30th Meeting of the International Hamster Workgroup

Vienna, Austria

29 September – 1 October 2023

CONFERENCE BOOK

The 30th Meeting of the International Hamster Workgroup was funded by

Stadt Wien – Umweltschutz (MA 22)

Preface

The International Hamster Workgroup (IHWG) is dedicated to preserve and protect the common hamster (*Cricetus cricetus*), a critically endangered species that faces an ongoing population decline in most parts of its distribution range.

At the annual meetings of the IHWG, scientists present their research findings from the fields of biology, ecology, physiology, and genetics. Experts in common hamster conservation report their results and efforts on current hamster population monitoring and distribution. Together they discuss conservation measures, recent status, and legal aspects of hamster protection.

In 2023, the meeting celebrates its 30th anniversary. It will take place from 29 September to 1 October 2023 in Vienna, Austria, and will be organized by the University of Vienna, Department of Behavioral and Cognitive Biology. Vienna is one of the few cities where urban populations of common hamsters occur. These fascinating animals inhabit parks and green areas, mainly in the southern districts of Vienna, which provides an exceptional and delightful opportunity to experience common hamsters close-up.

Also beyond the exceptional hamster situation, Vienna is always worth a visit.

We hope you enjoy the meeting and the city!

The Organizing Committee

Carina Siutz, Eva Millesi, Matthias Nemeth, Dagmar Rotter

Visit our homepage: https://ihwg2023.univie.ac.at/

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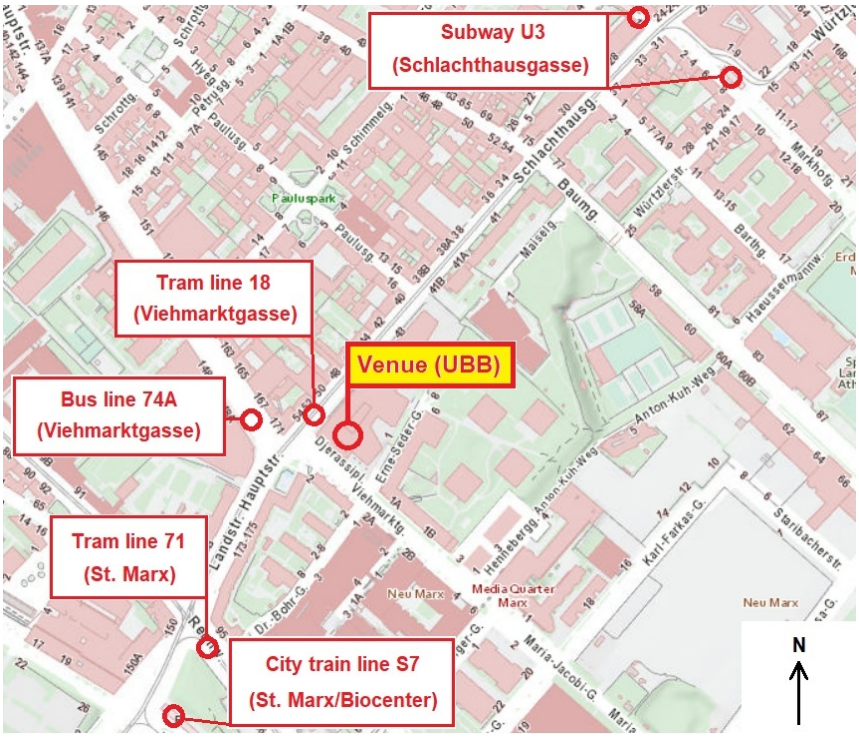
Venue and public transport service

The meeting takes place at the University of Vienna Biology Building (UBB) located at Djerassiplatz 1, 1030 Vienna.

The UBB can be reached by public transport:

- Tram line 18 (station *Viehmarktgasse*): the station is located directly in front of the UBB; this tram line connects the central station (Wien Hauptbahnhof) with the UBB
- Tram line 71 (station *St. Marx*): 4 minute walk to the UBB
- Bus line 74A (station *Viehmarktgasse*): the station is located across the street from the UBB
- Subway U3 (station *Schlachthausgasse*): 10 minute walk to the UBB; this subway connects the Vienna train station west (Wien Westbahnhof) with the UBB
- City train line S7 (station St*. Marx/Vienna Bio Center*): 7 minute walk to the UBB; this train connects Vienna Airport and the city



You can plan the route from your hotel to the UBB on the homepage of Vienna's public transport: https://www.wienerlinien.at/web/wl-en/

You can also download the official App of Vienna's Public Transport Service "WienMobil".

You can buy tickets at the airport, at every subway and city train station, and online (https://www.wienerlinien.at/web/wl-en/tickets).

You have several ticket options depending on how often you plan to use public transport:

Singe ticket: 2.40 € (only for one direction)
24h ticket: 8.00 €
48h ticket: 14.10 €
72h ticket: 17.10 €

You can use as many public transport services as necessary with one single ticket, but only in one direction.

With 24h/48h/72h tickets, you can use every public transport service in Vienna as often as you want and in every direction. They are valid for the respective period after validation.

Make sure you have a valid ticket when travelling using public transport, because of regular ticket controls.

Be aware: Vienna airport is located outside of Vienna. To take the S7 from the airport to Vienna or vice versa, an additional single ticket is needed.

Excursion

As with every meeting, there will be an excursion in a hamster habitat at this meeting too. Common hamsters inhabit natural landscapes, parks, and green areas surrounding buildings in several districts of Vienna, but mainly in the south and northeast. Not all of these spots are free accessible to everyone and/or not appropriate to be visited by a huge party as the IHWG 2023 fellowship. Therefore, the excursion will be held at the huge central cemetery (Wiener Zentralfriedhof, https://www.friedhoefewien.at/wiener-zentralfriedhof).

The main entrance (2nd gate) of the central cemetery is located at Simmeringer Hauptstraße 234, 1110 Vienna.

The central cemetery can be reached from the venue (UBB) by public transport, e.g. after a short walk using tram line 71 (from station *St. Marx* to station *Zentralfriedhof 2. Tor*). We will travel together (but in smaller groups) to the central cemetery using the tram or subway.

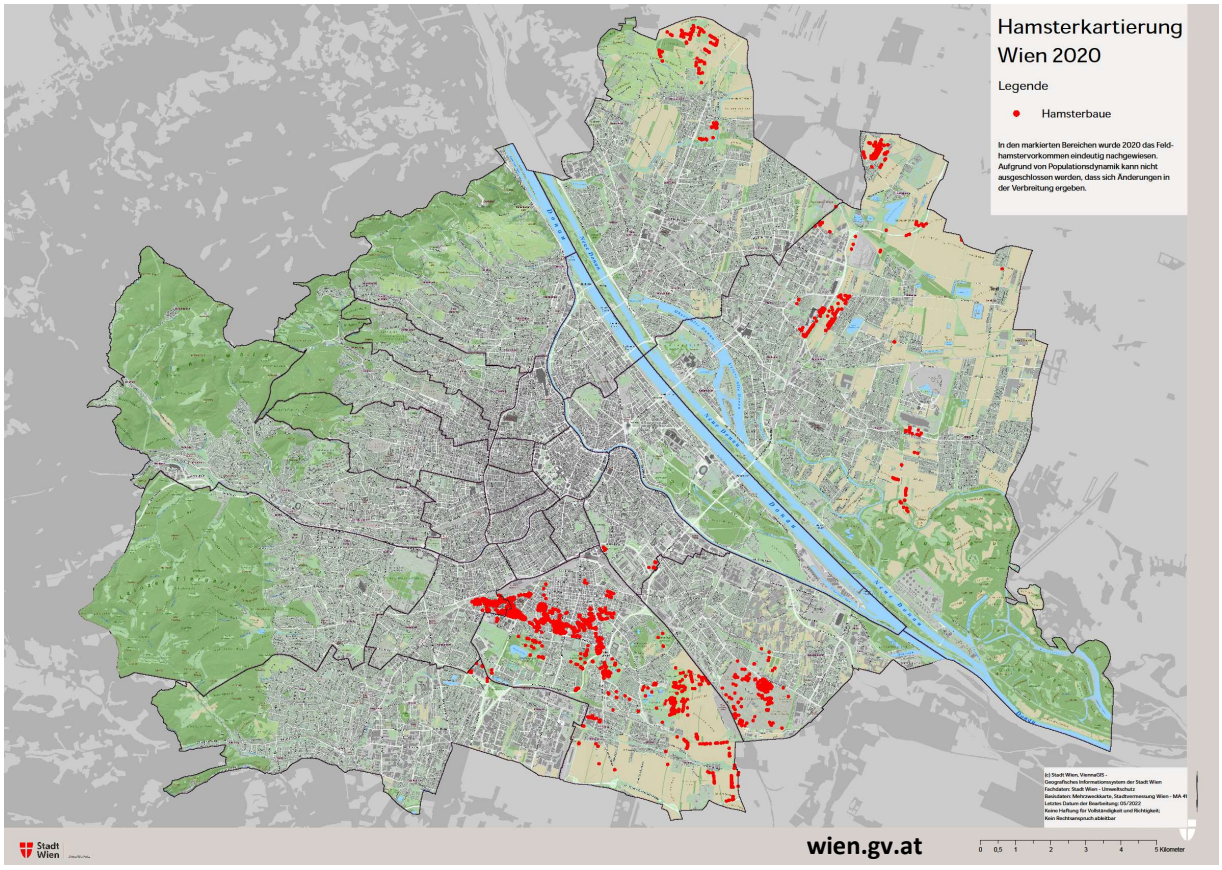
Of course, you can also get there on your own. We will provide detailed information on the hamster observation route through the cemetery, but the meeting point will be at the 2nd gate inside the cemetery at around 4.30 pm. For the excursion, however, you should move around the area on your own in small groups, because this increases the chance to observe hamsters.

The central cemetery is one of the largest cemeteries in Europe covering a total area of 2,5 km^2 with over 3 million people of all religions being buried here. It also represents a special sight in Vienna because of several Jugendstil buildings and honorary graves (among others, Ludwig van Beethoven, Franz Schubert, and Johann Strauss are buried here). The cemetery is structured like a park and contains forest-like areas and a rich fauna, including several bird species, deer, squirrels, and common hamsters.

Hamster hotspots in Vienna

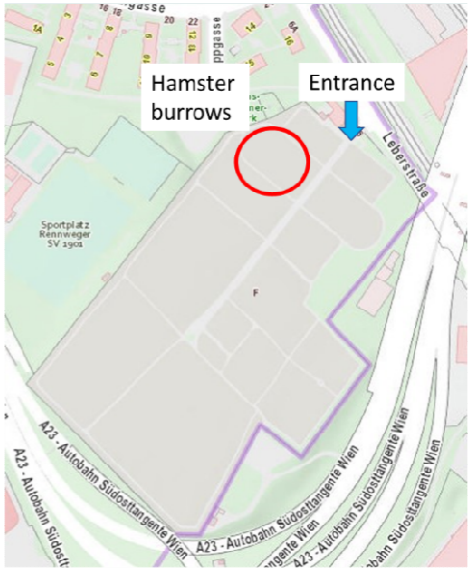
The central cemetery, where the excursion will take place, is only one of several sites where you can observe free-ranging common hamsters in Vienna. For a longer stay in Vienna, you can explore some other hamster hotspots. The best observation times would be in the morning from sunrise to about 8 am and in the evening from about 5 pm to sunset.

Based on a hamster mapping by the City of Vienna in 2020, a map was published showing all current hamster locations in Vienna:
https://www.wien.gv.at/umweltschutz/naturschutz/biotop/feldhamster.html
(This specific site is only available in German, but just scroll down to “Lebensraum Wien” and download the PDF “Hamsterkartierung Wien”)

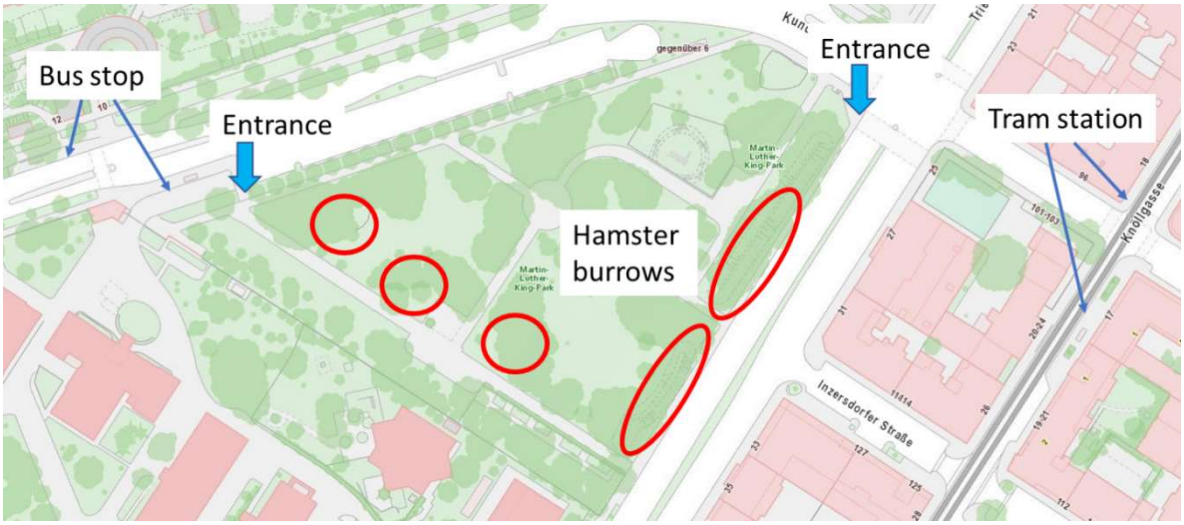


Despite the central cemetery, many other locations in the south of Vienna are easily accessible. Here is a small selection of hamster sites:

St. Marx Cemetery Park: Leberstraße 6, 1030 Vienna
https://www.wien.gv.at/english/environment/parks/sankt-marx.html
This cemetery was closed in 1874 and is now basically a park, but the gravestones (including Mozart's grave) still exist. This park is in walking distance (about 10-15 min) from our venue. It is not densely populated by hamsters, but you can find burrows between some gravestones mainly close to the entrance on the right-hand side. Please note the **opening hours** of the park from about 6.30 am to 6.30 pm (with variations of ± half an hour).

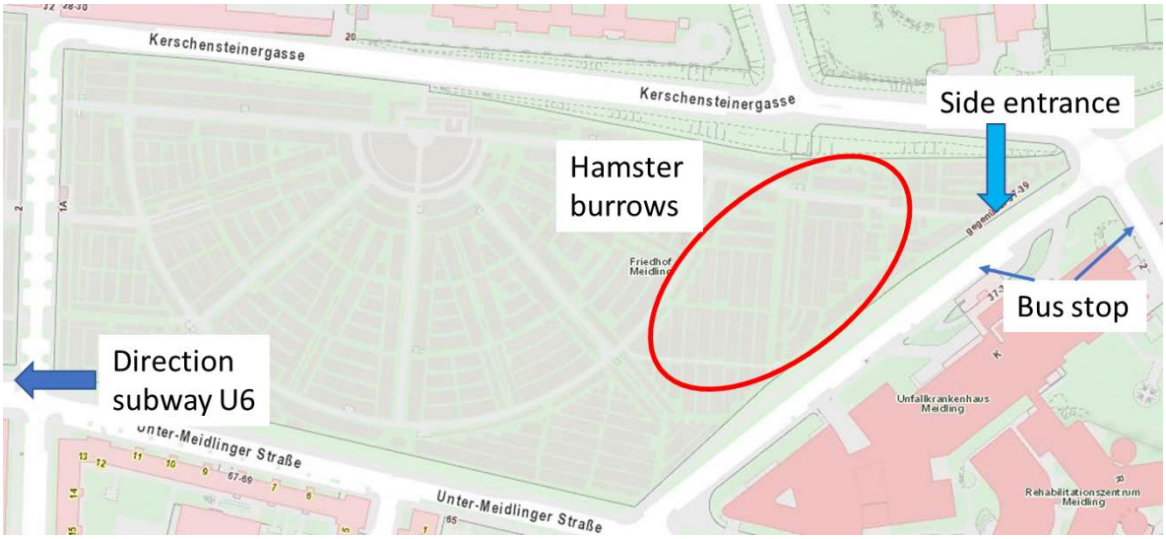


Martin-Luther-King-Park: Kundratstraße/Triester Straße, 1100 Vienna
You can reach this park by bus line 7A (station *Martin-Luther-King-Park*, directly in front of the park) or tram line 1 (station *Davidgasse*, 5 min walk to the park). Currently, there is construction work going on, but you can still observe the hamsters there. The park is opened 24h.



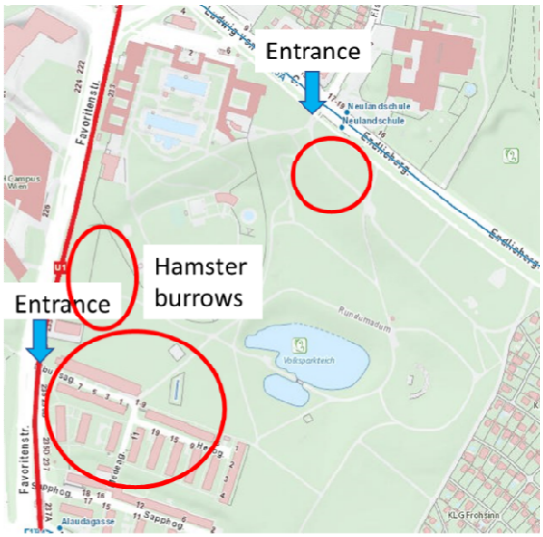
Cemetery Meidling: Haidackergasse 6, 1120 Vienna

You can reach this cemetery with the subway U6 (station *Meidling*) and walk through to the other end of the cemetery where the chance of observing hamsters is higher. Or you access the cemetery at a side entrance opposite the clinic Traumazentrum Wien (Kundratstraße 37-39, 1120 Vienna) using the bus line 63A or 7A (station *Unfallkrankenhaus Meidling* for both bus lines). Please note the **opening hours** of the cemetery from 7 am to about 6 pm.



Volkspark Laaerberg: Endlichergasse 6, 1100 Vienna

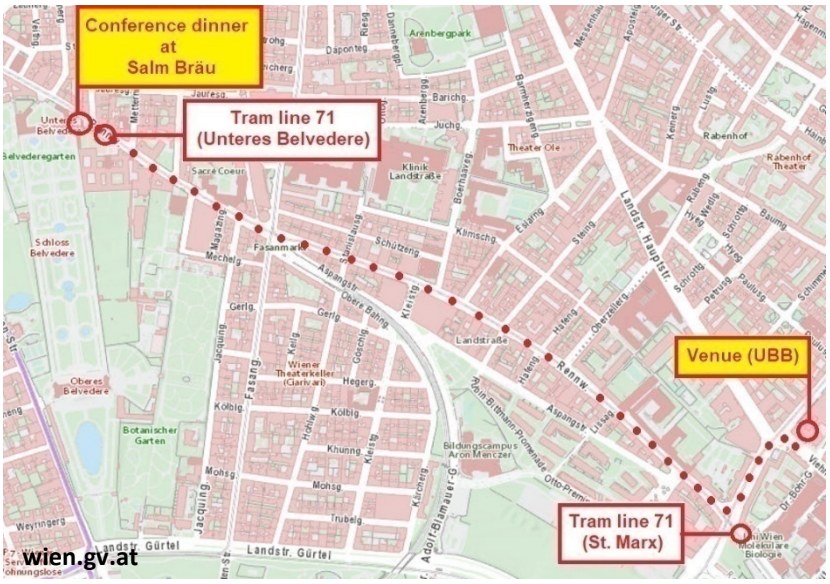
This park is located between the subway U1 stations *Altes Landgut* and *Alaudagasse* and is opened 24h. The hamsters not only inhabit the park, but also the green areas between adjacent apartment complexes in the south of the park.



Conference dinner

The conference dinner on Saturday 30 September 19:00 will take place in the Klostergewölbe of the restaurant Salm Bräu (https://www.salmbraeu.com/home/) located at Rennweg 8, 1030 Vienna.

The restaurant can be reached by public transport (e.g. after a short walk from the venue using tram line 71 from station *St. Marx* to station *Unteres Belvedere*) or by foot (about 1.9 km, 30 min).



It is located next to the Belvedere Palace (Schloss Belvedere) and its garden, one of the most famous sights in Vienna that is always worth a visit.

Program

	Friday, 29 Sept 2023	Saturday, 30 Sept 2023	Sunday, 1 Oct 2023
08:00 - 08:30		Registration	
08:30 - 09:00			
09:00 - 09:30		Opening Session 1	Session 5
09:30 - 10:00			
10:00 - 10:30			
10:30 - 11:00		Coffee break	Coffee break
11:00 - 11:30		Session 2	Session 6
11:30 - 12:00			
12:00 - 12:30			
12:30 - 13:00		Lunch break	Closing Farewell
13:00 - 13:30			
13:30 - 14:00		Session 3	
14:00 - 14:30	Registration Welcome		
14:30 - 15:00			
15:00 - 15:30		Coffee break	
15:30 - 16:00		Poster session	
16:00 - 16:30	Excursion	Session 4	
16:30 - 17:00			
17:00 - 17:30			
17:30 - 18:00			
18:00 - 18:30			
18:30 - 19:00			
19:00 - 24:00		Conference dinner	

Friday 29 September 2023

14:00 – 16:00	Registration and Welcome at the venue
16:00 – 19:00	Excursion to the Vienna central cemetery (Wiener Zentralfriedhof)

Saturday 30 September 2023

8:00 – 9:00	Registration
9:00 – 10:30	**SESSION 1** (chair: Eva Millesi)
9:00 – 9:30	Carina SIUTZ & Eva MILLESI: Opening
9:30 – 9:50	Edin LUGIĆ: Current status of the common hamster (*Cricetus cricetus*) in Croatia
9:50 – 10:10	Kerstin MAMMEN & Ubbo MAMMEN: Dramatic decline of the Common Hamster in Saxony-Anhalt
10:10 – 10:30	General discussion Session 1
10:30 – 11:00	Coffee break
11:00 – 12:30	**SESSION 2** (chair: Ulrich Weinhold)
11:00 – 11:20	Monika PETKOVIĆ: Development of national monitoring program of Common hamster (Rodentia: Cricetidae; *Cricetus cricetus*) in Croatia
11:20 – 11:40	Hayat MIMOU: Mid-term assessment of the 2019-2028 French National Action Plan for the common hamster (*Cricetus cricetus*) and the biodiversity of the Alsace plain
11:40 – 12:00	Simon HEIN & Julia-Marie BATTERMANN: Project Feldhamsterland - A glance back at Germany's largest conservation project on the common hamster
12:00 – 12:20	General discussion Session 2
12:30 – 13:30	Lunch break
13:30 – 14:50	**SESSION 3** (chair: Sarah Descamps)
13:30 – 13:50	Marie-Cécile VIRION: Example of one action from the French National Action Plan for the common hamster (*Cricetus cricetus*) and the biodiversity of the Alsace plain: Create and manage a food industry with hamster favourable crops
13:50 – 14:10	Valentina BAUMTROG: The common hamster and its protective measures - the nutritional state of the common hamster (*Cricetus cricetus*) depending on sown wildflower fields and other protective measures in Hesse
14:10 – 14:30	Timothée GÉRARD: Testing the effect of crop associations on the hibernation and reproductive success of the European hamster (*Cricetus cricetus*) – Promising results for the protection of the species
14:30 – 14:50	General discussion Session 3

14:50 – 15:20 Coffee break

15:20 – 16:00 POSTER SESSION

16:00 – 17:20 **SESSION 4** (chair: Caroline Habold)

16:00 – 16:20 Magdalena HĘDRZAK & Joanna ZIOMEK: The behaviour of the European hamster *Cricetus cricetus* after releasing from the breeding facility to the natural environment

16:20 – 16:40 Urszula EICHERT & Joanna ZIOMEK: An attempt of designation factors and a set of behavioural features, which may have an impact on the survival of European hamsters from the breeding colony, released into the environment

16:40 – 17:00 Tom ANGELO: From visible cutaneous pathologies to a lesional photographic guide of the common hamster in Alsace

17:00 – 17:20 General discussion Session 4

19:00 – 24:00 Conference dinner at Salm Bräu

Sunday 1 October 2023

9:00 – 10:20 **SESSION 5** (chair: Edgar van der Grift)

9:00 – 9:20 Tobias E. REINERS: From the wild to captivity - from genetics to genomics - Challenges in the genetic management of the Common hamster

9:20 – 9:40 Julia HEINZE: Breeding with wild caught hamsters – first three years of "assisted migration" in Langgöns and Pohlheim

9:40 – 10:00 Fabrice CAPBER: Lympho-epithelial thymoma in a common hamster (*Cricetus cricetus*)

10:00 – 10:20 General discussion Session 5

10:20 – 10:50 Coffee break

10:50 – 12:10 **SESSION 6** (chair: Tobias E. Reiners)

10:50 – 11:10 Marieke BEIER: How do you know they are in estrus? – Preliminary results on the use of vaginal swabs in female common hamsters (*Cricetus cricetus*)

11:10 – 11:30 Thomas LIEBENSTEIN: A holistic approach for a charismatic field dweller – Zoo Leipzig's novel role in the cooperative conservation project for the common hamster (*Cricetus cricetus*) in Saxony (Germany)

11:30 – 11:50 Stefanie MONECKE: Advanced breeding and the restocking program of European hamsters in North Rhine-Westphalia

11:50 – 12:10 General discussion Session 6

12:10 – 13:30 Closing/Farewell with drinks and snacks

Abstracts Talks

in presenting order

presenters are underlined

Current status of the common hamster (*Cricetus cricetus*) in Croatia

Edin LUGIĆ [1], Monika PETKOVIĆ [1], Dora ČULJAK [1], Tea HUTEN [2], Marija KOVAČEVIĆ [3], Daniela HAMIDOVIĆ [4], Marko BOLJFETIĆ [1], Matija KRESONJA [1], Milorad MRAKOVČIĆ [1], Boris KRYŠTUFEK [5,6], Nikola TVRTKOVIĆ [7]

[1] *OIKON Ltd – Institute of Applied Ecology, Trg senjskih uskoka 1-2, Zagreb, Croatia*
[2] *Supernatural Ltd, Koledinečka 3, Zagreb, Croatia*
[3] *Public Institution for the management of the protected area of Požega-Slavonia County*
[4] *Ministry of Economy and Sustainable Development - Institute for Environment and Nature, Radnička cesta 80, Zagreb, Croatia*
[5] *Slovenian Museum of Natural History, Prešernova 20, Ljubljana, Slovenia*
[6] *Science and Research Centre Koper, Garibaldijeva 1, Koper, Slovenia*
[7] *Natura -Society for nature protection of Croatia, Šulentićeva 9, Zagreb, Croatia*

In Croatia, the common hamster (*Cricetus cricetus*) is reportedly present all the way along the right bank of the Drava River, which is at the same time a fraction of the southern edge of its European range. There is a significant lack of knowledge about the main ecological features of this population such as distribution, abundance, population size and habitat availability. Croatia, as EU Member state, Croatia is obliged to report on the conservation status of strictly protected species under the Habitats Directive every six years (Council Directive 92/43/EEC). To obtain appropriate data for the conservation status assessment, a national monitoring plan was initiated in 2021 and funded by the EU. This also included gathering of additional data on hamster occurrence in Croatia.

From May to September 2022, 20 plots of 10x10 km were surveyed by at least three transects with a total length of 500 m were conducted on each of these plots. The species was recorded in 9 transects on 4 plots, i.e. on 9.2 % of the total transects surveyed. In the plots where the target species was detected, the average number of transects conducted was 3.25 per plot, and only 69.23 % of them were positive. The presence of the population in Međimurje County near Slovenian border was confirmed but no individuals were recorded further east along the Drava River and in Baranja near the Danube River. To save the remnants of the eastern population, joint coordinated actions of nature conservation authorities and transboundary cooperations are urgently needed. In addition, implementation of national monitoring program is necessary for the accurate assessment of the species' distribution, population size and habitat quality, as well as assessment of pressures and threats in order to establish effective conservation measures to improve hamster unfavourable-bad (U2) conservation status in Croatia.

Dramatic decline of the Common Hamster in Saxony-Anhalt

Kerstin MAMMEN [1], Ubbo MAMMEN [1]

[1] *ÖKOTOP GbR, Willy-Brandt-Straße 44, 06110 Halle (Saale), Germany*
info@oekotop-halle.de

The population of the Common Hamster in Germany has been declining for several decades. However, Saxony-Anhalt was long considered the stronghold of the Common Hamster in Germany. Now we have concrete evidence that proves that also in Saxony-Anhalt there has been a massive population collapse in recent years:
(1) There were very strong population declines in the FFH monitoring areas. In the 2022/23 mapping period hamsters were not found in all monitoring areas yet.
(2) When compiling the data from various mappings, reports on road casualties and other observations as well as targeted mapping at the distribution boundary, we have also noticed a decline in recent years. The area of distribution has continued to shrink. Current evidence of Common Hamsters come almost exclusively from the last remaining core areas.
(3) To compensate for the loss of hamster habitat through construction projects, several hamster-friendly managed areas have been established in the last 20 years. The population level was significantly higher on these areas than on the conventionally farmed areas in the surroundings. Nevertheless, these areas also show clear declines up to the extinction of the population.
In the lecture, the possible causes will be discussed and ideas for saving the Common hamster in Saxony-Anhalt will be presented.

Development of national monitoring program of Common hamster (Rodentia: Cricetidae; *Cricetus cricetus*) in Croatia

Monika PETKOVIĆ [1], Edin LUGIĆ [1], Dora ČULJAK [1], Tea HUTEN [2], Marija KOVAČEVIĆ [3], Daniela HAMIDOVIĆ [4], Marko BOLJFETIĆ [1], Matija KRESONJA [1], Milorad MRAKOVČIĆ [1], Boris KRYŠTUFEK [5,6], Nikola TVRTKOVIĆ [7]

[1] *OIKON Ltd – Institute of Applied Ecology, Trg senjskih uskoka 1-2, Zagreb, Croatia*
[2] *Supernatural Ltd, Koledinečka 3, Zagreb, Croatia*
[3] *Public Institution for the management of the protected area of Požega-Slavonia County*
[4] *Ministry of Economy and Sustainable Development, Institute for Environment and Nature, Radnička cesta 80, Zagreb, Croatia*
[5] *Slovenian Museum of Natural History, Prešernova 20, Ljubljana, Slovenia*
[6] *Science and Research Centre Koper, Garibaldijeva 1, Koper, Slovenia*
[7] *Natura - Society for nature protection of Croatia, Šulentićeva 9, Zagreb, Croatia*

The development of the National hamster monitoring program in 2022 and 2023 was preceded by analysis of previously available hamster distribution data, as well as mapping its current distribution. The analysis of available existing data resulted in only 7 hamster-positive localities in six 10x10km cells (Projected coordinate system for Croatia, EPSG: 3765). The research on current hamster distribution was conducted via online surveys and field research. Additional field work was carried out in the species' historical range, in 20 randomly selected 10x10 km grid cells. Within the grid cells, at least three visual transects were conducted. Based on expert opinion and literature sources, transects were performed in habitats of the highest probability of hamster presence.

The research confirmed the hamster's presence in an additional 30 localities (transects), while 89 yielded negative results. The results did not provide satisfactory insight into the distribution of the species, and its habitat requirements. Hence, to develop the National hamster monitoring plan, we fitted a habitat suitability model. BIOCLIM, ENFA, GLM, Random Forest and MaxENT algorithms were used to build the model, with MaxEnt, providing the best results according to statistical and expert evaluation. In addition, according to expert opinion, the BIOCLiM model well describes the most likely range of the species according to expert opinion. All models were run in R programming language.

The result of the modelling is a quantified species – environmental relationship in the form of a raster. Each pixel in the 1x1 km raster defines the probability of a distribution of habitats favourable for the hamster. Based on the obtained model, the territory of the Republic of Croatia was classified in 4 classes. Class/stratum 1 represents the highest quality habitat, the one where the relative habitat suitability index ranges from 75 – 100; stratum 2 with the range from 50 – 75; stratum 3 with the range from 25-50 and stratum 4, the least suitable habitat, with the range from 1-25. Further studies of relative population density and population trends will be carried out by counting an absolute number of hamster burrows on 2 ha plots per each 1x1 km cell defined for a national monitoring program of the species. The cells will be selected based on habitat suitability, with the greatest research effort being invested in the class 1, and the least effort in the cells with the lowest probability of finding hamsters (class 4). Models will be improved with newly collected data on an annual basis.

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Mid-term assessment of the 2019-2028 French National Action Plan for the common hamster (*Cricetus cricetus*) and the biodiversity of the Alsace plain

Hayat MIMOU [1]

[1] *DREAL Grand Est, France*

In France, the populations of common hamster declined significantly in the 1980s. Nowadays, the species is endangered and strictly protected. In order to restore the populations, several national action plan (NAP) have been implemented since 2000. The fourth NAP for the common hamster (*Cricetus cricetus*) and the biodiversity of the Alsace plain 2019-2028 is on his mid-term.
As it was initially planned in the NAP, a mid-term assessement was organised by the DREAL Grand Est in partnership with all the NAP's stakeholders.
This assessment revealed that the NAP had already a quite good state of achievement: approximately one third of the actions have been done, one third have been started/are ongoing and one third have not been implemented yet. Although populations seem to slightly increase, they has not reached a viable state yet. Efforts need to keep going. Moreover, this assessment also highlighted possible improvements in the organization and communication between all the stakeholders involved in the NAP.
So, based on those results, all the stakeholders met to plan the last part of the NAP: how to improve our organisation? Which actions do we have to start first? Do we need to apply to a new financial program?

Project Feldhamsterland - A glance back at Germany's largest conservation project on the common hamster

Simon HEIN [1], Julia-Marie BATTERMANN [1]

[1] *Deutsche Wildtier Stiftung (German Wildlife Foundation), Germany*

Feldhamsterland is Germany's largest conservation project to preserve the common hamster (*Cricetus cricetus*). The aim of the five-year project (2018 – 2023) was to halt the dramatic decline of the common hamster on the project sites and to develop and improve known conservation strategies to preserve the species in its habitat in the long term. The overall long-term goal was to ensure that the structures and conservation measures would be permanent even after the end of the project period.

Intensive public relations work, a valid monitoring of the remaining populations with the help of many citizen scientists (volunteers) and a targeted implementation of measures in agriculture proved to be the most important pillars of the project.

Today, at the end of the project, we look back on five years of successful hamster conservation in close cooperation with all stakeholders. With the help of more than 250 citizen scientists, we monitored 17,900 hectares of arable land. More than 20,000 hamster burrows were found over the years and all collected data was imported into the so-called *Feldhamsteratlas*, a powerful tool and database for centralized common hamster data in Germany. Based on the data, 4541 protective measures for the hamster were implemented by our farmers specifically on common hamster sites.

Funding: The collaborative project was funded by the *Federal Agency for Nature Conservation* with funds from the *Federal Ministry for the Environment* in the Federal Program for Biological Diversity. The *Deutsche Wildtier Stiftung* coordinated the nationwide project and local partners were responsible for the three federal states: Hesse (*Arbeitsgemeinschaft Feldhamsterschutz der HGON e.V.*), Rhineland-Palatinate (*Stiftung Natur und Umwelt Rheinland-Pfalz)* and Thuringia (*Landschaftspflegeverband Mittelthüringen e.V.).* In Lower Saxony and Saxony-Anhalt, the *German Wildlife Foundation* led the regional project work. The Senckenberg Research Institute provided scientific guidance.

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Example of one action from the French National Action Plan for the common hamster (*Cricetus cricetus*) and the biodiversity of the Alsace plain: Create and manage a food industry with hamster favourable crops.

Marie-Cécile VIRION [1]

[1] *DREAL Grand Est, France*
marie-cecile.virion@developpement-durable.gouv.fr

In the previous national action plan (NAP) fot the common hamster 2012-2016, a first study was initated to measure the potentiality of creating a food industry with hamster favourable crops. The NAP's stakeholders confirmed their motivation to build this food industry during the redaction of the current NAP. So, in 2022 Bio Grand Est (association who federates the organic farms) started with organic flour production with crops from hamster fields. A brand was created, and in 2023 five breweries joined to create the first hamster beer.
This is the very beginning of a food industry, but it received a cheering start from consummers and from the NAP's stakeholder. Other products are also planned over the next few years.

The common hamster and its protective measures - the nutritional state of the common hamster (*Cricetus cricetus*) depending on sown wildflower fields and other protective measures in Hesse

Valentina BAUMTROG [1]

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In the German federal state of Hesse protective measures to protect the common hamster were introduced. These include sown wildflower fields and late or no harvest of crop land. At the current state of knowledge these measures slow down the rate of extinction but cannot prevent it. That is why these protective measures should be studied and potentially optimized. In this study we captured 71 common hamsters of two Hessian populations (“Langgöns-Süd 1” and “Pohlheim”). These hamsters were measured, weighted and the nutritional state was determined as measured by their body fat proportion. The experiments were conducted on fields with no protective measures, with late harvest and within sown wildflower fields. The latter one provides a more diverse food supply than crop fields in general. The control group contained 14 common hamsters of the same populations which were captured and held in a breeding unit with steady and diverse food supply. Afterwards the weight and the body fat proportion were analysed in the context of protective measure types and the distance to those. After habituation to captivity the control group weighed more and reached higher body fat proportions than free-ranging common hamsters. After harvest, males and females that were captured in sown wildflower fields had a higher body fat content than hamsters captured in late- or non-harvest measures. Females that were captured further away from measures had lower body fat, compared to those in measures. Furthermore, late- or non-harvest measures resulted in an increase of burrow-density and survival rates. However, sown wildflower fields lead to better nutritional states of the animals and elevated reproduction rates. To ensure the preservation of existing populations and the long-term survival of the species, the reproduction rates need to be increased. Furthermore, we investigated the hibernation survival rate of hamsters within protective measures and in crop fields without measures. The winter mortality is lower in the protective measures than the data reported in list of references. Thus, a positive effect on the hibernation success through the conservation measures can be confirmed. Positive factors influencing hibernation success turned out to be, on the one hand, high density and, on the other hand, a site-specific combination of crop measures and wildflower fields. The number of Common Hamsters surviving the winter increases slightly with increasing area size and significantly with a decreasing perimeter to area ratio. As a results, for the same area, a more "compact" shape, such as a square, showed a higher hibernation success than a measure with an elongated or angled shape.

Testing the effect of crop associations on the hibernation and reproductive success of the European hamster (*Cricetus cricetus*) – Promising results for the protection of the species

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The current loss of biodiversity is particularly pronounced in agricultural areas, where intensive farming practices and monoculture have severely modified the ecosystems. In Alsace, this has led to the recent and rapid decline of the European hamster. Previous work by the IPHC has linked this decline to an altered body condition in spring and a reduced reproductive success, linked to vitamin B3 and/or protein deficiencies in monocultural ecosystems.

To address this issue, we tested three crop associations that could compensate for these deficiencies, and that are of economic and technical interest for farmers. We chose associations either rich in lipids (*RF: rapeseed and faba beans),* proteins (*ML: maize and lablab beans),* or intermediate (*WS: wheat and soybeans)* and compared them to a negative control (*W: wheat only*). Each diet was tested on 8 females and 3 males. Hamsters were housed in controlled laboratory conditions during hibernation and then released into an outdoor enclosures for reproduction. Reproductive success was characterised through capture and genetic analysis of the pups.

The diets had contrasting effects on the hamsters. No differences in hibernation behaviours were observed between groups. Hamsters fed a lipid-rich diet (FR and WS) showed a greater mass gain before reproduction, and a higher reproductive output of 15 ± 1,5 pups per female against 7 ± 1,5 pups in the control group (W). Pups from these groups also showed a faster growth rate (3,9 and 3,5 ± 0,1 versus 3,0 ± 0,2 g/day). Overall, these results suggest that in the wild, hamsters can find food supplements (arthropods and weeds) to compensate for protein deficiencies. Under these conditions, the energy provided by lipids is critical to further enhance reproductive success. This should help to better adapt the conservation measures implemented in Alsace and protect hamsters, agri-fauna, and their environment.

The behaviour of the European hamster *Cricetus cricetus* after releasing from the breeding facility to the natural environment

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The study assumed that, depending on sex, age classes and origin, individuals of the European hamster *Cricetus cricetus* will show differences in those behavioral elements that are related to vigilance, as well as in presenting behaviors characteristic of individuals kept in breeding conditions. A hypothesis was also formulated that the moment of leaving the aviary does not depend on the age, sex, and origin of the individual. Between 2020 and 2021, 115 individuals were released into acclimatization aviaries and their behaviour was observed before and after the aviaries were removed. The "All occurrences of some behaviours" method was used, and the total observation time was 83 hours. Thirty-four categories of behaviours were distinguished. The most numerous were vigilance (40%) and exploration (30%). Hamsters also exhibited behaviours characteristic for animals raised in captivity (14%). For individual categories of "vigilance" behaviors, significant differences were found between adults and subadults. There were no significant differences in the manifestation of behaviors acquired in the breeding conditions depending on age, sex, and origin. 73.9% of the introduced individuals left the acclimatization aviaries before they were removed. The time of leaving the aviary was not dependent on the age or sex of the reintroduced hamsters. A highly significant relationship was found between the origin of hamsters and the time after which they left the aviary. The analysis using classification trees, considering the age, sex, and origin of individuals, clearly shows that the origin of the individuals was the first and most significant criterion for dividing the reintroduced individuals in terms of the speed of leaving the place of resettlement.

An attempt of designation factors and a set of behavioural features, which may have an impact on the survival of European hamsters from the breeding colony, released into the environment

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The experiment aimed to study the behaviour of common hamsters kept in a breeding facility. It was assumed, that the selection of individuals in terms of features which may increase survival in the natural environment, can have a positive impact on the effectiveness of conservation programs for this species. 49 individuals were tested. Three behavioural experiments were conducted, each one in two series. On an arena (100x100x150 cm) with two lines crossing in the middle of the floor a) boldness, b) exploration and c) aggressiveness of hamsters were tested. The boldness experiment showed that 65,3% of hamsters left the cage and entered the arena faster in 2nd test than in 1st test. Those individuals who left the cage faster or slower, showed a similar tendency in 2nd test. Age, sex, and origin (from nature/born in captivity) have no impact on the average time of staying in the cage. The exploration experiment showed that hamsters spend more time on the edges of the arena than in the middle part. Between tests 1st and 2nd, significant differences in the average number of crossings of the line in the central part of the arena were found for all individuals, for females and for individuals, whose at least one parent was born in the breeding colony. The aggression experiment showed significant interdependencies between some behavioural categories (attack, vocalization, threatening, escape, and defensive posture). For all tested individuals, a significant positive correlation was found between attack and squeak in the 1st and 2nd tests, and between attack and threatening posture in the test 1st. A cluster analysis performed with the inclusion of all features analysed in the aggression experiment excluded three groups of individuals in tests 1st and 2nd. Every group of individuals differed significantly with a distinct set of features (attack, vocalization, escape, and defensive posture). At the present stage of studies, no method of individuals selection based on the set of behavioural features which may predestine them for release was defined.

From visible cutaneous pathologies to a lesional photographic guide of the common hamster in Alsace

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In the context of the reinforcement program of the French National Action Plan for the protection of the common hamster (*Cricetus cricetus*) and the lowland biodiversity in Alsace (2019-2028), a study was conducted by the CNRS DEPE and the OFB from 2021 to 2023 to follow captive-born individuals released into the wild. In 2022, numerous skin lesions on wild and reintroduced hamsters were identified on camera traps and during trapping sessions. Skin analysis revealed the presence of *Trichophyton mentagrophytes*. This zoonotic disease can be responsible of thermoregulation impairment, malnutrition, stunted growth, and reduced feed conversion rate or even death. Cutaneous analysis revealed the presence of ringworm caused by *Trichophyton mentagrophytes* (9 samples were analyzed and 4 of them positive). Following these observations, 60 samples have been collected in the wild (21 of them positive) and 102 will also be done in the three different breeding colonies together with a genotyping in order to give us information on the prevalence of these fungi in the hamster populations and the possible link with the breeding centers. The presence of this fungus raised questions on the possible impact on fertility and survival, and the causes of the clinical signs (stress induced in the context of healthy carrying or triggered by the contact with the fungi). More information on the source and pathogenesis of this pathogen is yet to be discovered.
Furthermore, as ringworm lesions have been clearly noticed on pictures, we are going through data gathered during a period of 10 years from camera traps positioned in the vicinity of hamster burrows to carry out a global screen of visible affections, enlarging the cutaneous lesions to every potential sign of disease on pictures. This screening method has been adapted from the work of Laura Lenglin in 2023 who analyzed 26805 photos of Lynx (*Lynx lynx*) and has been able to show that the camera trap was indeed a good start to follow mostly dermatological lesions and also punctually ocular, locomotor, behavioral, respiratory, digestive pathologies and body conditions. The aim of this work is to construct a guide, easy to use, that will enable any biologist studying hamsters to detect diseases thanks to camera trap pictures, and therefore have an indicator of the global health state of their population.

From the wild to captivity - from genetics to genomics - Challenges in the genetic management of the Common hamster

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The Common hamster *Cricetus cricetus* is considered as one of the most endangered mammal species in Western Europe. Formerly considered as a pest, the species has rapidly declined throughout the range which resulted in a reassessment by the IUCN as "*critically endangered*" on the global scale. In Western Europe the extinction process started already in the 90ties and only less than 50% of the distribution is left compared to the favourable status implemented in the EU habitats directive. Intensification of farming, habitat loss, climate change as well as loss of farmland biodiversity are known drivers of the decline. Nowadays many populations are isolated and population sizes remain low, resulting in an ongoing loss of genetic diversity where some populations exhibit extreme levels of inbreeding consequently leading to local extinction events. To which extent genetic diversity loss can be considered as cause or consequence in the extinction process is still unknown. To counteract the loss of populations in the wild and to conserve genetic diversity, a sound long term genetic management is needed including ex situ conservation breeding measures.

Using a large scale microsatellite dataset of several thousand Common hamster samples originating from more than 50 wild populations at different time scales as well from five conservation breeding centres, we show current levels of diversity loss in the wild, attempts to conserve genetic management units in captivity as well as the effect of reintroduction and restocking efforts on maintenance of genetic diversity.

To further investigate the genome-wide properties of genetic diversity loss, we will also present preliminary results of a whole genome-sequencing study of >35 individuals covering the western range of the species. Genetic features derived from genomic monitoring (heterozygosity, inbreeding, runs of heterozygosity) will be of utmost importance to set up a long term genetic management for the species.

Breeding with wild caught hamsters – first three years of "assisted migration" in Langgöns and Pohlheim

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As part of the "2. Hessian species protection plan" for the common hamster in Hesse (Germany), conservation authorities asked to develop an "reconnection concept", to restore the genetic exchange of the two hamster populations "Langgöns" and "Pohlheim". As there are no short-term possibilities to reconnect both sites by preparing a corridor for expansion, we suggested to use the method of "assisted migration". The method contains breeding of wild hamsters of both sites ex situ followed by a subsequent reinforcement in both populations with genetically refreshed descendants for at least 5 years. In 2021 the AG Feldhamsterschutz started the reconnection of these two hamster populations using "assisted migration". Therefore 12 hamsters, six from each population, were caught every year for breeding, first ones in spring 2021. To maximize genetic mixture, only hamsters from different origins were mated in the breeding station. Because of the very low breeding success in the first year, strategy was changed and hamsters for the following breeding seasons were not caught in spring anymore but in September for hibernation in the station. Hamsters, caught in September habituate before winter and have a much better body condition after hibernation in captivity than in the wild. Accordingly second breeding season went quite well with six litters and 50 pups. Successfully mated hamsters get released into their origin population after breeding. Offspring hibernate in the breeding station and get released on specific reintroduction sites which are situated neighboring the donor populations.
First reintroduction started in June 2022, while releasing the first 12 hamsters in "Langgöns Nord" (3 males, 9 females). Using telemetry and life-trapping 46 pups got individualized until September. In 2023 we released 21 hamsters in "Langgöns Nord" and also the first 25 hamsters in "Pohlheim". On both reintroduction fields intensive monitoring such as a telemetry, camera monitoring and a life-trapping is used to evaluate the success of reintroduction. Until August we counted 49 new individualized hamsters in "Langgöns Nord" (mostly pups) and also 25 individualized pups in "Pohlheim". In every year, all monitoring methods last from day of releasing until September. As part of life-trapping, we determine the nutritional state of the individual hamsters as well as the reproductive state, especially of the females.

Lympho-epithelial thymoma in a common hamster (*Cricetus cricetus*)

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A 780-day-old male common hamster raised in a breeding facility in the frame of a conservation program in Alsace (France) was examined for dysorexia, apathy, weight loss and difficulty breathing. Clinical examination was performed under anesthesia. The animal showed severe dyspnea, the lungs were hardly audible and the heartbeats were only heard in the caudal part of the chest. The animal was cachectic.

The X-ray showed a large mediastinal mass pushing the trachea and lungs dorsally. The lungs presented a normal structure but their volume was drastically reduced. The heart was not visible. A tumour was strongly suspected.

The very bad body condition of the animal led us to euthanize it. The necropsy revealed a large cranial mediastinal tumour compressing the lungs dorsally. The mass was whitish and lobulated. The position of the tumor suggested that it may be a thymic neoplasm. The histological investigation confirmed the thymic nature of the tumor.

In the French breeding facilities mortality related to thymomas accounts for 27.18% of all deaths due to diseases over an investigated period of 5 years. A viral cause was suspected for this neoplasm. Indeed, hamsters are susceptible to several tumor diseases, some of which are of viral etiology, including viruses of the papovavirus family. The hypothesis of a genetic background has also been suggested. These two assumptions are discussed.

How do you know they are in estrus? – Preliminary results on the use of vaginal swabs in female common hamsters (*Cricetus cricetus*)

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Conservation programs for the critically endangered common hamster (*Cricetus cricetus*) do not only try to save existing populations in the wild but aim to restore former populations. The successful breeding of European hamsters in captivity is an important precondition for such conservation programs. The aim of this study was therefore to evaluate vaginal swabs as a method to determine the stages of the estrus cycle in female common hamsters to improve breeding success of breeding facilities. We investigated the estrus stages of captive female hamsters of a breeding facility (Zoo Heidelberg) and in wild female hamsters captured in the area around Mannheim (Germany). For the vaginal smears, a cotton swap, wet with NaCl-solution, was inserted to one third into the vagina and turned around several times. The swap was transferred onto a microscope slide and PAP-colored. The stages of proestrus, estrus, metestrus and diestrus were distinguishable through quantification and ratios between the predominant cell types (leukocytes, nucleated epidermal cells, cornified epidermal cells). In captivity vaginal smears were taken before each breeding attempt, which were conducted between April and July 2023. Wild individuals were captured once per month, starting in April until September 2023, with live traps. In females vaginal smears were taken of all age classes. In my talk I will present first and preliminary results of this study.

A holistic approach for a charismatic field dweller – Zoo Leipzig's novel role in the cooperative conservation project for the common hamster (*Cricetus cricetus*) in Saxony (Germany)

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The common hamster (*Cricetus cricetus*) was once widespread in Middle Germany and roamed through nearly all parts of Saxony. In the mid-20th century, like in many other parts of its former distribution, it was treated as pest, hunted for fur, and killed in millions. Finally, the intensification of agriculture, land consumption and climate change led to a drastic decline of the common hamster. Today, the common hamster is not only listed as critically endangered by the German and Saxonian Red List, but also by the IUCN. Unfortunately, the last hamster burrow in Saxony was recorded in 2019, since 2020 the Saxonian common hamster population is below the detection limit and is deemed to go extinct without further strengthening of the conservation efforts. Because of this, Zoo Leipzig joined the working group "Kooperativer Feldhamsterschutz im Freistaat Sachsen" in 2021, a cooperation for the conservation of the common hamster in Saxony. While most of the other partners of the cooperation focus on *in-situ* conservation and regeneration of hamster-friendly cultivated agricultural habitat, Zoo Leipzig started an *ex-situ* common hamster breeding facility to establish an *ex-situ* hamster population as backup population and for future reinforcements and other conservation translocations. While following the IUCNs guidelines for conservation translocation, these approaches together result in a holistic "One-Plan-Approach".
Here I'll present Zoo Leipzig's first steps in planning and establishing an *ex-situ* common hamster breeding population for the Middle German population, how the population developed in its first year and what is to come in the following years.

Abstracts Poster

presenters are underlined

Current state of knowledge on the occurrence of European hamster (*Cricetus cricetus*) within the city boundaries of Kraków

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The European hamster is found in various city in Poland including Jaworzno, Lublin, Dębica, Iłża, cities in Silesia and others. Determining the location of sites and recognising the situation of this species within urban boundaries, should be taken into consideration when the urban plans, that may lead to habitat destruction, are created.
With early identification of hamster sites, and sensible cooperation between scientists, naturalists and city authorities, it is possible to avoid conflict emerging at the interface between the needs for spatial development and the need to protect biodiversity in urban areas.
The information on the occurrence of European hamster within the administrative boundaries of the city of Kraków comes from various sources such as reports from residents, recorded cases of hamsters killed on roads, nature inventories carried out for environmental impact assessment reports and targeted inventories of the species carried out as part of scientific research.
The number of European hamster sites that have been recorded in Kraków is 13, most of which are located in the eastern part of the city, i.e. east of the S7 expressway. These are certainly not all sites where the species occurs. The known sites in the western part of the city are already mostly isolated from other European hamster sites, and the process of isolation is continuing. The sites in the eastern part of Kraków are located in areas used for agricultural purposes and intended for development of industrial and residential zones. The hamster has not been taken into account in many of the previous investments carried out in Kraków. In the near future, efforts must be made to create compensatory habitats where hamsters will be resettled from areas threatened with destruction and which can be used as places for education about biodiversity in the city.

Awareness of the common hamster in Poland – results of survey research (2021-2023)

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In the years 2021-2023, a research survey about the common hamster was available online. 1094 people from all over Poland took part in the survey, of which 1,4% did not recognize species on the included photo, and did not continue the survey. In the voivodeships, where the hamster is absent, the percentage of such people was twice as high. 969 people answered in another part of the survey. 38,2% stated that the common hamster lives in their city/village, while 5,4% answered that the hamster used to live in their area. Those two groups of people (group "A" n=422) were asked if they think the hamster is a pest. About 20% admitted that they have no opinion on that subject. More than 65% stated hamster is not a pest for them, while 12,4% stated that it is a pest and they based their opinion on personal experience. Of all people from group "A", 77% had knowledge that this species is endangered. Only 11% of people knew proper IUCN conservation status. Respondents asked if they knew any positive aspect of hamster's occurrence in the environment, mainly described hamsters as a part of biodiversity, an element of the trophic chain, or an umbrella species. 11% of people could not name any positive aspect of hamster presence in the environment, there were also sarcastic comments that f. ex. hamster is an attraction for cats. Group "A" was also asked what are the threats to the common hamster. The most often answers were predation, also of uncontrolled cats and dogs (32% of all pointed threats). As an important reason for the common hamster's decline, respondents indicated an agricultural intensification (14,2%). Similarly often (7-9%) group "A" indicated threads such as investments, urbanization, development of rural areas, chemicalization of the agricultural environment, and killing on purpose hamsters by farmers and garden owners.
Results of survey research indicate the need for further educational activity and change the image of the species as a pest.

Can captive-bred Common hamsters (*Cricetus cricetus*) reproduce in the wild in their first year? New perspectives for restocking programs

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Population dynamics play a fundamental role in conservation efforts, with individual recruitment being a critical component. While current restocking programs aim to optimize population growth, the selection of individual for release often lacks scientific evidence, particularly due to the challenge of conducting tests on vulnerable species. For the "Critically Endangered" Common hamster (*Cricetus cricetus*), one-year-old captive-bred individuals are commonly released but face high mortality rates in the weeks following the release and show relatively low reproduction rate, probably due to the difficulty of adapting to a new environment. In contrast, because young individuals display higher behavioural plasticity, they could adapt faster and thus be optimal candidates for restocking programs. However, the release of animals unable to reproduce may jeopardize restocking programs success. In this study, we investigated the reproductive success of 1.5- and 3-month-old (MO) female captive-bred Common hamsters after release, respectively in 2021 and 2022. Genetic analysis and field data (camera traps and trapping sessions) enabled us to determine parentage lineage between pups born in the wild and their released mothers. 3MO and 1.5MO females reproduced successfully, but only the 3MO were able to rear a second litter. The birth date of their first litter was around 30 days post-release in both groups (3MO: 31.4 ± 5.9, 1.5MO: 30.2 ± 4.08), given an estimated mating date around 10 days post-release. These findings indicate that released captive-bred hamsters reach sexual maturity around 47 days after birth and contradict previous claims that Common hamsters could not reproduce during their birth year. The release of young individuals could have advantages in improving the success of restocking programs. However, further studies are needed to compare their respective survival and reproduction rates between these groups and older individuals to assess their overall role in population recruitment in comparison to one year-old females.

A potential 4th litter per season for the European hamster? Body temperature monitoring as a way to determine parturition dates

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In the past, several field studies investigated reproductive performance in female common hamsters *Cricetus cricetus*. However, to our knowledge, there is no method to precisely measure parturition dates in free-living hamsters. Body temperature (T_b) as an indicator for parturition is well documented in several mammals. Therefore, we used T_b variations to identify parturition in common hamsters. Using intra-abdominal data loggers, we studied the T_b pattern of 4 laboratory control and 32 free-living adult female hamsters during their reproductive season. We observed a decrease in daily ΔT_b (difference between day and night T_b) during the last week of gestation, followed by an 1°C elevation in mean T_b at parturition. For controls, estimated and observed birth dates successfully matched, thus showing that T_b monitoring is a reliable method to detect parturitions. By applying this method to free-living females we observed up to four litter per female and per year. However, these litters were smaller and did not allow a higher reproductive success than in females having three litters.

Getting a better grip on population dynamics of Common hamster in The Netherlands via non-invasive genetic monitoring

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Wild populations of Common hamster (*Cricetus cricetus*) currently occur at four locations in the south of The Netherlands, yet yearly release of individuals from a breeding stock are required to sustain the populations. Although populations have been monitored in past years using various methods, certain aspects of their demography that may explain limited population growth, including litter size and variation in survival rates among age classes, remain uncertain. Starting in 2023, we will therefore augment existing field monitoring using radio transmitters with a multi-year genetic study based on non-invasive samples (hairs). Hair samples will be collected at the entrances of all discovered burrows each spring and individual genetic profiles gained from these samples will be compared with those obtained from similar samples the year before, as well as genetic profiles of released individuals. To increase potential for individual recognition, a new analysis method will be implemented based on high-throughput sequencing of SNP (single nucleotide polymorphism) markers.

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