



Transdisciplinary Symposium:
Bat Conservation Science & Care

BOOK OF ABSTRACTS



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TABLE OF CONTENT

INFOS

BAT X AUSTRIA	3
Programm	4

ABSTRACTS

Katharina Leibezeder & Doris Swoboda	6
Isabella Klebinger	7
Rym Nouioua & Bea Maas	8
Jozsef Meszaros	9
Sándor András Boldogh	10
Vojo Milanović	11
Francesca Festa	12
Zoltán Bagó	13
Clemens Schnaitl	14
Markus Milchram	15
Leonardo Ancillotto	16
Isabella Mandl	17
Claudia Hirtenfelder	18
Diana Karle	19

POSTER ABSTRACTS

Eva Bernhart & Oliver Gebhardt Ines Ćutuk	21
Isabella Karner & Max Nardin Isabella Klebinger	22
Nathalie Koberwein	24
Sarah Kugler & Niklas Vesley Fragkiskos Machairas & Nichole Morley	25
Judith Ullmann Elisabeth Wilkinson	26

SPECIAL THANKS

Sponsoring partners	28
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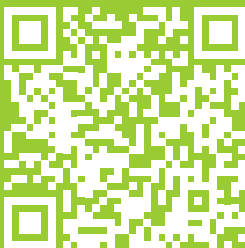
ABOUT THE SYMPOSIUM

BAT X AUSTRIA

BAT X AUSTRIA IS A ONE-DAY SYMPOSIUM IN VIENNA THAT BRINGS TOGETHER ECOLOGICAL RESEARCH, VETERINARY MEDICINE, WILDLIFE REHABILITATION, SCIENCE COMMUNICATION, AND ENVIRONMENTAL EDUCATION.

The event addresses current challenges in bat conservation from a transdisciplinary perspective. It focuses on integrative approaches that combine scientific knowledge, practical expertise, and public engagement.

In the face of accelerating biodiversity loss, climate-driven habitat shifts, and the growing risk of zoonotic diseases, dialogue between research, practice, and society is becoming increasingly vital. The symposium features scientific talks, critical discussions, applied case studies, and participatory formats that transcend disciplinary boundaries and professional domains.



SCAN THE QR-CODE FOR MORE INFOS OR
VISIT OUR WEBSITE: [FLEDERMAUSSTATION.AT/EN/BATXAUSTRIA](https://fledermausstation.at/en/batxaustria)

BAT X AUSTRIA is a joint initiative of:
Fledermaus Station Österreich | Verein der Freunde des Haus des Meeres |
Öko Campus Wien | Universität Wien, Projekt SOUNDS WILD (Department für
Botanik und Biodiversitätsforschung)

The following book of abstracts translates
„Fledermaus Station Österreich“ as „Austrian Bat Station“.

PROGRAMM

SESSION 1:

9:30 • Opening and Welcoming

9:45 • Fledermaus Station Österreich: Between Wings and Wounds
Katharina Leibežeder (Austria) (10 min talk + 5 min)

10:00 • Applied bat conservation: Habitecture for bats and swifts on the Campus of the University of Vienna (Altes AKH)
Isabella Klebinger (Austria) (10 min talk + 5 min)

10:15 • Linking Biodiversity Conservation, Ecosystem Services & Science Communication in Agriculture—First Results from ECO-OLIVES & SOUNDS WILD
MSc Rym Nouioua & Dr. Bea Maas (Austria & Italy) (20 min talk + 5 min)

10:45–11:15 Coffee Break

SESSION 2:

11:15 • The rescue activities of the Bakony Bat Conservation Foundation
Jozsef Meszaros, Kornel Imre (Hungary) (10 + 5 min)

11:30 • Teamwork Makes the Dream Work: Case Studies of Bat Protection from Hungary
Dr. Sándor András Boldogh (Hungary) (10 + 5 min)

11:45 • Bats as Nature's Warning System: Blood Changes from Heavy Metal Pollution
BSc Vojo Milanović (Bosnia & Herzegovina) (10 + 5 min)

12:00 • Same old reservoirs, brand new risks: urban bat populations & emerging viral threats
MSc Francesca Festa (Italy) (10 + 5 min)

12:15 • Bat lyssavirus surveillance in Austria
Dr.med.vet. Zoltán Bagó (Austria) (10 + 5 min)

12:30–14:00 Lunch Break



SESSION 3:

14:00 • Is the end of the night upon us?
Dipl. Ing. Clemens Schnaitl (Austria) (10 + 5 min)

14:15 • KFFÖ: 22 years of advancing bat conservation and research in Austria
Dr. Markus Milchram (Austria) (10 + 5 min)

14:30 • Urban bats: from individual responses to population dynamics and conservation challenges
Dr. Leonardo Ancillotto (Italy) (10 + 5 min)

14:45 • Protecting threatened bats around the globe - bat conservation International's approach
Dr. Isabella Mandl (Austria) (10 + 5 min)

15:00 • Urban Infrastructures and Multispecies Relations: The Vienna Bat Station
Dr. Claudia Hirtenfelder (Austria) (10 + 5 min)

15:15 • Bats and Art: Planet Ultra - A Performative Audiowalk about Bats
MFA. Diana Karle (Germany) (10 + 5 min)

15:30–16:15 Coffee Break & Poster Session

16:15–16:45 • Panel Discussion
Converging Care and Science - Conflicts and Synergies
Moderation: Dr. Konstantin Deininger

16:45–17:00 • Farewell and further information (evening program)

17:00–17:30 Free Break

CHOOSE YOUR EXCURSION

17:30 • Parallel Excursions (all approx. 1 hour)*

- 1) Bat Walk with Acoustic Detectors (Isa Klee & Tom) – Campus Uni Wien
- 2) Practical Bat Care Session (Katharina Leibežeder) – Fledermaus Station Österreich
- 3) BIO BOX Workshop (Anna Hollerer & Marta Polizzi) – Main Event Room Haus des Meeres

*For detailed excursion information see Website

20:00 • Open End–Pub Gathering (Down Under | Windmühlgasse 32, 1060 Vienna)

20:30 Quiz time!!



ABSTRACTS

FLEDERMAUS STATION ÖSTERREICH: Between Wings and Wounds

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**We thank the entire team of the Fledermaus Station Österreich - including volunteers, carers, and supporting experts for their invaluable work in bat rehabilitation and data documentation.*

Bats need protection - not just in legal texts, but in everyday practice. In response to growing ecological pressures and a clear gap in structured bat rehabilitation, Fledermaus Station Österreich was founded in February 2024 as a national hub for bat rescue, care coordination, and cross-sectoral collaboration.

Since then, the station has supported 1328 rescue cases and coordinated many new trained bat carers across multiple federal states. It has become a central point of contact, for the public, for authorities, and for professionals working at the intersection of conservation, science and education.

But the Fledermaus Station Austria is more than an emergency service. It actively contributes to knowledge exchange, develops national care standards, and strengthens recognition for bat related work through workshops, training, and collaborative events. At its core is a vision of a well connected, scientifically informed care system that is accessible, reliable, and grounded in respect for these ecologically vital animals.

By linking field and care expertise with public engagement and institutional dialogue, the station seeks to embed bat protection into broader biodiversity strategies. It is a place of learning, coordination, and shared responsibility, built to ensure that bats are not only rescued, but respected.

We are a contact point for anyone who finds injured or orphaned bats. You can always reach us via our emergency hotline - even though it's hard to believe, we do everything on a voluntary basis!

APPLIED BAT CONSERVATION: Habitecture for bats and swifts on the Campus of the University of Vienna (Altes AKH)

Presenting Author: Isabella Klebinger

ISABELLA KLEBINGER¹

¹ Öko Campus Wien (oekocampuswien.com)

Bats are among the strictly protected species in urban areas in Vienna, as are swifts. Due to building renovations and urban development, these animals are losing their habitat day by day. The project "Urban Biodiversity at Narrenturm" is creating new habitats by providing replacement roosts on buildings for bats and swifts on the University of Vienna/Altes AKH campus. The aim of the project is to improve habitats, research and monitoring and providing bat boxes on buildings in collaboration with various stakeholders on campus, taking into account the preservation of historical monuments.

As a place of learning and nature experience in the middle of the city, the campus brings together a wide range of efforts and measures to protect species and promote urban biodiversity; The Öko Campus Wien association, headed by Isabella Klebinger, pursues a holistic nature conservation strategy on the campus and has been implementing ecological measures such as mowing and maintenance adjustments (scything), renaturation and the reintroduction of protected species since 2021.

Cooperation partners such as the Natural History Museum Vienna/PASiN Collection, the Medical University of Vienna and the University of Vienna will in future provide potential habitats for bats and swifts in listed existing buildings. To ensure the success of the project, there is accompanying monitoring and a variety of events (BatNight) and educational modules (Bat Walks) in cooperation with the Öko Campus Wien association, which make bats more visible and audible.

The project is financed by the Biodiversity Fund of the Federal Ministry of Agriculture, Forestry, Climate and Environmental Protection, Regions and Water Management. Isabella Klebinger is leading the project and implementing it together with Öko Campus Wien.

Note: As part of the evening programme, there will be an opportunity to visit the project sites. (Bat Walk)

LINKING BIODIVERSITY CONSERVATION, ECOSYSTEM SERVICES & SCIENCE COMMUNICATION IN AGRICULTURE

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Global degradation of biodiversity and ecological functions is driven by land-use intensification and climate change. Agroforestry systems, such as traditional Mediterranean olive groves, can buffer these effects - particularly when managed to support key species and ecological functions. Bats are a key species as they are mobile insectivores and providers of natural pest control.

In the ECO-OLIVES project, we studied 12 organically managed olive groves in Tuscany over three years (2022–2024), combining acoustic monitoring, arthropod sampling, yield measurements, predator exclusions and seasonal pruning trials. Biodiversity was shaped by local vegetation and surrounding semi-natural habitat (SNH): bird and bat activity was higher in structurally complex, low-SNH groves, while high-SNH sites supported more insectivorous specialists and arthropod richness. Bird and bat exclusions increased pest infestation and reduced yields.

Acoustic data also revealed sustained winter activity across multiple bat species, challenging assumptions of winter hibernation and highlighting behavioural responses to warming climates. These findings call for a re-evaluation of conservation timing and monitoring strategies in agricultural landscapes and beyond.

Complementing this, the SOUNDS WILD project showed that biodiversity perceptions among 657 Austrian school children, especially regarding bats and birds, improved significantly through emotionally engaging and practical learning formats. The strongest gains occurred in younger, initially less-informed groups.

Together, these findings support conservation approaches that integrate ecological function, seasonal adaptation and social engagement. Bats and birds provide a powerful lens to connect biodiversity science, ecosystem services and inclusive communication.

THE RESCUE ACTIVITIES OF THE BAKONY BAT CONSERVATION FOUNDATION

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¹Bakony Bat Conservation Foundation, Hungary

Our foundation has been involved in bat conservation for many years. This is a multifaceted task for us, and we are contacted about bat-related issues throughout the year. We provide the most assistance during the breeding season, but winter is also a busy time due to weakened animals emerging from hibernation. We collaborate closely with several other organisations. We often share our experiences and proven practices to ensure that bats receive the best possible care and are released in the most suitable locations.

As well as taking in and treating physically weakened or orphaned animals, we place great emphasis on surveying and studying their habitats. We believe that environmental education also plays a vital role in saving bats. It is important for people to learn about bats and understand that they are useful creatures that should not be feared.

TEAMWORK MAKES THE DREAM WORK: Case Studies of Bat Protection from Hungary

Presenting Author: Sándor András Boldogh
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SÁNDOR ANDRÁS BOLDOGH^{1,2}

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²BirdLife Hungary, Mammal Conservation Group, Hungary

Over the past few decades, research on bat fauna and conservation biology aimed at supporting protection efforts has also intensified in Hungary. Based on recent findings, significant bat populations still inhabit the country, with several colonies being of outstanding importance even in an international context. However, the preservation of these populations requires immediate and effective measures. This necessity calls for interdisciplinary collaboration and the exchange of knowledge both within Hungary and across its borders.

To facilitate networking and knowledge sharing, our presentation offers a concise overview of the organizational framework of bat conservation in Hungary (including governmental and non-governmental organizations), the main monitoring programs, and population trends of selected key species. We also present concrete examples of practical conservation interventions where effective cooperation was established with initially opposing stakeholders to promote bat protection. We believe that some of these initiatives represent innovative approaches that could serve as exemplary models elsewhere.

Given the Carpathian Basin's particular vulnerability to the impacts of climate change, we highlight practical examples of conservation actions targeting bat colonies roosting in buildings susceptible to overheating.

BATS AS NATURE'S WARNING SYSTEM: Blood Changes from Heavy Metal Pollution

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Heavy metals are persistent environmental pollutants that can silently affect wildlife health. Bats, with their long lifespan, high position in the food chain, can serve as natural "warning systems" for ecosystem quality. In 2024, we examined the impact of selected heavy metals (Pb, Cr, Cd, Cu, Mn, Fe, Co, Zn) on *Miniopterus schreibersii* from two contrasting sites in Bosnia and Herzegovina: a polluted quarry near Zvornik and a reference cave on Ozren Mountain. We collected guano, soil, and water samples, as well as blood from live-captured bats. Metal levels were measured using flame atomic absorption spectrometry (FAAS), and water quality parameters were recorded on-site.

Guano from the polluted site contained higher levels of almost all metals (except Mn), following the pattern Fe > Zn > Cu > Mn > Pb > Ni > Co > Cr. Soil and water from the same area showed a similar contamination profile, with Fe and Mn dominating water samples. While body mass was statistically significant lower and leukocyte counts remained similar between the two groups, blood smear analysis revealed clear signs of cellular stress. These included changes in both red blood and white blood cells, commonly linked to heavy metal exposure. Importantly, our findings confirm that bats at the polluted site exhibit early toxic effects before visible population-level impacts occur.

This study suggests that guano is a valuable non-invasive tool for environmental monitoring, and that bats may indicate pollution impacts in their early stages, offering crucial time for conservation action.

SAME OLD RESERVOIRS, BRAND NEW RISKS: urban bat populations and emerging viral threats

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Bats are recognized as natural reservoirs for potential emerging pathogens, including „pathogen x“ and „pathogen y,“ which may cause future infectious diseases in humans and domestic animals. A spillover event is the transmission from a natural reservoir to a host, and is a stochastic process influenced by several factors. Usually, there are key barriers preventing spillover events that includes the presence of the reservoir, the infection, environmental persistence, interspecies contact, and host susceptibility.

In the Anthropocene, due to climate and land-use change, bats are reshaping their distribution and interaction with humans and animals, creating potential spillover interfaces. For example, habitat fragmentation in Latin America has intensified rabies virus transmission among vampire bats (*Desmodus rotundus*), with increased predation on livestock. Similarly, the 1998 Nipah virus outbreak in Southeast Asia was linked to ecological disruptions and proximity between fruit bats, pig farms and humans. While spillover risks are often associated with tropical regions, recent findings show they are also relevant in Europe.

From 2020, public health authorities in Italy have studied urban populations of *Miniopterus schreibersii*, a cave-dwelling bat species, and their association with lyssaviruses, coronaviruses, and filoviruses. A 2020 rabies case in a domestic cat in Arezzo (Italy) linked to West Caucasian Bat Lyssavirus highlighted unexpected urban spillover dynamics. Although ecological modelling suggest low urban suitability for this species, field data reveal otherwise, indicating the need for refined models and expanded surveillance to better understand the zoonotic potential of urban bats and mitigate future health risks through integrated One Health approaches.

Bat lyssavirus surveillance in Austria

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ZOLTÁN BAGÓ¹

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Bat lyssavirus-monitoring in Austria has been carried out continuously since 2006. Because all European bats are classed as protected species, only passive monitoring can be carried out. Between 2006 and August 2025, around 2000 bats have been analysed at the Austrian Rabies Reference Laboratory (NRL).

The first (and so far only) positive case detected in autumn 2023. It was an adult male serotine bat (*Eptesicus serotinus*), which was found in the summer, weakened and lying on the ground next to a horse stable in Lower Austria. The animal was taken to a rescue centre, where trauma was suspected as the animal showed signs of paralysis in the hind limb area. The animal died a few days later and was sent frozen to the NRL in Mödling. Fluorescence antibody test (FAT) of the brain revealed clear positive results. Subsequent analyses (pan-lyssavirus-RT-qPCR, EBLV-1-RT-qPCR, classical PCR and whole genome sequencing, and virus isolation in cell culture) confirmed the first case of European Bat Lyssavirus-1 (EBLV-1) in Austria. EBLV-1 is the most common bat lyssavirus in Europe and serotine bats are the mostly involved species. All of the European lyssavirus species are zoonotically relevant, but fortunately, spill over infections are rare events.

The more animals that are examined as part of passive surveillance, the higher the chance of detecting further cases. Therefore, a wide area surveillance is necessary and communication with the responsible rescue centres, the competent authorities and also with the public should be intensified.

IS THE END OF THE NIGHT UPON US?

Presenting Author: Dipl. Ing. Clemens Schnaitl

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The end of the night is near. The starry sky with its thousands upon thousands of stars is sinking into a man-made sea of lights from street lamps, building illuminations, and neon signs. This phenomenon is known as light pollution. In doing so, we are disrupting a rhythm that is millions of years old, dividing day (light) and night (dark). Countless organisms are affected by this, including us humans ourselves. Some organisms are active by day and rest during the night, some organisms are active by night and rest during the day.

More than 60% of all living creatures are nocturnal. Their nocturnal activities (pollination, reproduction, foraging) are disrupted. They are blinded, displaced, distracted, and irritated by the abundance of light. This leads to behavioral changes, shifts in predator-prey relationships, and the decimation of habitats and/or populations. For countless insects, light even becomes a deadly trap. Diurnal creatures, including us humans, are disturbed during their nighttime rest. This leads to sleep disorders and sleep deprivation. Chronic sleep deprivation, in turn, leads to exhaustion and even illness.

So... what can we do? How can we strike a balance between the benefits of artificial light at night for our modern civilization and the preservation of naturally dark nights for the benefit of nature and us humans?

Clemens Schnaitl, speaker of "Paten der Nacht – Österreich" is talking about challenges associated with light pollution, its impacts at different levels and presents actions to preserve naturally dark and starry nights.

KFFÖ:

22 years of advancing bat conservation and research in Austria

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For over twenty years, the Coordination Centre for Bat Conservation and Research in Austria (KFFÖ) has been a leader in bat conservation and research within the country. Founded in 2003, the KFFÖ has played a crucial role in protecting Austria's bats through scientific research, public engagement, and policy advocacy. This presentation will provide an overview of our achievements over the past 22 years, including key activities such as monitoring, roost protection, and education, as well as innovative research projects. We will also consider the challenges bat populations face in Austria, including habitat loss and human-wildlife conflict, and discuss how the KFFÖ has addressed these issues. By reflecting on past efforts, this talk will emphasise the importance of ongoing conservation work and the crucial role organisations like the KFFÖ play in protecting bats.

URBAN BATS: from individual responses to population dynamics and conservation challenges

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Urbanization is among the fastest-growing drivers of biodiversity change worldwide, reshaping landscapes and altering ecological processes. Bats, as mobile, long-lived mammals with diverse ecological requirements, offer a powerful lens through which to examine these changes. This presentation explores how bats respond to urban environments across biological scales, from individual behavior to population-level outcomes. At the behavioral level, urban bats exhibit species and guild-specific patterns in how they respond to urbanization and its pressures. For instance, some edge-space foragers increase activity near lit areas, while clutter-adapted species avoid them altogether. At the population scale, urban areas can act as ecological traps, refuges, or even dead-ends to bat populations, mainly depending on landscape configuration and species traits. In long-term studies, patterns of local colonization and extinction reveal how urban green spaces can sustain bat diversity—provided connectivity and structural complexity are preserved. These trends underscore the importance of conservation strategies that integrate urban planning with bat-friendly policies, such as preserving mature trees, reducing light pollution, and enhancing roost availability. Moreover, the human dimensions of bats in cities adds a key factor in the multi-faceted challenge of conserving urban bats. Urban areas may not only be considered as threats to bats and biodiversity, but as novel ecosystems with untapped potential for biological conservation. Understanding the multiscale responses of bats to urbanization is thus essential for designing cities where wildlife and people can peacefully coexist.

PROTECTING THREATENED BATS AROUND THE GLOBE – Bat Conservation International's approach

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Bat Conservation International's mission is to conserve the world's bats and their ecosystems to ensure a healthy planet. We are dedicated to preventing extinctions based and focused on scalable results. Our approaches are as varied as the contexts in which bats are threatened globally: from preventing destruction of urban bat habitat in the US, to understanding the resource needs of flying foxes on islands and developing community-led conservation sites in Kenya, we adapt to local needs. Conservation actions are based on participatory, community-led decisions making processes and rooted in global expertise for maximum impact.

URBAN INFRASTRUCTURES AND MULTISPECIES RELATIONS: The Vienna Bat Station

Presenting Author: PhD Claudia Hirtenfelder
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The planet is increasingly urbanized, and more animals are finding themselves drawn to or stuck in cities. To move away from urban, multispecies relations that are overwhelmingly violent and harmful will require a range of physical, political, and social interventions. This includes, for example, securing space for animals to live and laws that protect their rights to the city. From an interdisciplinary social sciences and humanities perspective, we explore how actions undertaken by The Austrian Bat Station could be understood as creating the infrastructures necessary to develop more just, multispecies cities. This includes establishing physical infrastructure for bats (like the station itself but also bat boxes set up around the city), working with policy makers, and crafting more inclusive social imaginaries (that reject the framing of bats as dangerous or pests). While some bats are among the species who do well in cities, many other animals are struggling due to the negative anthropogenic effects of urbanization. It is thus necessary to put in place infrastructures that move away from potentially devastating futures for animals towards ones that are more productive and hopeful. We think focusing on organizations like The Austrian Bat Station might provide a map for unpacking what such infrastructures might be.

PLANET ULTRA - a performative audiowalk about bats

Presenting Author: MFA Diana Karle
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DIANA KARLE^{1,2}

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² Freelance Sound Artist (diana-karle.org)

**I thank everyone involved in the project – including performers, speakers, technicians and research team.*

The project “Planet Ultra” is a walk-in radio play that explores the potential of art to communicate ecological issues and challenge anthropocentric worldviews. The play was performed in Weimar, Thuringia, Germany, in September 2024. Participants were invited on a speculative journey to encounter the hidden lives of bats, animals whose acoustic worlds remain largely inaccessible to human perception.

Almost all bat species native to Thuringia are endangered and strictly protected; some face imminent extinction. Against this backdrop, Planet Ultra becomes both a sonic exploration and an artistic call to reconsider our relationship with more-than-human life. The piece combines artistic storytelling, site-specific sound, and elements of everyday science fiction to create new forms of ecological sensitivity. It asks: how can listening — particularly to that which we cannot usually hear — reveal overlooked forms of coexistence?

The artist Diana Karle spent over a year researching the situation of bats in Thuringia and worked closely with various bat experts during her research: Rym Nouioua M.Sc. from the University of Vienna, Gaetano Fichera from Stiftung FLEDERMAUS and Stephan Schauer from NABU Weimar/ Apolda e.V.

By merging artistic and scientific approaches, the project foregrounds the urgency of biodiversity preservation while opening up a sensorial space where empathy and attunement become tools for environmental awareness. The work contributes to a broader conversation on how art can function as ecological mediator and proposes an embodied, affective way of engaging with the nonhuman.

NOTES:

POSTER ABSTRACTS

STYRIAN BAT RESCUE PROJECT – Bat Care Meets Bat Science

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The Styrian Bat Rescue Project has existed for five years now and pursues the following goals: to help bats in need by providing them with professional assistance and care. It also offers competent advice to persons undergoing problems with bat colonies in their buildings due to building renovations or pollution. Moreover, the collected reports from throughout Styria generate valuable data on the distribution and habits of individual species and also help to identify potential roost threats. Through these advisory activities and frequent media contributions, the project contributes to raising awareness about bats. The project is a successful collaboration between the „Coordination Center for Bat Conservation in Austria“ (KFFÖ), the „Austrian Bat Station,“ and the „Small Wild Animals in Great Need“ association, and is mostly funded by the Styrian State Government, Department of Nature Conservation. Here we present three representative examples of interventions from 2025.

THE IMPACT OF ABIOTIC FACTORS ON THE DISTRIBUTION OF BATS IN THE SREDNJA BIJAMBARSKA CAVE, BOSNIA AND HERZEGOVINA

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The research analyses the influence of temperature and humidity on bat hibernation and distribution in the Srednja Bijambarska Cave, situated within the Bijambare Protected Landscape, Bosnia and Herzegovina. The aim of the research is to determine how variations in abiotic factors affect the population size, distribution, and diversity of bat species during the winter period. The research was based on field monitoring conducted from December 2024 to April 2025, using methods such as visual surveys, marking of each individual bat on a cave map, and measuring temperature and humidity at standardized points. Additionally, data from previous studies conducted between 2013 and 2024 were included, aiming to provide insight into potential long term changes in species composition at this location. A total of 11 species were recorded: *Myotis myotis*/M. *blythii*, *Barbastella barbastellus*, *Plecotus* sp., *Rhinolophus hipposideros*, *Rhinolophus ferrumequinum*, *Myotis daubentonii*, *Myotis emarginatus*, *Myotis dasycneme*, *Myotis mystacinus/brandtii*, *Myotis* sp., and *Eptesicus serotinus*. Statistically significant correlations between temperature and bat abundance were found for *Myotis myotis*/M. *blythii* and *Rhinolophus hipposideros*, while *Myotis myotis*/M. *blythii* also showed a statistically significant correlation between humidity and abundance. The obtained results may serve as a basis for future conservation measures and management of cave habitats for bats.

LISTENING TO THE RAINFOREST: Bats, Sound, and Conservation in the Tropical Biodiversity of Costa Rica

CORRESPONDING AUTHORS: ISABELLA KARNER¹ & MAX NARDIN¹

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This thesis proposal outlines a planned study on the acoustic ecology of bats in the Golfo Dulce region of Costa Rica, adjacent to the lowland rainforest of Piedras Blancas National Park, a biodiversity hotspot facing increasing pressures from habitat fragmentation and agricultural expansion. The project aims to investigate bat species composition, activity patterns, and habitat preferences across contrasting environments - primary forest and agricultural landscapes - at the Tropical Field Station La Gamba. Data collection will combine passive acoustic monitoring (using AudioMoth and Song Meter devices) with traditional mist netting across 24 sampling sites. Species identification will be conducted through echolocation call analysis using Kaleidoscope Pro, supported by manual verification and GIS-based habitat mapping. The research is structured around four core hypotheses relating to foraging strategy, vegetation loss, survey methods, and activity patterns in modified landscapes.

A key outcome of this thesis will be the development of a reference sound catalogue and a replicable monitoring protocol for long-term biodiversity assessments. By comparing habitats through both ecological and agro-technical lenses, the project seeks to contribute valuable insights for conservation strategies and ecosystem health monitoring in tropical regions.

DE: URBANER BIODIVERSITÄTS- UND FLEDERMAUSSCHUTZ: Öko Campus Wien EN: URBAN BIODIVERSITY AND BAT CONSERVATION: Eco Campus Vienna

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DE: Öko Campus Wien bündelt als Verein seit 2021 viele naturschutzfachliche Maßnahmen und Projekte in Wien, mit Schwerpunkt an Campus Standorten der Universität Wien (Altes AKH/Spitalgasse, 1090 und UBB Djerassiplatz, 1030). Dieser ist als Lern- und Lebensraum eine Art Living Lab für Artenschutz und breite Öffentlichkeitsarbeit sowie Naturvermittlung im Kontext urbaner Biodiversität. Grün- und Freiflächen werden vom Verein Öko Campus Wien naturschutzfachlich gepflegt, renaturiert und derart (um)gestaltet, dass gesamte ökologische Zusammenhänge lokal gestärkt werden. Zudem wurden Kästen für Fledermäuse und Mauersegler an Gebäuden angebracht, ua. In den Projekten Urbane Biodiversität am Narrenturm und Aufblühen – Biodiverser Campus Uni Wien. Fledermaus- und Insektenmonitorings begleiten die zeitgemäßen Artenschutzmaßnahmen in Wien. Eine breit angelegte Mahdanpassung in Kooperation mit der Uni Wien ist ein Teil des Ansatzes und dabei kommen auch postfossile Sennen zu. Im Rahmen von Citizen Science sind Besucher:innen des Campus eingeladen, selbst zur lokalen Artenvielfalt zu forschen und mit Beobachtungen zur Forschung am Campus beizutragen.

Durch die Arbeit am Campus wird Biodiversität für eine breite Öffentlichkeit zugänglicher und zum Thema gemacht, egal ob in der Verwaltung selbst oder bei Campusbesucher:innen, zudem werden unterschiedliche Lernansätze getestet und umgesetzt, etwa auch im EU-Projekt Co-Creating Biodiversity in Urban Areas. Zeitgenössische Naturschutzarbeit wird so Studierenden und Interessierten näher gebracht und Naturvermittlung und der Campus zu einem vielschichtigen Lernraum und Testfeld für den Schutz urbaner Biodiversität.

EN: Since 2021, the Öko Campus Wien association has been coordinating numerous nature conservation measures and projects in Vienna, with a focus on the University of Vienna's campuses (Altes AKH/Spitalgasse, 1090 and UBB Djerassiplatz, 1030). As a learning and living space, it serves as a kind of living lab for species protection and broad public relations work, as well as nature education in the context of urban biodiversity.

Green and open spaces are maintained, renaturalised and (re)designed by the Öko Campus Wien association in accordance with nature conservation principles in such a way that overall ecological relationships are strengthened locally. In addition, boxes for bats and swifts have been installed on buildings, including in the projects Urban Biodiversity at the Narrenturm and Blossoming - Biodiverse Campus University of Vienna. Bat and insect monitoring accompanies the contemporary species protection measures in Vienna. A broad-based adaptation of mowing practices in cooperation with the University of Vienna is part of the approach, and post-fossil scythes are also being used. As part of Citizen Science, visitors to the campus are invited to conduct their own research into local biodiversity and contribute to research on the campus with their observations.

The work on campus makes biodiversity more accessible to the general public and raises awareness of the issue, both among the administration itself and among campus visitors. In addition, different learning approaches are being tested and implemented, for example in the EU project Co-Creating Biodiversity in Urban Areas. This brings contemporary nature conservation work closer to students and interested parties, and turns nature education and the campus into a multi-layered learning space and testing ground for the protection of urban biodiversity.

DE: MULTISPECIES URBANISMUS UND HABITECTURE als Antwort auf den Verlust von (urbaner) Biodiversität EN: MULTISPECIES URBANISM AND HABITECTURE as response to the loss of (urban) biodiversity

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DE: Das globale Artensterben schreitet voran und erfordert neuartige Lösungsansätze und Zugänge in der gesamten Gesellschaft. Das Auflösen von Disziplin Grenzen und gemeinsame Erarbeiten von Lösungen und neue Ansätze können dabei eine wichtige Rolle spielen, ebenso wie allgemeines Biodiversitätsmainstreaming als wichtiger Baustein für ein breiteres Verständnis über die Bedeutung von Artenvielfalt und Biodiversität und deren Schutz auf allen gesellschaftlichen Ebenen. Durch den Megatrend der Verstädterung kommt dabei einem auf den Erhalt und die Wiederherstellung von Biodiversität ausgerichteten Urbanismus und Habitat-Architektur eine besondere Bedeutung zu.

Multispecies Urbanism als Gestaltungs- und Denk-Disziplin, die im (urbanen) Raum ökologische Erfordernisse und biodiverse Raumansprüche mitdenkt, kann in Städten für die Artenvielfalt einen großen Unterschied machen. Straßenräume werden nicht mehr nur als Korridore für Autos und Fußgänger:innen geplant und gedacht, sondern auch als Mobilitäts- und Lebensräume für Tiere, Pflanzen und Pilze. Im Besonderen kann auch Habitecture als Architektur, die sich an Habitatfunktion für nichtmenschliche Arten orientiert, als Baustein für eine Stadt der vielen Arten dienen und Lebensräume an Gebäuden schaffen- dies kommt insbesondere auch Fledermäusen zugute.

Als Beispiele für Multispecies Urbanism dienen hier Projekte wie: Co-Creating Biodiversity in Urban Areas, Öko Campus Wien und auch künstlerische Projekte wie die Wiese am Oskar-Kokoschka-Platz wo unterschiedliche disziplinäre Zugänge den Lebensraum Stadt herausarbeiten und Biodiversität im urbanen Kontext zum Thema machen. Hier ist nicht nur die Stadt-Mensch-Beziehung umfasst, sondern andere, lokale Arten und ihre städtischen Lebensrealitäten werden bewusst einbezogen und Stadt in den Beispielen für andere Arten (mit-)gestaltet und darüber hinaus auch Naturschutz als integrativer Bestandteil der Raumgestaltung mit enthalten. Stadtentwicklung an sich steht vor großen Herausforderungen aufgrund des Zuzuges und dem Anspruch der Leistbarkeit von Wohnraum - auf der anderen Seite drängt sich die Frage nach inklusiverer Stadtgestaltung auf, und der

Frage, wie das Leben in der Stadt nicht nur lebenswerter und leistbar, sondern auch naturverbundener und biodiverser werden kann. Stadtgestaltung braucht uns alle!

EN: Global species extinction is advancing and requires innovative solutions and approaches across society. Breaking down disciplinary boundaries and working together to develop solutions and new approaches can play an important role in this, as can general biodiversity mainstreaming as an important building block for a broader understanding of the importance of species diversity and biodiversity and their protection at all levels of society. Due to the megatrend of urbanisation, urbanism and habitat architecture focused on the preservation and restoration of biodiversity are becoming particularly important.

Multispecies urbanism as a design and thinking discipline that takes ecological requirements and biodiversity needs into account in (urban) spaces can make a big difference to species diversity in cities. Street spaces are no longer planned and conceived solely as corridors for cars and pedestrians, but also as mobility and living spaces for animals, plants and fungi. In particular, habitecture, as architecture oriented towards habitat function for non-human species, can serve as a building block for a city of many species and create habitats on buildings – this is particularly beneficial for bats.

Examples of multispecies urbanism include projects such as Co-Creating Biodiversity in Urban Areas, Öko Campus Wien, and artistic projects such as the meadow at Oskar-Kokoschka-Platz show different disciplinary approaches highlight the urban habitat and address biodiversity in an urban context. This not only encompasses the relationship between the city and its inhabitants, but also consciously includes other local species and their urban realities. In these examples, the city is (co-) designed for other species and, beyond that, nature conservation is also included as an integral part of spatial urban design.

Urban development itself faces major challenges due to migration and the demand for affordable housing - on the other hand, the question of more inclusive urban design arises, as well as the question of how life in the city can become not only more liveable and affordable, but also more connected to nature and more biodiverse. Urban design needs us all!

THE ROLE OF BAT STATIONS IN CONSERVATION: First Results from the Austrian Bat Station

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Austria hosts 29-31 bat species, with the variation reflecting ongoing taxonomic revisions, uncertainties in the distribution of cryptic species, and recent range shifts linked to climate change and migration. Many of these species are affected by urbanisation, building renovation, traffic, and predation. To address the lack of a coordinated rehabilitation system, the Austrian Bat Station was established in February 2024 as a national hub for bat rescue, care coordination, and cross-sectoral collaboration. Since its foundation, the station has processed 1,354 rescue cases across five federal states (Lower Austria, Upper Austria, Styria, Burgenland, and Vienna) and has integrated a growing network of newly trained bat carers and volunteers. The most frequently admitted species are the Kuhl's pipistrelle (*Pipistrellus kuhlii*), the common pipistrelle (*Pipistrellus pipistrellus*), and the Savi's pipistrelle (*Hypsugo savii*), together accounting for 46% of all cases. Admissions peak in summer, coinciding with juvenile dispersal and seasonal stressors. Main admission causes include weakness due to lack of nutrients and dehydration (~25%), cat predation (~7%), building-related incidents (~12%), and collisions (~8%). Of all admitted bats, 579 individuals (~43%) were successfully released into the wild. These results highlight that rehabilitation is not limited to animal welfare: in long-lived, low- fecundity species, the survival of even a

small number of juveniles and reproductive females can influence population stability. Each successful release therefore contributes both to species conservation and to maintaining bats' ecological roles in insect control and ecosystem balance. In addition, the station undertakes outreach and training activities to build a well-connected, scientifically informed care network.

IRON OVERLOAD – ASSOCIATED LIVER DISEASE IN TWO CAPTIVE EGYPTIAN FRUIT BATS

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Iron storage disease is a major cause of morbidity and mortality in captive Egyptian fruit bats (*Rousettus aegyptiacus*). The overload appears to be dietary, however the reason for the susceptibility of this species compared to other frugivorous bats is unclear. This report presents the pathological findings of two adult male Egyptian fruit bats housed in captivity, which died within a week of each other.

The first bat presented with severe cavitary effusions, multinodular firm liver and tan nodules in the lungs, spleen and diaphragm. Histology revealed liver cirrhosis and metastatic hepatocellular carcinoma. Prussian blue staining confirmed extensive iron deposition in liver, spleen and lymph nodes with lower amounts also observed in the lungs, heart, kidney, and intestine. The second bat showed similar liver lesions without the evidence of neoplastic progression.

Both cases were diagnosed with hemochromatosis, characterized by tissue damage resulting from increased iron deposition. Neoplasia can occur in fruit bats with liver damage associated with chronic iron overload. These cases highlight the importance of thorough pathological examination – if only the first case had been evaluated, the diagnosis may have focused solely on the neoplasia, overlooking the potential role of excessive dietary iron uptake.

A SNAPSHOT OF BAT ACTIVITY ACROSS URBAN MICROHABITATS IN THE BOTANICAL GARDEN OF THE UNIVERSITY OF VIENNA

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We conducted a one-night acoustic survey to explore bat activity at the Botanical Garden of the University of Vienna, as part of the student field course 300032 UE Bat Monitoring and Methods (2025S). Five ecologically distinct sites were selected to characterize species presence and patterns of spatial habitat use. Using full-spectrum detectors, we recorded 7193 validated bat passes. The resulting species list is dominated by urban adapted taxa, particularly *Pipistrellus* sp. Activity levels and behavioral call types varied across sites, with the coniferous forest and water pond area exhibiting the highest levels of foraging and social behavior. Although based on a single spring night, our study highlights the potential of small-scale acoustic surveys for assessing urban biodiversity, and encourages further student initiatives for monitoring bat populations in urban areas.

WHAT MAKES A GOOD BAT HOUSE? Designing, building, testing and monitoring bat houses in Vienna, Austria: from inner-city to urban-forest environments

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In this emerging citizen science project by Österreichischer Naturschutzbund, we are aiming to build and monitor bat houses with trained volunteers for conservation and method-testing purposes in Vienna, Austria. Bats are essential for healthy ecosystems and are valuable indicator species. All European bats are protected. The loss of roost sites, however, accounts for population declines. In cities, roosts (tree holes, façade crevices, attics) are often lost due to tree felling and building renovation. Bat houses may help alleviate stresses of acute roost site shortages. But little research has been conducted on design and installation parameters. Our objective was to develop a low-cost design easy to build (and maintain) in large quantities, test different roofing materials (durability) and multiple-chamber prototypes (microclimate). Through frequent long-term monitoring (every 2–4 weeks, year-round), we hope to gain insights into the usefulness of artificial roosts in different urban settings and the winter activity of bats in general. Fifty single- and double-chamber wooden bat houses, suitable for tree- and crevice-dwelling species, were built. Twenty-four are going to be installed at the respective inner-city and urban-forest sites Haus des Meeres and Lainzer Tiergarten this autumn (final permits pending). Other sites are to be added in 2026.

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THE ACOUSTIC BEHAVIOUR OF THE ENDANGERED BAVARIAN PINE VOLE: First Evidence of a Complex Ultrasonic Repertoire

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The Bavarian pine vole (*Microtus bavaricus*) is one of Europe's most endangered species. It lives much of its life underground and has rarely been found in the wild. Its behaviour has never before been investigated. Studying vocal communication provides an opportunity to understand behaviour that is hard to observe and could have useful implications for future conservation efforts. Our study took place at Alpenzoo Innsbruck, where a breeding programme has been established. We recorded pair interactions and introduced established pairs to unfamiliar conspecifics to capture vocalisations in multiple social contexts. We annotated spectrograms of these vocalisations with a classification system based on repertoires of related species and ran an unsupervised cluster analysis. Our results show that *M. bavaricus* emits mainly ultrasonic vocalisations, often with complex structures and harmonics. A significant change in call structure and rate depending on the sex of the unfamiliar individual suggests that *M. bavaricus* adapts its vocal behaviour according to social context. Our manual classification and unsupervised analysis enabled us to create an initial description of a rich vocal repertoire and highlighted areas to be more precisely defined in future iterations. Our study provides the foundation for a new approach in the conservation of *M. bavaricus*.

NOTES:

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