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MATE

EURORACCOON2026

IV. European Raccoon Colloquium

PROGRAMME AND BOOK OF ABSTRACTS

4-6 February, 2026

Gödöllő, Hungary

EURORACCOON
GÖDÖLLŐ, HUNGARY 2026

HUNGARIAN NATIONAL LABORATORY

National Laboratory for HEALTH SECURITY

INVASION BIOLOGY DIVISION

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EURORACCOON is an open, collaborative project aiming to bring together researchers and managers working on raccoons at the European scale covering all aspects of the raccoon ecology. The overall goal of EURORACCOON is to develop evidence-based management of this highly invasive alien species.

EURORACCOON conferences:

- 2023, March 16–17; Lyon, France - 1st European Raccoon Colloquium
- 2024, April 18–20; Pratovecchio Stia, Italy - 2nd European Raccoon Colloquium
- 2025: March 13–15; Vöhl, Germany - 3rd EURORACCOON Meeting
- 2026: February 4–6; Gödöllő, Hungary - 4th European Raccoon Colloquium

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The 4th EURORACCOON Meeting 2026 is organised by the Institute for Wildlife Management and Nature Conservation of the Hungarian University of Agriculture and Life Sciences (MATE), Gödöllő, Hungary.
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We wish a great conference and unforgettable experiences in Hungary for all participants!

Additional information can be found at the website of the event:

https://euroraccoon2026.uni-mate.hu

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PROGRAMME

PROGRAMME

February 4 2026, Wednesday

8:00 Breakfast
9:00 Registration

9:40 Welcome speech (organisers, head of EURORACCOON, head of institute)
10:00 Miklós Heltai: Coexistence and/or Management of Carnivores?
10:20 Francesca Cagnacci: Euroraccoon and Euromammals: recap of opportunities and future perspectives (*REMOTE TALK*)
10:50 Johannes Lang: Interactions of raccoons with other mesocarnivores in Europe derived from camera trapping studies

11:10 Buffet break

11:40 Julia Suchobieska: Interaction of raccoon with other mesocarnivores - Season 2
12:00 Eva Tafforeau: Assessing the predation effects of the raccoon (*Procyon lotor*) in Europe: a literature-based evaluation using semi-quantitative tools
12:20 Jan Cukor: First insight into northern raccoon (*Procyon lotor*) spatial ecology in the Czech Republic
12:40 Krisztián Katona: Spatiotemporal distribution and home range use of raccoon in a Hungarian forest

13:00 Lunch

14:10 Tamara Szentiványi: Rising parasitological risks: the role of invasive raccoons and other carnivore species in Hungary
14:30 Tamás Győrffy: The captive racoon: Their husbandry and lifestyle in the zoo environment
14:50 Maren Kettwig: Animal welfare vs. species conservation: Monitoring of rehabilitated young raccoons after their release
15:10 Jarkovsky Frantisek: Methods for effective monitoring and spreading rate of northern raccoon in Western Bohemia
15:30 Gergely Schally: Spatiotemporal trends of raccoon (*Procyon lotor*) and raccoon dog (*Nyctereutes procyonoides*) populations in Hungary between 1997-2024 based on hunting bag data
15:50 Jean-François Maillard: History, distribution, and scientific questions to be studied regarding raccoons in the French West Indies

16:10 Buffet break

16:40 Alain Frantz: Prevalence, distribution and genetic origin of the raccoon roundworm in Luxembourg
17:00 Péter Fehér: Genetic diversity and population structure of the raccoon (*Procyon lotor*) in Hungary: Findings from the first large-scale genetic survey

17:20 Weronika Baranowska: Diet of raccoon Procyon lotor after 20 years of invasion in bird paradise
17:40 László Szabó: Raccoons on the menu: diet of an invasive species in Hungary

18:00 Outdoor cooking party

February 5 2026, Thursday

7:45 Breakfast

9:00 Bus tour to Ócsa raccoon site

12:00 Packaged lunch

16:00 Arrival back to Gödöllő

17:00 Dinner

18:00 Free time in Gödöllő or Budapest

February 6 2026, Friday

8:00 Breakfast

9:00 Sándor Csányi: The potential and limitations of using hunting statistics in managing invasive species
9:30 Sandro Bertolino: Knowledge gaps and research priorities on the raccoon (*Procyon lotor*) in its native and alien ranges
9:50 Diederik Strubbe: Raccoons in Flanders: current distribution, establishment, and implications for management
10:10 Quentin Watthez: Learning while trapping : Lessons for long-term management
10:30 Pauline Emond: Towards a Management Plan for the raccoon (*Procyon lotor*) in Wallonia: An interdisciplinary regional strategy

10:50 Buffet break

11:20 Mateusz Cieplinski: The litter size of the raccoon in Poland
11:40 Katerina Brynychová: When the natal den is not safe: First evidence of infanticide in the northern raccoon (*Procyon lotor*)
12:00 Magdalena Bartoszewicz: Characteristics of raccoon natal dens on the wetlands of Warta Mouth National Park (western Poland)
12:20 Zsolt Biró: Occurrence of raccoons and other invasive mammal species in Hungarian settlements based on a nationwide survey
12:40 Balázs Bócsi: Raccoon eradication project in Hungary: local or country-wide solution?

13:00 Lunch

14:30 Closing discussion
15:00 END of meeting, free buffet discussion

ABSTRACTS

(in alphabetical order of the presenting Authors)

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Diet of raccoon *Procyon lotor* after 20 years of invasion in bird paradise

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The main environmental impact of the Northern raccoon (*Procyon lotor*) in its introduced range is primarily exerted through predation. Diet analysis is therefore crucial for assessing the level of this impact on native species. As an omnivorous mesocarnivore, the raccoon can pose a threat to many animals. The Warta Mouth National Park (WMNP), located in Western Poland, is a highly valuable wetland area and an important breeding site for many waterfowl species. Throughout 2025, we collected 200 fecal samples for macroscopic analysis of the raccoon's diet composition in the WMNP area. The most important food categories were small mammals (30.9% of the consumed biomass), and birds (15.9%), following by amphibians (7.7%) and fish (8.9%). The most frequent food category (75.5% of the occurrence) were insects, altough they did not contribute significantly to the total biomass consumed, making up only 4,4%. Among the insect remains, wasps and hornets were present in 12% of the samples. Raccoons also preyed on crustaceans (2.1% of the biomass) and, more notably, molluscs – primarily snails, which contributed 14.6% of the consumed biomass and occurred in 62.5% of samples. Raccoons in WMNP also consumed plant foods, detected in 53.5% of samples and accounting for 15.5% of the biomass consumed. In terms of the biomass, this category was dominated by fruits and seeds. We compared this data with results obtained in the same area two decades ago, at the beginning of the raccoon invasion. Despite some differences, the similarity of diet between those periods was relatively high. Many of the observed differences can be explained by potential changes that may occur in the prey population under the influence of global warming. In some cases, the impact on the prey population may also have changed due to climate-driven changes in the environment.

Keywords: diet composition, predation pressure, national park

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Characteristics of raccoon natal dens on the wetlands of Warta Mouth National Park (western Poland)

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Eight raccoon natal dens were discovered by direct finding during research conducted in Warta Mouth National Park in 2025. Birth sites with newborn cubs were found between April 1st and 18th. The newborns were small and helpless, estimated to have been born less than a week before discovery. Camera traps were installed near the dens and operated until the females left with their cubs. Despite visits to the den surroundings every three days, females did not relocate their young. Almost all birth sites were located within tree structures; only one was located in an artifical wooden box designated for ducks. Seven dens were situated in willows (*Salix* spp.), and one in a black alder (*Alnus glutinosa*). Den trees were living and thick (circumference at breast height 117-650 cm), entrances measured approximately 15x15 cm and were located 1,5-8,5 m above the ground. Cavities varied in structure, from enclosed hollows within main trunks to open-topped, hollow stumps and relatively small wooden box. The den lining consisted of wood mulch, while no padding was found in the box. Most natal dens were located in floodplains, where the distance to the nearest water body changed throughout the nursing season. Typical birthing sites in the study area were located in trees distinguished by their thickness or height, surrounded by meadows, pastures and willow thickets. Litter sizes ranged from 3 to 6 cubs. Females moved her cubs 44- 60 days after den discovery, in early June (2nd -10th). Leaving the dens occurred during the day, starting between 9:55 and 13:15 and lasting up to 1,5 hours. Only one female moved her cubs after 39 days, to another hollow within the same tree. In two cases, dead cubs were found under the natal dens: one at the beginning of the breeding season and another just before den abandonment.

Keywords: reproductive biology, birth sites, national park

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Knowledge gaps and research priorities on the Raccoon (*Procyon lotor*) in its native and alien ranges

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Understanding how scientific attention varies across a species' native and alien ranges can reveal important biases in research effort and priorities. We analysed 3,206 scientific articles published on the raccoon (Procyon lotor), distinguishing between studies conducted in its native range (North America, n = 2,606) and in introduced areas (Europe and Asia, n = 600). Each article was classified into ten predefined research topics using ChatGPT, based on the content of the title, abstract, and authors' keywords. In the native range, the three most represented research topics were Diseases, Parasites & Zoonoses (38.6%), Ecology (12.0%), and Wildlife Management (11.4%). In the alien range, the leading topics were Diseases, Parasites & Zoonoses (47.0%), Distribution & Biogeography (10.7%), and Ecology (9.5%). The overall thematic distribution differed significantly between the two areas ($\chi^2 = 37.67$, df = 10, $p < 0.001$). Research in alien ranges was dominated by studies on Diseases, Parasites & Zoonoses, reflecting a strong emphasis on the raccoon's role as a vector of pathogens and its potential risks to wildlife and human health. Conversely, topics such as Behavioral Ecology, Physiology & Biochemistry, and Ecology were comparatively underrepresented. These patterns suggest that while research in the native range covers a broader spectrum of ecological and biological aspects, studies in introduced regions are largely driven by biosecurity concerns. Overall, our results highlight distinct differences in scientific focus across the raccoon's global range. In the alien range, research is dominated by studies on parasites and diseases, whereas studies on ecology and wildlife management are limited. Such studies are needed to support effective, evidence-based management of this widely distributed invasive species.

Keywords: research priorities, literature review, management

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Occurrence of raccoons and other invasive mammal species in Hungarian settlements based on a nationwide survey

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Recently, the raccoon (*Procyon lotor*) is widely distributed in Europe as a result of escaped individuals and introductions. The spread of this invasive animal can threat the native and also the urban ecosystems. The raccoons can prey upon pets, eat the garbage, disturb the people with noise, can damage the buildings and can transmit pathogens or parasites to domestic animals or humans in the settlements. However, we have no reliable national datasets about the urban presence of the raccoons and other invasive mammalian species in Hungary. That is why we performed an online country-wide questionnaire survey among the municipialities about the occurrence, effect and management of the raccoon, raccoon dog (*Nyctereutes procyonoides*), coypu (*Myocastor coypus*) and muskrat (*Ondatra zibethicus*) in 2024. The response rate was about 20 %. Among the respondents 10 % gave positive occurence data about the invasive species. The muskrat was the most often detected species, the nutria was the second one and the raccoon was the third most common species. Raccoons were observed in small villages and also in the capital, Budapest. The individuals of this species were mainly detected in the garden buildings or in the attics, but similarly they were seen in public areas and in forests. Raccoons occurred in the most types of habitats compared to other invasive species. The sightings of the invasive species were always in those settlements where water bodies could be found inside the urban area. The occurrence rate of raccoon and nutria increased between 2022 and 2024. There was only one damage case caused by the raccoon. It seemed that these animals appear very rarely in urban areas in Hungary, probably due to the low Hungarian raccoon population size and the patchy distribution. Therefore, population control measures have been implemented in a timely manner to prevent individuals from causing more damage or problems.

Keywords: urbanisation, human-wildlife conflict, questionnaire survey

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Raccoon eradication project in Hungary: local or country-wide solution?

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The raccoon (*Procyon lotor*) population has increased by 300% in Central Europe since the 1990s. Similarly, in Hungary, the species has been constantly appearing since 1998, with an annual hunting bag of less than 10 individuals for two decades, but exceeding 20 individuals in the last years. Management of the species, preventing its expansion and reducing population density in an early phase by effective methods, is a very actual task. Within the framework of a state-funded eradication programme launched in 2024 and continued in 2025, we aimed to control raccoons with gun and traps in the main occurrence area of the species in Hungary in cooperation with the local hunting association. The area is located about 35 km from Budapest. It is a mosaic of floodplain forests, scrublands, reed beds, wet meadows and agricultural lands. The population control was mainly carried out by the hunters by means of live traps and by shooting at bait sites established for wild boar. During the first period (30 May – 10 October 2024) 23 (throughout the year 32) raccoons were removed by gun or trap; while during the second period (22 May – 15 November 2025) 27 (throughout the year 38) individuals were harvested. Comparing the results of the years we can say that the number of the harvested population increased by 19% (38/32=1.19). Trapping in 2025 was effective (19 captured individuals out of 27), with 3.16/100 trapnights; however in 2024 this value was higher, with 5.03 captures/100 trap nights. This latter meant a 155% increase in the number of hunted individuals compared to 2023. In 2024 the number of shot animals was 7 from 28 hunting occassions, while in 2025 it was 8 individuals / 24 hunting events. Normalising the efforts to hours and comparing the two methods, we found that the effectiveness of hunting by gun was 6,25%/hour, while for the trapping it was 10,06%/hour in 2024 and 8.3%/hour and 6.3%/hour in 2025, respectively. The results indicate that the control programme was successful, it could significantly increase the pressure on the raccoon population. Trapping was effective and represented an important control technique of the raccoons in addition to hunting with firearms. However, the camera trap images and hunters' observations reveal that the culling has only reduced, but not removed, the entire population. Therefore, we expect to continue the programme in 2026, as the population is clearly breeding, and without the intense hunting pressure we can expect the population growth and expansion. Extending the programme to neighbouring areas and additional activities, like research on ranging behaviour, public awareness, education of people, cooperation with different interest group and revision of the legal options of managing the species should be also necessary.

Keywords: population control, culling, trap, trapping, shooting, bait site

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When the natal den is not safe: First evidence of infanticide in the northern raccoon (*Procyon lotor*)

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Infanticide, the killing of dependent offspring, is common throughout the animal kingdom and often serves adaptive purposes, such as increasing mating opportunities or reducing competition. Despite its ecological relevance, it had not been confirmed in northern raccoons (*Procyon lotor*). Here, we present the first clear evidence of infanticide in a free-ranging population of raccoons. Through continuous camera monitoring of a female raccoon and her cubs, we documented how a male raccoon entered their natal den and gradually killed all the cubs despite the female's repeated defensive efforts. This observation provides direct evidence of infanticide in raccoons and highlights its potential role in reproductive strategies or opportunistic foraging. Our findings emphasise the importance of long-term behavioural monitoring to improve our understanding of the ecological function of infanticide and clarify its drivers and prevalence.
The research was funded by the Technological Agency of the Czech Republic (SS07020021).

Keywords: northern raccoon, *Procyon lotor*, infanticide, natal den
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The litter size of the raccoon in Poland

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Raccoons have been present in Poland for at least 50 years. The population continues to expand, and the species is becoming one of the most common mesocarnivores. An important indicator of population dynamics is raccoon litter size. Most available data come from the species' natural range in North America, but in many cases these are based on very small samples. There is little information on litter size in areas where the species has been introduced. The aim of our research was to determine litter size in Poland, where the population is continually growing and occupying new areas. Estimating reproductive rates is important for population management aimed at limiting its size. We collected data on raccoon litter sizes from 2020 to 2025. To obtain as much data as possible, we used several sources of information on litter size: (1) verifiable photographs and videos from camera traps or filmed with a camera, both our own and those published in the press, on television, and on social media (Facebook, YouTube) (77 litters); (2) information about observations of young raccoons obtained during direct conversations and through an electronic survey from people professionally involved in fieldwork related to environmental management, such as foresters, hunters, and naturalists (57 litters). We collected data on 134 raccoon litters. The litters averaged 3.81 ± 1.19 individuals (range: 1–7). These data are consistent with reproductive indices determined by analysing the number of foetuses and placental scars in the Japanese raccoon population. Our results indicate the potential for using diverse data collection methods to estimate ecological indicators, which aligns with the iEcology trend of collecting valuable population data from a large area without costly, time-consuming or invasive research methods.

Keywords: reproduction rate, iEcology, fieldwork

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First insight into northern raccoon (*Procyon lotor*) spatial ecology in the Czech Republic

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The northern raccoon (*Procyon lotor*) is a rapidly spreading invasive species in many European countries, including the Czech Republic. Despite its growing distribution, information on the spatial ecology of raccoons in Central Europe remains limited. In this study, we investigated the total home range size, and habitat preferences of raccoons in two study areas in the Czech Republic using GPS telemetry. The monitoring period lasted an average of 84.9 ± 62.9 days. Our results revealed clear sexual differences in space use. Females had significantly smaller home ranges (74.8 ± 39.6 ha, n = 5, MCP 90) compared to males (688.3 ± 441.5 ha, n = 5, MCP 90). Male home ranges were larger and overlapped with females as well as with other males. Habitat analysis demonstrated a strong avoidance of open areas, with raccoons showing a clear preference for habitats providing cover, such as forests, habitat with water elements and also areas near human settlements. These habitats offer both protection from disturbance and abundant food resources. Our findings provide new insights into the spatial ecology and habitat preferences of raccoons in the Czech Republic. The observed patterns of extensive home range overlap and avoidance of open habitats reflect the species' adaptability to fragmented landscapes and its potential to expand further in the region. Understanding these ecological characteristics is crucial for developing effective management and monitoring strategies aimed at controlling raccoon populations and mitigating their impacts on ecosystems.
The research was funded by the Technological Agency of the Czech Republic (SS07020021).

Keywords: home range, GPS monitoring, Central Europe, habitat
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The potential and limitations of using hunting statistics in managing invasive species

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Effective management of invasive species requires reliable data to monitor population dynamics, spread, and the impacts of conservation and management. In the absence of systematic monitoring, long-term hunting statistics can serve as a proxy for understanding the invasion process. In our case, the comprehensive datasets from the Hungarian Game Management Database contain the necessary data (1997–2024). In Hungary, hunting bag reporting is mandatory and standardized; these data provide an index of population trends and relative abundance over decades, a scale unattainable with localized methods such as camera trapping.

This lecture evaluates the utility of hunting-bag data for analyzing the expansion of the golden jackal (*Canis aureus*), raccoon (*Procyon lotor*), and raccoon dog (*Nyctereutes procyonoides*). The findings presented here were published in peer-reviewed journals. The potential of hunting statistics lies in their spatiotemporal coverage and consistency. These data document the exponential increase and range saturation of the golden jackal, identifying it as a dominant competitor within the European mesopredator guild. Hunting bags allow niche modelling, revealing that anthropogenic food sources (e.g., big-game viscera) and topography are the primary drivers of expansion. Furthermore, for invasive alien species such as raccoons and raccoon dogs, which are currently in a "lag phase" of invasion, hunting bags are the sole indicators of presence and distribution.

However, relying on hunting bags has limitations. Data quality depends on sampling effort, such as the number of hunters, game management priorities, and limited information on hunting pressure, which can introduce detection biases. For example, high harvest numbers may reflect temporary resource surges rather than true habitat quality, and zero counts may indicate non-detection rather than actual absence. Moreover, broad regression models based on hunting bags suggest coexistence among sympatric carnivores (e.g., jackals, red foxes, and badgers), but they often lack the detail needed to identify subtle behavioral interactions or local interference competition. Therefore, while data on hunting are essential for large-scale management, they should be used carefully and complemented by behavioral research to understand the dynamics of biological invasions better.

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Towards a management plan for the raccoon (*Procyon lotor*) in Wallonia: An interdisciplinary regional strategy

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First observed in Belgium in 1986, the raccoon (*Procyon lotor*) has gradually spread from the German and Luxembourg borders. Since the 2010s, its expansion has accelerated significantly, with particularly high densities now observed in southern Wallonia, especially in the Ardennes massif and the Gaume region. In response to this spread, the Walloon administration commissioned in 2024, following a public tender, an interdisciplinary research group from the University of Liège — bringing together expertise in biology, environmental science and management, humanities, and technical sciences — to elaborate a management plan for the raccoon.

The objective of this initiative is to define a regional management strategy supported by an operational plan that is both technically and legally robust, and that could be formalized through a Ministerial Decree or a Decree of the Walloon Government. The plan aims to: (1) compile and analyse all available data on the distribution, ecology, and population dynamics of raccoons in Wallonia and neighbouring regions; (2) identify the means, actors, and existing control measures; (3) propose several management objectives reflecting different levels of ambition; (4) design and assess alternative management strategies in consultation with stakeholders; and (5) draft, based on the selected strategy, a management plan accompanied by an environmental impact assessment.

This presentation will highlight the current progress of this work and the first strategic orientations adopted by the Walloon administration.

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Genetic diversity and population structure of the raccoon (*Procyon lotor*) in Hungary: Findings from the first large-scale genetic survey

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The raccoon (*Procyon lotor*) is an invasive carnivore in Europe, introduced intentionally and escaping from fur farms. Although its Hungarian population remains relatively small, long-term monitoring indicates a gradual increase in abundance and distribution. Given the species' ecological impacts - competition with native fauna, predation pressure, and its role as a potential disease vector - genetic assessment is essential for understanding its establishment dynamics and informing management strategies.

This study analysed raccoon individuals collected across Hungary. Genomic DNA was extracted from muscle tissue, and ten previously published microsatellite loci were adapted and optimised for multiplex PCR. Genetic diversity metrics were calculated in GenAlEx. Population structure was inferred using Bayesian clustering (STRUCTURE) and Principal Coordinate Analysis (PCoA), while kinship relationships were examined with Colony2 software.

The Hungarian raccoon population displayed moderate genetic variation, with allele numbers ranging from 2 to 6 per locus. Observed and expected heterozygosity values were comparable (H_O = 0.54; H_E = 0.54), indicating a genetically viable population without clear signs of inbreeding. STRUCTURE analysis supported the presence of two genetic clusters: one dominated by individuals from the Ócsa region, and another composed of samples of mixed or uncertain origin, including several from the Tisza River region. Two individuals showed admixed genetic profiles, suggesting recent or ongoing gene flow between clusters. Kinship analysis revealed a well-defined family unit comprising two putative parents and six offspring, all originating from the Ócsa area. This provides direct evidence of local reproduction and long-term establishment. Overall, the results demonstrate that the raccoon population in Hungary possesses sufficient genetic diversity to sustain further spread. Continued genetic monitoring will be essential for tracking invasion processes, identifying source populations, and supporting evidence-based wildlife management and biosecurity measures. The study was funded by the National Research, Development and Innovation Office in Hungary (RRF-2.3.1-21-2022-00006).

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Prevalence, distribution and genetic origin of the raccoon roundworm in Luxembourg

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The raccoon roundworm (*Baylisascaris procyonis*), a gastrointestinal nematode parasite of the raccoon (*Procyon lotor*), is the causative agent of a zoonotic disease that can cause severe neurological sequelae and even fatal cases. The parasite is now established in Europe and, while not present in all raccoon populations, it is currently expanding its range. Understanding the geographic distribution of the roundworm is a necessity for public health. Following the first confirmation of *B. procyonis* in Luxembourg in 2023, we examined the intestines of 70 raccoons collected across the country in 2024 to assess the parasite's distribution. The roundworm was found to be widely distributed, with an overall prevalence of 37.5% across all animals and 52% among adults. No clear geographic clustering of infections was detected. We will present population genetic analyses conducted to identify the geographic origin of the Luxembourg *B. procyonis* population. These findings highlight the need for increased awareness among wildlife practitioners, hunters, and others who may come into contact with raccoons, given the potential public health risks associated with this emerging zoonotic parasite.

Keywords: raccoon, *Baylisascaris procyonis*, expansion, Europe, population genetics, zoonotic risk

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The captive racoon: Their husbandry and lifestyle in the zoo environment

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As with many European countries, racoons (*Procyon lotor*) have appeared in Hungary in the last few years/decades with their population seeming to increase as time goes on. Due to their incredible adaptability and fast reproductive rate, it is very important to monitor the species and learn more about their behaviour.

Racoons are often kept in zoos worldwide for various reasons, educational purposes and their popularity with the public are the main reasons. Racoons can be perfect ambassadors for education and wildlife conservation mainly because they are very interactive, intelligent and energetic animals.

Although the racoons are not endangered, keeping them in zoos can be very beneficial because they can help to bring the natural world closer to people. Public feeding times or training and enrichment demonstrations are very popular attractions for many visitors. As well as this these are very important tools for zookeepers to keep the animals healthy and well stimulated.

The other major reason for racoons being in captivity is the need for wild rescue and rehabilitation. Zoos or other animal sanctuaries provide a safe haven for those animals who cannot survive in the wild. As a wildlife sanctuary, our job is to understand the rescued animals needs and behaviour. By observing their day-to-day life and the seasonal changes in their activity, food intake, forging behaviour, we will be better able to understand the species in the wild.

In Hungary, racoons are classified as an invasive species. Therefore keeping them in zoos and wildlife sanctuaries is strictly regulated. A special license is required in order to keep them captive legally, and all racoons held in captivity must be spayed.

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Coexistence and/or management of Carnivores?

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The negative perception of predatory/carnivores species, persecution, and often unjustified hatred, are based on external factors such as helplessness, individual ignorance (lack of knowledge), protection that does not take into account distribution, population changes, and the true ecological role and impact, as well as the lack of conscious data-based management. The situation is further exacerbated by the fact that nature and species conservation based on animal welfare attitudes (so-called compassionate conservation) regularly uses the concept of "coexistence" in the case of typically conflictual species, such as predators. The problem with this is that the concept is suitable for describing or characterizing a positive or, at worst, neutral relationship. The relationship between humans and predators is generally not like this, but rather conflictual. Therefore, those directly affected do not understand what someone means when they talk about peaceful coexistence with predator species, even if it is not explicitly stated but implied. The use of this concept simply misleads social groups that are not involved in the issue. The management of predator species is also influenced by its more detailed objectives. It matters whether:

- we want to reduce the pressure of huntable predators on protected or huntable prey species populations;
- we want to reduce the pressure of protected predators on protected or huntable prey species populations;
- we want to reduce the presence and impact of protected or huntable predator species that are likely to be competitors in order to protect protected predator species.

From a wildlife management (and nature conservation and social) perspective, predator species should be assessed based on their actual impact rather than their diet or the status of potential prey species populations. Their protection or huntability should be based on this impact and on continuously monitored distribution and population changes. Both large and medium-sized predator species have a demonstrable negative impact on certain prey species. The negative impact is stronger in the case of prey species in a poorer conservation status. With informed, controlled, and effective predator management based on appropriate baseline data, we can have a positive impact on prey species populations. Future predator management must also be evidence-based.

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Methods for effective monitoring and spreading rate of northern raccoon (*Procyon lotor*) in Western Bohemia

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The northern raccoon (*Procyon lotor*) is considered one of the most significant and adaptable invasive species in Czechia. In recent years, its aggressive spread has been documented across Central Europe. Due to its omnivorous diet, the species has the potential to negatively impact native birds, reptiles and amphibians. Despite these risks, systematic monitoring of its spread has been lacking in Czechia. This study monitored raccoon presence between 2022 and 2025 in the eastern part of the Karlovy Vary district. During the spring months, 102 camera traps, supplemented by scent bait, were positioned near watercourses within an area of approximately 200 km². The effective exposure time appears to be about one week, or at minimum five days, as most initial detections occurred by day three. A Bayesian multi-season occupancy model was developed to account for imperfect detection and estimate colonisation and local extinction. Because spatial autocorrelation was detected in camera-trap detections, though declining with distance, a Gaussian Process (GP) spatial random effect was incorporated into the initial occupancy component. The GP term explained about 52% of the variance, and spatial correlation was determined to be short-ranged, with an effective range estimated at 972 m. This local clustering suggests that raccoon occupancy patterns are primarily driven by fine-scale mechanisms, such as dispersal or local resource availability. If a site was occupied, there was approximately a 50% chance that a camera trap would detect raccoons per occasion ($p = 0.524$, CrI = [0.485, 0.563]). Posterior estimates showed increasing occupancy from 2022 ($\psi = 0.524$, CrI = [0.430, 0.618]) to 2024 ($\psi = 0.645$, CrI = [0.557, 0.730]), followed by stabilisation in 2025 ($\psi = 0.642$, CrI = [0.548, 0.732]). To improve predictive accuracy, the model is being extended to include site-specific environmental covariates, allowing assessment of ecological drivers of colonisation, persistence and detectability.
The research was funded by the Ministry of Agriculture of the Czech Republic (QL24020333).

Keywords: invasive species, non-native species, camera traps, occupancy, biological invasion

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Ranging behaviour and activity pattern of raccoon in Hungary

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The raccoon (*Procyon lotor*) is an invasive mammal that has established a stable population in central Hungary. We aimed to describe the occurrence, distribution and temporal activity of the species there. For this purpose, 20 camera traps have been continuously operating in the area since October 2023 at baiting and wallowing sites for wild boar. Photos taken on raccoons were analysed by the end of October 2024. Furthermore, we equipped the first raccoon (an adult male) in Hungary with a GPS-GSM transmitter and tracked it for four months between March and July 2025. The raccoons were detected by our camera traps at almost all places of the study area (19 of 20 camera sites) taking 2529 photos and registering 1019 visits during a whole year study period. The species was characterised by high activity in October-November and very low activity in December-January, with a daily activity pattern showing a nighttime activity peaking after the sunset period and with a low daytime activity. We could frequently detect groups of raccoons (more than one individual on 25% of the photos), even six of them together, or feeding individuals near to wild boars or deer (9% of photos with other species; 72% of them with wild boar, 24% with roe deer). The tracked individual used a relatively large home range covering more than 300 ha between March and July. The average displacement distance between two consecutive locations was 849 ± 612 m; with a maximum of 3617 m. Control of the raccoon population, which we have been intensively targeting for two years in this area, is a fundamental task to prevent the dispersion of individuals and further expansion of the species.

Keywords: radiotelemetry, home range, camera trap, daily activity, seasonality

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Animal welfare vs. species conservation:

Monitoring of rehabilitated young raccoons after their release

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The increasing number of healthy orphaned young raccoons found in Germany has created a conflict between animal welfare and species conservation. As euthanasia of healthy animals is legally restricted and publicly opposed, most orphaned raccoons are admitted to wildlife rescue centres. Here they must remain in captivity for life and such places are scarce. Rehabilitating and releasing them could alleviate welfare concerns with minimal impact on conservation, given the large raccoon population in Germany. However, such a measure is only justifiable if post-release survival is comparable to that of wild raccoons. In this study, 15 orphaned raccoons (seven females, eight males), aged 4–6 weeks, were raised in three rescue centres using standard methods and later released. Prior to release, all animals were sterilised (n = 3) or spayed (n = 12) and equipped with GPS-GSM transmitters (93 g, Model MTNR-50 4G, Ornitela, Lithuania). Survival was monitored for six months, and carcasses of deceased animals were examined. Two raccoons were excluded due to insufficient data. Of the 13 individuals evaluated, only three survived the six-month study period, resulting in a survival rate of 23% (95% CI = 0.06–0.47). Main causes of death included metabolic disorders, hunting, and traffic accidents. Three raccoons died within three weeks, and six more within six weeks after release. The survival rate was substantially lower than that of wild raccoons of comparable age described in the literature. Consequently, releasing rehabilitated young raccoons using current methods is considered ethically unacceptable from an animal welfare perspective. Further studies are needed to investigate the survival of young raccoons using alternative methods. Until then, euthanasia of such animals may be justified under animal welfare law. As similar conflicts may occur in other countries with expanding raccoon populations, management decisions should rely on scientific evidence rather than emotions.

Keywords: animal welfare, management, rehabilitation

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Interactions of raccoons with other mesocarnivores in Europe derived from camera trapping studies

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Invasive alien species are among the leading threats to global biodiversity, often competing with native fauna for limited resources. In Central Europe, the North American raccoon (*Procyon lotor*) has expanded its range and increasingly overlaps with native mesocarnivores such as the red fox (*Vulpes vulpes*), European badger (*Meles meles*), European wildcat (*Felis silvestris*), stone marten (*Martes foina*) and pine marten (*Martes martes*). We used camera-trap data from three forest areas and the Kellerwald National Park in Hesse, Germany supplemented by data from the European citizen science project "Snapshot Europe", to analyse spatial and temporal niche overlap between raccoons and native mesocarnivores. Presence/absence matrices and Pianka's index were used to assess spatial overlap, while temporal activity patterns were analysed using kernel density estimates and D̂-overlap statistics. Co-occurrence was further evaluated with C-score null model analysis. The relative activity index (RAI), indicated a substantial presence of raccoons across the study sites, positioning it among the most active mesocarnivores in the monitored areas. Spatial niche overlap was found to be generally low to moderate (highest between raccoons and badgers, P = 0.20), while temporal activity overlap was found to be high across most species (e.g., badger D̂4 = 0.868, Stone marten D̂1 = 0.852). Observed C-scores were consistently lower than expected under random distribution, indicating aggregation rather than spatial avoidance. The results demonstrate a high degree of temporal overlap of raccoons with native mesocarnivores in Germany, but a low degree of spatial overlap. Despite the occurrence of shared activity periods, there is no evidence for spatial exclusion or displacement. C-score analysis supports non-random co-occurrence, pointing toward coexistence or shared habitat use rather than avoidance behaviour. These findings imply that competition, if present, may be subtle and mediated through fine-scale behavioural adaptations rather than direct exclusion.

Keywords: invasive alien species, temporal overlap, spatial overlap, competition, coexistence

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History, distribution, and scientific questions to be studied regarding raccoons in the French West Indies

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The French West Indies islands (Martinique, Guadeloupe, Saint-Martin and Saint-Barthelemy) in the Caribbean have experienced significant declines in biodiversity due to human pressure, including the increasing introduction of non-native species. The northern raccoon, *Procyon lotor*, was introduced to the Ile de la Guadeloupe during the 19th century, and during the 20th on the Martinique and Saint-Martin islands. However, information on its distribution within these islands and impacts on local biodiversity, particularly on endemic species, is lacking.

The distribution of raccoons in Guadeloupe (2018) and Martinique (2018 and 2025) has recently been determined using unbaited camera traps placed in various habitats. Co-occurrence with other introduced and native mammals has been assessed, and the raccoon appears to be expanding on the latter island. The differences between Guadeloupe and Martinique may reflect the introduction history of the species and its former legal protected status in Guadeloupe where it was previously considered a native and endemic species, although genetic studies have shown that these populations belong to the northern raccoon. The impacts on native biodiversity remain unknown in both Martinique and Guadeloupe, and the agricultural impacts appear to be non-negligible, particularly in market gardening.

Outside its temperate habitats, whether in its natural areas or in those where it has been introduced, the biological parameters and population dynamics of raccoons have not yet been studied in tropical latitudes. Further research appears necessary, including studies on potential health risk.

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Spatiotemporal trends of raccoon (*Procyon lotor*) and raccoon dog (*Nyctereutes procyonoides*) populations in Hungary between 1997-2024 based on hunting bag data

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During the last three decades, populations of medium-sized predators have increased in Hungary. Our study analyzed changes in hunting bag data and spatial distribution of two invasive alien species, the raccoon and the raccoon dog, based on annual game management reports from 1997 to 2024, obtained from the National Game Management Database. For spatial analysis, we used a UTM grid system (10 × 10 km) covering the country. Our findings confirmed increasing trends both in the hunting bag and the area (number of grid cells) covered for both species. From the first (1997–2001) to the last (2020–2024) 5-year period studied, the average annual hunting bag has increased (raccoon: 0.4 → 22.9 ind/year, raccoon dog: 3.1 → 14.7 ind/year), and the average number of cells with hunting bags also expanded significantly (raccoon: 2.0 → 13.0 UTM cells/year, raccoon dog: 5.8 → 26.4 UTM cells/year). These trends and the size of suitable habitats suggest a further spread and population increase, posing challenges for wildlife managers and nature conservationists.

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Raccoons in Flanders: current distribution, establishment, and implications for management

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In Flanders, raccoon (*Procyon lotor*) occurrence has shifted over the last decade from scattered, isolated records to a pattern consistent with a self-sustaining population. Earlier observations (1980s–2000s) were predominantly single individuals, often attributable to recent escape or illegal keeping, without evidence of reproduction. In contrast, data now document a steady increase in occupied grid cells. Reproduction has been confirmed in each Flemish province, with multiple cases of lactating females, juveniles, and family groups. By integrating these sources, the current situation can no longer be interpreted as incidental presence: raccoons are established across Vlaanderen. This expansion poses immediate management questions. It is unlikely that Flanders can remove or prevent recolonisation without coordinated action beyond its borders. At the same time, a laissez-faire approach risks local impacts, including predation on sensitive fauna, nuisance around settlements, and zoonotic concerns. The challenge is thus to define where and when intervention is justified. A central requirement is robust, spatially explicit monitoring, particularly in nature reserves, riparian systems, and other sensitive habitats, so that managers know where and when the species occurs and can anticipate potential impacts. A discussion is needed on the feasibility, proportionality, and long-term practicality of different management approaches, given the species' current establishment and likely continued expansion.

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Interaction of raccoon with other mesocarnivores - Season 2

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Competition for food resources between the raccoon *Procyon lotor* and native mesocarnivores is not sufficiently understood. The aim of our study was to determine whether aggressive behaviour occurs between these species and whether the presence of raccoons influences the use of feeding grounds by other species. Observations were carried out in a sparsely populated rural area surrounded by extensive forests. The observation site was located near periodically inhabited buildings on the Pliszka River within the Natura 2000 site 'Dolina Pliszki' in western Poland. We monitored mammal activity from June to October 2025 (96 nights) at an open kitchen waste composting site using camera traps. We analysed 8,813 photographs and videos of mesocarnivores. We recorded the presence of six mesocarnivore species: red fox *Vulpes vulpes*, raccoon, stone marten *Martes foina*, domestic cat *Felis catus*, badger *Meles meles*, and domestic dog *Canis familiaris*. We observed the activity of two foxes, a female raccoon with four cubs and two additional adult raccoons, a female stone marten with four cubs and one additional adult, three cats, one badger, and, incidentally, three dogs. Observations of more than one species were frequent, including simultaneous feeding in close proximity. Interactions between raccoons and other predators were mostly not associated with aggressive behaviour. Females with cubs tend to avoid other species. Foxes showed aggression towards martens. However, when young martens played near feeding sites, foxes stopped feeding and left the area. Overall, interactions between raccoons and other predators were rarely aggressive. Nevertheless, raccoons seldom retreated from other species, maintaining a relatively high rank in the feeding hierarchy.

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Raccoons on the Menu: diet of an invasive species in Hungary

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Raccoon (*Procyon lotor*) was introduced to Eurasia from North America in the 1930s for the purpose of fur breeding, hunting and for domestication. The first raccoon was shot in 1998 in Hungary. Trend of the hunting bag shows a slow increase since then, although the number of officially shot animals has been relatively low in the last decades (less than 20 individuals annually). Due to the occasional occurrence and low population density no research has been conducted neither on the biology nor its possible effects on the native species so far. Preliminary field observations by hunters proved that raccoons regularly visit the wild boar baiting sites and feeders. Furthermore, our camera trap study revealed that they searched artificial nests and carried the eggs away. Therefore, the purpose of our recent study was to describe and evaluate the feeding habit of this mesocarnivore by stomach analyses. Carcasses (n=24) were collected by the help of hunters country-wide. After the autopsy and analyzing the stomach content frequency of occurrence (FO%) and biomass (B%) were calculated. Raccoons are predatory species, but in terms of their diet they are omnivores. Results show that raccoons most frequently consumed arthropods, plant parts and corn. Although these food components were presented with a high frequency (around FO=50% separately) the biomass of the food compositions were low (arthropods B=2%, plant parts B=1,3%) except the biomass of corn (B=54%). Moreover fruits, small mammals, birds, amphibians, molluscs and reptiles were also consumed (FO< 30%, B<20%). Various diet (9 dietary elements) was shown reflecting its opportunistic feeding strategy. With a low sample size significant differences were revealed between sexes and age classes. The diet composition showed high diversity and proved wide range of food. Our first results show that this invasive species could have negative impact on native flora and fauna in Carpathian Basin by its varied feeding habit.

Keywords: food habits, predation, diet analysis

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Rising parasitological risks: the role of invasive raccoons and other carnivore species in Hungary

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Wild carnivores are important reservoirs of parasitic nematodes and other zoonotic pathogens with substantial veterinary and zoonotic relevance. However, the role of invasive carnivores, particularly raccoons and raccoon dogs, in parasite circulation remains poorly understood in Europe**.** We molecularly screened 371 native and invasive carnivore individuals across six species in Hungary (e.g., red foxes, badgers, golden jackals, raccoons, raccoon dogs, and beech martens) using COI and S12 molecular markers, detecting *Dirofilaria immitis*, *Crenosoma vulpis*, *Angiostrongylus vasorum*, *Thelazia callipaeda*, and *Spirocerca lupi*. Badgers (32.0%) and red foxes (15.7%) showed the highest prevalence, but invasive raccoons also exhibited notable infection rates (13.2%)**,** highlighting their potential epidemiological importance. *Dirofilaria immitis* was one of the most widespread species, occurring in four host species and representing the first confirmed infections in Hungarian badgers and invasive raccoons**,** expanding the known host range of this parasite in Central Europe. *T. callipaeda* was recorded

in red foxes and an invasive raccoon dog**,** constituting the first sylvatic host reports of this zoonotic eyeworm in Hungary. The detection of *C. vulpis* in raccoons indicates that invasive carnivores may act as incidental carriers of endemic nematodes. These results show that invasive carnivores, especially raccoons and raccoon dogs, may harbour high parasite burdens and affect local parasite networks more strongly than previously assumed**.** Importantly, beyond the nematodes identified here, these species may also serve as reservoirs for other zoonotic pathogens**,** indicating the need for further investigation.

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Assessing the predation effects of the raccoon (*Procyon lotor*) in Europe: a literature-based evaluation using semi-quantitative tools

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In Europe, the raccoon (*Procyon lotor*) is listed as an invasive alien species of concern by the European Union under Implementing Regulation (EU) 2016/1141, adopted pursuant to Regulation (EU) No. 1143/2014. Although many concerns have been raised about its impact on native wildlife, these impacts have rarely been assessed through an evidence-based approach. As part of the development of a management plan in Wallonia (Belgium), this study aims to identify the native species most likely to be affected by raccoons to propose appropriate management and protection measures. An extensive bibliographic review encompassing both peer-reviewed and grey literature from the raccoon's invaded and native ranges. In its native range, raccoon populations have reached high densities in recent decades, largely due to access to anthropogenic food subsidies. The EICAT framework was used as a reference to evaluate the effects of ecological interactions at the individual, population, and species levels in non-native areas. Moreover, a complementary scoring system was developed specifically for this study to better reflect local ecological contexts. In addition, the Harmonia+ tools was also used to provide a more comprehensive assessment of raccoon's impacts. The results show that the majority of studies on raccoon predation effects originate from its native range in North America, whereas only a few have been conducted in Europe. Raccoons affect several taxonomic groups, particularly birds, reptiles, amphibians, mammals, mollusks, and insects. However, the methodological robustness and confidence level of many studies were often limited, due to a lack of direct evidence, confounding effects, and inadequate spatial or temporal scales. Work carried out in its native range appears to be more robust, mostly due to the general availability of ecological background data and longer experienced research. Although the limited number and quality of studies make it difficult to draw conclusions at the landscape scale, growing evidence point to local-scale ecological impacts in Europe. It is therefore essential to initiate long-term research on ecological effects of raccoons, using more rigorous methodologies to better quantify their impacts and to inform adaptive conservation and management strategies in the coming years.

Keywords: Literature review, semi-quantitative tools, biodiversity effects

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Learning while trapping: Lessons for long-term management

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In Wallonia, several large-scale initiatives aim to locally curb the demographic expansion of the raccoon. Through close collaboration with field practitioners, the Public Service of Wallonia wants to make the most of ongoing trapping campaigns by collecting comprehensive biological and spatial data.

The goal is to turn each capture into a valuable data point. This could help to assess the cost–benefit ratio of different management strategies, and better understand the ecological and operational implications of control efforts.

In this presentation, the results of two trapping campaigns implemented under different management strategies are presented.

The first involved intensive and methodic control actions concentrated over short periods, while the second relied on continuous, year-round background trapping. We compare the outcomes of both approaches, highlighting their differences, respective advantages and drawbacks, as well as the logistical challenges encountered during implementation.

Is the fight against raccoon expansion an endless struggle? While complete eradication of raccoons is widely considered unrealistic, data collected through trapping provides valuable insights for refining management strategies, with the goal of maintaining the population at a low level.

The challenge now is to learn from experience, adapt our methods to local realities, and build the foundations of a long-term, sustainable management approach.

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