts, needs, and barriers to adopting livestock protection measures. For example, despite intensive communication efforts by the project, associated institutions, and local administrations, many livestock farmers and shepherds continue to adhere to the misconception that shooting wolves and the lowering of its protection status will completely resolve predation issues. This belief substantially hinders the adoption of protection measures and is perpetuated through local media and stakeholders' associations. In the limited instances where protective measures have been implemented, the project has observed the emergence of new challenges associated with this adaptation. For instance, restructuring high-altitude summer pasture management to integrate herd protection encompasses not only the technical implementation and funding of new measures but also engenders new intra-community conflicts among farmers regarding the methods, legitimacy, and communication of these changes. It is not rare, that farmers or shepherds who implement protection measures often face social pressure, being stigmatized as traitors or wolf-supporters within their own groups. These and other complexities will be examined in greater detail, with proposed solutions to address these challenges in future policy decisions and projects focused on herd protection measures and conflict management.

Tuesday 11:40 - 12:00

Living labs - a shared management tool for wolf, livestock and hunting coexistence: The case study of the 4Pethabeco project (Ipa-Adrion Interreg Project) in the areas of the Dinaric Alps and the North Eastern Alps

Stefano Filacorda

Affiliation

Co-authors: Rebecca Missaglia, Andrea Madinelli, Antonella Stravisi, Sara Vezzaro, Lorenzo Bernicchi, Lorenzo Frangini

Living labs (open innovation ecosystems in real-life environments) are born from an idea of MIT researchers, and were first introduced in the design of innovative information and communications technology; these have subsequently been used in participatory planning and design across various sectors in the fields of sustainability, environmental management, conservation. In the context of management and conservation of large carnivores, in particular of Wolf and Bear, this approach is being applied in the context of the Dinaric Alps and the North Eastern Alps within the framework of the Interreg IPA-Adrion 4Pethabeco project. The project aims to identify, in a shared way with farmers and hunters, administrative and research bodies, the solutions and strategies to reduce the impact of wolves on livestock activities and to improve coexistence with other human activities; also by identifying experimental research measures applied to livestock management and damage prevention and hunting management. This approach seeks to identify research strategies, coexistence and management visions, based on real needs, experience and perception of farmers (and other stakeholder) in combination with the knowledge and technology held by research organisations. The approach and first results are presented

Parallel Presentations

Theme: Farmers

Tuesday 12:00 - 12:20

The relationships between wolves and pastoralists in the context of shrinking grasslands in Surendranagar district, Gujarat, India

Malaika Mathew Chawla

Affiliation

Co-authors: Rebecca Missaglia, Andrea Madinelli, Antonella Stravisi, Sara Vezzaro, Lorenzo Bernicchi, Lorenzo Frangini

The conservation of the endangered Indian grey wolf (Canis lupus pallipes) in India's grasslands has received little government support compared to the efforts focused on forest-dwelling large carnivores. Indian wolves primarily occupy grasslands, thorn forests and agro-pastoral landscapes that are integral to the livelihoods of livestock-keeping communities. In the state of Gujarat in India, wolves have become extinct across most of their former range, with the state's Forest Department attributing this decline to retaliatory killings by pastoralists. In our study, we seek to capture pastoralist's perspectives of wolves and the larger context in which these perspectives are embedded in. We individually interview sheep and goat pastoralists across the Surendranagar district in Gujarat, in areas where wolves are both absent and present in current times. We also undertake ethnographic field work in Gugaliyana village where wolves are present. In Gugaliyana, pastoralists graze their livestock in remnant patches of grassland, some of which overlap with the village's Reserved Forest, owned and controlled by the state's Forest Department. Outside the Reserved Forest, the grasslands are used for industrial activities like sandstone extraction, stone crushing, coal mining and as a dumping ground for ceramic waste. Residents of the village are dependent on the Reserved Forest for grazing or for fuelwood. However, they are stopped and confronted by the Forest Department who prevents them from grazing. The India wolf continues to survive in Gugaliyana and neighbouring villages despite it being largely extinct in many parts of Gujarat. The wolf's presence here is thought to coincide with the movement of sheep and goat pastoralists. Pastoralists generally know the whereabouts of the wolves and shut potential breeding dens with thorny branches to prevent wolves from residing in the area, as a means of protecting their livestock. Compensation for livestock losses due to wildlife by the Forest Department is either not provided or significantly delayed. The Forest Department's management strategies for wildlife conservation are largely focused on tree-based afforestation and regulating people's entry and use of the forest rather than efforts to decrease industrial pressures at the boundaries or providing timely compensation to pastoralists. The relationship between the sheep and goat pastoralists and the wolf is embedded in a larger context of shrinking grasslands that affect both pastoral livelihoods and wildlife survival. Our study aims to bring out this larger context and ask two primary questions. First, how do pastoralists think of the wolf in areas where they are present versus where they are absent? Second, how do broader economic and political structures in the landscape shape the way pastoralists perceive and interact with wolves in Gugaliyana? This study is a work in progress.

Tuesday 11:00 - 11:20

Himalayan Wolves: Ecology and Conservation in Human Dominated Landscapes

Salvador Lyngdoh

Affiliation

Co-authors: Shivam Shrotriya and Bilal Habib

The Presentation is about various aspects of wolves in India, particularly Himalayan Wolves. This presentation is the culmination of aspects of diet, public perception, ranging and interactions with other carnivores in the landscape of the northern Himalayas. From a decade of research on the species, the talk will be about how Himalyan wolves feed compared to its con-specifics in Asia and other parts. The talk will also showcase the wolf diet in the Himalayas and finally a ranging behavior of the wolves and other canids. The trans Himalayan landscape has a unique cultural setting, and these are resource-scarce areas. The region is dominated by another large carnivore, i.e. the snow leopard. The talk shall also discuss aspects of snow leopard ecology and human -wildlife interface in the region.

Wolves recolonize novel ecosystems in Europe leading to novel interactions

Dries Kuijper

Affiliation

Co-authors: T.A. Diserens, E. Say-Sallaz, K. Kasper, P.A. Szafrańska, M. Szewczyk, K.M. Stępniak, and M. Churski

The wolf (Canis lupus) is highly successful at recolonizing its now human-dominated former ranges in Europe and N-America. Over the centuries while the wolf was absent, humans have transformed ecosystems to a large extent. This includes changes to (meso)carnivore communities, wolves themselves (genetics, behavior), woody plant communities and the playing field for predator-prey interactions (landscape structure). We argue that the recognition of the novelty of human-modified ecosystems logically leads to novel pathways of how wolves can influence ecosystem functioning. Thus far, the ecological impacts of wolves have largely been predicted based on the documented effects they have in well-preserved systems with low human impact. However, wolves in human-modified ecosystems will engage in an array of novel interactions and potential novel trophic cascades that do not occur in more natural ecosystems with lower human impact. A promising direction for future studies is exploring what novel interactions establish and under what conditions wolves can exert their ecosystem impacts in the human-modified ecosystems. This knowledge could guide us to act to improve conditions to enable wolves to exert their ecosystem impacts again. These novel interactions may be the true ecological and societal value of having wolves returning to human-modified landscapes.

Parallel Presentations

Theme: Wolves in Landscapes

Tuesday 11:40 - 12:00

Home range, habitat use, and activity patterns of African wolves (Canis lupaster) in the Ethiopian highlands

Tariku Mekonnen Gutema

Affiliation

Co-authors: Anagaw Atickem, Diress Tsegaye, Dessalegn Chala, Afework Bekele, Claudio Sillero-Zubiri, Jorgelina Marino et al.

African wolves (Canis lupaster) and Ethiopian wolves (C. simensis) occur often sympatrically across habitats in the Ethiopian Highlands, with recent studies finding evidence for interspecific competition. However, unlike the well-studied Ethiopian wolf, comparatively little is known about the ecology of the African wolf in the Ethiopian Highlands. To address this empirical gap, We collected data on home range size, habitat use, and activity patterns of radio-collared African wolves at the Guassa Menz Community Conservation Area (GCCA) and Borena Saynt Worehimenu National Park (BSNP). We followed the African wolves (5 in GCCA, 6 in BSNP) for 16 months and had 659 ± 83 encounters with each individual. The mean 95% kernel density estimate home range size of African wolves was higher in BSNP (4.5 ± 1.5 km2) than at GCCA (2.2 ± 0.7 km2). In 55% (n = 3934) of the encounters the wolves were found to be solitary, whereas in other encounters we found them in groups of two to seven. At both sites, the African wolves were more often found in areas close to human settlements than in more intact habitat, and they were mainly active at dawn and dusk. These results show flexibility in African wolf ion and anthropogenic disturbance. We recommend further studies on major causes of spatial and temporal niche partitioning of Ethiopian wolves and African wolves in the Ethiopian Highlands.

Transboundary Monitoring of the Wolf Alpine Population over 7 countries and 24 years

Francesca Marucco

Affiliation

Co-authors: Ilka Reinhardt, Elisa Avanzinelli, Fridolin Zimmermann, Hubert Potočnik, Theresa Walter, Felix Knauer et al.

Wolf expansion in Europe is occurring over administrative boundaries and the majority of the wolf populations are shared between countries, hence the need to develop monitoring programs at the population level. Wolves in the Alps are defined as a functional population and management unit. The range of this wolf alpine population now covers 7 countries: Italy, France, Austria, Switzerland, Slovenia, Liechtenstein and Germany, making the development of a joint and coordinated monitoring program particularly challenging. To ensure strong coordination among wildlife experts of the different countries, we founded in 2001 a technical working group, the Wolf Alpine Group (WAG). Under the umbrella of the WAG, researchers developed uniform criteria for the assessment and interpretation of field data collected in the frame of different national monitoring programs. This standardization allowed for data comparability across borders and the joint evaluation of distribution and trends of abundance at the population level. We documented the increase in the number of wolf reproductive units (packs and pairs) over 21 years, from 1 in 1993-1994 up to 243 units in 2020-2021, and examined the pattern of distribution and expansion over the Alps up to 2023-2024. This long-term and large-scale approach is a successful example of transboundary monitoring of a large carnivore population that, despite administrative fragmentation, provides robust indexes of population size and distribution that are of relevance for wolf conservation and management at the transnational alpine scale.

Tuesday 13:30 - 13:50

LIVE

25 years since the return of wolves in Germany – is the public as polarised as we think?

Emu-Felicitas Ostermann-Miyashita

Affiliation

Co-authors: Sophia Hibler, and Darragh Hare

In 2000, wolves reproduced in Germany for the first time since their eradication in the mid-19th century. As wolf populations have grown, their return to contemporary German landscapes has been received with mixed reactions. While some celebrate wolves' return as a major conservation success, others express concern for the safety of livestock and humans. Strong polarisation is evident in how organised advocacy groups interact publicly, but to what extent is that polarisation reflected in broader public opinion?

In this presentation, we share findings from a questionnaire study explicitly measuring how members of the general public in Germany think about wolves. Our findings are based on responses from a sample of 1,500 adults living in Germany, stratified to approximate the German population in terms of gender and age, and designed specifically to examine potential rural-urban differences. We co-produced our questionnaire in close collaboration with a diverse range of stakeholders, including representatives of hunting associations, government authorities, shepherding, forestry, environmental NGOs, animal welfare organisations, tourism and conservation science. Two workshops were held: the first to identify knowledge gaps on public perceptions, and the second to refine the questionnaire based on those inputs.

This co-creation and co-production approach allowed us to capture a wide spectrum of perspectives and delve into subjects such as: "effective implementation of livestock protection measures leading to new conservation conflicts with local fauna" and "public understanding and support for restrictions on daily life resulting from livestock protection measures". We use quantitative analyses to identify key factors that explain differences in an individual's perceptions of coexistence with and management of wolves. These include respondents' age, gender, rural or urban location, ecological knowledge about wolves, awareness of management and livestock protection strategies, preferred media sources and trust in wildlife management by local and national governments. Additionally, we compare public perception on lynx and bears, to test whether differences in body size, iconic image, and historical relationships shape public attitudes towards these species. Understanding public perceptions is crucial for achieving long-term coexistence with wolves in Germany, especially now under the possibility of less strict legal protection.

Parallel Presentations

Theme: Wolves and Society

Tuesday 13:50 - 14:10

LIVE

Wolves, Science & Society

Hugh Jansman

Affiliation

Co-authors: D. Lammertsma, M. Laar, F. Ottburg & A. De Groot

With an increasing wolf density of currently 11 packs (2024-2025), 9% of the country protected as Natura 2000 (but in relatively poor quality), over 500 humans / km 2 , substantial influence of humans on wild ungulate distribution and density (management) and the highest livestock density in the world, The Netherlands is not your average wolf country. This does not go unnoticed with frequent media reports and political interest addressing wolves in relation to livestock casualties, cases of bold wolves, and unfortunately even bite incidents between wolves and humans. Since 2012, WENR performs policy advising research and participates in the monitoring of wolves for the Dutch authorities. This resulted in factfinding reports regarding the return of wolves to the Netherlands (2012 and 2021), a proposition for a Dutch Wolf management plan (2013), a habitat suitability study (2024) and the determination of the Favourable Reference Value for wolves in the Netherlands (2025). Besides that WENR conducts the ecological post mortem examinations on dead wolves and runs the genetical monitoring (information: www.wageningenur.nl/wolven). Al together, the Dutch wolf population is one of the best studied in the world. Governments acted timely by addressing the return of wolves with stakeholders years before the first wolves settled in the Netherlands in 2018. Subsidies for preventive measures and compensation for livestock losses have been organised. Despite this, support for wolves is moderate. Given the fact that almost all attacked livestock had no reliable protection and swift acting in case of potential bold wolves is not thoroughly organised, resulting in an increase of the conflict potential, this is probably not a surprise. Therefore we recommend to not only address the ecological science, but other disciplines as well, as social science, juridical knowledge, communication expertise and mediation. And next to consider the challenges related to coexisting with wolves in a broader framework of for instance the climate- and biodiversity crisis. In the presentation the results of the science will be addressed and the societal perception discussed, in particular in relation to the close encounters between wolves and humans in The Netherlands.

Tuesday 14:10 - 14:30

LIVE

Taming the Wolf Debate: Lessons from the LIFE BOREALWOLF Project Communication

Iina Ala-Kurikka

Affiliation

Co-authors: Mirja Rantala, Aku Ahlholm, Harri-Pekka Pohjolainen, Jani Pellikka, Mari Lyly

Human-wolf conflicts are strongly shaped by social and cultural perceptions of wolves. Effective communication is essential for managing environmental conflicts. Well-designed strategies can influence public perceptions, promote informed decision-making, and help resolve conflicts.

The LIFE BOREALWOLF project (2019-2025) aimed to improve public acceptance of wolves, reduce wolf-related damage to dogs and livestock, and develop tools for managing the wolf population while reducing illegal killings. A key part of the project was a comprehensive communication strategy designed to foster public dialogue and disseminate information.

Over the five-year period, the project appeared in the news on average 2.5 times per week. One notable outcome is that 25% of Finns living south of the reindeer herding area have heard of the LIFE BOREALWOLF project. Furthermore, one in five people have seen media coverage or heard about the project's core themes, such as wolf DNA sampling and the joint patrol of police and game warden. Nearly half of respondents are aware of the available measures to protect livestock from wolves.

This presentation will reflect on the initial goals and results of the communication strategy. Additionally, key lessons will be shared, along with considerations of what could have been done differently with the benefit of hindsight.

Tuesday 14:30 - 14:50

LIVE

The Nez Perce Tribe and Himiin (gray wolf): A reflection of the past and dream for the future

Alma Sanchez

Affiliation

Co-authors: Eric Kash Kash

The Nez Perce Tribe has long been recognized for efforts in the reintroduction and conservation of wolves in the Northern Rocky Mountains. This presentation highlights the Tribe's historical leadership in wolf recovery, beginning with the landmark wolf reintroduction project in 1995, where the Nez Perce Tribe filled the role in the successful reintroduction of gray wolves to Idaho. The Tribe's involvement not only revitalized the wolf population but also marked a significant milestone in the integration of indigenous knowledge with modern conservation science.

Drawing from this rich history, the Nez Perce Tribe is poised to once again lead wolf conservation efforts in Idaho, Oregon, and Washington. This renewed leadership is rooted in a profound sense of duty to cultural and treaty rights, coupled with a commitment to cutting-edge conservation science.

Incorporating case studies and empirical data, the presentation will demonstrate how the Nez Perce Tribe's approach to wolf conservation is both holistic and adaptive. Key elements include habitat restoration, conflict mitigation strategies, and community engagement, all of which are informed by a deep respect for the land and its inhabitants. By marrying cultural stewardship with scientific rigor, the Tribe ensures that conservation initiatives are sustainable and resilient.

The presentation will also discuss the Tribe's current and future initiatives aimed at expanding their leadership role. These include collaborative partnerships with federal and state agencies, research institutions, and other Indigenous communities. Emphasis will be placed on the importance of honoring treaty rights and Indigenous sovereignty in wildlife management, as well as the need for inclusive and equitable conservation practices.

In conclusion, the Nez Perce Tribe's leadership in wolf conservation exemplifies a harmonious blend of tradition and innovation. As they step forward to lead once more, their vision for the future of wolves in the Pacific Northwest and Inland Empire, is one of coexistence, balance, and respect for all forms of life. This presentation invites stakeholders to join the Nez Perce Tribe in a collective effort to ensure the long-term survival and flourishing of wolves in their ancestral territories.

Parallel Presentations

Theme: Wolves and Society

Tuesday 14:50 - 15:10

LIVE

Coexisting with wolves: Managing conservation and public concerns on the Utrechtse Heuvelrug

Floor Lormans

Affiliation

Co-authors: Eric Kash Kash

The Utrechtse Heuvelrug became official wolf territory in May 2023 after the reentry of the species in the Netherlands in 2018. In 2024 a wolf pack successfully established itself in the smallest and one of the most densely populated provinces of the Netherlands, the province of Utrecht. This development has not gone unnoticed. The presence of wolves in the Province of Utrecht has raised concerns among residents, keepers of ungulates, nature managers and policymakers, especially after various incidents occurred. As the provincial government, we are legally responsible for species protection. Our tasks and instruments include monitoring, providing subsidies for livestock preventative measures as well as providing compensation for agricultural damage. However, responsibilities regarding public order and human safety lie elsewhere, creating a complex governance situation when faced with human-wolves interaction. This presentation explores our experiences with incidents, available policy instruments and the complexity of balancing species conservation with public concerns. By sharing our experiences and dilemmas, we aim to provide insights into the possibilities to facilitate coexistence with wolves in a densely populated area.

Parallel Presentations

Theme: Wolves and Society

Tuesday 15:10 - 15:30

LIVE

‘Uuluesheued!’ A long term historical perspective on wolf-human relationships

Rob Lenders

Affiliation

Parallel Presentations

Theme: Wolf Habitat / Wolf-Dog

Tuesday 13:30 - 13:50

Habitat protection is crucial for the future well-being of Poland's wolf population

Roman Gula

Affiliation

Co-authors: Katarzyna Bojarska, Dominik Kaim, Jacek Kozak, Mahsa Shahbandeh, and Joanna Toczydłowska

Wolves in Poland have been legally protected since 1998, but the enforcement of the protection laws is weak. Frequent cases of wolf killing attract public attention, however in a longer perspective ongoing rapid alteration of wolf habitats seems to be a more important conservation challenge. The forest has been the main habitat for the recovery of the wolf population over the last 50 years. Our telemetry data collected in 4 regions of Poland shows that wolves establish their territories in forested areas, breed there, and prefer them over open areas. 30% of Poland is covered by forests, of which 77% is state-owned. The recovery of the wolf population has paralleled the spontaneous reforestation of arable lands, primarily due to changes in the agriculture industry that accelerated in the mid-1970s. Reforestation of private farmland has increased the forest cover in some areas by almost 100%, reducing the isolation of existing state-owned forests. Although this was not the sole cause of wolf recovery, it benefited wolves by allowing wolf packs to establish and control territories previously divided by arable lands and facilitated the recolonization of new areas. Recently, a growing part of reforested agricultural land has been converted into new residential areas accompanied by infrastructure. That process hurts the renaturalized regions by increasing the wildlife-urban interface and creating potential for wolf-human conflicts. Rapid road infrastructure expansion and improvement and the dramatic increase in traffic (20% over only the last 5 years) pose another challenge to forest habitats. Boundaries of existing wolf territories are often already established along public roads.

Parallel Presentations

Theme: Wolf Habitat / Wolf-Dog

Tuesday 13:50 - 14:10

Modeling habitat- and conflict potential for wolves in Austria to inform management

Jennifer Hatlauf

Affiliation

Co-authors: Florian Kunz, Fabian Knufinke, Luca Fuchs, Matthias Amon, Klaus Hackländer

Since the first re-establishment of Grey wolves (Canis lupus) in Austria, in the year 2016, their occurrence has increased steadily, with six packs confirmed in 2023. Questions arise regarding the monitoring and management of this species in diverse habitats. Although models from other countries exist, Austria's unique environment (human-dominated alpine regions) requires special consideration. This study presents comprehensive analyses of both, habitat- and conflict potential for wolves in Austria. First, a habitat model identified key areas that may provide optimal ecological conditions for wolf packs. The model was developed using current Austrian data and provides an up-to-date representation of potential regions, where packs are likely to occur, regardless of their current distribution. Secondly, the conflict potential model evaluated socio-economic factors, including depredation, livestock production, herd protection, and besides several others, proximity to human settlements. Unlike models based on surveys, this model leveraged data to produce a detailed and actionable map of conflict-high areas.
We used correlative statistical modeling and mechanistic approaches to build models for habitat potential, predation risk and human-wildlife conflict potential. All spatial models were built at fine spatial scales, using moving window approaches. Conflict potential was assessed using an adapted Potential of Conflict Index (PCI), which involved experts in weighing factors. Emphasis was placed on generating appropriate input data, including stakeholder-specific variables such as occurrence of game species (hunting), the presence of protective forests (forestry) or the predisposition of livestock to wolf predation (agriculture). Stakeholder involvement played an important role in this study: At least one representative from each of the provincial governments and one from the federal ministry were involved through meetings, workshops and their expertise in evaluating the models. The results were merged and priority areas for management were identified, particularly where high habitat- and high conflict potential overlap.
Overall, the resulting maps are presented on a sectoral basis - agriculture, forestry, and tourism - and provide a necessary tool for discussion and management of growing wolf populations. By combining ecological requirements with socio-economic concerns, this study can provide a basis for sustainable wolf management and support wider conservation coexistence objectives.

Parallel Presentations

Theme: Wolf Habitat / Wolf-Dog

Tuesday 14:10 - 14:30

The natural resettlement of the Grey wolf in Normandy, France

Clémence Méheust

Affiliation

Co-authors: Philippe Madeline, Olivier Cantat, Farid Benhammou, François Leboulenger

After an absence of over a century, the return of the wolf to Normandy took place on lands of Pays de Bray (Seine-Maritime) from November 2019 to February 2021, then in Pays d'Ouche (Eure) in the spring and summer of 2021. The specimen that stayed in the area was a wolf of Italian-Alpine lineage, looking for territories that remain unoccupied and a female mate. During the summer of 2023, the presence of another wolf has once again been confirmed in Normandy, in the department of Manche. In January 2024, a wolf of German lineage was found dead in Seine-Maritime. Between these lupine episodes, observations and signs of wolves presence is generating doubts in all five departments in the Normandy region. The predation of wildlife and domestic stock have been found, creating an unprecedented situation for stakeholders of the land, including professional breeders and owners of sheep, judicial authorities amongst others.

Our geography research sought to understand the predator’s arrival in Normandy where we met with different stakeholders in order to identify issues and address questions following the return of the wolf. Our exploratory proposal culminated in a thesis which highlighted the apprehensive difficulties associated with the presence of the wolf in the territorial plain. Indeed, the legal framework and mechanisms to protection domestic stock are adapted for mountain areas and their agricultural contexts. In Normandy, sheep and goat farming are extensive and predation is primarily an issue concerning hobby breeders (who keep small ruminants for leisure, yard maintenance or personal consumption) and few professional breeders who often breeds sheep or goat as a secondary activity.

Our research work is based on semi-structured interviews with breeders, hunters, environmental protection associations, administrations, etc. We also conducted a survey based on a quantitative analysis of a questionnaire sent to breeders throughout the Normandy region.

(Re)Connecting the dots: assessing connectivity loss and landscape demogenetics of Ethiopian wolf populations

Sandra Lai

Affiliation

Co-authors: Claudio Sillero-Zubiri and Jorgelina Marino

The Ethiopian wolf, endemic and highly specialised to the Afroalpine ecosystem, faces significant challenges in dispersal and recolonisation due to extensive habitat loss and fragmentation. Expanding subsistence agriculture in the Ethiopian Highlands has created hard borders that limit their ability to move between populations, further isolating them. We assessed the loss of landscape connectivity by comparing the current connectivity considering the remaining Afroalpine habitat with the potential connectivity based on a habitat suitability model. In addition, to evaluate the capacity of conservation translocations to counteract Ethiopian wolves's limited dispersal capacity, we simulated landscape demographic and genetic processes on the current landscape to predict the genetic diversity and population persistence in the future with or without this intervention. The remaining populations are expected to become increasingly isolated and shrink in size, highlighting the critical need for more proactive conservation efforts to prevent further decline of this endangered species.

A novel approach to investigating the impact of urbanization on wolf-dog interactions in Central Italy

Martina Lazzaroni

Affiliation

In Italy, the wolf population has been consistently increasing, recently estimated over 3,300 individuals. As a result, wolves are moving closer to human infrastructures and this increased proximity has led to a rise in wolf attacks on pet dogs, exacerbating wolf-human conflicts.
The current study aimed to investigate the potential difference in the behavioral reactions of wild wolves living along an urbanization gradient in the presence of a small ‘fake’ dog. Dummy conspecifics, have been used as proxies for live social partners across various species, including hyenas, bees, birds, and domestic dogs, and various studies have shown that the animal’s initial reactions to such models are consistent with reactions to ‘real’ conspecifics (Reid et al, 2022). Thus, we exposed 30 packs of wild wolves to a fake dog (test condition) but also to a fake magpie (control condition). By comparing the wolves' initial reactions to the fake dog versus the fake magpie, we first assessed whether the fake dog elicited more social or even predatory behaviours in the wolves as compared to the magpie, which is a species largely ignored by wolves in Italy. We then analyzed the wolves' detailed social behaviors when interacting with the fake dog and explored potential differences across the urbanization gradient and in relation to encountering the fake dog alone or with other pack members. We will discuss the implications of these findings for understanding wolf behavior in urbanized environments and consider potential strategies for managing wolf-dog interactions to mitigate conflicts.

Tuesday 15:10 - 15:30

Wolf-dog hybridization and introgression in and around Dalmatia, Croatia

Astrid Vik Stronen

Affiliation

Co-authors: Barbara Boljte, Djuro Huber, Maja Jan, Marjeta Konec, Josip Kusak, Carsten Nowak et al.

Human-induced hybridization is a global threat to wild species, including plants, fish, birds, and mammals. Where related domestic species are abundant, this can result in hybridization and, over time, a hybrid swarm. In southeastern Europe, Croatia's Dalmatia region and parts of Bosnia & Herzegovina experienced armed conflict during the 1990s. This caused large-scale human movements and abandonment of domestic animals, including dogs (Canis lupus familiaris), which are known to hybridize with wolves (C. lupus). At the same time, wolves were recolonizing Dalmatia following extirpation some decades earlier. Individuals at population edges are particularly vulnerable to hybridization given the reduced number of potential mates, and this risk is further elevated where anthropogenic factors promote the presence of related domestic species. Previous research in this region reported wolf-dog admixture and documented numerous individuals with atypical phenotypes classified as wolves based on limited sets of microsatellite genetic markers. Recently, a panel of 96 single nucleotide polymorphism (SNP) markers was developed to detect wolf-dog hybridization and introgression in Europe, and tests in populations across the continent showed that backcrosses into wolves could be detected up to and including the second-generation backcross (BC2w). In 170 samples from Dalmatia and neighbouring parts of Bosnia & Herzegovina we found 31 individuals categorized as BC2w. In contrast, no first-generation hybrids were found, indicating that ongoing hybridization between domestic dogs and wolves is now rare or absent. Our results suggest that the initial wolf-dog hybridization event or events occurred over a decade ago, followed by introgression of domestic dog genes into the recolonizing and expanding wolf population. Analyses of samples collected in recent years indicate that introgression may be spatially restricted, despite its occurrence in a region with broadly similar ecological and environmental conditions. However, the SNP panel identifies introgression up to and including BC2w, and later-generation backcrosses may therefore exist undetected in the population. Whole-genome sequencing of regional canids, including individuals with atypical phenotypes, combined with ecological and behavioural research, are needed to evaluate introgression and its long-term influence on wolf genomes and phenotypes.

Tuesday 15:30 - 15:50

Wolves across species' borders - genetic determination of wolf-dog hybrids kept as pets in Finland

Helena Johansson

Affiliation

Co-authors: Katja Holmala, Mia Valtonen

Finland has seen some high profile cases of captive-bred or captive-held wolf hybrids in the past decades, and at least one even escaping into the wild. Wolf dog hybrids are illegal to keep as pets in Finland. A collaboration between the Finnish Centre for Economic Development, Transport and the Environment (ELY-keskus), the Finnish Police and the Finnish Natural Resources Institute (LUKE) was set up in 2023 to map the occurrence of captive hybrids in Finland. In this project samples taken from putative hybrids identified by, for example, practice veterinarians, during animal welfare inspection visits, or by police, would be screened with genetic tools by LUKE. To do this work, LUKE applies a genetic tool developed and used successfully in screening for wolf dog hybrids in the wild wolf population - a SNP panel comprising 93 diagnostic or near diagnostic genetic markers. After analyzing several cases of suspected hybrids we found that 1) captive hybrids are not always easy to diagnose 2) the genetic tool's power is limited to diagnosing F1 (wolf x dog) and F2 (hybrid x hybrid) crosses and 3) captive hybrids, for example F2s, do appear slightly genetically different from F2s found in the wild population. We discuss our results in light of limitations to the method, potential breeding practices and their genetic consequences, and the potential legal quagmire.

Echoes of survival: hidden genetic challenges in the Iberian wolf

Isabel Salado

Affiliation

Co-authors: Carles Vilà, Jennifer A. Leonard

Over the last century gray wolves faced dramatic declines across much of their range, primarily due to human persecution. However, unlike other regions in Europe, the gray wolf population in the Iberian Peninsula was not completely extirpated, though it did experience a severe bottleneck. In recent decades, while the species has expanded and recolonized parts of the northwest Iberian Peninsula, it has become locally extinct in the south and remains genetically isolated from other European wolf populations. Population bottlenecks and geographic isolation leave distinct signature on the genomes of wildlife, influencing long-term viability. To assess the impact of these factors on the Iberian wolf, we conducted genome-wide analyses of both contemporary and historical samples from across the species' range in Iberia. Our findings reveal a significant loss of genetic diversity despite apparent population recovery over the last five decades. Furthermore, we detected high variability in inbreeding levels and genetic similarity among wolves from neighboring areas in the northwest, suggesting a pattern of small-scale population fragmentation. These results underline the complex dynamics of the Iberian wolf population, revealing that while it may appear to have rebounded in size, it is still genetically vulnerable. Despite this genetic vulnerability, Iberian wolves currently very rarely hybridize with dogs, but this may be a risk if genetic problems become too severe. Conservation strategies should consider not only population numbers but also the genetic health of the population to ensure its long-term survival.

Parallel Presentations

Theme: Genetics and Health / Public Engagement

Tuesday 13:50 - 14:10

From wilderness to urban edge: genetic insights into a newly established wolf population in Parnitha National Park—Central Greece

Aimilia Ioakeimidou

Affiliation

Co-authors: Iliopoulos Yorgos, Kampouris Theodoros, Bartzokas Georgios, Antoniadi Eirini, Papandreou Maria, Akriotis Triantafyllos et al.

Over the last decades wolves have been significantly recovered in Greece as in other parts of Europe, thanks to conservation legislation and habitat natural restoration, following centuries of organized persecution and habitat loss. The conservation status of wolves in Greece is currently characterized as "inadequate but improving (U1+)". Their distribution has expanded considerably beyond protected areas, since they have colonised human dominated landscapes, such as rural and peri-urban areas. Inevitably, the proximity of wolves to human settlements raises major concerns about human safety, livestock and dog depredation as well as wolf-dog hybridisation. We evaluated the status of a recently established wolf population (since 2014) in Parnitha National Park—Central Greece after an absence of at least 60 years. Wolves inhabit a highly anthropogenic and constantly changing typical Mediterranean ecosystem, which has already been influenced by frequent and severe wildfires due to climate change. We applied non-invasive genetic sampling by collecting 124 wolf faecal samples from the wider area of Parnitha National Park from July 2022 to June 2023 in the framework of the pan-European LIFE WILD WOLF project. Samples were genotyped at 15 canine-specific autosomal microsatellite loci and sexed using DBX intron 6 and DBY intron 7, to accurately estimate the population size, sex ratio and assess levels of genetic diversity. We built a genetic database by analysing 50 wolf tissue samples collected across Greece and 50 tissue samples from stray dogs, sympatric to wolves in Parnitha, at 8 microsatellite loci to detect possible wolf-dog hybrids. Those tissue samples served as reference genetic profiles for comparison of allele frequencies at each locus enabling to correspond each faecal sample to wolf, dog, or hybrid. Our research represents the first systematic effort to examine levels of wolf-dog hybridisation in a highly urbanized area by implementing standard genetic methods, and underlines the need for targeted management strategies to ensure balanced long-term conservation of wolves in peri-urban areas.

Parallel Presentations

Theme: Genetics and Health / Public Engagement

Tuesday 14:10 - 14:30

Pedigree-based analysis of livestock depredation behaviour in German wolves

Caroline Sophie Birkenhain

Affiliation

Co-authors: Stephan Kurbin, Gregor Rolshausen, Carsten Nowak

Wolves are currently recolonizing parts of Europe from which they had been previously eradicated. This conservation success, however, results in human-wildlife conflict due to the predation of the wolf on sheep and other livestock. Since wolves are social animals strongly involved in parental care, it is assumed that young wolves may socially inherit hunting behaviour, including prey selection, from their parents. Currently, solid data is lacking regarding the extent to which a propensity towards livestock is passed on to subsequent generations via genetic predisposition or learning behaviour. To answer this question, we used thousands of genetically analysed livestock depredation cases as well as pedigree information from the German wolf monitoring to investigate the potential linkage between kinship and livestock depredation behaviour. Interestingly, we did not find any significant correlation between the livestock killing rates of parents and their offspring, questioning the assumption that wolf progeny is adapting their parents' propensity for predation on livestock. Our results instead suggest that the availability of unprotected livestock, as well as individuals' experiences with livestock protection measures, are the most important factors explaining the observed variation in livestock kills between wolf individuals and packs in Germany.

Tuesday 14:30 - 14:50

Seasonal and Health-Related Variations in Wolf Hair Cortisol: A Method Validation from Captive and Field Samples

Gwendolyn Wirobski

Affiliation

Co-authors: Carmela Musto, Martina Lazzaroni, Rudy Brogi, Friederike Range, Marco Apollonio, Rupert Palme, Sarah Marshall-Pescini

Conservation endocrinology has advanced considerably in understanding physiological responses as predictors of population health. One key approach is quantifying hormone concentrations, such as cortisol. Hair cortisol concentrations (HCC) reflect chronic stress and are ideal for monitoring populations under changing environments. Despite their potential, several unresolved issues impede the use of hair cortisol in wolf studies. To address these, we validated HCC by studying 4 captive-housed wolves at the Wolf Science Center (WSC) Austria, using a 'shave-re-shave' approach, to 1) identify annual hair growth patterns, 2) measure seasonal HCC fluctuations via enzyme immunoassay, 3) test for a correlation between faecal cortisol concentrations (FCC) and HCC, and 4) examine the effects of collection method and body area on HCC. Following method validation, we investigated the factors affecting HCC in a sample of 258 wild wolf carcasses from Italy. Results from the WSC showed rapid hair re-growth during summer (May-Oct) and slower re-growth during winter (Nov-April). HCC peaked in hair grown during winter (breeding season) and again in late summer (ChiSq=11.42, df=3, p=0.009) coinciding with the hair re-growth peak. There was a significant, positive association between HCC and FCC (ChiSq=8.02, df=1, p=0.005). The collection method did not affect HCC (ChiSq=0.283, p=0.595), but belly and shoulder hair contained higher HCC than back hair (ChiSq=21.84, p=0.000). Results from captivity confirm seasonal variation in hair growth and HCC. HCC collected from the shoulder reflect systemic cortisol levels, but HCC can vary by body region, necessitating consistent sampling. Results from the wild wolves showed no effect of sex, age, body mass, latitude, or urbanization on HCC, but a significant effect of health status and seasonality. Poor health was associated with higher HCC (beta coefficient= -0.61, df=8.73, p-value=0.042), and HCC was highest in wolves that died in autumn (beta coefficient= -0.29, df= 209.60, p-value= 0.003). Ultimately, HCC is a useful indicator of health status, and thus a valuable contribution to conservation and management efforts, however methodological aspects linked to the effect of hair growth seasonality and cortisol incorporation into hair need to be considered when interpreting data from wild samples.

Parallel Presentations

Theme: Genetics and Health / Public Engagement

Tuesday 14:50 - 15:10

The Wildity Scale as a communication tool on reintroduced wolves

Terrance Vincent O'Halloran

Affiliation

Grey wolves are recolonizing their native habitats in different regions around the world. This return has occurred through both natural processes and reintroduction programs. The case of the Mexican wolf is one of the most representative. Eradicated in the wild, a captive reproduction program began in 1977 with the last seven remaining specimens. Currently, there are over 300 specimens in captivity and more than 200 specimens in the wild across Mexico and the United States. In North America, a management model based on continuous monitoring and control of specimens has been implemented to recover endangered wolf populations. This model provides specific information about wild specimens, including subspecies, sex, birth, dispersion, habitat preferences, interactions in rural areas, and vaccination status against diseases. Here, the Wildity Scale is proposed as a tool for communicating the state of reintroduced specimens. The proposal results from a conceptual synthesis based on the management of the Mexican wolf.

Through controlled management, specimens can be categorized as wild-born, released from captivity, treated medically, or fitted with tracking devices. The knowledge about controlled characteristics and some potential scenarios have been synthesized in the conceptualization of wildity. The Wildity Scale has been developed to describe the wildity. The scale consists of 11 categories of specimens. The categories are integrated by specific criteria related to birth, health, location, genetic integrity, and habituation. Additionally, five types of wildity corresponding to the scale categories have been defined.

The lack of information about wolves in the wild can lead to controversy and heightened human-wolf conflicts. This tool aims to streamline universal access to information, addressing gaps in the integration and communication of knowledge about reintroduced wolves. It can support research on social acceptance and coexistence with wolves or similar species. Despite traditional views on wild specimens, controlled management, tracking, and conservation efforts are crucial for preventing extinction. Effective communication is essential to reduce misconceptions and promote understanding of the rewilding process.

Parallel Presentations

Theme: Genetics and Health / Public Engagement

Tuesday 15:10 - 15:30

Wolves in Southern Algoma (Ontario, Canada): A Private-Public Partnership Project

Kees van Frankenhuyzen

Algoma Highlands Conservancy, Sault Ste. Marie

Co-authors: Dean Thompson, Paul McBay, Joe Meating, Aaron Jones, Phil Wiebe, Derek Goertz et al.

The Algoma Highlands Conservancy is a private land trust that was established to protect a 1315-ha property near Sault Ste. Marie in Algoma District, Northeastern Ontario. Frequent observations of wolf activity over the years motivated Conservancy volunteers to deploy trail cameras to monitor resident wolves (Canis lupus x lycaon). Monitoring results lead to a 3-year (2021-2024) curiosity-driven project to study canids throughout southern Algoma District. Expertise, infrastructure, and funding needed to execute the project were secured by cultivating collaborations with provincial and federal natural resource management agencies, universities, utility companies, and other landowners, notably the Garden River First Nation of the Ojibwe Anishinaabe people. Core funding was provided by Hydro One, Ontario's largest electricity transmission and distribution service provider. To study the occurrence of predominant canid genotypes and their interactions with other wildlife across a range of habitats, 5 areas of ~400 km2 each were selected along a ~4000-km2 corridor that stretches from Lake Superior's eastern shore to Lake Huron's northern shore and that is thought to link western, northern and eastern canid populations in the Great Lakes region. Arrays of trail cameras were deployed in each area in randomly selected sites (on powerlines, recreational trails, and in undisturbed forest) to elucidate how anthropogenic linear features and associated human activities affect presence and activity of canids and their primary prey species. The ~2 million images collected are being analyzed using an automated image recognition system that was developed by collaborators at the University of Guelph using deep learning computer vision approaches. Satellite telemetry of 3 wolves revealed their home ranges, movement patterns and locations of denning sites. One collared wolf undertook an unusual unidirectional long-distance (~1000 km) dispersal. DNA was extracted from scats collected during winter months and proportional ancestry was determined at Trent University using autosomal microsatellite markers. Most samples were highly assigned as eastern coyote (C. latrans) and Great Lakes wolf (C. lupus x lycaon). Samples indicating a high degree of admixture with eastern wolf (C. lycaon), which is threatened and restricted to a small Central Ontario region East of our research corridor, require further corroboration.

Parallel Presentations

Theme: Genetics and Health / Public Engagement

Tuesday 15:30 - 15:50

Volatility in volunteer work: developing large carnivore observation network in Finland

Mari Lyly

Affiliation

Co-authors: Mirja Rantala, Harri Norberg, Olli Kursula

In Finland, the population monitoring of large carnivores relies profoundly on citizen observations, which are assessed and reported by trained volunteers. These volunteers form a network of large carnivore observers (LCOs) that has existed for over 40 years, gradually growing to 2 400 participants. Currently, the network reports tens of thousands of observations annually. They are a valuable resource to research, but also provide vital information to management and people living or visiting rural areas. At best, LCOs help to mitigate the human-wolf conflict, which has arisen after the long-term increase of the wolf population.

Typically, LCOs are hunters who have the interest, time resources and the know-how to monitor large carnivores locally and check observations made by others. All LCOs receive a brief, compulsory basic training when taking on the volunteer task. Key elements include species identification and guidelines of reporting observations to the online database. New LCOs are trained, appointed and supervised by the Finnish Wildlife Agency.

Among other themes, the LIFE BOREALWOLF project (2019–2025) focuses on developing stakeholder cooperation. To support the LCO network, the project has updated training materials into a web course and a field guidebook, thus facilitating easy access, extensive dissemination and honing of fieldwork skills. The course materials include modules on species ecology, track identification, quality requirements for observations, and communicating with the public and media. These materials aim to increase LCOs' expertise and help to secure sufficient quantity and quality of data, but also work towards motivating the volunteers. For similar purposes, administration organises annual regional events of feedback and training.

Building and managing a volunteer network is not free but requires effort. Recent changes in national policies have prompted some volunteers to refrain from reporting or even resign. This has raised concerns for the functionality of the LCO network and prompted the need for strategic planning to secure cooperation between LCOs, citizens and relevant authorities. The aim is to ensure that wolves are comprehensively monitored, people have access to reliable wolf information, and territory residents have opportunities to engage. All of these are crucial to successful management of wolves.

Feeding ecology of wolves in The Netherlands

Kevin Groen

Affiliation

Co-authors: T. van der Veken, D. Mikova, K. Trimbos, H. de longh, G. Lelieveld

After years of acting as a transit area for gray wolves (Canis lupus), the first wolf resettled in the Netherlands in 2018. This recolonization has led to increasing human-wolf conflicts, primarily through livestock attacks. Concerns have risen among farmers, hunters, and land managers regarding the feeding behavior and diets of wolves' in human-dominated landscapes and its impact on prey populations in natural habitats. Research on wolf diet and feeding patterns is therefore crucial for a better understanding of these dynamics. Gathering accurate, long-term data on the wolves' diet is thus important for supporting policy and informing public discourse in the Netherlands.

To understand the feeding behavior and diets of wolves, we conducted a complementary diet analysis using DNA-based methods (eDNA) and microscopic analysis of hair and macroscopic analysis of bone fragments and other prey remains found in wolf scat. This analysis aimed to assess spatial and seasonal (winter, spring, summer, and autumn) variations in the wolf diet based on frequency of occurrence (%FO) and biomass consumed (%BM).

In 2023, a total of 735 scat samples were collected and analyzed, with 624 scats used for dietary composition based on %FO via eDNA analysis and 427 scats used for dietary composition based on %BM via microscopic analysis. The wolf's diet in the Netherlands mainly consists of wild ungulates, with roe deer (59% FO, 35% BM), wild boar (37% FO, 29% BM), and red deer (18% FO, 8% BM) as key prey. Livestock accounts for a smaller portion of their diet, consisting of mainly cattle (24% FO, 19% BM) and sheep (8% FO, 3% BM). Birds, hares, and small mammals make up the remainder of the diet.

Spatial variation is evident, with more cattle (37% BM) in the diet of wolves in Drenthe (more human dominated landscape) compared to the diet of wolves in the more natural habitat of the Veluwe (<1% BM), where the diet mostly consisted of wild ungulates (96% BM). Seasonal shifts were observed, particularly during the wolf breeding season (March to June), where contribution of adult ungulates in the diet decreased, while the contribution of young wild boar and juvenile deer increased. This research underscores the wolf's opportunistic diet and adaptability, providing valuable insights for improving management and reducing misinformation concerning the feeding ecology of wolves in The Netherlands.

Video wolf predating beaver: how wolves influence beaver foraging

Dani R. Freund

Affiliation

Co-authors: Thomas D. Gable, Austin T. Homkes, Olivia Jensen, Sage D. Patchett, Joseph K. Bump

Knowledge of wolf (Canis lupus)-beaver (Castor canadensis) interactions has largely been derived from indirect observations due to the cryptic nature of wolves and the densely forested areas where they regularly kill beavers. In September 2023, we opportunistically recorded a video on a remote camera of a wolf killing an adult beaver, providing direct evidence of how wolves kill beavers. The camera also recorded beaver foraging activity before and after the predation event, providing a unique opportunity to observe changes in foraging behavior of the surviving beavers at the pond in response to predation. Specifically, beaver foraging on the trail declined by 97% immediately following predation. Consumptive effects may have decreased use of the trail, however, we recorded at least three beavers regularly foraging prior to predation. This suggests that non-consumptive effects may have prevented the surviving group-members from foraging on the trail post-predation as an anti-predator strategy. Furthermore, we recorded vegetation along active feeding trails to understand the influence that forage may have on where the wolf killed the beaver. The trail the attack occurred on was the longest at the pond, and had a significantly higher proportion of Populus spp. (a preferred tree species by beavers) than other trails on average. Preference for aspen may therefore have driven beavers to forage farther from the water and thus increased their risk of predation at this trail. Although we present just a single observation, to our knowledge, there is only one other documented observation in the literature of a wolf catching and killing a beaver. Our data therefore provide unique insight to difficult-to-observe predatory behavior.

Tuesday 14:10 - 14:30

The Influence of Wolves and Wild Boars on European Facultative Scavengers

Elke Wenting

Affiliation

Co-authors: Jasper A.J. Eikelboom, Henk Siepel, Femke Broekhuis, Frank van Langevelde

The re-establishment of wolves might change the source of carrion supply and availability for facultative scavengers. The wild boar is one of the most prominent facultative scavengers in European ecosystems but also an important prey species for wolves. It remains unclear how the re-establishment of wolves influences the population dynamics of facultative scavengers, including wild boar, and how that in turn is influenced by different human hunting strategies. We simulated the biomass densities of a trophic web including European scavengers, wild boars and wolves, under different human hunting strategies. We found that the presence of wolves generally led to a positive trend in scavenger biomass. However, other resources rather than carrion were more important for overall scavenger dynamics, irrespective of the origin of the carrion (i.e. human hunting or predation by wolves). Like human hunters, wolves can maintain prey population levels but cause more natural fluctuations in both wolf and prey populations over the years. Therefore, our results show the importance of adapting human hunting strategies in accordance with the re-establishment of wolves.

Tuesday 14:30 - 14:50

Kill patterns of recolonizing Eurasian wolves

Joost de Jong

Affiliation

Co-authors: Jakob Leidekker, Leontien Krul, Laurens R. Dijkhuis & Patrick A. Jansen

As large carnivores like wolves recolonize parts of North America and Europe, an important question arises: how do these predators adapt to new landscapes and learn to hunt successfully? When wolves enter unfamiliar terrain, how do they learn to navigate, identify prey, and develop hunting skills? Theory suggests that newly settled carnivores start by targeting easy or non-dangerous prey and gradually expand their hunting grounds and prey scope. Positive encounters with prey may shape their future hunting strategies through learning and memory.

In this presentation, we will explain how we investigated these questions by studying the early recolonization of Eurasian grey wolves in National Park De Hoge Veluwe, The Netherlands. Across a period of 2.5 years, we tracked the spatiotemporal patterns of wolf kills, analyzing the types of prey targeted and where these hunts took place over time. By mapping these kills, we aimed to understand how wolves familiarize themselves with their environment and develop their hunting techniques.

The results represent a process in which wolves settling into new territory progressively refine their behavior and expand their hunting repertoire. Our research sheds light on the learning process that unfolds as carnivores adapt to the challenges of new terrain.

Parallel Presentations

Theme: Feeding and Predation

Tuesday 14:50 - 15:10

Wolves as a scavenger and supplier of carrion in the Veluwe, the Netherlands

Bart Beekers
ARK Rewilding Netherlands
Co-authors: M. Pekel

Since 2018 wolves (Canis lupus) returned to the Veluwe, the largest protected Natura 2000 area on land in the Netherlands. During the years the wolf population growth steadily into 5 reproducing packs and 2 territoria in 2023.
With the return of wolves questions concerning nature restoration and game management of large ungulates appear:

- will scavenging become a part of their diet and under what kind of conditions?
- what are the effects of wolf prey on (vertebrate) scavenger communities and nutrient the cycle?

Monitoring scavenging behavior
For scavenging communities the Veluwe is an interesting area since approximately 30% of the yearly culled ungulates and road kills are left in nature to become biomass. This is part of a growing understanding under (game)managers and nature conservation to complete the circle of life. From the end of 2019 collaboration started with wildlife managers to monitor scavenging behavior of wolves at so-called deposit sites. What are those sites telling us during the years of return?

Monitoring wolf prey and vertebrate scavengers
Wolf prey is rarely located by game managers in the Veluwe area. Raven (Corvus corax) however do so more easily. Together with the Dutch Raven working group, Sovon Dutch Centre for Field Ornithology and Wageningen University juvenile raven have been GPS collared. What are we learning so far from the “eyes and ears” from the forest?

Adaptive (game)management
With the return of wolves as a natural supplier of carcasses, carrion could become more available around the year – which could be interesting for vertebrate scavengers to profit. Can we expect rare species like kites, eagles and even vultures to adapt? Can adaptive (game)management open the way?

Parallel Presentations

Theme: Feeding and Predation

Tuesday 15:10 - 15:30

How fast do native ungulates respond to the return of the wolf in anthropogenic landscapes?

Charlotte Vanderlocht

Affiliation

Co-authors: Valerio Donini, Andrea Corradini, Elisa Iacona, Laura Limonciello, Lucrezia Lorenzetti, Matteo Nava et al.

As wolves naturally recolonise their historical range throughout Europe, ungulate populations are once again in the presence of this natural predator. Classical predator-prey theory predicts that the arrival of a large carnivore will induce adaptive behavioural changes in prey, which could in turn impact other trophic levels through cascading effects. Shifts in diel activity allocation can be an important, and potentially immediate, response for ungulates to mitigate risk exposure. It remains however unknown whether, how and how fast natural predators can provoke these behavioural modifications in highly anthropogenic landscapes, where the 'human super-predator' is a source of risk for both ungulates and wolves. In this study, we investigated the diel activity responses of three native ungulate species along the wolf recolonisation process, detecting the emergence of predator-prey interactions through behavioural plasticity of prey species. Taking advantage of the unique and timely opportunity of the ongoing natural wolf recolonisation in the Central-Eastern Alps, we designed a study placing camera traps throughout four study areas, creating a gradient in time since wolf establishment with alternating hunting contexts. We hypothesised that ungulates would decrease nocturnal activity as wolf presence increased and stabilised, but that the concurrent presence of (diurnal) human hunters and (nocturnal) wolves would force ungulates back to a marked crepuscular activity pattern. We found diel shifts towards diurnality as an immediate and direct response to the wolf recolonisation process in red deer and Alpine chamois, thereby increasing their activity overlap with humans. In red deer, this 'diel shield effect' disappeared in the additional presence of lethal risk from humans, potentially indicating a higher perceived hunter-related lethality during autumn. On the other hand, roe deer modified their diel activity in response to human hunting but not to the wolf, highlighting the lethality of humans or the presence of other risk-mitigating behaviours for this solitary, forest-dwelling species. Our study shows that the wolf recovery in Europe can induce immediate and lasting diel shifts in large herbivores, depending on the biology of the species, but that these diel shifts can disappear in the presence of human hunters.

Parallel Presentations

Theme: Feeding and Predation

Tuesday 15:30 - 15:50

Beavers - not ungulates - are the primary pray of many wolves during summer in a southern boreal ecosystem

Thomas D. Gable

Affiliation

Co-authors: Austin T. Homkes, and Joseph K. Bump

Wolves and beaver co-occur across vast expanses of North America and Eurasia, and as a result, beavers are an important secondary prey for wolves in many systems. However, the extent to which wolves can subsist on beavers is poorly understood. Most observations suggest beavers are an important secondary prey but there is little evidence to indicate beavers are the primary prey of wolves during extended periods. We studyed the predation behavior of 47 wolves in the Greater Voyageurs Ecosystem (GVE), Minnesota, USA from April to October (the a 7 month period representing the biological summer for wolves) by searching clusters of GPS-locations and identifying predation events. In doing so, we documented >1,900 kills of white-tailed deer, beavers, and other prey, and then used this data to estimate biomass acquisition rates for wolves during this period. We demonstrate that beavers—not ungulates— are the primary prey of many wolves in the Greater Voyageurs Ecosystem during the summer with beavers constituting up to 86% of the biomass acquired by individual wolves during this 7 month period. The ability of wolves to subsist and thrive primarily on beavers during the summer allows wolves to partially decouple from the population dynamics of ungulate prey, which likely influences various aspects of wolf population dynamics. Our findings are almost certainly not unique to our system because the GVE is not a closed, isolated system. Rather, wolves in the GVE are part of an expansive, well-connected wolf population, and many wolves in this population occupy environments that are identical or very similar to the GVE with respect to habitat and the abundance of beavers. All of this evidence indicates that beavers must be considered important prey for wolves in many systems and that beavers are likely influencing, to some extent, larger patterns of wolf-prey dynamics in those systems.

On wolves and commons: Institutionalizing local deliberation and social learning in Danish wolf management

Hans Peter Hansen

Affiliation

Co-authors: Cathrine Schrøder Dethlefsen and Annika Skarðsá Jeppesen

With an offset in a small-scale research project on local deliberation and social learning, the Danish Environmental Protection Agency (EPA) (Hansen et. al. 2022; Dethlefsen, C. S. & Hansen, in press), are in the process of institutionalizing local deliberation and social learning in Danish wolf management. The transition from a small-scale research project, designed and facilitated by researchers and enforced by a strong discourse ethic, within a single minor rural community, to large scale institutionalized public dialogue and social learning processes, uncover a number of logistic, institutional and sociopolitical challenges, far beyond the local. Being actively involved as advisors, facilitators and researchers in the governmental attempts to institutionalize local deliberation and social learning in Danish wolf management, we describe the various challenges. These includes the institutional barriers and the general conflicts between strategic interests seeking to politicize and flex their power, and the ambition to create a space for dialogue, deliberation and social learning. Seeing the attempts from the Danish EPA as an experiment in itself we pinpoint the most crucial challenges for institutionalizing local deliberation and social learning in Danish wolf management. Further we present and discuss the main lessons from the process and outline some key recommendations. Finally, we tie the lessons from Danish wolf management to some of the more overarching sociopolitical challenges of contemporary society.

Parallel Presentations

Theme: Navigating Challenges of Co-existence

Tuesday 14:10 - 14:30

Ending the cycle of endless conflict: four years of keeping wolves off a cattle ranch in Minnesota, USA

Austin T. Homkes

Affiliation

Co-authors: Thomas D. Gable, Dakota Bird, John Hart, Jack Morawczynski, Eric M. Gese, Wesley Johnson

Raising livestock amidst wolves has led to wolf-human conflict for millennia. A 1500-acre cattle ranch in Northern Minnesota, USA has been no exception, losing livestock annually to wolf depredations for nearly two decades. From 2020 to 2023, we constructed a fence designed to keep wolves off the ranch and end longstanding wolf-livestock conflict. Additionally, we fit wolves in wolf packs around the ranch with GPS collars to understand wolf movements in relation to the fence as well as identify if and how wolves got past the fence. The calving season of 2024 was the first in nearly two decades where not a single cow was lost due to depredations and the second season not a single wolf was lethally removed from this ranch. However, this success was hard won, with many lessons learned through multiple years of troubleshooting. We describe lessons learned from failing and then succeeding in keeping GPS collared wolves off the cattle ranch and how other ranching operations might implement a similar solution to minimize, if not end, similar wolf-livestock conflict.

Parallel Presentations

Theme: Navigating Challenges of Co-existence

Tuesday 14:30 - 14:50

Polarising discursive practices in the debate on the comeback of the wolf

Anne Kessels

Affiliation

Co-authors: Annette Klarenbeek, Petra Sneijder, and Elisabeth S. Bakker

It is widely recognised that social factors, in addition to ecological and economic factors, have a major influence on wildlife-related conflicts. Specifically the dynamics in the debate, that is how people communicate with each other, are to a large extent responsible for the intractability of these conflicts. Therefore, our aim was to gain understanding of the current state of knowledge with regard to discursive practices that are employed in the wildlife debate. Accordingly, we conducted a systematic review of discourse analytic literature that studied this debate. This review primarily yielded publications that analysed debates on wolves and other canids. These publications described a variety of discursive practices employed by interlocutors. For instance, interlocutors positioned others (e.g. authorities and NGOs) negatively by questioning their trustworthiness and competence, and legitimised the presence of wildlife by shifting the responsibility away from the animals to the complaining victims. Such discursive practices emphasise the differences between interlocutors and impede opportunities for reconciliation, which may contribute to social division and polarisation. This systematic review and its insights into the polarising effect of discursive practices in the debate on wolves and other canids can advance the understanding of the intractability of wildlife-related conflicts. This understanding is important in order to conserve and restore wildlife populations, and, in this case specifically, wolf populations. In this presentation, we present the insights of this systematic review accompanied by examples from our own analysis of the online debate about the wolf in the Netherlands.

Tuesday 14:50 - 15:10

Wolves in the Netherlands : past, present and future

Esther van der Meer

Affiliation

Co-authors: Annette Klarenbeek, Petra Sneijder, and Elisabeth S. Bakker

Ten years ago we received the first validated sighting of a wolf in the Netherlands. Sightings became more frequent and in 2019 the first pack of wolves established itself and produced a litter. After an absence of 150 years this marked the return of the wolves in the Netherlands. Ever since that first sighting, the Dutch wolf population has increased to 11 packs with an estimated population size of 104-124 wolves. This increase in range and numbers has had a marked impact on human-wolf conflict and the sociopolitical attitude towards wolves. In this presentation we give an overview of ten years of wolves in the Netherlands and discuss what the future may hold for this controversial large carnivore.

Tuesday 15:10 - 15:30

Projecting wolf population dynamics in Europe, the need for regional parameters, and how to use population modelling in wolf policy and management

Jasja Dekker
Affiliation
Co-authors: Bob van den Brink, and Esther van der Meer

To inform decision-making on wolf policy, we formulated a stage-population model. This model projects the population development of Dutch wolves. To develop the model, we reviewed the literature for available parameters, and prior models for population viability or population dynamics. We formulated several model variants to capture the uncertainty in estimates for some of the vital rates of wolves.
The model variants al predict the presence of a sustainable population consisting of settled packs and a constant presence of roaming wolves. The predicted stable population size depends on settlement rate, survival and the carrying capacities as estimated by other researchers. Some of these however are from other parts of the world, are uncertain, or are expert estimations.
We therefore call upon participants to keep gathering and sharing data on reproduction, survival, migration, dispersal end settlement rates of the Central European wolves. Getting (more accurate) parameters for the Central European population will improve model predictions and increase their value for decision making.
We conclude our talk with a discussion of rules and caveats for the successful use of models in (carnivore) management.

Parallel Presentations

Theme: Navigating Challenges of Co-existence

Tuesday 15:30 - 15:50

Swiss Wolf Monitoring and Management: Integrating Science, Policy, and Conservation

Inès Moreno

Affiliation

Co-authors: Sven Buchmann, Saskia Mäder, Fridolin Zimmermannr

The return of wolves (Canis lupus) to Switzerland since the nineties and the rapid population growth in recent years has raised social and political challenges, leading to a new management plan. This presentation provides an overview of wolf monitoring in Switzerland, the methods used, and the challenges in both monitoring and management.
Monitoring in Switzerland is conducted at the national level through a combination of methods, including genetic analyses, camera trapping, recovered dead wolves, damages to livestock and chance observations (tracks, killed wild prey, pictures). At the beginning of the recolonization phase, monitoring provided comprehensive data on most individuals in Switzerland. As the population grew, the focus shifted to tracking and discriminating packs and using population indices rather than estimating total abundance. Nevertheless, these data allowed us to closely monitor the recolonization from the first recorded individuals in the 1990s to the establishment of the first pack in 2012 and the subsequent expansion - while also providing insights into biological patterns. Recently, management actions shifted from a reactive framework, triggered by repeated damage to livestock, towards a more proactive approach, including the preventive removal of wolves and entire packs, with a legal minimum of 12 packs in Switzerland. This new approach has led to an increase in the number of wolves legally removed. These changes necessitate more precise demographic estimates and scenario-based assessments to evaluate the effectiveness of different management strategies and their long-term impact on wolf population viability, livestock damages and population acceptance. To support decision-making, we are developing an Integrated Population Model (IPM) to synthesize monitoring data and estimate key demographic parameters, such as survival, reproduction and dispersal. This will serve as the basis for an Individual-Based Model (IBM), which will simulate the effects of different management actions, including the removal of targeted individuals, pups, or entire packs. These models aim to improve the accuracy of population assessments and guide sustainable wolf management strategies under an adaptive management framework. By integrating long-term monitoring data with advanced modeling approaches, this research will provide science-based insights to inform adaptive conservation policies and assess the demographic consequences of different management interventions.

Wednesday 10:30 - 10:50 LIVE

Towards Coexistence: Mapping costs and benefits associated with living with wolves in Spain

María Granados

Affiliation

Co-authors: María Martinez-Jauregui, Francisco Díaz-Ruiz, Fernando Garrido, Jenny A. Glikman, Ana Luz Márquez, Zebensui Morales-Reyes et al.

Large carnivore recovery in Europe is primarily attributed to conservation policies and passive land restoration. In Spain, the Iberian wolf has increased its range considerably since the 1970s. However, this conservation success is not without conflicts over how to manage wolves, as the species may cause damage to livestock, affecting local communities. Since such human-wildlife conflicts are harmful to both wildlife and human livelihoods, it is crucial to predict areas where conflict is likely to occur in the coming years. To address this, we conducted a nationwide survey of Spanish environmental rangers (n>1800) to assess their perception of the costs and benefits associated with local communities coexisting with wildlife. Later, we developed an environmental favourability model using the current distribution of Iberian wolf, along with a number of socio-ecological predictors (e.g. climate, land uses, prey availability). We then used this model, along with survey data, to predict areas in Spain where the costs and benefits of coexisting with wolves might be felt, incorporating socio-economic factors such as average population age, income,or agricultural employment. According to preliminary results, 600 rangers reported the presence of wolves in their work area. Benefits associated with wolves were reported by less than 10% of surveyed rangers. In contrast, costs were perceived in most municipalities within wolf range with over 75% of rangers reporting damage). Furthermore, 50% of the rangers considered the costs to be very important for residents. Environmental favourability model suggested that more than the upper two-thirds of Spain would be appropriate for wolves ecological requirements. In addition, socio-ecological favourability model suggested that cost and benefit perceptions was mainly related to wolf presence, regardless of other social factors. This model allowed us to identify suitable areas for future wolf restoration, considering both environmental conditions and the balance of benefits and costs. Models also allowed to identify favourable regions for cost perception in areas close to current distribution, where recolonization is very likely to occur in the coming years. This might help environmental agencies to focus policy concentrating economic resources for preventive measures in these areas before the conflict occurs.

Wednesday 10:50 - 11:10 LIVE

Establishing favourable reference values under the Habitats Directive for the wolf in Germany

Katharina Steyer

Affiliation

Co-authors: Götz Ellwanger, Sandra Balzer

Establishing favourable reference values under the Habitats Directive is a challenging task – especially for species with large home-ranges like the wolf. After eradication of the wolf in Germany in the 19th century, in 2000 the first reproduction of wild wolves was observed in Saxony for the first time since many decades. Since then, the wolf population has been growing and spreading in a densely human populated cultural landscape. The scientific-based approach used to establish reference values for the favourable reference population and the favourable reference range for the wolf in will be described for German. A population viability study, a habitat suitability analysis study for wolves in Germany, a genetic study and the results of annual nationwide wolf monitoring since 2010 culminated in reference values. We will additionally illustrate obligations and pitfalls we identified for setting the reference values. We further highlight the complex coordination process between the scientific and political actors and conclude with lessons learned when it comes to outreach and communication of these findings.

Wednesday 11:10 - 11:30 LIVE

The (Italian) Urban Wolf Project: a multidisciplinary approach exploring the effect of the anthropogenic environment on wolves' behavioral, hormonal, health-related and genetic profile

Sarah Marshall-Pescini

Affiliation

Co-authors: Martina Lazzaroni, Rudy Brogi, Carmela Musto, Gwendolyn Wirobski, Rupert Palme, Massimo Scandura et al.

The expanding wolf population in the Italian peninsula has resulted in wolf packs carving out a livelihood ever closer to villages and towns. Many Canid species, from coyote to red foxes have shown their capacity to not only tolerate, but even exploit anthropogenic environments, altering their behavioural responses in more urbanized contexts. In the current project, we adopted a multidisciplinary approach to evaluate the potential effects of living closer to humans on wolves' behavioral, genetic, hormonal and health profile. Using field tests (including play-back stimuli, novel objects and risk-taking tests) we evaluated the behavioural profile of over 50 wolf packs tested in Tuscany along a wide urbanization gradient (with a Human Footprint Index -HFI ranging from 9 to 47; where the minimum could be 0 and maximum 50). Since both hybridization with dogs and the incidence of toxoplasmosis may affect wolves' behaviours, using scat samples analyses we assessed the incidence of dog-hybridization in the behavioural test areas and based on the collection of over 200 wolf carcasses across the peninsula we assessed whether the urbanization gradient affects the incidence of toxoplasmosis. Furthermore, the effect of HFI on chronic stress measures in hair cortisol was analyzed from carcasses. Preliminary results on a subset of the data show that wolves show bolder behaviours when encountering novel objects in a pack than alone ($N=15$, $z= 4.077$, $P<0.001$) and show stronger fear responses towards human audio stimuli than natural controls ($N=22$, $z=4.030$, $P<0.001$). However, the effect of the urbanization gradient is yet to be analysed with the complete dataset. No effect of HFI was found on hair cortisol concentrations. The complete results of this 5-year multidisciplinary project will be presented at the conference, with the aim of seeking out collaborators to expand this approach across borders.

Parallel Presentations

Theme: The Path to Co-existence

Wednesday 11:30 - 11:50 LIVE

Wolves: the uninvited guests - A nature conservation NGO facing the return of a large predator

Niels Gilissen
Affiliation

Vereniging Natuurmonumenten is a Dutch nature conservation NGO owning and managing 112.000 hectares of nature reserves, supported by 900.000+ members and donors. Natuurmonumenten is not only a land owner and manager, but also, in the public and political debate, represents the voice of millions of Dutch citizens that support nature conservation in the Netherlands.
The Netherlands faces several challenges when it comes to the wolf, which is returning to the Netherlands after a long absence. Although in several European countries one has gained experience on how to shape coexistence with wolves, there is still much to learn. Moreover, applying these lessons learned to the situation in the Netherlands is not straightforward. This is due to the Netherlands hosting, from a European perspective, the highest densities of people, livestock, and infrastructure, combined with low availability of natural prey and natural areas. This also reflects the challenges that Natuurmonumenten is facing while striving for coexistence with wolves, while minimizing conflict.
The presentation will focus on the ways Natuurmonumenten, as a nature conservation NGO, land owner and societal actor, is dealing with these challenges and dilemmas in the Dutch context. Major challenges dealt with comprise:

- Livestock management: Implementing the appropriate preventing measures for protecting livestock and natural grazing herds from attacks. How much loss of animals is acceptable ethically and juridically and how do we relate to our tenant farmers?
- Wildlife management: Adapting wildlife population management according to wolf presence. How to develop a feedback system for adaptive wildlife management?
- Political and public pressure and polarisation: Influencing the debate and decision making while avoiding further polarisation. When is lobby effective and when should we stay quiet?
- Public awareness and disinformation: Taking a role in communicating for public awareness and debunking disinformation. How to avoid making Natuurmonumenten owner of the ‘wolf problem’?
- Internal organisation: Organising central coordination while delegating responsibilities. Developing action protocols for daily management and crisis management. How to ensure a safe working environment for employees considering the heated debate?

Parallel Presentations

Theme: Lessons Learned from Monitoring

Wednesday 10:30 - 10:50

“The Italian wolf network”: presenting a model for a multidisciplinary operational network for the systematic processing of wolf samples

Carmela Musto

Affiliation

Co-authors: Marco Apollonio, Giuseppe Merialdi, Marco Gobbi, Lorella Barca, Jacopo Cerri, Mauro Delogu, Sarah Marshal-Pescini

In recent years, competitive research has been moving in a direction that aims to enhance multidisciplinary and the use of large datasets. Within the framework of the “Urban Wolves” project - a research grant funded by the WWTF [10.47379/ESR20009] - the “Italian wolf network” was established, based on an agreement between 7 Institutional Bodies, setting out 14 research questions, ranging from the fields of ecology, biology, zoology, behavior, epidemiology, physiology, anatomy, statistics and infectious diseases. The network unifies the methods used to collect samples from wolves found deceased and subjected to necropsy investigation. The shared necropsy procedures ensure that the entire data and sample collection chain - starting from reporting the location and contextual details of the carcass been found, up to the sampling of the target matrices - is consistent across labs. The network also collects samples from free-ranging animals that are studied both with non-invasive techniques and through telemetry. Through the agreement, researcher ‘earmarked’ selected research questions and hence receive the required samples or data from all other labs. This collaborative approach increases samples sizes, guarantees a unified high standard of methods thereby increasing validity of results. The network became active in December 2022 and the agreement will continue until the official end of “Urban Wolves” project (December 2025). As of September 2024, 323 wolf carcasses and hundreds of scats from free-ranging wolves have been collected spanning the length of the Italian peninsula. The contribution will outline a few results from the network and several particularly interesting ‘case studies’ showing how this approach can result in top level research but also allow an in depth understanding of the history of individual animals, including the phenotype, genetic profile, diet, hormonal profile, antimicrobial resistance, presence/absence of environmental contaminants as well as bacterial, viral and parasitic pathogens. We suggest that this approach could be adopted “across borders” allowing for a more systematic use of opportunistic sampling, obtaining valuable data from multiple perspectives and providing a holistic integration of multiple fields of study, as well as to unify and harmonise data at European level, through networking promoted and funded by EU programming.

Parallel Presentations

Theme: Lessons Learned from Monitoring

Wednesday 10:50 - 11:10

Wolves in Italy: insights for a European scenario

Marco Apollonio
Affiliation
Co-authors: E. Bassi, D. Berzi, R. Brogi, C. Buelli, S. Cavazza, M. Del Frate et al.

Wolves in Italy have undergone one of the most remarkable recoveries in both distribution and demography across Europe, offering valuable insights into potential upcoming scenarios for the species on the continent. This summary consolidates over 30 years of research conducted in Central and Northern Italy, focusing on wolf diet, spatial behavior, and colonization patterns. Our findings are based on long-term dietary studies from multiple areas in the Apennines and Alps, data collected from 20 GPS-tracked wolves since 2018 across the Alps, Apennines, and Tyrrhenian coastal regions, as well as regional and provincial long-term population estimates. Italian wolves primarily feed on wild ungulates, with wild boar being the dominant prey in the Apennines and roe deer in the Alps. However, local variations in prey availability can lead to a prevalence of other species, such as fallow deer or mouflon. Domestic livestock can constitute a significant portion of the diet, especially during summer in newly recolonized areas. Data from GPS-tracked wolves indicate substantial variation in foraging strategies, with some packs and lone wolves relying heavily on scavenging or garbage, while others focus more on wild prey hunting. The recovery of the wolf population has progressively led to significant changes in their behavioral ecology, likely driven by increased intra-specific competition for space. First, wolf packs in Italy substantially reduced their home range size along the time since recolonization, with some packs occupying areas as small as 3,000 hectares in regions with a long recolonization history and/or high available prey biomass. Second, heightened competition for space has driven wolves, confined to mountainous regions in the 1970s, to expand into heavily human-populated flat lands and coastal areas, often living within a few kilometers of urban centers. This expansion has led to a steady rise in human-wildlife conflict and public concern, including predation on pets and rare, though concerning, direct attacks to humans, particularly in newly colonized areas.
Unfortunately, Italy's management structures have been largely unprepared to address these challenges, because of a persistent tendency to underestimate the size and growth of the wolf population, as well as the potential shifts in their behavioral ecology.

Wednesday 11:10 - 11:30

Towards transboundary genetic monitoring of wolves: an online platform for harmonization and sharing of wolf genetic monitoring data across countries and laboratories.

Tomaž Skrbinšek
Affiliation
Co-authors: Luca Fumagalli, Heidi Christine Hauffe, Martin Janovsky, Elmira Mohandesan, Carsten Nowak, Tomaž Žagar, Gregor Simčič

While genetic monitoring is increasingly gaining importance in national wolf monitoring programs, its potential for transboundary population-level monitoring remains largely underutilized. There are two main obstacles that hinder such use: problems with compatibility and repeatability of genotype data produced by different laboratories, and lack of an online data-sharing platform suitable for sharing of such data for the purposes of transboundary wolf monitoring. The problem of data compatibility is being solved through adoption of new genetic markers, but participating laboratories need to use the same marker panels. A joint data sharing platform still remains elusive.

Through the ARGE ALP initiative we've developed such a platform for sharing wolf genetic monitoring data across the Alps, hand-in-hand with standardization of genotyping methods that we are coordinating across genetic laboratories involved in wolf monitoring in the area. All involved laboratories are transitioning to genotyping-by-sequencing of microsatellites using a standardized panel of markers to make the data immediately compatible. The data sharing platform was developed as a plugin for the online wildlife monitoring database MBase (https://portal.mbase.org), which has been developed through various LIFE projects. The platform is fully based on free open source software. All genotype data is stored at the level of DNA sequence, ensuring data compatibility between participating laboratories. The platform has tools for entry and import of sample field data, tracking of samples as they are analyzed, geographic visualizations on base maps, and export of genotype data. It allows transboundary tracking of animals detected in genetic samples and can be used to provide direct feedback to different stakeholders. It also tracks data ownership, permissions, and data usage licenses, allowing the producers of the data to retain control of how their data is being used. This facilitates faster adoption of the platform and ensures that the data is used fairly.

Extreme mobility and long-range dispersals of wolves require large-scale collaboration in their monitoring to understand how their populations are developing at the level of the European continent. Harmonized methodology and efficient, seamless data sharing are the key prerequisites for any such endeavor. This is what our platform aims to provide.

Parallel Presentations

Theme: Lessons Learned from Monitoring

Wednesday 11:30 - 11:50

Chasing tail – 30 years of wolf management in Croatia

Josip Kusak
Affiliation
Co-authors: Jasna Jeremić, Marija Perković, Iris Mijatović

In 1994, during the Croatian War of Independence, the NGO “Croatian Wolf Group” was actively involved in changing the status of the wolf from a pest to a protected species. The saying “War is a brother of the wolf" has proven to be true. In 30 years (1995-2004), the government's willingness and ability to manage wolves has fluctuated constantly. In the first ten years (period 1/1995-2004) there was no management plan. In 2002, the State Institute for Nature Protection (SINP) was established, two regional offices and several experts worked on wolf conservation. Workshops were organized with stakeholders on the donation of livestock guarding dogs and to strengthen the expert network for damage and compensation. Basic monitoring was carried out in the form of research and carcass collection. Balanced management was introduced, and the legal hunting quota was set. Croatia was a candidate for EU accession and nature conservation was an important political issue. For the next 11 years (period 2/2005-2015) there was a wolf management plan that expired without being updated. The management plan brought a balance and compromise between the needs of nature conservation and stakeholders. Between 2005 and 2012, the legal and limited hunting quota was exercised by hunters who voluntarily participated in monitoring. After 3-4 years, the volunteers' enthusiasm for monitoring waned. The better days of wolf management lasted until 2015, when the SINP was integrated into the Ministry, losing its independence and majority of its staff. The donation program was discontinued and communication with stakeholders became less frequent. Another eight years (period 3/ 2016-2024) were characterized by simple conservation measures and an outdated management plan. The government's wolf conservation efforts were evaluated based on all measures and activities in three periods, scored and weighted on a scale of 1 to 5. In periods 1, 2 and 3, a total of 54, 122 and 55 management activities were carried out, scoring 121, 326 and 131 points respectively. The difference in management effort between periods 1 and 2 was significant ($X2(1df)=4.2$, $p=0.04$). From the outset, the understaffed government enlisted the help of experts and volunteers to fill the capacity gaps. This reliance proved to be a “bear favor" for wolf conservation in Croatia. Volunteer involvement is unpredictable and institutional capacity was never sufficiently developed and was even reduced after Croatia's accession to the EU and the political shift to the right.

Parallel Presentations

Theme: Lessons Learned from Monitoring

Wednesday 10:30 - 10:50

Probably the best wolf monitoring in the world

Robert Ekblom
Affiliation
Co-authors: Daniel Mallwitz, Linn Svensson, Øystein Flagstad, Petter Wabakken, Mikael Åkesson, Richard Bischof

The Scandinavian wolf monitoring is, arguably, one of the most complete and ambitious annual surveys of any wild population worldwide. Since the re-establishment of the Scandinavian wolf population in the early 1980ies, the population has been closely followed by yearly counts using a standardised methodology. The methods are similar in Sweden and Norway, and all data are collected in a joint database (Rovbase), which is also partly open for public viewing. On average 97% of all reproductive events are recorded each year using snow tracking and camera-trapping. In addition, some 3500 DNA-samples are collected (mainly using non-invasive technology) and analysed each year to verify species, sex, individual ID, inbreeding coefficient and genetic relatedness between individuals. Monitoring data is also utilised to produce precise population size estimates using a spatial capture-recapture modelling approach (RovQuant). This extensive field- and genetic data, enables the re-construction of an almost complete pedigree of the whole breeding population, from the establishment of the population 40 years ago until today. Finally, all encountered dead individuals (from legal hunting and natural causes) are examined at the state veterinary institute to investigate the incidence of injuries, disease, and morphological malformations. We will present the most recent results from this monitoring effort, and discuss the management implications of having access to such detailed biological data.

Parallel Presentations

Theme: Wolf Management

Wednesday 10:50 - 11:10

How to (legally) kill a wolf in Sweden

Daniel Mallwitz
Affiliation
Co-authors: Robert Ekblom, Mona HansErs, Andreas Ahlén

During the last decade between 20 and 80 wolves have been legally shot in Sweden each year, even though this species is strictly protected under the Habitats Directive (annex II and IV). The hunting is controversial and has raised questions about the legality of these management decisions, including an infringement case against Sweden from the EU commission, that has been open since 2011. During this session we will provide background on the Swedish legal framework, as well as practical considerations, for hunting of protected large carnivores. Culling of individual wolves can be performed after a management decision at the county board to avoid direct damage to domestic animals (protective culling), the police with regard to public safety or by an individual animal keeper or hunter in order to interrupt an ongoing attack. In addition, license hunting quotas can be issued by the regional county boards with the aim of controlling the general population density of the wolf population. Such decisions need to be based firmly on a very detailed yearly census of the entire wolf population and on scientific data on population growth parameters. With the aim of ensuring that the total hunting pressure will not lead to a population size that falls below the national reference value (thus leaving the population in an unfavourable conservation status), yearly harvest models are produced by leading researchers. After ensuring an appropriate level of hunting in relation to the reference value, derogations are made based on article 16 of the Habitats directive.

Parallel Presentations

Theme: Wolf Management

Wednesday 11:10 - 11:30

The effect of legal status on wolf population dynamics

Juan Pablo Ramírez Loza
Affiliation
Co-authors: José Vicente López-Bao, Yaffa Epstein, Guillaume Chapron

In December 2023, the European Commission presented a proposal to change the level of protection of gray wolves (Canis lupus) under the Bern Convention from strictly protected to protected species. In European Union (EU) legislation, this may be followed by moving wolves from Annex IV (strictly protected) to Annex V of the Habitats Directive, which would allow EU member states to permit their hunting as long as their "favourable conservation status" was maintained. The demographic consequences of these legal changes at EU level remain uncertain, as no change in the legal status of wolves under EU law has occurred before. We illustrate the potential consequences of these legal changes by looking at the dynamics of wolf populations across states with differing regimes of legal protection for wolves. We built hierarchical Bayesian state space models to assess how variation in the strictness of legal protection influences gray wolf population trends in different jurisdictions. From our results, we infer what consequences downlisting could bring for wolves in the EU and provide insights into the question of whether conservation achievements can be maintained if legal protection is relaxed or removed. We also comment on the differences between the legal and biological contexts of wolf recovery in the US and Europe.

Parallel Presentations

Theme: Wolf Management

Wednesday 11:10 - 11:30

Reporting of wolf sightings: a window into the spatiotemporal distribution of people’s concerns?

Rudy Brogi
Affiliation
Co-authors: G. Neirotti, J. Cerri, M. Lazzaroni, S. Marshall-Pescini, L. Mattioli, & M. Apollonio

European wolf populations are increasingly expanding into human-dominated landscapes, leading to novel interactions and potential conflicts with common citizens which may potentially disrupt the current paradigms of large carnivore management and conservation. Citizen reports of wolf sightings provide valuable information about the location and timing of these interactions, as well as public attitudes towards wolves. The frequency of sightings and the associated public attitude may indeed be influenced by factors such as local wolf and human densities, the length of time since the area was recolonized by wolves, and the seasonal patterns of wolf movements. We analysed 772 wolf reports received by a dedicated phone line service operating in Tuscany, Italy, from 2021 to 2024. We modelled their spatiotemporal distribution as a function of the human footprint index, the time since the area was (re)occupied by wolves (1972, 1996, 2005, 2016, or later), and the period of the year. Then, we investigated the effect of the same factors and that of the nature of the sightings (i.e., involving or not a predation event) on the reporters’ attitude towards wolves. Human-dominated areas accounted for most wolf sighting reports ($p<0.001$), suggesting that human population density, rather than wolf density, was the primary predictor of wolf-human interactions. Wolf reports were significantly more common in recently recolonized areas ($p=0.02$), indicating limited habituation of people to wolves, and showed a significant seasonal variation ($p<0.001$) with a negative peak in summer and a positive peak in late winter, aligning with the wolves' breeding and dispersal periods. Negativity of the attitude towards wolves increased until intermediate values of human footprint and then remained stable ($p<0.01$) but did not vary across areas recolonized in different times. However, the sighting of predation events significantly exacerbated negative attitudes in newer recolonized areas ($p<0.01$).
We depict a novel and complex landscape of wolf-human interactions in human-dominated areas, which may be only partially predictable through the lens of wolf biology and ecology. Our findings facilitate the identification of key regions where novel conflicts are more likely to occur and where ad-hoc socio-ecological management plans will be more needed in the upcoming future.

Wednesday 10:30 - 10:50

Effects of helicopter captures on wolf movements and behaviour

Giorgia Ausilio
Affiliation
Co-authors: A. Thiel, K. Nordli, H. Sand, C. Wikenros, P. Wabakken, B. Zimmermann

One of the most revolutionary advances in technology within the field of animal ecology is the use of Global Positioning System (GPS) collars, which allows biologists to obtain accurate locations to study animal behaviour and ecology. In order to deploy these sensors, animals need to be captured and, in most cases, immobilized using a combination of anesthetic drugs. The capture process can induce stress and phsyiological changes to the sedate animal, including elevated heart rate, body temperature, injuries and, in some cases, capture myopathy and death. Because the capturing and handling of wildlife is often crucial to obtain data on demography, behaviour, physiology of wild animals, it is therefore important to investigate the potential effects of capture and immobilization events on wildlife. In this study, we address the potential effects of helicopter captures on the movement pattern and possibly the kill rate of Scandinavian wolves. Movement patterns in this study are represented by speed between consecutive GPS positions. We used GPS data from 59 wolves captured between 2011 and 2023 in south-central Scandinavia to analyze the movement behaviour before and after a capture event in relation to several factors (e.g., age, sex, drug, body temperature). Our initial findings indicate that there is a notable decline in the movement of wolves for about 10 days following the capture event, after which their movement speeds return to pre-capture levels. We observed no significant differences related to the sex of the individuals. However, the weight of the wolves appears to influence their post-capture mobility; lighter wolves showed more variability in their movement patterns compared to heavier individuals. We are currently continuing our analysis, which includes examining how the drug combination, the body condition and the social status of a wolf influenced post-capture movements, as well as whether the capture event influences the kill rate of wolves.

Parallel Presentations

Theme: Innovations

Wednesday 10:50 - 11:10

Factors impacting collar malfunction and collar chewing behavior in gray wolves in Yellowstone National Park

Jeremy Sunder Raj
Affiliation
Co-authors: Matthew C. Metz, Jack W. Rabe, Taylor L. Rabe, Kira A. Cassidy, Erin E. Stahler, and Daniel R. Stahler

Variation in behavior and habitat use can make monitoring and research difficult for a variety of wildlife species. Among these, carnivores are particularly difficult to study because of their cryptic nature, use of rugged habitat, and ability to move long distances. Radio collars are an effective method to monitor such species, gathering invaluable data essential for conservation. However, deploying collars on animals is logistically challenging, expensive, risky, and can cause short-term stress for both the animal and the humans involved in the capture process. While the overall collar performance and data quality justify their use, they sometimes malfunction. When collar performance is unreliable, it can compromise our ability to monitor individuals effectively. This malfunctioning seems to be more prevalent among some social carnivores. Gray wolves (Canis Lupus) are known for higher collar malfunction rates and for chewing off the radio collars on other individuals in their packs. We therefore sought to identify what factors affected whether collars were chewed, malfunctioned, or worked well. We compiled data from 203 radio collars placed on gray wolves in Yellowstone National Park between 1994 and 2023. For each collared wolf, we characterized collar type (VHF or GPS) and manufacturer. We also examined the presence of studs, pack affiliation, pack size, age, and the number of pups as these factors may influence the amount of damage the collar could potentially endure. Collars were then classified as a malfunction or neither for evaluation. We used generalized linear mixed models to evaluate the factors that affected malfunctions. We found that age was an important factor in malfunctions, with the predicted probability of malfunctions decreasing as wolves age. VHF collars are less prone to malfunction than GPS collars. We also found that some packs have affinities for chewing radio collars, indicating a learned behavior. One particular pack accounts for nearly one-third of all chewed collars in Yellowstone National Park. We recommend biologists use a mixture collar types in wolf packs to ensure data collection and contact with the pack. We also recommend targeting mature individuals when possible, especially in packs with a known history of chewing radio collars.

Parallel Presentations

Theme: Innovations

Wednesday 11:10 - 11:30

A new perspective: The advantages and disadvantages of using GPS camera collars to study gray wolves

Maeve Rogers
Affiliation
Co-authors: Thomas D. Gable, Austin T. Homkes, Sean M. Johnson-Bice, John G. Bruggink, and Joseph K. Bump

How wolves hunt and kill prey during summer in boreal ecosystems is not well understood due to the challenges of observing predation in densely forested landscapes. However, novel approaches that use new technology offer potentially viable methods to study predation in ways not possible before. In 2020 and 2021, we deployed Vectronic Vertex Plus™ collars equipped with cameras on 4 wolves to test the feasibility of studying predation via camera collars. In 2020, camera collars (n=2) were set to record a 30-second video at the beginning of every daylight hour. The camera collars functioned for >6 weeks at these settings but we detected very few predation or scavenging events. In 2021, we set camera collars (n=2) to record a 20-second video every 5-minutes during daylight hours. Although these settings greatly reduced camera battery life (cameras functioned for 12 days), we detected far more predation and scavenging events than we did in 2020. We conclude that camera collars can be a viable tool to study predation behavior over short-time periods but current battery life limitations will limit the value of camera collars for studying predation in some circumstances.

Parallel Presentations

Theme: Innovations

Wednesday 11:30 - 11:50

Drones as a Potential Hazing Tool to Reduce Livestock Depredation by Wolves

Loredana McCurdy
Affiliation
Co-authors: Dr. Dustin H. Ranglack, Dr. Julie K. Young, Dr. Erica F. Stuber

Recovery and conservation of large carnivores has been challenging, as carnivores often conflict with producers as threats to their livestock. The gray wolf (Canis lupus) has recovered throughout much of its range in the northwestern USA, including Oregon. In southwestern Oregon, wolves remain listed under the Endangered Species Act, limiting livestock producers to using nonlethal tools to reduce depredation. Current nonlethal tools, such as livestock guarding animals, range riding, fladry/turbo-fladry, and less-than-lethal ammunition, can effectively reduce conflict, but wolves become habituated and render tools ineffective over time. Livestock producers and agencies tasked with mitigating conflicts are interested in applying modern technology, such as remotely piloted aircraft (i.e., drones). I am evaluating the effectiveness of drones as a potential hazing tool on wolves near livestock. I am experimentally evaluating differences in the response of wolves to hazing with drones that emit human voices, other sounds, lights, and a combination of lights and sounds, relative to control drones without an attached hazing apparatus, as these apparatuses are expected to have different habituation rates. I am also measuring wolf behavioral responses to the drone, how this varies across different habitats, and whether wolf responses vary across time (i.e., habituation). These findings will contribute to an improved understanding of whether drones are an effective hazing tool to reduce conflict and improve wolf-livestock coexistence.

Parallel Presentations

Theme: Co-existence in Communities

Wednesday 13:00 - 13:20

LIVE

Wolves and Communities: Co-existence and Conflict in Trans-Himalayas

Salvador Lyngdoh
Affiliation
Co-authors: Dr. Dustin H. Ranglack, Dr. Julie K. Young, Dr. Erica F. Stuber

The wolves in the Hindukush-Himalayan region belong to one the most basal lineages within Canis lupus, yet little is known about its ecology, distribution, and behaviour. We predict wolf distribution, analyse diet patterns in contrast with other Asian wolves and conflict perception using ecological, social and remotely sensed information. We collected scats (n = 283) of wolves and other predators over a period of 3 years (2014-17). Wolf diet constituted mostly of domestic prey while wild prey constituted to lower amounts of wolf diet over the three years. Village surveys recorded that only 4% of the respondents confirmed wolf presence and perceived them as a possible threat to various livestock. Over 98% of the respondents claimed that wolves were unsafe for livestock and were averse to their presence. MaxEnt marginal response curves of wolf scats depicted the model as having positive responses to animal location, land use-landcover, village population, village density, and wolf depredation. We found that perceived levels of depredation by those who claimed wolves mostly fed on the domestic stock were significantly different from the actual diet consumed by wolves ($\chi 2 = 99.64$, p-value <0.0001). It is advocated that conflict and negative perceptions towards wolves may be managed through a holistic conservation strategy that is in sync with tradition, enhances capacity, and promotes livestock security.

Wednesday 13:20 - 13:40

LIVE

LIFE BOREALWOLF project mitigates farmers’ concerns about wolves

Mari Tikkunen
Affiliation
Co-authors: Mikko Jokinen, Jenni Pirinen, Mari Lyly

The LIFE BOREALWOLF project has co-operated with Finnish livestock farmers since 2020. According to the survey implemented before the project most of livestock farmers in wolf areas experienced the concern caused by large carnivores to be annual and all the year round.
One of the most important parts of the project has been the work of project planners, who have visited farms and shared information of livestock protection, delivered and assembled trail cameras, fladry and different deterrents on the pastures, and helped farmers to plan electric fences around pastures. During 2020–2024 project planners contacted over 150 farms and conducted some 260 visits to them. These are farms which have experienced increased risk of the wolf attack; either there have been attacks on livestock or the farms are situated on wolf territory.
Since the 2020 the number of wolves in Finland has increased from 230 to 300 wolves (March estimate). At the same time, the annual number of confirmed, compensated depredation cases has increased from 35 to ca. 80. This is mainly because of the increased number of wolves.
However, also other costs occur from wolf presence, such as worry and increased workload. An important measure of success for the project is to gauge, whether farmers have experienced that these concerns and workload have decreased due to project actions. Even if the measures provided by the project help to protect livestock more effectively, they may also increase the workload and accrued expenses of farmers. Farmers were presented with a questionnaire which focuses on the aforementioned issues. The results are shown in our presentation.
Before the project the use of deterrents on farms has been scarce. LIFE BOREALWOLF has introduced new tools for farmers to protect their livestock. However, the most important aspect has been the personal support and consultation given by project planners. This mitigates farmers concerns about predators, and plans are made to continue this work in the future, to promote better coexistence of farmers and wolves, as well as other large predators.

Wednesday 13:40 - 14:00

LIVE

Land of wolves, school of shepherds: the importance of pastoral knowledge on coexistence with the wolf in Spain and Italy

Carlos Javier Durá Alemañ
Instituto de Estudios Sociales Avanzados. IESA-CSIC
Co-authors: Francisco Almarcha, Mario Masucci, José Antonio Sánchez-Zapata, Irene Pérez-Ibarra, Jenny Glikman, Miguel Delibes-Mateos et al.

The wolf (Canis lupus) is recovering and recolonizing its historic range in Europe. In areas where wolves have long been absent, their recent recolonization has led to opposition from extensive livestock farmers. In contrast, in other areas where wolf presence has been continuously present during long time, conflicts associated with the wolf are less severe likely because the culture of traditional management has not disappeared. This has allowed coexistence with the species in a decisive way.
In order to compare two areas in Europe with uninterrupted presence of wolf, we conducted a total of 7 qualitative interviews in each one, with livestock farmers and shepherds: Spain (León Mountains) and Italy (Abruzzo and Molisse).
Our results primarily show that in these places, wolf attacks on livestock are either very low or non-existent . There is a high level of professionalization among livestock owners, as well as widespread maintenance of shepherding profession. For example, the use of guard dogs – such as Mastiff or Maremmano-Abruzzese sheepdogs-, and the practice of guarding of livestock at night are still common. This highlights the importance of indigenous and local knowledge (ILK) in reducing conflicts and enabling coexistence.

Parallel Presentations

Theme: Co-existence in Communities

Wednesday 14:00 - 14:20

LIVE

Close encounters with wolves: who's tiptoeing around whom?

Charlotte Lorand
Affiliation
Co-authors: Ane Eriksen, Olivier Devineau, Marianna Chimienti, Camilla Wikenros, Håkan Sand, Petter Wabakken, Barbara Zimmermann

Wolves are back in their former distribution range, where they establish themselves as neighbors to stay. From remote to highly anthropogenic areas, humans and wolves are now bound to live next to each other, and sometimes, unexpectedly meet. Such encounters might be perceived as dangerous and unpredictable − while on the other hand, hunting and poaching by humans remains a major factor of mortality to wolves themselves. In these crucial times, understanding wolf behavior towards humans could be the key to mitigate fear and facilitate human-wolf coexistence.
To this end, we use a standardized protocol to assess the responses of GPS-collared wolves to approaching humans. Taking advantage of the rise of biologging methods in wildlife monitoring, we developed complementary models able to detect specific behaviors and associated energy expenditure from on-board fine-scale accelerometers. These models were created with machine learning algorithms and based on acceleration data collected in captive wolves, as well as heart rates and daily energy expenditure estimated from a doubly labelled water technique.
With this biologging toolkit at hand, we are now able to analyze wolf flight responses from multiple angles, at an unprecedented level of detail. We present: (1) flight responses of free-ranging Scandinavian wolves during human approach trials, (2) a behavior analysis of wolf movement and posture before, during and after approach trials using 32-Hz triaxial acceleration data, and (3) an exploration of the energy invested by wolves in their response to approaching humans.
Results from these controlled experimental encounters can be compared to other situations involving wolves coming to close encounters with humans (such as capture for monitoring purposes, or events involving “bold” individuals), and this, at a variety of scales. By establishing a baseline distribution of wolf response patterns along gradients of anthropogenic impact and stressful situations, we intend to provide management responders with more accurate assessment tools, and overall, contribute to de-mystify the behavior of wild wolves towards humans in public perceptions.

Parallel Presentations

Theme: Co-existence in Communities

Wednesday 14:20 - 14:40

LIVE

Wildlife-smart communities as novel local governance models for coexistence with carnivores in Europe

Fabien Quétier
Affiliation
Co-authors: Annette Mertens, Sara Casado Aliácar, Wiebke Brenner, Mario Cipollone, Valerio Reale, Marta Viera, Corinna Winkler

The successful comeback of large carnivores such as wolves across Europe challenges human activities in rural areas where the species have been absent for prolonged periods. Finding ways for people to coexist with large carnivores is paramount to the persistence of these species in the landscape and their important role in restoring key ecological process, and must also address the psychological, social and economic burden that they bring to rural communities and livelihoods, particularly for pastoralism.

Inspired by approaches to coexistence with bears in North America and other wildlife in the global South, “wildlife-smart communities” are a local development concept for communities that fully embrace and take advantage of the coexistence with wildlife. This includes urban and land use planning (zoning), adaptations to farming, pastoral and forestry systems as well as recreational activities, including techniques for avoidance and mitigation of conflicts.

A key feature of this approach is the proactive development of novel governance arrangements through public – private – community partnerships, sometimes called "conservation agreements", that aim to build shared knowledge and understanding of human – wildlife interactions and establish clear roles and responsibilities for appropriate responses, but also grow business opportunities around wildlife comeback, and develop benefit sharing mechanisms where coexistence costs are shared equitably among community members. This departs from more widespread sectoral approaches that typically focus on public agencies providing financial and technical support to farmers once conflicts have become chronic.

Despite its demonstrated success to foster coexistence in diverse settings, this concept is still largely underemployed in Europe. Here we present how this approach can be adapted to the European context using lessons learned from three on-going case studies: the Central Apennines of Italy (bears and wolves), northern Portugal (wolves) and the border regions of NE Germany and NW Poland (wolves, lynx).

Parallel Presentations

Theme: Co-existence in Communities

Wednesday 14:40 - 15:00

LIVE

First steps on the long road to find out if and how sheep farming on Tyrolean mountain pastures in Austria could adapt to the increasing presence of wolves

Martin Janovsky
Affiliation
Co-authors: Josef Gitterle

In Austria, there has been evidence of recolonisation by wolves from various populations of origin since 2009. Despite the generally relatively favourable habitat characteristics for wolves in Austria, there are major challenges, particularly in the heavily used Alpine regions in the west of Austria.
Alpine pastures have a high value in several respects, and sheep play an important role as Alpine landscape managers that goes beyond the immediate financial value of the sheep.
Accordingly, predated sheep represent the greatest conflict when wolves return. The structures of sheep farming are very small-scale. Sheep farming in the sense of guided pasturemanagement is not established on alpine pastures. Methods for protecting sheep in alpine terrain from wolf attacks that have already proved successful in other countries have no tradition in Tyrol, and the very small structures and special alpine conditions pose particular challenges for changing existing traditions.
Tyrol, an Austrian province in the alpine western part is with a number of 2099 home to the majority of Austria's alpine farming businesses and 60% of all sheep on alpine pastures in Austria are herded on mountain pastures in the Tyrol. In this context, initial experience with the guided pasture management of a flock of sheep and the use of livestock guarding dogs was gained in Tyrol in 2024-2017. The complexity of the issues raised and the number of problems to be solved became apparent. In a new attempt, the office of the Tyrolean Provincial Government has been supporting and accompanying two mountain pastures since 2021 and one more since 2022 in order to gain further experience. As many relevant areas as possible are being considered and analysed. For example, the health management of the sheep, the development and provision of suitable shepherd accommodation, the working time situation of the shepherd staff, the different ways of the guided pasture management, the evaluation of botanical development and the calculation of additional economic costs are key areas. The sheep on the project pastures are protected by night pens. Two to three livestock guarding dogs have been in use on one mountain pasture since 2023. To date, no animals have been lost to wolves or other large predators on the project mountain pastures as far as herd protection has been implemented.
During the first years of the projects, a great deal of valuable experience was gained, which is reported on in detailed yearly interim reports (http://www.tirol.gv.at/herdenschutzprojekte). The measures required for the establishment of herd protection measures in alpine terrain represent a fundamental change to the previously established sheep herding, which can only take place over generations and requires considerable public support. The most important basic prerequisite for the implementation and establishment of herd protection measures beside the availability of skilled shepherds, a relevant amount of public money and others is the motivation of livestock farmers to face these challenges.

Wednesday 13:00 - 13:20

The lethal removal of two bold wolves in Saxony-Anhalt, Germany, as part of management guidelines

Julia Kamp
Affiliation
Co-authors: M. Unger, A. Weber

As part of the natural recolonization of wolves to Germany, the first wolf settled in the federate state Saxony-Anhalt in 2008. After the first documented reproduction in 2009, wolf numbers have increased up to 42 territories in the monitoring year 2022/2023. In Saxony-Anhalt the handling of the return of the wolf and its accompanying human-wolf-conflicts are summarized in a guideline. Within the frame of this guideline authorities lethally removed two bold wolves at the turn of the year 2023 and 2024.
In the beginning of December 2023 residents of the village ‘Zschornewitz’ reported repeated sightings of wolves within the village to authorities. Following investigations on site revealed, that the sighted wolves were suffering from mange and visited several feeding stations for feral cats, birds of prey and foxes, and a meat stall within the village regularly. The wolves, which were identified to be about seven to eight months old, displayed a concerning loss of shyness towards humans. After several attempts of non-lethal deterrence measures failed, authorities granted permission for the lethal removal of those wolves. Subsequently, the first wolf was shot on December, 19th in 2023 and the second wolf was shot on January, 27th in 2024. No more sightings of bold wolves within and around the village were reported afterwards.
This case is a successful implementation of wolf management guidelines. It underlines the high importance of a well-prepared authority and good communication and collaboration with stakeholders. Without the assistance and cooperation of local hunters, residents and politicians, the process would surely not have been as smoothly as it was.

Parallel Presentations

Theme: Bold Wolves

Wednesday 13:20 - 13:40

Coming (too) close? The behaviour of one individual wolf requires carefully considered action

Johanna Fritz
Affiliation
Co-authors: Hannah Weber et al.

We present a casy study showing the challenges occuring when a wolf acts on the border of tolerable behavior. The example of one wolf in the Black Forest illustrates the multi-causal connections, when preparing a management scenario in a highly frequented national park.

Wednesday 13:40 - 14:00

Is harvest creating a new wolf? Wolf behavior, sociality, and genomics

Ariana L. Cerreta
Affiliation
Co-authors: David E. Ausband

Humans have variably harvested gray wolves (Canis lupus) throughout their range, providing an opportunity to evaluate how harvest affects the genetic composition of candidate alleles that influence behavior and morphology. Historically, natural selection should have favored the survival of wolves that feared humans. Additionally, wolves with more aggressive phenotypes may have assumed breeding positions. Assuming these behaviors are genetically based, extant wolves presumably maintained behavioral variation in aggressive or fearful phenotypes in the wild. Thus, harvest by humans may affect the allele frequencies of these loci and thus the evolutionary trajectory of the species. In this study, we use a long-term genetic dataset on wolves in Idaho, USA, over differing levels of harvest through time to investigate how harvest and group social dynamics impact allele frequencies in loci putatively associated with aggression, fear, boldness, and exploratory behavior. We have developed and optimized a GT-seq panel of 267 loci targeting genes associated with behavioral and physical traits, herein referred to as the adaptive loci panel. We selected genes from peer-reviewed genomic studies on dogs and wild canids. The adaptive loci panel consists of genes associated with the physical traits of body size, coat, cognition, color, fecundity, immunity, and senses, as well as the behavioral traits of activity level, aggression, attention, boldness, social behavior, timidity, and vocalization. Preliminary analyses revealed extant variation in most loci evaluated (n=64 wolves), including some loci that were previously documented as being homozygous in wolves. By the conference, we will have sequenced 947 tissue samples from harvested wolves in Idaho and will have evaluated changes in allele frequencies among known breeders and dispersing wolves which will be reported in this presentation. This innovative tool will aid evaluating wolf populations and could be used to aid management of populations in other regions of the world.

Parallel Presentations

Theme: Bold Wolves

Wednesday 14:20 - 14:40

The subjectiveness of facts and feelings. Perceptions on how non-lethal management of bold wolves was stopped in courts

Glenn Lelieveld
Affiliation

Wolves have come back to the Netherlands and were reproductive in 11 wolf packs last year. All these wolf packs are in multi-use landscapes where people live, work and recreate. Most of the territorial wolves and their young avoid people. However, we have had several cases in which wolves actively show themselves to people (and were recorded by mobile phone) and reported to the Zoogdiervereniging. In these footages, the wolves show behaviour that could be defined as bold behaviour (after Reinhardt et al 2020) as wolves clearly come closer than 30 meters to people (and their dogs).
In response to these cases and in line with Reinhardt et al 2020, we advised the regional authorities in these cases to catch and collar the wolves to increase the knowledge basis and as a first form of aversive conditioning. By use of alternative facts and victimizing the wolf, the mists of doubt were sufficiently raised to stop this measure in three different court cases by animal activists. In this talk, we will explore the data available, show some of the video footages and give insight into the different perceptions of relevant stakeholders in these cases.

Parallel Presentations

Theme: Bold Wolves

Wednesday 14:40 - 15:00

Wolves perceive hunting dogs in their territory as rivals

Mari Tikkunen
Affiliation
Co-authors: Ilpo Kojola, Ville Hallikainen, Mari Tikkunen, Marko Kübarsepp, Peep Männil, Samuli Heikkinen, Vesa Nivala

Wolves recolonized Finland in the 1980’, and there are now approximately 300 wolves in the country. The return of wolves has led to numerous conflicts between human and wolves, the most conflict enhancing being wolf attacks on dogs. Finland has traditionally valued hunting culture, and the most popular animal hunted is the moose, and this hunting is mostly dog-assisted. Hunters use solitary working dogs pursuing prey over large areas far from their owners, which places the dogs in danger when hunting in wolf areas.
Although the total number of attacks on dogs is not high (approximately 30-50 dogs yearly), every dog released to hunt in wolf areas is at risk. Even though the government provides compensation, dogs are perceived as beloved members of the family and loss of a dog can be traumatic to both the hunter and his family.
Wolves are highly territorial animals, which defend their resources against intruders through attacks, and this territorial defense is at its most intense during late autumn, which is also the primary hunting season in Finland.
In this study we wanted to examine whether dogs are considered by wolves to be more of a conspecific rival than prey. This is related to the fact that humans increase competition by introducing another canid species to the wolf territories; a species which also preys upon the wolves’ primary prey.
We discovered that when prey is scarce, wolves are more prone to attack dogs. This indicates that when competition for prey is higher, the rate of attacks on rivals increases. It was also revealed that hunting dogs are killed more often in territory border areas than could be expected when compared to the time wolves spend there. Thus, it appears that wolves are aware of competitors coming to their territory and remove them as soon as possible.
The risk of attacks on hunting dogs could be decreased if hunters are made more aware of what motivates wolves to attack and are knowledgeable of risk areas on the territory. In regards to the management of ungulates, game managers should assess hunting quotas on prey species with the understanding that smaller quotas could serve to decrease the conflict between hunters and wolves.

Parallel Presentations

Theme: Wolf Politics

Wednesday 13:00 - 13:20

Wolf policy in a densely populated region of Flanders

Koen Driesen
Affiliation
Co-authors: Ilpo Kojola, Ville Hallikainen, Mari Tikkunen, Marko Kübarsepp, Peep Männil, Samuli Heikkinen, Vesa Nivala

Flanders comprises the northern half of Belgium. It is a densely populated region with intensive, varied land use spread over (relatively) small areas. Wolf has been permanently present there since 2018 and has also successfully reproduced since 2020. Around the core areas of the pack, largely located on military grounds, there is mainly small-scale livestock farming, with a mixed professional and private character. After the first wolf arrived, a Flemish policy framework with regard to wolves was drawn up, the so-called 'wolf plan'. This framework includes all kinds of aspects, ranging from drawing up a protocol on problem wolves and developing a subsidy scheme for prevention to creating a list of frequently asked questions with accompanying substantiated answers, etc.

To develop the Flemish policy framework, the Flemish Government calls on all kinds of expertise present in various organisations, also abroad. In the preparation and interim revisions of this framework, a strong focus is also placed on involving and intensively collaborating with the various sectors that may come into contact with wolves (agriculture, nature, hunting, experience, private management, local and regional authorities). These stakeholders are closely involved in the 'wolf platform', a consultation structure within which relevant information about wolves is shared, and feedback and input are requested and which also serves as a sounding board. At local level, there are additional consultation moments for both mayors and municipal services in order to involve them as much as possible in the wolf policy and to support them in informing/raising awareness among citizens. This approach aims to ensure that everyone knows each other's positions and shows understanding for each other's situation and beliefs with regard to wolves, however diverse they may be. As a government, we then try to work out a supported solution for each problem or issue in an objective and transparent manner that meets all these positions as much as possible and in which the legal protection of wolves is of course taken into account. Our presentation will focus on the Flemish damage and prevention policy. In the context of this policy, a good collaboration has been developed with the Wolf Fencing Team Belgium, which has gained increasing trust from livestock farmers over the years and has thus contributed greatly to the support for wolves in Flanders.

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Wednesday 13:20 - 13:40

The history and current status of the Dutch inter-provincial wolves policy plan

Femmie Smit
Affiliation

Wolves re-established in the Netherlands in 2018, after being hunted to extinction around 1869. Their return was expected, and the Dutch national and provincial (12) governments anticipated on their return by investigating the consequences of their return (in 2012). The Dutch national government commissioned experts to make a draft plan for wolves management (2013). Since nature conservation tasks are delegated to provincial governments, this report was presented to them, and they set up a steering group (with governmental employees), which had the task to make an operational handbook for stage 1 (wandering wolf present). It appeared in 2016 and contained mainly information and protocols on how to monitor wolves and how to secure DNA samples. It discussed the risk for humans and their pet and livestock animals. Communication on and research into preventative measures to reduce damage were advised. In this early stage the recommendation was also that preventative measures should not be mandatory to apply for wolf damage compensation by the governments. The reason being that the presence of wolves was not predictable, and therefore the investment in prevention was judged as not yet reasonable. The advise was also that in order to receive damage compensation, proof that damage was done by a wolf or wolfs, had to be delivered through DNA analyses.
Governments started working on an actualisation en expansion of the first handbook, to include the expected wolves settlement. They used the experiences with monitoring wolves and damage that occurred in 2017 and 2018 and consulted NGO's whom had an interest in wolves management (administratively established in January 2019). The biggest changes with the first plan were: 1. Preventative measures could be subsidised by the governments, 2. After three years of establishment of wolves (single or packs), preventative measures should be in place in order to receive compensation for damage and 3. The intervention guidelines were expanded, in able to assess whether interventions to manage conflicts between people-wolves, dogs-wolves and life stock-wolves, should be undertaken. In 2023 an addendum appeared that updated certain subjects and in 2025 a revised version of the complete handbook is expected.

Wednesday 13:40 - 14:00

Evaluating 50 years of wolf protection in Slovakia

Robin Rigg
Affiliation
Co-authors: Ilpo Kojola, Ville Hallikainen, Mari Tikkunen, Marko Kübarsepp, Peep Männil, Samuli Heikkinen, Vesa Nivala

The Wolves Across Borders conference in 2025 coincides with the 50th anniversary of the first legal protection of wolves in Slovakia. Here, as elsewhere, the wolf was heavily persecuted as vermin. Although never eradicated, its numbers and range were substantially reduced. A turning point came in 1975, when the most destructive practices (trapping, poisoning, removing pups from dens) were banned and a closed season was introduced from spring to autumn. These measures, together with an increase in wild prey and expansion of forest cover, enabled wolf recovery. The challenge subsequently shifted from saving the wolf to learning to live with it.
Wolf recovery led to renewed concerns about attacks on livestock and competition for game. With successive changes of government policy, the pendulum has swung back and forth between traditionalism, protectionism and pragmatism, but the overall direction of travel is from persecution through co-occurrence to coexistence. Milestones along the way include ratification of the Bern Convention in 1994 (with a reservation allowing regulation of wolf numbers); accession to the EU in 2004 (with the wolf listed as ‘protected’ in Habitats Directive Annex V rather than ‘strictly protected’ in Annex IV); an infringement process in 2013; adoption of a national wolf management plan in 2016; and a ministerial decree adding the wolf to the national list of strictly protected species in 2021 despite opposition from farmers and hunters.
In the half century from 1975 to 2025, Slovakia has run the full gamut of wolf management policies from eradication to strict protection and almost everything in between. Many lessons can be learned, for example, it is possible to have wolf presence without high levels of damage where wild prey is abundant and prevention measures are used. Technical fixes such as LGDs and fencing, although they can reduce damage substantially, do not solve complex social conflicts. The management flexibility afforded by HD Annex V does not prevent conflicts and lethal control of wolves does not necessarily reduce damage. Dialogue and negotiation can achieve progress, but compromises that would be acceptable to most people may be undone by politics, power dynamics and fundamentalist positions.

Parallel Presentations

Theme: Wolf Politics

Wednesday 14:00 - 14:20

Transboundary cooperation on carnivore management and wildlife crime in Fennoscandia and southern Africa – challenges and opportunities

Maria Falkevik
Affiliation
Co-authors: Henrik Häggström

What kind of management system is needed when neither wildlife nor criminality cares about administrative borders? Wildlife crime in the Fennoscandia region is rising, threatening protected species like brown bears, lynx, wolves, and wolverines. The region also serves as a transit hub for organized wildlife crime, exacerbated by weak law enforcement and gaps in collaboration across borders. Despite existing legal frameworks at both the EU and national levels, law enforcement in the region faces significant challenges, including a lack of resources, legal loopholes, and strained relations between law enforcement and local communities. Wildlife crime often enjoys tacit support from local interest groups, complicating enforcement efforts. This conflict is especially pronounced in managing large carnivores, where competing interests among stakeholders, combined with a lack of trust, hinder progress.

Given these challenges, cross-border collaboration is essential to combat wildlife crime effectively in Fennoscandia. However, current enforcement efforts remain fragmented and lack the coordinated approaches needed to dismantle wildlife crime networks. Lessons from other countries and continents, e.g. Africa's Transfrontier Conservation Areas (TFCAs) provide valuable insights. In these African regions, cross-border cooperation has proven essential in managing shared ecosystems, coordinating anti-poaching efforts, and ensuring sustainable wildlife conservation.

Drawing on these lessons, Nordic law enforcement agencies, and Conservation agencies have decided to launch a new project to foster a similar level of collaboration in Fennoscandia, focusing on building robust cross-border partnerships between Norway, Sweden, and Finland and create lasting partnerships and build trust among law enforcement, conservation groups, and community leaders. The project will strengthen national and regional law enforcement capacity, harmonize legal frameworks, and create a multi-agency approach to combat wildlife crime in close collaboration with local community groups. Central to this effort will be the establishment of a Fennoscandia Wildlife Crime Unit (WCU), modelled after successful African examples, to facilitate community partnership, joint investigations, intelligence sharing, and patrols. By leveraging the success of African TFCAs, this initiative aims to disrupt wildlife crime networks and protect Fennoscandia's natural heritage, ensuring the long-term survival of its vulnerable species.

Parallel Presentations

Theme: Wolf Politics

Wednesday 14:20 - 14:40

Challenges and Opportunities in Delisting Carnivores: A Comparative Study of Gray Wolves in the US and EU

Temple Stoellinger
Affiliation

This presentation will examine the complex issues surrounding the delisting of carnivores, focusing on gray wolves in the United States under the Endangered Species Act and in Europe under the EU Habitats Directive. This comparative approach will provide insights into different legal frameworks and conservation strategies.

I plan to begin with an overview of carnivore conservation, highlighting the ecological importance of apex predators and the challenges they face in human-dominated landscapes. The gray wolf's history under both the ESA and the EU Habitats Directive will be outlined.

Key topics to be covered include:

1. Comparison of legal frameworks: ESA vs. EU Habitats Directive
   - Distinct population segment (DPS) policy in the US
   - Favorable conservation status concept in the EU
2. Controversies surrounding delisting approaches in both regions:
   - US: Reliance on core populations, interpretation of "significant portion of its range"
   - EU: Member state discretion, hunting as a management tool
3. Legal challenges to wolf delisting attempts in both jurisdictions
4. Alternative legal approaches to carnivore management:
   - Financial instruments to encourage tolerance
   - Use of 4(d) rules (US) and derogations (EU)
5. Comparative analysis of recovery planning:
   - Need for a national wolf recovery plan in the US
   - Pan-European management approaches

The presentation will highlight how both systems grapple with similar challenges:
- Defining recovery and favorable conservation status
- Managing human-wolf conflicts
- Balancing central authority with local/state management

By examining wolf conservation in both the US and EU, this presentation aims to identify best practices and potential areas for policy transfer between the two systems. It will conclude by proposing potential paths forward that draw on lessons from both sides of the Atlantic, emphasizing the need for adaptive management, stakeholder engagement, and science-based decision-making in carnivore conservation.

Wednesday 14:40 - 15:00

Voter Directed Wolf Restoration to Colorado, USA.: A synopsis of the process to restore wolves and the status of gray wolves in Colorado

Eric Odell

Affiliation

Co-authors: Reid DeWalt, Brian Dreher, David Klute, Brenna Cassidy

In November 2020, voters of Colorado approved Proposition 114, which directed Colorado Parks and Wildlife to develop a plan to restore gray wolves to Western Colorado and to take the steps necessary to begin that restoration by December 31, 2023. This is the first time that voters have mandated the restoration of any wildlife species in the United States, and the first time that a state wildlife agency has conducted wolf restoration. The process to develop the plan involved substantial public participation and the development of a Stakeholder Advisory and a Technical Working Group to provide the best social, political and scientific principles upon which to base the plan.

The Colorado Wolf Restoration and Management Plan describes the process with which wolves will be restored to Colorado, the manner in which confirmed livestock depredation will be compensated, tools to minimize conflict and state recovery goals and other details pertinent to the management of the species. The Plan was presented to the Colorado Parks and Wildlife Commission in May 2023, and it was passed by a unanimous vote.

According to the Plan, wolves are to be restored to Colorado over a period of 3-5 year, translocating 10-15 wolves per year. Beginning in mid-December 2023, CPW worked to capture 10 wolves in eastern Oregon for transport to Colorado. All 10 animals were successfully reintroduced by the December 31 deadline. Wolves are monitored using GPS collars, trail cameras and other methods. In spring of 2024, the first documented litter of pups from reintroduced wolves was documented.

There has been documented wolf-livestock conflict, and this has proven to be a very challenging aspect of wolf management in the state. CPW worked with the US Fish and Wildlife Service to develop a rule to relax some of the management restrictions that would otherwise exist for a federally listed species. Wolves in Colorado will continue to be monitored, and plans are underway for the next capture and translocation season, which will occur Winter 2024-25. This presentation will provide an overview of the process to restore wolves to Colorado, and to provide an update on their status.

Predation of wolves on domestic pet dogs: a new frontier of the humans and wolves relationship in North-East Italy

Stefano Filacorda

Affiliation

Co-authors: Daniela Romanin, Aexandra Mareschi, Nicola Cesco, Leandro Dreon, Roberto Bullo, Enrico Bortolotto Andrea Vendramin et al.

The presence of wolves in urbanized and semi-natural areas and the predation of domestic animals, especially against pet dogs, are critical elements in the relationship between this species and humans. In Friuli Venezia Giulia, North East of Italy , on the border with Italy and Austria , from May 2023 to August 2024, more than 30 cases of predation by wolves on pet dogs have been reported and partly documented. The predations have involved pet dogs of mixed and pure breed, small and medium size , both at night and during the day , even in the presence of the owner, especially at scattered homes or during walks in agricultural and natural areas. The number of wolves observed during predation ranged from 1 to 2 . The area, 173 km2 , affected by predation has had variations during the study period and the intensity of predation has varied according to the seasons: The areas involved foothills with the alternation of extensive agricultural components to natural and semi-natural areas and small countries and isolated house. Predation behaviour and the ecological context, both in terms of natural preys, co-presence with jackals and environmental characteristics, and social context, and perception of the problem, is discussed and the management plan presented

Wednesday 13:20 - 13:40

Shepherds at the Crossroads: Integrating Herd Protection and Landscape Management in South Tyrol

Benjamin Kostner
Affiliation

Shepherds are at the heart of herd protection, deeply embedded in the cultural heritage of many regions, including South Tyrol. However, despite their cultural significance and growing societal support, the economic and legal framework surrounding their profession remains inadequate. Beyond their pivotal role in herd protection, shepherds can offer immense ecological value when equipped with proper knowledge of local biodiversity, botany, and experience in managed grazing. This active shepherding can significantly enhance landscape maintenance and contribute to ecological goals such as preventing habitat loss due to overgrowth, invasive neophytes and shrub encroachment while providing effective herd protection.

In South Tyrol, the coexistence with wolves faces considerable challenges due to low acceptance and resistance among the local population. At the same time, the region is in danger of losing valuable and unique habitats if extensive grazing practices continue to decline. Together with policymakers and the administration the LIFEstockProtect project is working towards introducing a concept of contract-based nature conservation into South Tyrol, which could provide a pathway for the sustainable financing and professionalization of the shepherding profession. This system aims at a win-win scenario, benefiting both conservation efforts and agriculture by offering new sources of income for ecosystem services, which have so far gone unrewarded.

This presentation will explore practical case studies, challenges, and perspectives from the field, illustrating how reviving and professionalizing shepherding not only supports herd protection but also enhances ecosystem management. It will highlight how shepherds, if given the right tools and resources, can contribute to both biodiversity conservation and sustainable agriculture in wolf-inhabited areas. By fostering professional development within the shepherding sector, we can promote a more resilient coexistence between humans, livestock, and large carnivores like the wolf.

Parallel Presentations

Theme: Conflict Management

Wednesday 13:40 - 14:00

Testing a conservation compromise: Has public wolf hunting in Slovakia reduced livestock losses?

Miroslav Kutal
Affiliation
Co-authors: Martin Duľa, Alisa Royer Selivanova, José Vicente López-Bao

Variation in the legal status and management of wolves (Canis lupus) across EU Member States provides a good opportunity to test the effectiveness of different practices to reduce livestock losses. This opportunity for testing is particularly useful for lethal interventions, as they are among the most controversial actions within the large carnivore management toolbox and the European Commission suggested decreasing the wolf protection in the Bern Convention. We aimed to test a conservation compromise adopted in Slovakia, based on a public wolf-hunting scheme and annual hunting quotas between 2014 and 2019, and partially justified to reduce livestock losses. We assessed whether this hunting scheme influenced livestock depredation levels (at the district level). Wolves in the area fed mainly on wild ungulates (98.9% of consumed biomass). While domestic sheep comprised only 0.5% of the diet, they were dominant among the reported livestock killed by wolves (91.1%). Using two different approaches, we did not observe a relationship between the number of killed wolves and livestock losses. Alternatively, a negative relationship between wild prey biomass and livestock losses was found. Although the previous justification for this conservation compromise to reduce livestock losses is no longer valid, the populist Slovak government has renewed the hunting of wolves since 2025.

Parallel Presentations

Theme: Conflict Management

Wednesday 14:00 - 14:20

Spatio-temporal dynamics of attacks around deaths of wolves: A statistical assessment of lethal control efficiency in France

Oksana Grente
Affiliation
Co-authors: Thomas Opitz, Christophe Duchamp, Nolwenn Drouet-Hoguet, Simon Chamaillé-Jammes and Olivier Gimenez

Evaluating the efficiency of lethal control of wolves to reduce their attacks on livestock is important given the controversy surrounding this measure. We used retrospective data over 10 years and an intra-site comparison approach to evaluate the effects of lethal control on the distribution of attack intensities in the French Alps. We analyzed 278 legal killings of wolves between 2011 and 2020 and the 6110 attacks that occurred during a period of ± 90 days and within 10 km around these lethal removals. This large number of attacks allowed us to perform an original framework that combined both continuous spatial and temporal scales through 3D kernel estimation. We also controlled the analysis for livestock presence, and explored different analysis subsets of removals in relation to their locations, dates and proximity to other removals. This statistical method provided an efficient visualization of attack intensity spatio-temporal distribution before and after removals. A decrease of the intensity of attacks was the most common result after the lethal removals of wolves. However, this outcome was not systematic for all subsets and depended on the scale of the analysis. Thus, for about half of the subsets, the greater the analysis scale, the lesser the decrease. In addition, attacks tended to persist after removals while showing frequent interruptions in time after but also before removals. We also observed localized positive trends of attack intensities at varying distances from removals after they occurred. To summarize, our results showed that considering the scale of the analysis is crucial and that effects should be analyzed separately for each local context. As a next step, we recommend to move forward from patterns to mechanisms by linking the effects of lethal control on wolves to their effects on attacks through analysis of fine-scaled data on wolves and livestock.

Wednesday 14:20 - 14:40

The Impact of Parental Loss on the Fate of Wolf Family Groups – Implications for Species Conservation and Population Management

Wojciech Śmietana
Affiliation
Co-authors: Thomas Opitz, Christophe Duchamp, Nolwenn Drouet-Hoguet, Simon Chamaillé-Jammes and Olivier Gimenez

Understanding the effects of social structure disruptions in wolves, particularly due to mortality caused by humans, is crucial for effectively managing this species. Of particular importance is the impact of parental loss on the stability and fate of wolf family groups. My research, conducted in the Bieszczady Mountains (eastern Polish Carpathians) between 2004 and 2018, employed both telemetry and genetic analysis to track and study wolf population. Kinship analysis, based on non-invasive genetic sampling, provided insights into the spatial organization of the population and enabled a detailed understanding of the dynamics within several family groups. In the studied groups, the loss of at least one parental individual was observed. When the breeding male was lost, he was typically replaced by an unrelated outsider. However, the loss of both parents led to the eventual disintegration of the family group. This breakdown was not immediate; initially, the offspring remained on the family's territory, but this phase lasted only for a relatively short period. Family group that retained both parents had a high reproductive success - on average 5.1 pups surveyed until the beginning of winter. In one case, I observed a family group consisting of two breeding pairs, where the second pair was formed by the daughter of the first pair and an unrelated male. In another instance, within a group that had lost its parental pair, one individual became habituated to human presence and food, leading to its eventual elimination after it attacked children. These findings suggest that non-selective reducing wolf numbers in saturated populations, may not be the most relevant management strategy. The results call for alternative approaches to population management that account for the social dynamics, structure of wolf groups and conflicts with humans.

Parallel Presentations

Theme: Conflict Management

Wednesday 14:40 - 15:00

Wolves on the Scandinavian Peninsula: crossborder directional and long-range dispersals as the main depredation challenges

Petter Wabakken
Affiliation
Co-authors: A. Eriksen, Ø. Flagstad, O. Liberg, E. Maartmann, K. Nordli, H. Sand et al.

Since the reestablishment of the crossborder wolf population on the Scandinavia Peninsula (Sweden and Norway) during the early 1980s, wolf-human coexistence has been challenging, mostly caused by wolf depredation on livestock and domestic dogs, but also people's fear, and competition between hunters and wolves for moose, i.e. the main prey of Scandinavian wolves. To reduce conflicts, knowledge about wolf dispersal patterns and the potential of livestock depredation by wolves is essential for management policies. We have analyzed the dispersal patterns of Scandinavian wolves born in 1) fully Norwegian territories associated with today's wolf zone, 2) crossborder territories, and 3) Swedish territories, respectively. Based on the dispersal patterns, we also analyzed wolf occurrence and potential for livestock depredation in Norway, both on a national and regional levels. In Norway, the main wolf-livestock conflict was depredation on free-ranging domestic sheep. For the 38-year-period studied (1986-2023), we concluded that young, solitary, dispersing wolves posed the greatest potential risk and damage to free-ranging sheep in Norway. Morevover, confirm that the great majority of the wolves immigrating to potential conflict areas in Southern Norway were born in Sweden. This is particularly true for those immigrating into Southern Norway outside the Norwegian wolf zone region; among 66 wolves, 60 were Swedish-born, five were born in crossborder territories, and one were from the 77 wolf litters registered in fully Norwegian wolf territories associated with the wolf zone. Wolves from fully Norwegian territories dispersed east into neighboring countries, i.e. Sweden, Finland and Russia. Only four (6%) out of 65 wolves which during a 27-year period were culled in Norway in direct association with attacks on livestock during the grazing season had dispersed from a fully Norwegian wolf territory associated with the Norwegian wolf zone. We thereby conclude that the number of litters in fully Norwegian wolf territories seems to be of minimal importance for the extent of depredation on free-ranging sheep in Southern Norway as long as the reproductions happen in association with the wolf zone.

The effective size of European wolf populations and its implications for policy and management

Joachim Mergeay
Affiliation

The effective population size is a pivotal statistic in conservation: it provides information on how populations behave genetically and how vulnerable they are to inbreeding, and on evolutionary potential. The convention on biological diversity has recently adopted the threshold value of Ne=500 to define sustainable populations, but what does this really mean for wolf populations in Europe, and how should this influence European wolf policy and management?

Few species have been studied genetically so intensively as the grey wolf in Europe: genetic data are available across two to sometimes four decades for several populations and across thousands of individuals, and increasingly such data are publicly available. This abundance of data allows us to calculate accurately the genetically effective size of these populations, compare this to other monitoring data and provide non-genetic shortcuts (“proxies”) that can be easily used by management and policy to guide decision making. Here I provide an overview of effective sizes for European wolf populations, with results based on empirical data and proxies, and link this to the European Habitats Directive, showcasing implications for the favourable conservation status.

Parallel Presentations

Theme: Population Management

Thursday 13:40 - 14:00

LIVE

Wolf population size estimation: Challenges and insights from Scandinavia and France

Cyril Milleret
Affiliation
Co-authors: Christophe Duchamp, Pierre Dupont, Jean-Michel Vandel, Richard Bischof, Olivier Gimenez

Population size is a key metric for the management and conservation of large carnivores. Although population size estimation of elusive carnivores, such as the wolf, has benefited from the development of efficient monitoring and statistical methods, it often remains financially costly, as well as logistically and analytically challenging. Given the controversial status of the wolf, population size is also often at the core of acrimonious public and political debates. In that context, managers and researchers often have to navigate a complex and hostile environment while attempting to estimate, but also communicate, wolf population size estimates. After describing the wolf monitoring and population size estimation in both Scandinavia and France, we will summarize the progress and issues encountered, but also discuss possible paths forward.

Parallel Presentations

Theme: Population Management

Thursday 14:00 - 14:20

LIVE

Using a stage-based life cycle implementation to model population viability of European wolves

Florian Kunz
Affiliation
Co-authors: Jennifer Hatlauf, Paul Griesberger, Frederik Sachser, Klaus Hackländer

Population viability analyses (PVA) are essential tools for informing management decisions, particularly for species with complex social structures such as the Grey Wolf (Canis lupus). PVA often rely on age-based models, yet stage-based approaches that account for an individual's social status can provide more accurate predictions for species with more complex social structures. In this study, we developed a stage-based life cycle model for European wolves (with the stages pups, yearlings, subdominants, dispersers and territorial breeding individuals) to be implemented in the Vortex software. We used the German part of the Central European wolf population as a case study, as the population is currently rapidly expanding from a recent bottleneck after the re-colonization of Germany. Hence, PVA are especially important to predict population trajectory, extinction risk and genetic integrity. We applied data from the monitoring program to model different population trajectories, extinction risks, and genetic diversity under various scenarios by including recent life history parameters and recorded genotypes.
Our findings highlight the impact of mortality rates at different life stages on overall population growth. High mortality among pups and dispersers led to negative growth and elevated extinction risk, while mortality among yearlings and subdominants slowed growth but did not result in similar population declines. As expected, high mortality among territorial (adult) individuals had the highest impact on population trajectory. Despite being a relatively young population with a recent bottleneck, we did not find any negative effects on genetic diversity as long as the population is not held at low population numbers. Hence, we conclude that the initial population in 2015 was sufficiently diverse
Within our study, we present a stage-based life cycle model for European wolves and describe how to adapt the Vortex software from age-based to stage-based. As such, we promote a flexible, easy-to-use framework that can be adapted for PVA in other wolf populations and similar social species. By integrating stage-based approaches, we demonstrate the importance of considering social structures in conservation models, thereby improving predictions of population dynamics and the effectiveness of management strategies.

Wolves on the Move: Investigating Dispersal and Human-Caused Mortality in a Social Carnivore

Kathleen Petersen

Idaho Cooperative Fish and Wildlife Research Unit, Department of Fish and Wildlife Sciences, University of Idaho

Co-authors: David E. Ausband

Dispersal is a vital demographic process for populations to maintain genetic diversity and persist over time. In cooperative breeding species like the gray wolf (Canis lupus), individuals must decide whether to remain in their natal territory to assist kin or disperse far away in search of outside breeding opportunities. We are investigating how human-caused mortality (hunting and trapping) impacts wolf dispersal patterns in Idaho, USA. Idaho's wolves offer a unique opportunity to study dispersal dynamics in a cooperative breeder, as intense harvest pressures drive them to immigrate and fill vacancies created by harvest-related mortality. Our research seeks to address key questions regarding wolf dispersal: What drives their departure, where they disperse, and why they select specific destinations. We want to understand how human-caused mortality influences wolf immigration and investigate the ecological and demographic drivers that predict dispersal. Specifically, we want to evaluate how harvest intensity, sex, prey biomass, and wolf abundance influence dispersal patterns across two spatial scales. First, we developed a novel method to identify dispersers and calculate genetic metrics using DNA collected from wolves harvested between 2017 and 2022. We identified 75 dispersers out of 325 wolves, with a mean dispersal distance of 100 km. Second, we used scat samples collected from 2008 - 2024 to estimate dispersal dynamics within packs. We explored the relationship among familial pedigrees and assessed how intra-pack social dynamics, such as breeder turnover, influence dispersal decisions, and examined how pack size, relatedness, and harvest intensity affect these decisions. We successfully collected 966 samples over 16 years, and have identified 26 dispersers (10 females, 14 males, 2 unknown). Using both data streams, we will build a predictive dispersal model to understand how harvest impacts both landscape-scale movements and localized dispersal. This research aims to enhance our understanding of wolf population dynamics and help inform wolf management and conservation.

Parallel Presentations

Theme: Population Management

Thursday 14:40 - 15:00

LIVE

Current Situation in Switzerland and declaration of intent

Inès Moreno
Affiliation
Co-authors: Florin Kunz, Nina Gerber, Sven Buchmann & Fridolin Zimmermann

In countries like Switzerland, long-term coexistence with wolves can only be achieved with management aimed at mitigating the negative interactions between concerned interest groups and the wolf. To achieve this, various lethal and non-lethal management measures (e.g. herd protection, deterrence, communication) are applied. Since 1 December 2023, wolf packs can be regulated proactively in Switzerland with following envisaged aims: i) to prevent damage to livestock, ii) a danger to humans and iii) an excessive decline in the regional population of wild ungulates. Various measures are envisaged, such as the elimination of 1/2 or 2/3 of the pups, the elimination of a particularly harmful reproducer or the complete elimination of the pack if certain conditions are met. However, there are few studies examining the effectiveness of these management measures, whereas such evaluations are essential for evidence-based and adaptive management.
We now have the opportunity to monitor and analyse the effects of various management measures. Our aim is to study the effects of lethal wolf management on: i) damage to livestock, ii) wolf population trends and pack stability, and iii) social acceptance of the wolf. In 2025 we will present the current situation in Switzerland, the analyses from the first year, but obviously cannot present long term analyses. Our evaluation however, should pave the way towards an evidence management of the wolf in Switzerland and promote long-term coexistence between wolves and humans in a multi-use landscape.

Parallel Presentations

Theme: Preventative Measures

Thursday 13:20 - 13:40

Carnivore exclosures to protect sheep in the boreal forest affect the area use of moose

Barbara Zimmermann
Affiliation
Co-authors: Alessandro Forti, Pierre Lissillour, Ane Eriksen, Petter Wabakken, Benoit Cerjak, Carla Campon, Sona Motlova

Fences fragment wildlife habitat and can hinder the movement of other than the target species only. We studied potential effects of fences built to protect sheep (Ovis aries) from depredation on the area use and behavior of wild cervids. In 2008, two carnivore exclosures encompassing 11 km2 and 22 km2 of boreal forest, respectively, were set up inside Norway's wolf (Canis lupus) management zone. The fences consisted of 6-10 powered steel wire strands with the top strand at 135 cm. While the strands of the smaller exclosure remained mounted year round, but unpowered during winter, the strands of the larger exclosure were demounted each year after grazing season. We used this semi-experimental setting to compare densities of moose (Alces alces) fecal pellet groups (FPG) inside and outside of the exclosures during winter 2021-2022 and summer 2022. We also mounted 24 camera traps along the fence of the smaller exclosure to film the behavior of cervids.
Our findings give support to a potential fragmentation effect: during winter, moose FPG density was double as high outside than inside of the permanently mounted fence, while it was equal inside and outside of the exclosure with demounted strands. On just a few of all moose videos did the animals actually cross the fence, they mostly walked along or explored it. During grazing season, moose FPG density was equal or higher inside than outside of the exclosures. We hypothesize that moose used the exclosures as refuge to avoid predation of neonates by large carnivores. This hypothesis was supported by videos showing how moose mothers left their calves behind inside the fence while jumping over to forage outside. We also found that moose used forage-rich habitat to a lesser extent inside than outside of the exclosures, maybe due to interference competition with sheep. This case study is a first approach to increase our understanding of potential effects of livestock protection fences on other wildlife species. Surprisingly, even moose, a large-bodied species, seemed to be affected by the physical fence, the presence of livestock and the absence of carnivores inside the exclosures.

Parallel Presentations

Theme: Preventative Measures

Thursday 13:40 - 14:00

Effectiveness of strobe light as a potential deterrent stimulus for wolves

Annika Held
Affiliation
Co-authors: Marianne Heberlein, Lina Oberliessen, Katja Trinkaus, Océane Schmitt, David Wewetzer, Melissa Vanderheyden, Uta König-von Borstel

The growing wolf population in Europe poses increasing challenges for livestock farmers. One way of enabling peaceful coexistence between pastured livestock and wolves would be the use of effective deterrence measures to scare the wolf away before it even explores the pasture fence, so that the wolf is prevented from discovering opportunities to pass through.
Due to the fact that canids heavily rely on vision for hunting and that they have more sensitive eyes than humans, a strobe light seems to be a suitable candidate for deterring them. The flickering light is assumed to cause short-term glare and discomfort, which should interfere with focusing on potential prey.
The aim of the study was to test the hypothesis that strobe light makes the wolves leave the feeding site and effectively prevents wolves from eating palatable food.
We tested 11 captive wolves kept in 5 groups (group sizes: 2-3) at the WolfScienceCenter Ernstbrunn, Austria. We used a spotlight with a brightness of 8000 lumen, which produced 5 seconds of flashes at 20 Hz after activation via motion sensor, if a wolf passed by. After a control week of feeding wolves with dead chicks at a designated corner within their enclosure each evening at dawn, a test week followed, with the strobe light activated and otherwise identical conditions.
Against our expectations, linear mixed-effects model analysis showed that strobe light has no effect on the time until consumption of the chicks (control vs. test: -6.8 s ±5.9 s; t=1.15; p=0.31), amount of eaten chicks (control vs. test: 0.0±0.2; t=0.02; p=0.14) or the time wolves spent in the testing area (control vs. test: -12.6 s ±15.6 s; t=-0.81; p=0.46). Wolves showed no signs of discomfort during exposure to the deterrent. The wolves in our study were likely accustomed to light in general and were therefore able to tolerate any potential short-term glare or discomfort caused by the strobe light. It can be assumed that, aside from initial neophobia, wild wolves would respond similarly to this stimulus. In conclusion, strobe lights cannot be recommended as an effective deterrent for wolves.

Parallel Presentations

Theme: Preventative Measures

Thursday 14:00- 14:20

Free-ranging cattle and the return of the wolf; implications for conservation management

Chris Smit
Affiliation
Co-authors: Tom Tijsma

Grazing with free-ranging cattle is a much applied management strategy in nature areas in Western-Europe. The recent return of the wolf in these areas raises urgent new questions to conservation managers. At the moment, there is very little information about how free-ranging cattle respond to the re-appearance of wolves. To what extent are these free-ranging herds capable of defending themselves (and their young) against wolves ? To what degree can they develop this behavior, and how quickly can they adapt to this new situation? How does social structure or group size play a role in this, and how do these behaviors differ between different breeds? To what extent do the effects of wolves on natural grazing have consequences for vegetation development and achieving nature management goals, also in the context of opening areas to the public (public safety)? To address these questions, we set-up a study to investigate the behavior of free-ranging cattle in areas where wolves have recently returned. We use a network of wildlife cameras to capture behavior during and after cattle-wolf interactions, and use GPS collars to study habitat use of cattle over the season in relation to wolf presence. Here, we report on the behavioral responses of free-ranging Galloway cattle in a natural area in Drenthe following various recorded wolf encounters between spring 2023-2024, the first caught on wildlife cameras in the Netherlands. These well-documented wolf–cattle interactions show promising information as they highlight anti-predator behaviors from an unexperienced cattle breed, all within a year of the wolves' return. We broadly discuss the relevance of these findings for grazing management, including selection for breeds, anti-predator behaviors, and impact of herd structure and size, and we provide avenues for future studies to address current knowledge gaps.

Parallel Presentations

Theme: Preventative Measures

Thursday 14:40 - 15:00

Evaluating the non-lethal effects of wolves on cattle herds in the Swiss Jura mountains

Philippine Surer
Affiliation
Co-authors: Alex Del Fante, Cécile Weber, Nina Gerber, Florin Kunz, Erik Versluijs, Philippe Christe & Fridolin Zimmermann

Wolves have significantly expanded their range in Europe over recent decades, leading to increased livestock depredations and negative human-wildlife interactions. In Switzerland, while most damages caused by wolves concern free-grazing sheep and goats, certain areas are recently emerging as hotspots for cattle depredations, and given the importance of cattle husbandry, achieving low-conflict coexistence is crucial for the future of wolves in the country. Beyond direct mortality, wolves can induce behavioral and physiological changes in their prey (i.e. risk effect). These non-lethal effects can result in changes in behaviors, such as increased vigilance, changes in foraging time budget, shifts in group structure and dynamics, and habitat selection. So far, most studies have focused on how wild preys respond to the return of the large carnivore. However, livestock responses remain poorly understood and require further investigations.
This study aims to assess how cattle respond to the presence of wolves by comparing their habitat preferences, behavioral patterns and physiological stress in two study areas within the Swiss Jura Mountains, each experiencing different levels of wolf presence (i.e. resident packs vs sporadic solitary wolves). In each study area, we selected 5 herds and fitted 5 cattle per herd with GPS and accelerometer sensors from May to October 2024. We analyzed cattle habitat selection within the fenced pasture using step-selection analysis incorporating variables such as forest cover, distance to forest edge, forest roads, water sources and food supplements. We conducted behavioral observations and used random forest models to classify behaviors using accelerometry signatures and predicted behaviors throughout the study period. Additionally, we assessed baseline levels of glucocorticoid metabolites by measuring concentrations in feces over 5 consecutive days in all 10 herds simultaneously. Overall, we evaluated whether heifers expressed differences in habitat selection, frequency of specific behaviors and glucocorticoid metabolites levels between the two study areas. Our research provides a first evaluation of the costs of the non-lethal effects of wolves on cattle herds in the Swiss Jura Mountains. Measuring such effects could help developing methods for compensating productivity losses experienced by livestock owner, supporting the long-term coexistence of wolves and cattle farming in Switzerland.

Parallel Presentations

Theme: Wolves in Cultural Landscapes

Thursday 13:20 - 13:40

FERUS' Pastoraloup program: supporting appeased wolf coexistence

Catherine Frizat
Affiliation
Co-authors: Fannie Mallet

French nonprofit FERUS (named after the Latin word for “wild”) was founded in 1993 to support and promote the protection and conservation of Europe’s large predators (wolf, bear, and lynx) and to improve their coexistence with human activities like farming.
Since its early days FERUS has realized that the main key to achieving coexistence was to establish dialogue and build relationships between wolf advocates and the farming community. Aware of the challenges faced by farmers in the presence of wolves, a volunteer-based support program named Pastoraloup was established in 1999 to help farmers and shepherds implement protection methods.
FERUS recruits candidates sensitized to the pastoralism/wolf theme among its members/supporters. A mandatory 5-day training camp takes place four times a year for the sixty-four selected candidates (16 per camp). Set in the heart of wolf country on a sheep farm in the French Alps, the training is a time of encounter and exchange between different stakeholders involved with the “wolf issue”.
Every year between March and November, trained volunteers are then sent on missions with FERUS’ farming partners in the field; lasting one to several weeks each mission consists mainly of night (and/or day) surveillance. Immersion is total and participants must fully embrace the shepherd’s way of life - hardships and joys.
In the past 25 years over 800 volunteers and at least 120 different farmers have participated in the program, with volunteers contributing more than 14 000 nights/days of surveillance in approximately 972 missions. There hasn’t been any predation 99% of the time in their presence.
Beyond its measurable benefits Pastoraloup’s value also resides in the human experience it generates. Indeed, one of the program’s main strengths is found in the human relationships it forges. In this space of dialogue and openness, it is easier to overcome the usual “pro-wolf and anti-wolf” divide, and to work together towards the use of fair and durable solutions - indispensable prerequisites to appeased coexistence.
In addition to highlighting Pastoraloup‘s positive results, our presentation will also examine the recent creation of an emergency intervention team in the Jura region to address cattle predation.

Thursday 13:40 - 14:00

Living with wolves: A new framework to enhance coexistence with wolves by studying livestock behaviours

Erik Verlsuijs

Affiliation

Co-authors: Barbara Zimmermann, Anna Hessle, Morten Tofastrud

Coexisting with wolves brings multifaceted societal challenges of high complexity, such as livestock losses due to depredation. Countries often support farmers with economic compensation of livestock losses. However, farmers affected by repeated depredation events might not only suffer economically, but also emotionally. The resulting increase in stress and worry can impact their daily life, which in turn can negatively effect animal welfare. Furthermore, repeated livestock depredation will negatively effect animal welfare, as individuals which are not attacked who might have higher stress levels. In the meantime, many studies related to wolf management and coexistence are focussing directly on wolf behaviour and preventive measures to alleviate conflicts. These efforts are of great importance. However, in addition to this, we propose a new framework for studying livestock behaviours using precision livestock farming (PLF) techniques to enhance coexistence with wolves. Within livestock farming there is a strong increase in technological applications to measure and monitor animal health, with the main focus on increasing production and maintaining high animal welfare standards. These PLF techniques can reach further than only be used in highly modernized barns. One such example is the use of accelerometers, i.e. activity sensors from which behaviours or certain activity states can be derived. We have in an earlier study successfully used accelerometers in free-ranging cattle in large extensive forest areas in Norway to study cattle behaviours at high spatio-temporal resolution. Based on these experiences, we propose creating a broader network of cattle behaviour studies that consider different herd compositions, pasture types, breeds, ages, and management practices. Therefore, creating a wide knowledge base about breed specific livestock behaviours and responses towards wolf presence gives the opportunity to 1) inform farmers and suggest adjustments of management practices in specific situations, such as changing to breeds or herd compositions with a lower probability of depredation. And 2) developing tools to better monitor livestock behaviour, for example to detect sudden changes in behaviour suggesting towards wolf presence. In this presentation we will outline this interdisciplinary framework, discuss the technology and methods, and use a practical case to show how this might be implemented.

Thursday 14:00 - 14:20

Of wolves navigating a human landscape of fear

Katharina Kasper
Affiliation
Co-authors: Elise Say-Sallaz, Maciej Szewczyk, Paulina A. Szafrańska, Marcin Churski, Michael Clinchy, Liana Y. Zanette et al.

After a long period of persecution, wolves are recolonizing Europe’s human-dominated landscapes. Previous studies from areas with low human presence or ongoing human risk find wolves to avoid humans. However, close human-wolf encounters are increasingly reported in areas where wolves are strictly protected and raise concerns about the potential habituation towards humans and dogs. We tested the behavioral responses of wolves to human, dog, and control sounds in a playback experiment, using speaker-paired camera-traps in an area without legal wolf hunting and intense human activities – the Tuchola Forest in Poland. The frequency of running (indicative of fear) and proportion of displayed head-lowering (representative of inattentiveness) explained most of the variation in behavioral responses to playbacks. Wolves ran significantly more often from humans than controls, while dog playbacks did not differ from either human or control playback. However, we found that wolves strongly avoid encounters with humans and dogs on a diel basis. After a decade of experiencing strict protection, instead of losing their fear, wolves navigate sharing their habitat on a very fine scale. Fear of humans is widely found in large carnivores and might pose an alternative coexistence strategy to habituation.

Thursday 14:20 - 14:40

The effect of diseases on the depredation of calves by wolves

Uri Arad
Affiliation
Co-authors: Dror Ben-Ami

The depredation of livestock in the Golan Heights causes a substantial economic loss to ranchers. Historically, wolf predation of mostly calves has led to both legal culling measures and illegal poisoning by ranchers, resulting in detrimental effects to the local ecosystem, including the near extinction of the Griffon Vulture. Various factors influence the susceptibility of herds to predation, including ecosystem stability, wolf pack dynamics, anti-predation strategies (guardian digs, fences, carcass removal), herd health and more. However, little is understood about the health status of calves prior to predation, including the potential impact of diseases or other non-predatory factors. We evaluated long-term herd health records of a ranch in the Golan Heights. Utilizing high-resolution accelerometry in the same ranch, we conducted physiological observations on a free-ranging herd of 120 calves over three months in rugged, grassy terrain. To assess predator dynamics, we placed camera traps around the grazing areas to monitor predator presence, and at carcasses to observe predator interactions. Our results show that a significant loss of livestock and disappearance is due to unknown causes, and that the rate of livestock loss is similar to internationally observed rates. We found a negative correlation between the physiological well-being of the herd and decreased predation rates, despite the high presence of predators including wolves, jackals and hyaenas, in the study site. Livestock guardian dogs displaced predators at carcasses. These findings underscore the importance of herd health, in conjunction with non-lethal depredation mitigation, to mitigating predation risk and livestock loss, and inform future strategies for livestock management in wolf-inhabited regions.

Thursday 14:40 - 15:00

Anticipating wolf comeback to Western France

Hadrien Raggenbass
Affiliation
Co-authors: Jean-Jacques Blanchon, Fabien Quétier, Laure Kloetzer, Olivier Thaler, Jean-Marc Landry, Eric Guttierrez

Wolves have expanded from the Alps to Western France, emerging in lowland environments. This is generating an expansion of real and perceived conflicts with wolves, in a highly polarized public opinion that ranges from fascination to loathing. This is accentuated by widespread ignorance about the specie's behavior, in part due to the lack of empirical field research and posturing by politicians and local representatives over the past 35 years since wolf's comeback to France. Government support for livestock breeders to adopt appropriate protection (e.g. fences, protection dogs) can take several years to be enacted as repeated successful predation events on livestock need to have occurred before the necessary administrative processes are put in place. This means predation pressure can grow largely unimpeded in the first few years of wolves settling into a new area, with obvious financial and psychological consequences for those affected, and open defiance at the State's incapacity to act. That's a recipe for perpetuating conflict.

In partnership with a willing group of forward-thinking farmers in southwestern France, we are experimenting with involving a coalition of local people in detecting dispersing wolves, and supporting farmers in their preparation to the challenge of wolf comeback. Building on earlier experiences in the Alps and Limousin since 2018, we address the challenge of very low wolf densities and temporary presence by using speculative tracking (as defined by Liebenberg) whereby Hypotheses are formulated on wolf presence and movement pathways to increase the likelihood of finding reliable indices (categorized using SCALP criteria). Speculative tracking facilitates the subsequent use of camera-trapping and genetic analyses of scat and other biological samples.

To increase our capacity to cover large areas with low densities of indices, we train actively volunteer farmers, landowners, hunters and walkers. Their involvement is based on a charter with technical criteria as well as a shared vision around the coexistence of extensive livestock rearing and wolves in the landscape. This approach aims to help bring together diverse rural communities around vulnerable farmers before traumatic depredation events, together with poor knowledge or disinformation, become unsolvable conflicts.

Parallel Presentations

Theme: Genetics and Feeding Ecology

Thursday 13:20 - 13:40

Visualisation an exploration of complex multi-generational pedigrees

Gregor Simčič
Affiliation
Co-authors: Tomaž Skrbinšek

The growing availability of genetic data has revolutionized our understanding of wolf population development and dynamics. Population monitoring schemes in many countries have enabled collection of genetic data from wild-living animals through multiple generations, allowing a deeper insight into long-term population trends. Reconstruction of pedigrees from this data has emerged as a powerful tool for investigating key aspects of wolf populations, including demography, pack structure, and reproductive behavior. However, managing and interpreting such large datasets covering multiple generations remains challenging, especially when attempting to track the spatial and temporal dynamics of many wolf packs and their interactions over time.

We introduce WildPedigreeExploreR (wpeR), an R package designed to streamline analysis and visualization of wild pedigree data. wpeR supports integration of reconstructed pedigrees with field data, allowing researchers to add spatial and temporal dimensions to their pedigree analyses, providing critical insights into population structure and dynamics.

The key features include organizing individuals into families, generating detailed temporal plots of pedigree relationships, and creating related spatial datasets that can be either directly visualized or exported for use in a Geographic Information System (GIS). wpeR is designed to be flexible and interoperable with other R packages and GIS, facilitating further analyses and graphical representations. It provides a scalable solution for handling pedigrees, from simple one-generation datasets to complex multi-generational data. Visualizations produced by the package help users intuitively visualize development of complex pedigrees across multiple generations at the landscape scale. Through simplified integration of spatial and temporal data, wpeR helps researchers to efficiently explore and interpret complex temporal and spatial dynamics of wild populations. These interpretations can provide critical insights that inform management decisions and aid in the development of effective conservation and management strategies.

Besides demonstrating the core functionalities of wpeR, we will showcase its application using 12 years of intensive genetic monitoring data from Slovenia, and highlight the potential of our approach to advance studies on population dynamics, ethology, ecology, and conservation of wolves.

Does Genetic Admixture Affect Ghost Wolf Ecology?

Lilian Heinzel
Affiliation
Co-authors: Q. Angus, Dr. J. Olin, Dr. B. vonHoldt, and Dr. K. Brzeski

Admixed genomes, or genomes that contain components of multiple genetic lineages, can be a source for evolutionary and ecological change since they can serve as a reservoir of genetic and phenotypic novelty. One such instance is a population of coyotes (Canis latrans) along the Gulf Coast region of the United States that have substantial admixture with critically endangered red wolves (C. rufus). These species interbred before red wolves were thought to be extirpated from the wild in the 1980s. Descendants of those admixture individuals now retain ghost alleles, unique red wolf genetic diversity only represented in admixed canids, and are thus colloquially called ghost wolves. We seek to identify how red wolf ancestry may impact the ecological role of genetically admixed ghost wolves. Red wolf ancestry is positively associated with larger body size, which may influence diets of individuals and packs. We hypothesize that individuals with more red wolf ancestry feed at higher tropic levels and consume larger-bodied prey species, like deer (Odocoileus virginianus), than individuals with less red wolf ancestry. To test this, we are conducting a non-invasive study to: 1) determine individual ancestry by optimizing a specialized genotyping panel via Genotyping-in-the-Thousands sequencing, 2) estimate diet content with DNA metabarcoding, and 3) assess the ecological niche with stable isotope analysis of carbon and nitrogen of ghost wolves in multiple locations in southeast Texas and southwest Louisiana, USA. We collected canid scat samples from a variety of habitats in private ranches, federally managed wildlife refuges, and densely populated urban areas. We aimed to quantify seasonal diet variation by sampling in summer 2023 and winter 2024. Our results from these three approaches will be combined in a mixed model to assess how admixture affects the ecological role of ghost wolves.

Parallel Presentations

Theme: Genetics and Feeding Ecology

Thursday 14:00 - 14:20

Title tbc

Robert Ekblom
Affiliation
Co-authors:

Abstract tbc

Parallel Presentations

Theme: Genetics and Feeding Ecology

Thursday 14:20 - 14:40

Short-term responses of red deer to wolf presence are related to predation risk

Katarzyna Bojarska
Affiliation
Co-authors: Johannes Signer, Maria Zetsche, Friederike Riesch, Elina Jarmer, Nina Gerber, Suzanne van Beeck Calkoen et al.

Wolf presence may impact red deer (Cervus elaphus) movement and habitat selection, yielding important consequences for ecosystems and wildlife management. However, evidence for this top-down behavioural effect is still scarce in Europe. We used camera-trap and telemetry data to assess behavioural responses of red deer to wolf presence during four years of wolf recovery in Grafenwoehr Military Training Area (Bavaria, Germany). Red deer in the area are maintained at high densities to aid preservation of open (non-forested) habitats that cover approx. 40% of the area. We assessed wolf presence in two areas of approx. 4 km2, corresponding to the annual home ranges of GPS-collared red deer and used by different wolf packs. Using a dense grid of camera traps (22 cameras per area), we quantified wolf presence as wolf days (when wolves were recorded on camera traps) or non-wolf days (when they were not). We compared red deer camera-trap data (GLM-predicted picture counts) and movement patterns (via integrated step selection analyses of 35 GPS-collared red deer individuals) on wolf days and non-wolf days while accounting for daily variation in human activity (estimated via human picture counts). During the study, the yearly numbers of wolf days increased three-fold. Camera traps recorded more red deer pictures on wolf days, especially at night. The increase in red deer pictures on wolf days was most pronounced when wolves started to breed in the study areas. Human activity had the opposite effect on red deer, with fewer red deer pictures on the human-busiest days, particularly during the day. Telemetry data revealed that on wolf days, red deer preference for open areas increased on a 24-hour scale but decreased at night. The responses of red deer to wolf presence were rather subtle and varied between years, seasons, and times of day, suggesting a complex relationship with the level of predation risk. While the increase in red deer camera-trap picture counts on a within-home-range scale may be interpreted as a change in movement rates, telemetry data did not detect a corresponding change. Therefore, our results corroborate the importance of considering variability among methods when studying wildlife behaviour.

Parallel Presentations

Theme: Genetics and Feeding Ecology

Thursday 14:40 - 15:00

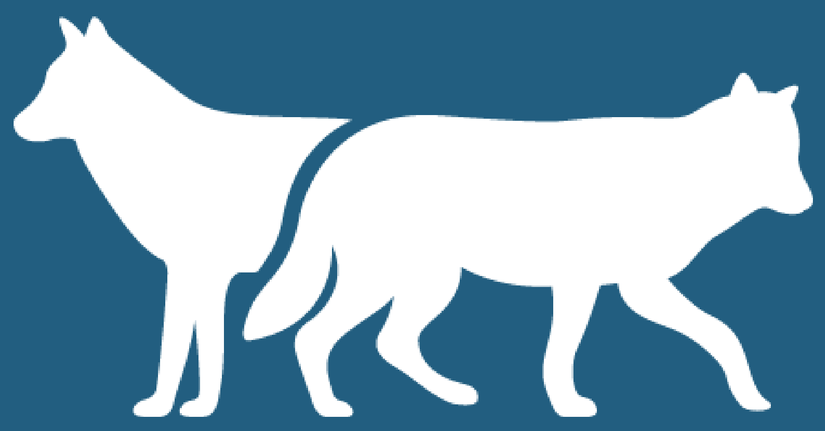
Unveiling the Feeding Patterns & Preferences of Wolves in Switzerland

Florin Kunz
Affiliation
Co-authors: Philippe Christe, Luca Fumagalli, Eduard Mas Carrio, Fridolin Zimmermann & Nina Gerber

As wolves recently returned to Western Europe, questions arose regarding their local diet, their influence on local prey populations and the importance of livestock in their diet. Because of the wolves' high adaptability to different habitats and prey species, local studies are necessary to analyze their interactions with other wildlife and livestock. Most wild ungulate populations are managed and thus there is an interest in knowing more about the influence and integration of the wolves' influence in the ungulate hunting planning.
In this study we explore the wolves’ diet in Switzerland, based on results of DNA metabarcoding of wolf scats. This is the first insight into the spectrum of wolvf prey species with modern genetic methods in the central alpine arch and the Jura Mountains. We investigate local composition in diet, compare and statistically test the frequency of occurrence of prey species over different regions, seasons, and social structures such as the one of packs and of lone wolves. Our analyses are based on wolf scats already attributed to specific individuals with molecular analyses, found by chance or near livestock killed by wolves. With this information we also incorporate the circumstances of scat detection and investigate its effect on the relative occurrence of livestock and wild prey in wolf’s diet.
Further, we compare the findings of prey consumption to the relative abundance of prey species in the respective regions and calculated their preference for the main ungulate prey species. Prey abundance is a key information which is difficult to acquire. We evaluated different methods of doing so and show an approach of using data on relative ungulate presence based on camera trap data.
We found that wolves in Switzerland feed predominantly on wild ungulates. Our data also shows that scat samples taken in proximity to livestock kills can influence the resulting diet results considerably. These and further results give important insights into the feeding regime of wolves in the Central Alps and the Jura mountains.

Parallel Sessions

In addition to the standard plenary presentations and breakout sessions, the program also features a range of parallel sessions in alternative formats. These include panel discussions, interactive forums, and other engaging session types designed to foster dialogue, exchange diverse perspectives, and encourage active audience participation.



WOLVES ACROSS BORDERS

Parallel Session

Tuesday 11:00 - 11:20

Citizen initiatives for co-existence with wolves

Moderators: Pepijn ‘t Hooft & Diemer Vercayie

Participants

Wolf Fencing Team Belgium

Mauro Belardi - Pasturs Italy

Jean Christophe Poupette - Entre chien et loup France

Annette Siegert - Herdenschutz Niedersachsen Germany

Across Europe, volunteer-driven initiatives are making a tangible difference daily—installing wolf deterrent fences, supporting flock protection, and educating tourists. They fill crucial gaps between policy and practice, offering constructive alternatives to polarization. These initiatives show how society can unite to implement effective damage prevention and make measurable progress toward peaceful coexistence with wolves. Drawing from a comprehensive mapping of these initiatives, we will present key data on their prevalence and impact. Speakers from five initiatives across Europe, each with a distinct approach, will share insights:

- on how their initiatives are structured and operated,
- on their tangible results and impact
- and on the important lessons learned and challenges faced

The session aims to inspire participants and highlight the high potential of volunteer-driven solutions in addressing coexistence challenges.These efforts not only provide practical, on-the-ground solutions but also foster community engagement and trust, making coexistence a shared responsibility.

Join us to explore how citizen-driven actions foster collaboration, why these efforts deserve greater recognition, and how scaling them up can enhance conservation strategies—paving the way for true coexistence between humans and wolves.

Parallel Session

Tuesday 13:30 - 13:50

Emotions in science and policy

Moderator: Gerda van Dijk

Participants

- Maarten Jacobs - Social Sciences Wageningen University & Research
- René Grotens - Municipality of Zeist
- Annet Muller - Stichting Wij(s) met Wolven
- Herman uit de Bosch
- Glenn Lelieveld

Parallel Session

Wednesday 13:00 - 15:00

EU Large Carnivore Platform: Youth workshop

Katrina Marsden
Adelphi Research & European Commission Large Carnivore Initiative

Come play! Modelled on the stakeholder dialogue platforms on large carnivores that have been implemented in different countries, a new role play, designed by the EU LC Platform, aims to increase understanding around the management of these species. It is designed to provide an opportunity for people “to step in someone else’s shoes”, thereby promoting empathy and tolerance while getting to know the various different perspectives on the topic. The game, simulates the discussion process involving key stakeholders with an interest in large carnivores to find joint solutions and a common way forward, enabling coexistence. Building on the empathy and understanding developed in the first part of the workshop, the second half will empower you to apply what you‘ve learned to create social media campaigns that reshape public narratives and promote coexistence with large carnivores. Learn about different narratives on large carnivores and come up with your own ideas on how to actively shape the public narrative through social media!

Parallel Session

Wednesday 13:00 - 15:00

Outside (off-site)

Limited places available

Going Dutch: The Wolf Approach in Gelderland, Netherlands

Organised by the Wolf Committee of Gelderland

As part of the Wolves Across Borders conference, the Wolf Committee of Gelderland invites participants to explore the unique Dutch approach to living with wolves. In one of Europe's most densely populated and intensively used landscapes, the return of the wolf raises distinctive challenges. Under the title Going Dutch, this interactive session provides insight into how the province of Gelderland is addressing wolf-related issues on the Veluwe, the area currently home to seven of the eleven wolf packs in the Netherlands.

Participants will engage in a guided, small-group activity—featuring rotating discussion stations and a practical field component—focused on key topics such as:

- The Dutch approach to wolf management, including the role and mandate of the Gelderland Wolf Committee, public engagement, conflict resolution, and preventive strategies.
- The need for a National Livestock Protection Team, modeled after successful programs in Belgium and Germany, and discussions on funding gaps and implementation in the Dutch context.
- A visit to the Livestock Protection Fence Demonstration Site, offering a hands-on look at various wolf-deterrent fencing methods used in the Netherlands.
- Living close to wolves, with a focus on how wolves coexist near human settlements and the implications for animal behavior and public safety.
- Voices of resistance, featuring livestock owners who currently choose not to implement protective measures, offering space for open dialogue and mutual understanding.
- Experiences with livestock guardian dogs, based on a Dutch pilot that showed promise but revealed challenges in public awareness and implementation.

The session is designed to encourage knowledge exchange and honest conversation. Experts, practitioners, and stakeholders are invited to walk, observe, and reflect together on what it means to share a landscape with wolves—and how policy, practice, and public perception can evolve accordingly.

Workshops

Workshops offer a hands-on, interactive environment for participants to engage deeply with specific topics. Led by experts in the field, these sessions focus on practical skills, collaborative learning, and active involvement, providing valuable takeaways for both research and practice.

WOLVES ACROSS BORDERS

Workshops

Tuesday 16:15 - 18:15

Designing Diverse Social Conflict Resolution Approaches to Manage Human-Carnivore Conflicts

Mireille Gonzalez

Affiliation

Workshops

Tuesday 16:15 - 18:15

C2C: Conflict to Coexistence- an integrated and participatory approach to HWC management

Femke Hilderink & Sybille Klenzendorf
Affiliation

Human-wildlife conflict (HWC) presents an escalating challenge to conservation and sustainable development worldwide. The World Wide Fund for Nature (WWF) has responded to this challenge by developing a globally applicable, yet adaptable approach to HWC management that can be tailored to specific local, regional or national contexts. The C2C: Conflict to Coexistence approach (referred to hereafter as C2C approach) was developed based on an existing HWC management approach launched in 2016 (the Safe Systems Approach), and is currently undergoing implementation and testing in various pilot sites in Asia and Africa. This integrated approach to HWC management intends to enhance stakeholder collaboration, conflict mediation, and the co-design- and implementation of effective HWC management strategies. Data collection and analysis uses the HWC module in SMART (Spatial Monitoring and Reporting Tool) and SMART collect.

In this session, we explore the framework and methodology of the approach and learn more about its initial implementation. We will zoom in on the main findings and challenges associated with the implementation of the integrated approach in different contexts. Since monitoring and data collection is often considered a major bottleneck in HWC management, we will discuss the application of SMART for HWC data collection and use.

Through an interactive workshop, participants are challenged to share and discuss successes and failures in HWC management from various perspectives and identify opportunities as well as challenges for implementing the C2C approach.

Aim of the session is to:

- Present the C2C: Conflict to Coexistence approach and share lessons learned from initial implementation.
- Share lessons learned (process, results, challenges) on HWC management interventions from various perspectives and identify opportunities and challenges for implementation of the C2C approach .
- Identify potential participants for a Europe focussed C2C training of trainers workshop and C2C pilot sites.

Workshops

Tuesday 16:15 - 18:15

Citizen Initiatives for Coexistence: Towards a Collaborative Manual

Diemer Vercayie & Pepijn 't Hooft
Affiliation

This workshop invites participants from a wide range of initiatives—whether emerging, established, or those looking to revive or improve existing projects—to collaboratively develop a comprehensive manual for citizen-driven coexistence initiatives, with the goal of publishing it in a special issue of Wildlife Biology.

Building on the success of volunteer-driven projects across Europe, this workshop will explore the challenges and opportunities of scaling and sustaining these efforts, share best practices, and identify the resources necessary for future success. Key topics will include:

- Overview of the initiative inventory: Mapping existing initiatives, examining their impact and approaches, and identifying gaps and opportunities for collaboration.
- Lessons learned and practical tips: Key success factors of specific approaches, advice on starting, improving, or revitalizing initiatives, and addressing external challenges and critical questions.
- Funding strategies and financial challenges: Discussing ways to overcome financial hurdles, the role of professional support, and potential to access EU resources.
- The role of scientific research: Exploring the need for research on prevention measures and evidence-based strategies for coexistence.

A central goal of the workshop is to foster collaboration among participants and explore future partnerships, with a focus on creating a network to facilitate further exchange across projects. This includes discussing opportunities for collective action in larger-scale projects.

By the end of the workshop, participants will leave with valuable insights and connections that can help strengthen and scale up volunteer-driven initiatives, enabling more effective coexistence strategies across Europe.

Join us to share your experiences, contribute to the development of a review of and manual for these initiatives, and help shape the future of citizen-led coexistence efforts between humans and wolves.

Tuesday 16:15 - 18:15

Understanding emotions in human-wolf conflicts

Thorsten Gieser
Affiliation

Human-wolf conflicts are often constructed as primarily rational disputes over arguments in favour or against the presence and impact of wolves in human-dominated landscapes. However, at the heart of these conflicts—whether they are direct confrontations with wolves or broader societal debates about their presence—lie complex emotions that drive and shape the interactions and narratives surrounding these animals. In this workshop, we explore the emotional dimensions of human-wolf conflicts from a humanities perspective, illustrated with examples from my ethnographic fieldwork in Germany, gaining a deeper understanding of how these emotions influence perceptions, behaviours, and policy decisions.

To begin, I propose to distinguish between emotions and feelings. Much of the research on emotions so far first tries to identify crude categories of emotion (sadness, anger, love) and second tries to measure its intensity. But are emotions really so easy to identify? And is it clear what stakeholders mean when they say, for example, that they are ‘angry’ (7 on a scale of 1 to 10)? While emotions refer to culturally normed categories, feelings represent the subjective experience of these emotions and are embedded within broader, lasting dispositions that influence how individuals and communities perceive and react to wolves over time. By exploring these complexities and depths of feelings, we are better equipped to address the complexities and depths of human-wolf conflicts and coexistence.

In a further step, we will discuss the relationship between rationality and feeling. Attempts to counter emotional responses to wolves with "facts" alone can be ineffective, as feelings are not merely irrational reactions but are deeply intertwined with individuals' identities, values, and lived experiences. In other words, feelings are not a mere ‘additional’ category to study next to attitudes, beliefs or knowledge. They are an integral part of all of them. We will explore this with the help of several examples from outreach/educational events from the field where ‘emotion’ and ‘rationality’ clash.

This workshop aims to provide participants with a nuanced framework for understanding the role of emotions in human-wolf conflicts, offering insights that can enhance conflict resolution strategies and promote coexistence between humans and wolves.

Tuesday 16:15 - 18:15

Howl You Say It? From Boomers to Zoomers

Cassiopeia Camara

Affiliation

This workshop will delve into the complexities of generational communication, offering participants an in-depth exploration of various generational cohorts. Attendees will gain a comprehensive understanding of the defining characteristics, communication preferences, and effective techniques for engaging individuals from different generations. This foundational knowledge will be applied specifically to the field of conservation communication, with a particular focus on wolf conservation.

The workshop begins by providing an overview of the key traits and values that distinguish generations, from Baby Boomers to Gen Z. Participants will learn how these differences shape communication styles and expectations, offering insights into tailoring messages that resonate across age groups. The session will then shift focus to conservation, analyzing how generational perspectives influence public attitudes toward environmental issues, with a deep dive into wolf conservation communication.

To make the learning process dynamic and interactive, the workshop incorporates engaging activities. Participants will play games designed to simulate real-world communication scenarios, helping them apply their understanding of generational dynamics in a fun and memorable way. These exercises will demonstrate how to navigate generational gaps, ensuring effective and inclusive messaging in conservation contexts.

In the second half of the workshop, participants will analyze real-world communication campaigns, focusing on conservation efforts that targeted multi-generational audiences. Case studies, including successful and unsuccessful campaigns, will be examined to identify strengths, weaknesses, and opportunities for improvement. Attendees are also encouraged to bring their own communication campaigns or specific situations to the table, allowing for hands-on, collaborative analysis and adaptation. This practical segment gives participants the chance to refine their strategies and develop actionable communication plans tailored to their unique challenges.

By the end of the workshop, participants will leave with a toolkit of generational communication strategies, specifically adapted for conservation work, and the ability to craft impactful messages that foster understanding and engagement across diverse age groups.

Tuesday 16:15 - 18:15

A crash course in wolf conflict cooking

Maria Falkevik
Affiliation

What is it about wolves that makes people’s emotions run wild? Or is it really about wolves at all? The wolf management have many characteristics of a “wicked issue”. It has a high complexity in both it’s socioeconomic and ecological context, and there are no simple solutions to the conflicts that inevitably will surround it. Simply telling a wolf sceptic about the wolves and their role in the ecosystem will not help. Neither will a verdict that a culling decision is legal convince someone who suspect managers of hidden agendas. So, if the conflicts can’t be solved, how can we hold space for coexisting in a safe and constructive level of conflict?

The idea of adaptive management is common in wildlife management, but not always practiced when it comes to learning and improving the management of its’ many conflicts. There are also many parallel issues between wolf management and wider societal conflicts where adaptive processes are becoming valued within social policy making etc. This is the area of expertise of Joseph Harrington, a senior design and strategy specialist working across the public and social sector. He will host this workshop together with Maria Falkevik, process manager at the County Administrative Board of Värmland with 20 years’ experience of working with wolf management, nature resource conflicts and stakeholder participation. You can expect a dialogue between learning from different wolf conflict cases and learning about wider societal conflicts, and the importance of engaging in conflict, enabling people to be part of processes of generating responses that go beyond the lowest common compromise. Welcome to a playful and explorative workshop on how to cook a wolf conflict properly, without anyone getting burnt.

Workshops

Wednesday 15:30 - 17:30

Outside

How to catch wolves

Ross Hinter & Hans van Eijden

Affiliation

Wednesday 15:30 - 17:30

Wolf-dog hybridization in Europe: definition and assessment

Astrid Vik Stronen
Affiliation

Wolf-dog hybridization, and the introgression of domestic dog genes into wolf populations —when first-generation (F1) hybrids reproduce or backcross with wolves—is considered an increasing threat to the conservation of wolves and their ecological role. Although the risk of hybridization and backcrossing is recognized in European legal instruments, we still lack a clear and science-based definition of “wolf-dog hybrid” (WDH). Posited that only genetic evidence of hybridization can be currently considered objective and reliable, ambiguities include how many generations of backcrosses a practical definition centered on conservation (as opposed to evolutionary research) should consider, and how to standardize WDH genetic/genomic testing. At present, these constraints are limiting urgently needed efforts to address and mitigate WDH in Europe and beyond.
Within the Biodiversa+ Wolfness project* (a consortium of scientists from various organizations in seven countries) preliminary actions have involved developing (i) a transparent and science-based definition of WDH for conservation management, (ii) feasible and cost-effective solutions for European-wide standardization of genetic tools and laboratory protocols, and (iii) shared recommendations for assessing WDH at the population level.
The objectives of our workshop are to share the work done in points i-iii above with a wider audience and gain from their input. After a short introduction outlining some of the challenges around WDH, we will present our WDH definition and the technical details for WDH detection and assessment at the population level. Finally, we will provide an opportunity for a guided discussion to obtain feedback from the audience. Wolf-dog hybridization is a complex, multifaceted topic, and we recognize that additional topics are relevant for a thorough discussion of WDH management. Yet, we argue that to meaningfully and productively address the whole complexity of managing WDH it is necessary to first reach solid agreements on the basic ideas presented in the workshop.
*https://www.biodiversa.eu/2023/04/19/wolfness/

Workshops

Wednesday 15:30 - 17:30

Outside (off-site)

Limited places available

Construction, electrification & grounding of permanent wolf-deterrent wire fencing for sheep, cattle and horses

Peter Schütte

Affiliation

Effective protection measures to protect grazing livestock from wolf attacks are the central key to the possible coexistence of livestock husbandry and wolves and to the acceptance of wolf presence. However, erecting wolf-deterrent fencing can be fraught with some pitfalls. Whether on agricultural land, nature reserves or dykes, reservations from decision-makers and land users often have to be overcome. In order to ensure effective protection, aspects such as preparation of the fence line, professionally correct installation of suitable materials and future maintenance must be planned and implemented. The permanent electric fence stands out from the multitude of technologies. Due to the one-time installation and the comparatively easy operation coupled with a very good protective effect, this type of fence is an important instrument for reliable protection against wolf attacks. This type of fence can also be erected in difficult terrain (nature reserves, dikes, slopes).

This practical workshop will show how to set up such a permanent electric fence. Every step from ramming the wooden posts to attaching the insulators and pulling the wire will be demonstrated. Correct electrification and grounding will be described and shown in detail. Approximately 20 meters of fence will be built. Aspects such as protective effects, animal welfare for sheep, cattle and horses as well as impact on wildlife movements will be discussed. The participants can lend a hand themselves and will be trained in the various working steps. All materials and tools can be tried out.

Workshops

Wednesday 15:30 - 17:30

EU and regional large carnivore platforms: what we've learned so far and future application

Katrina Marsden & Valeria Salvatori

Affiliation

Organised by the EU Platform on Coexistence between People and Large Carnivores, with the participation of platform members and the European Commission, this workshop explores the EU's initiatives to promote coexistence between people and large carnivores. Firstly, the role of regional platforms as forums for stakeholder engagement, conflict resolution, and the exchange of best practices is explored. These platforms, supported by the European Commission have been established in a range of EU countries.

The second half addresses EU funding for livestock protection measures, highlighting practical examples and comparative analyses across member states. The EU's financial support facilitates the implementation of protective measures such as electric fencing, livestock guarding dogs, and shepherding. The relevance of these measures in different situations will be explored.

In both sections, participants will discuss the relevance of the above measures for the Netherlands and compare with neighbouring countries. The workshop will aim to draw conclusions on practical ways forward for promoting participatory exchange and livestock protection in the Netherlands.

Workshops

Wednesday 15:30 - 17:30

How to vlog while doing research

Erik den Boer

Affiliation

Workshops

Thursday 15:30 - 17:30

Turning Sound into Discovery - Using Sound to Study Wolves

Paul Howden-Leach

Wildlife Acoustics

This workshop will explore how bioacoustics can be used as a non-invasive survey and research tool to identify wolf vocalization , the workshop will will cover equipment, deployment methods, recommended recording schedules as well as data analysis techniques. The workshop will focus on using a combination of both free and paid software (Kaleidoscope Pro from Wildlife Acoustics) to extract vocalizations from hours of audio recordings. Kaleidoscope Pro includes a cluster analysis feature that extracts audible signals of interest from larger files, and is also the first step towards building simple and advanced classifiers. Attendees will get a chance to look and handle different pieces of recording equipment and look at different deployment methods. In addition temporary Kaleidoscope Pro license will be provided to attendees, along with example recordings to “play along” with the software element of the workshop. “

Workshops

Thursday 15:30 - 17:30

The use of UAV (Unmanned Aeral Vehicle) and handheld thermal cameras in research

Theodoros Kominos

Affiliation

Thursday 15:30 - 17:30

Outside

The craft and art of trapping wolves

Josip Kusak
Affiliation

Trapping wolves with leghold traps is still used alongside modern, non-invasive methods of research and management. This ancient craft is adapted to ensure the safety and health of the trapped animal. However, anyone who resorts to this method should be aware that if they are successful, they will inflict an unpleasant experience on a sentient being. The skills of trapping and the “secrets of the trade” are normally passed on directly from one researcher/trapper to another, according to the "master -> apprentice" principle. This is also the best way to minimise the possibility of misconduct and not endanger the welfare of the animals caught.

This workshop will give an overview of the whole process, starting with the justification of the decision that it is necessary to live trap wolves. It will then describe how to prepare for wolf trapping, including equipment and pre-trapping field surveys. Leghold trap choice will be elaborated, and its functioning demonstrated. The other needed equipment will be listed, and its conditioning before trapping will be explained. The choice of equipment for wolf tranquilization will be briefly explained, but without details about the tranquilization and handling of tranquilized animal. The veterinarian, who must be present at the capture, is responsible for the veterinary protocols. An example of the field study that precedes the decision on where and when to set the traps will be shown. The setting of the trap will be demonstrated first on screen and then in reality, explaining each step of the process, followed by the activation of the trap, the setting of the bait and maintenance during the trapping campaign.

The safety procedures will be discussed and demonstrated in detail, including the choice of trap type and size, the differences in the design of various leghold traps, the choice of trap location, the way the trap is set, baited and constantly monitored. One of the most important factors affecting the safety and welfare of trapped animals is the response time. How to shorten the response time and all other safety factors will be elaborated and discussed with the workshop participants. Workshop participants will have the opportunity to open, set and trigger the leghold traps themselves - an experience that every trapper must have.

Workshops

Thursday 15:30 - 17:30

Trapping and collaring wolves under different conditions across Europe

Aldin Selimovic

Affiliation

Capture and collaring of wolves has remained one of the most important methods in wolf research throughout history. Although capturing of wolves has a very long tradition in some regions and cultures, diversity of habitats used by wolves makes this a difficult task for researchers. With a lot of hard work invested and competition thoughts many of paths to success remained hidden and unshared with other groups targeting the same species. Nowadays, researchers realized that wolf research mostly makes sense if data is shared across borders. In this workshop we aim to present capture and collaring methods that have been used in Austria since 2019 and since 2022 in the Czech Republic leading to success with different approaches. Especially, the variability in land and human use of study areas is the best example that there is no ultimate or universal method to capture wolves. In Austria we are using three different trap types and due to our study area being military restricted area we are limited in time and locations for trap sites. In the Czech Republic, trapping takes place in protected areas (national parks or landscape protected areas) where human access is usually not restricted. Tourists often accompanied by dogs pose a challenge to successful trapping and collaring of wolves, as dog owners often do not always respect the rules and their pets can interfere disrupt the trapping efforts. Additional extreme care is necessary when wolves trigger traps and during sedation time. Preparation of the trapping devices and choice of trap sites is also adapted to the study area.
Additionally, we want to discuss the choice of baits and lures and their effects on bycatch, types of trap sets used and behavior of trapping personnel on site.
Our main aim is to share the methods that have worked but more importantly the approaches that have not and to invite other colleagues who share the same interest and passion for trapping wolves to discuss these issues.

Workshops

Thursday 15:30 - 17:30

How to manage close encounters with wolves in human dominated landscapes

Valeria Salvatori

Affiliation

Wolves are increasingly reported in human dominated landscapes, being sighted nearby or in human settlements also during daylight. Although in the majority of cases their presence passes unperceived, they are also often reported to interact with humans or domestic animals in different manners, showing behaviours that range from scared to aggressive and predatory. The LIFE WILD WOLF project started in 2023 and is aimed at analysing the phenomenon of wolves living in human dominated landscapes and producing a set of guidance documents for adequate management of critical situations. Aspects investigated so far include past records of wolf behaviours while interacting with humans or dogs, a proposal of behavioural definitions, standardised data collection for all cases of interaction,spatial analysis of habitat selection through GPS collars of more than 300 wolves in anthropized areas of Europe, and preliminary results from knowledge and attitude surveys.
The workshop will include an interactive session for discussing the definition of behaviours and for brainstorming on how to communicate the potential threat posed by wolves without alarming the local population.

Workshops

Thursday 15:30 - 17:30

How to talk with press

Mathilde Klaasse, Vera Eijsink & Glenn Lelieveld

Affiliation

Outside Workshop Location

The workshops with the sun-icon will be held outside at the picnic spot. The location is shown in the picture below.

For the off-site sessions, please meet at the main entrance of Conference Center De Werelt.