

European mink news 2022

CONSERVATION ACTIVITIES ACROSS EUROPE TO SAVE THE MOST ENDANGERED EUROPEAN CARNIVORE



CONSERVATION ACTIVITIES PER COUNTRY

This is the fourth edition of the European mink (*Mustela lutreola*) newsletter. The input for the newsletter was delivered by conservationists from Estonia, Romania, Germany, France and Spain who have been working on the conservation of European mink for many years. It gives a short overview of the conservation activities that were carried out in the different countries during the year 2022. The aim of the newsletter is to reach a broader public in order to create awareness and support for the conservation of this small carnivore on the brink of extinction. The keywords for this year's newsletter are new translocations, captive holders and breeding centers. Saaremaa E-mink project in Estonia has reached the phase of mink translocations. Two new institutions in France have joined the European mink captive breeding programme. And new mink breeding facilities are being built in Germany and Spain.



European mink in Danube Delta in April 2022 (trail camera: Viorel Pocora & Chisamera Gabriel)

ESTONIA

Text by Kristel Nemvalts, Grete Nummert, Tiit Maran (Tallinn Zoo); Selve Pitsal, Gennadi Kotsur, Martin Silts (Foundation Lutreola)



European Mink Day on Hiiumaal Island

Tallinn Zoo has organized the European Mink Day for seven years, and so far, it has always revolved around the zoo. This year, since Hiiumaa Island is Estonia's only location with a wild mink population, it was decided to move the E-Day closer to the mink. The European mink conservation team introduced their fascinating work to the local community and shared stories about



European mink day team in Estonia (Photo: Tallinn Zoo)

this elusive creature. The day included many activities for the children as well, e.g. the kids could solve mink puzzles and games, make a European mink badge and participate in the E-mink drawing competition. The most anticipated event of the Mink Day was a visit to the minks' natural habitat on the island. After pushing through a tense forest, everyone could see the minks' pre-release enclosures and try out radio tracking. The sighting of mink tracks and scats by the river, however, was a highlight for many.

European mink captive breeding in Estonia



European mink kit (Photo: Grete Nummert)

In 2022, eight litters were born in the mink breeding center, with 31 pups in total (16 males, 15 females). Two minks were sent to Ranua Wildlife Park in Finland, two to Zoo Decin, and two to Stanice Pavlov o.p.s. (both in Czech Republic).

Three female mink from the EAZA *Ex situ* Programme (EEP) captive population were selected for a new translocation project on Saaremaa island. They were mated at Tallinn Zoo in the spring and transferred to the island's pre-release enclosures at the end of April. This project is discussed further in the following chapters.

Annual mink monitoring on Hiiumaa Island

The year 2022 brought the decline of the European mink population on Hiiumaa Island to the level of 2018. During live-trapping, only one mink was captured, although mink traces were seen in most of the monitored areas. The captured mink was in good physical health. There were 55 search areas, and European mink was recorded in 33 of them (60% of the areas). That is the same as in 2018 and 4% less than last year. Whether the decline in numbers is the beginning of a negative trend or a random fluctuation will be revealed from the results of the 2023 monitoring. In general, European mink population figures have decreased a little since last year. Estimated post-winter minimum number of minks on the island is 55 and maximum 83. The autumn minimum is 138 and maximum 206.

The mink food base was monitored as well. Amphibians show a decrease in their abundance to a lower level throughout the monitoring period. It seems that this is not a random fluctuation but a trend. The number of small mammals has also declined. Although the populations of

European mink and its prey have remained stable for a long time, this recent trend is a bit concerning.

Even though the island is thought to have a viable mink population, different monitoring methods should be further tested, so that the estimations of population numbers would be more accurate. For that, one region on Hiiumaa island, that is known to have a stable mink population, was chosen to conduct a study of monitoring methods. In chosen areas, four different monitoring methods were used: hair traps, trail camera traps, live traps, and trail marks survey. The DNA analysis of the hair from hair traps is to be completed in 2023. However, we know already that out of 33 collected samples, 12 yielded European mink DNA. At the moment, it seems that the old method with trail marks survey, works pretty good for that island as it is well designed at first place. For more consistent data collection, as not all sample areas are equally good for reading trail marks, one would prefer a different method.



Trail camera footage of European mink and fur traps in Hiiumaa

New mink translocation project on Saaremaa Island

A new translocation project was launched in 2019 on a second Estonian island, Saaremaa. First steps included an inventory of suitable habitats, mink food base and predators, and building pre-release enclosures. In 2022, it was time to release the first minks there.

Three pregnant females were brought to the pre-release enclosures in the spring, and in May, two of them gave birth to 7 kits, 14 in total. All the minks were released in August and nine of them got a VHF transmitter to further help with a mortality research. Animals mostly stayed near the water, and consumed crayfish and rodents. Out of 9 animals, 1 was killed by a predator, and no deaths by starvation was registered. Overall we can say that so far first release has been a success.

ROMANIA

Text by Mihai Marinov ("DANUBE DELTA"
National Institute For Research And
Development)



Although there is new information about the presence of the European mink in Romania outside the Danube Delta, there is still no solid evidence to attest its presence in the mountainous areas in the center of the country or in the Danube valley or other large rivers. It is likely that the species is present in Balta Mica a Brailei, W. Prut, W. Danube and some areas in the Carpathians.

Although 29 years have passed since the last European mink was discovered in the Carpathians, we find that the survival of some micro-populations in some areas is possible.

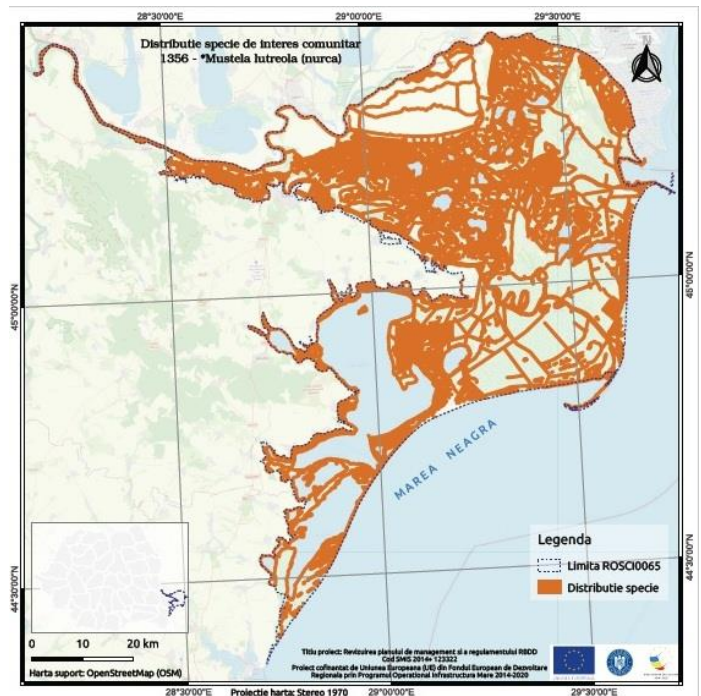
In 2022, an 8.5 million euro project was launched for the renaturation of some areas in the Danube Delta: the construction of 33 artificial platforms, and the construction of two canals over 10 km long, with related platforms.

The construction of these platforms is necessary due to the delay of the floods by approximately two months. They also compensate for the erosion of the banks of the canals by the boats with powerful engines, as a result of the very high increase in tourism traffic.



Artificial platforms in Danube Delta (Photo: Sorin Ivanov)

In another project, the population of the European mink in the Danube Delta (Danube Delta Biosphere Reserve, ROSCI0065) was evaluated. The results show a population of 1470-2320 individuals.



European mink distribution in the Danube Delta Biosphere Reserve

The European mink, although helped by the activities of ecological reconstruction – canal dredging and the formation of banks, is exposed to the changes produced by humans: changes in the climate, changes in land use (conversion of fish farms and ponds to agricultural land, over 13,000 hectares) , the expansion of the built space both within the town and outside the town (including on the only platforms in many areas), the destruction and degradation of riparian vegetation, pollution and intensive fishing, poaching, the use of powerful engines on boats that further erodes the platforms where the minks raise their offspring or store their necessary food reserves over the winter, the introduction of the American mink, the introduction of pathogens by domestic animals and many other forms of impact.

Thus, the current conservation status for European mink is evaluated as unfavourable – bad. Despite this, we are optimistic at least for the near future as a result of the measures taken: the dredging actions and the formation of new elevated river banks, as well as the observed increase in ecological plasticity of the species (the gradual increase in the degree of anthropophilia and feeding more and more frequently during the day).

GERMANY

Text by Eva Lüers (ÖSSM e.V.) and Christian Seebass (EuroNerz e.V.)



Captive breeding in Germany

In 2022, EuroNerz e.V. finished the urgently needed new construction of its mink keeping and mating facility. The first and smaller mating center was built with low budget in 2000. During the following years, many proposals aiming to set up a large breeding facility were not successful. Therefore finally, the old center was replaced by a new building with slightly higher keeping capacity. The facility has now 36 enclosures for keeping, as well as smaller observation enclosures for a controlled mating.

This year, 25 member institutions (zoos and wildlife parks) kept in total 28 mated females. Of these, 15 gave birth to litters with a total of 67 pups.



New E. mink breeding facility in Germany (Photo: Christian Seebass)

Mink monitoring: Steinhuder Meer (ÖSSM e.V.)

In 2022, mink monitoring based mainly on camera traps and a transponder reading device combined with a camera trap. Mink rafts were used to survey eventually immigrating American minks. There are still no detections of American mink within the survey area. This year we had more sightings of European minks than the last three years, but still less than we had once. Additionally, 37 pups bred in EuroNerz, were released to the region around Lake Steinhuder Meer.

SPAIN

Text by Madis Põdra & Asun Gómez (MTERD, Tragsatec)



The year 2022 was eventful in Spain. Several activities were carried out, having great importance for the European mink conservation, both *in-situ* and *ex-situ*.

The removal of American minks

The detection and removal of American mink has been the most important conservation measure across the distribution area of the European mink. Similarly to previous years, mink raft method was used for this. As a result, a few American mink have been detected and captured in the province of Álava (Basque Country) and in La Rioja, mostly in border areas. The situation is similar in whole distribution area of the native mink and in neighbouring territories in Ebro basin: low number of American mink specimen has been captured in Navarre, province of Zaragoza in Aragón and North of Burgos and Soria in Castile and León. Mostly, these are dispersive animals, trying to invade the area from other basins. The reproduction of alien mink in Ebro basin has only detected in a few, isolated cases. Also, the American mink is scarce in Cantabric rivers in North of Basque Country and North of Navarre, thanks to control measures taken place.

Both, administration staff (Ministry and Autonomous Communities) and experts are involved in this action in Spain.



The American mink captured on mink raft. (Photo: Raquel Hernandez)

European mink monitoring in Spain

National monitoring of the European mink was initiated in autumn, with the aim to evaluate its actual distribution and to give more precise estimation about the population size. For this, the hair-trapping was carried out in most of watercourses within the historical range. The next step in this work is the genetic analyses of hair samples, which is planned to be carried out in 2023.

Conservation breeding

It was a good year for Conservation Breeding in Spain. The main effort was done in the two bigger centres, El Pont de Suert and FIEB, although smaller centres as ADEFFA (Barcelona) and Legarda (Álava) also participated in the breeding. A total of 41 pups were born in 12 litters, this is the highest number of pups ever registered in captive-population. One of them died, so that final number of pups was 40. This result allowed to use 30 individuals in release operations: 20 were released in Ebro basin in Alava and La Rioja and the other 10 individuals are planned to release in upper-course of Aragon river, giving continuity to the assisted colonization project there. Due to great drought in the autumn in this part of Spain, it was decided to release this group of mink in spring 2023 when the conditions will be more favourable.

New Breeding Centre in Spain

The construction of the new breeding centre was started in Ribavellosa, in the Autonomous Community of La Rioja. The centre will have space for 50 mink, and also, two large pre-release enclosures will be built. Taking into account the small number of mink in captivity in Spain (50-60 ind. in recent years), the new breeding centre will significantly increase the viability of captive population. The project is financed by the National Parks agency of the Ministry for the Ecological Transition and the Demographic Challenge, and it is planned to be completed in 2024.



Building of new E. mink breeding centre in La Rioja (Photo: Madis Põdra)

FRANCE

Text by Alice MOUTON (University of Liege), Arnaud DAZORD (Zoo de la Bourbansais), Celine BLIN (OFB – French Wildlife Agency), Emmanuel MOUTON (Reserve Zoologique de Calviac), Guillaume ROMANO (Zoodyssée), Madis PODRA (TRAGSATEC), Maylis FAYET (OFB – French Wildlife Agency), Sandrine LEMAIRE (Parc d'Isle), Thomas RUYS (GRIFS – Wildlife association).



Release of European Mink in Spain (Photo: C.Bellanger - OFB)



Cooperation between France and Spain for the conservation of European mink

During September and October 2022, twenty European mink born in captivity were released in Spain (around Vitoria-Gasteiz and on the Ebro river). Other individuals had already been released a few years earlier, but this time two agents from the French Wildlife Agency (members of the French European Mink conservation team) were able to come and benefit from the experience. The acclimatisation enclosures were visited, many subjects were discussed and precious advice was given for future French releases. Big thanks to the Spanish team for this nice welcome, which once again reinforces our already joint actions (e.g. the fight against the American mink on the border) between our two countries!

Extension of the LIFE VISON programme

The LIFE VISON programme, initially 2017-2022, is extended until 30 November 2023. This extension will make it possible, in particular, to finalise the actions to avoid road collisions and the evaluation of their effectiveness on small fauna. With the team of the National Action Plan for the European mink, this extension will also allow the guide explaining how to well taking the European mink into account (habitat management measures, avoid road collisions, regulations to protect it...) to be updated.

Definition of a chromosome-scale reference genome for the European mink

A chromosome-scale reference genome for the European mink has been recently produced during the ERGA (European Reference Genome Atlas) pilot project (<https://www.erga-biodiversity.eu/pilot-project>), from an individual sampled in 2006 in Dordogne (France) by GREGE in the framework of the first National Action Plan for European Mink. A fibroblast cell culture was derived from a skin biopsy of this animal, and then cryopreserved in liquid nitrogen in the Paris National Museum of Natural History cell collection (curated by Bertrand Bed'Hom). This sample has been used by the Genoscope (French National Sequencing Center) to generate high-quality DNA and sequence and assemble a reference genome. Now it will be used for in-depth genomic studies of the European mink, especially estimating runs of homozygosity (ROH), an important index to measure inbreeding in endangered species. The results are expected to be published in a special issue for the ERGA pilot project in 2023.

Synthesis on international translocation experiences in order to define the French translocation strategy of European mink

A Master 2 internship allowed us to gather all the available information on international translocation experiences, through either bibliographic research or interviews with experts. From there, the objective was to identify good and bad methods, then to make proposals for translocation strategies adapted to France. For the choice of the translocation site, the most used criteria are absence of American mink, suitable habitat, sufficient food resources and a high degree of social acceptance. In the majority of cases, the individuals released were from breeding

centres. Different methods have been tested regarding acclimatisation, release periods, monitoring of individuals and they all have their advantages and disadvantages. However, all experts agree that the first two months are the months with the highest mortality and the most movements, justifying close monitoring during this period. Based on these results, the French translocation strategy for the European mink must be written and validated by the competent authorities in order to implement translocations.

European mink in French breeding centers

Two zoos continued to participate in the breeding programme. In Zoodyssée, 3 females and 3 males were selected for reproduction in 2022 but only one male bred with two females, resulting in two litters of two and three healthy kits. Both females displayed the proper rearing behaviour, so consequently there was zero mortality rate. This event was shared on social media and local newspapers. This is the 4th year of consecutive breeding at the center, showing the capabilities of the team and the success of the established protocols. At the moment, there are 32 European minks at the captive breeding center of Zoodysee, 6 males and 26 females, but with limited pairing possibilities.



New-borns in Zoodyssée (Photo: Zoodyssée – CD79)

In Reserve Zoologique de Calviac, a master student, Romane OZENNE, will help Calviac's team to, hopefully, achieve a long-awaited reproduction amongst individuals. Besides, the Reserve works on a trapbox that will help to identify the potential future wild-released animals (through photo, transponder reading, fur). Eventually, the 3rd European mink party will be held late Spring at Calviac.

New members of European mink EEP (EAZA *Ex situ* programme)

Parc d'Isle (France)



Parc d'Isle joined the European mink EEP in 2021, when they received two adult mink from Zoodysee. Unfortunately one of them died the next year due to a tumor of the digestive system. Now, they are waiting to receive a new mink. For the mink enclosures, they have two adjoining wooded enclosures with a pond and a waterfall, all vegetated. Each enclosure has two furnished boxes not visible to the public. The lodges are made up of a layer of thick bark and branches allowing the animals to climb and sleep. The animal is most active during public feeding and medical training.



European mink enclosure in Parc d'Isle (Photo: Parc d'Isle)

Zoo de la Bourbansais (France)



The zoo de la Bourbansais is a 60 yrs old zoo located in west of France. Member of EAZA for more than 20 years, it received the first male mink from Zoodysee in May 2022. To fulfill the EEP recommendations, an old coati enclosure (with a 50 cm deep pond on 1/8 of the total area) was renovated and new education panels were installed.

After more than 6 months, one can say that it's a rather success as the animal is occupying the whole enclosure. He is not completely nocturnal as it has been observed by visitors during the day. The animal is very curious and calm, and it is possible to perform public feedings with him, as he is used to come near the window.



Enclosure of European Mink in Zoo de la Bourbansais (Photo: Zoo de la Bourbansais)

As of the end of 2022, European mink EEP population and the captive population in Spain hold 237 and 70 mink respectively. More mink holders are still needed to keep the captive populations' genetic diversity as high as possible.

Research papers published in 2022

Articles

- Villanueva-Saz, S., Giner, J.; Palomar, A.M., Gómez, M.A., Pödra, M., Aranda, M.d.C., Jiménez, M.d.l.Á., Lizarraga, P., Hernández, R., Portillo, A., Oteo, J.A., Ruíz-Arrondo, I., Pérez, M.D., Tobajas, A.P., Verde, M., Lacasta, D., Marteles, D., Hurtado-Guerrero, R., Santiago, L., Ruíz, H., Fernández, A. (2022). **No Evidence of SARS-CoV-2 Infection in Wild Mink (*Mustela lutreola* and *Neogale vison*) from Northern Spain during the First Two Years of Pandemic.** – *Animals*. Doi: <https://doi.org/10.3390/ani12151971>
- Skorupski, J. (2022) **Characterisation of the Complete Mitochondrial Genome of Critically Endangered *Mustela lutreola* (Carnivora: Mustelidae) and Its Phylogenetic and Conservation Implications.** – *Genes (Basel)*. Doi: <https://doi.org/10.3390/genes13010125>
- Calle, A., Ramírez, M. Á. (2022) **Cryobanking European Mink (*Mustela lutreola*) Mesenchymal Stem Cells and Oocytes.** *Int J Mol Sci*. Doi: <https://doi.org/10.3390/ijms23169319>
- Kisleyko, A. A., Dinets, V., Grishchenko, M. Y., Kozlovskiy, E. E., Khlyap, L. A. (2022). **The European Mink (*Mustela lutreola*) on Kunashir Island: Confirmed Survival 40 years After Introduction.** – *Mammal Study*. Doi: <https://doi.org/10.3106/ms2021-0044>

Preprints

- Croose, E., Hanniffy, R., Harrington, A., Pödra, M., Gómez, A., Bolton, P. L., Lavin, J. V., Browett, S. S., Ruiz, J. P., Arnaez, D. L., Galdos, I., Ugarte, J., Torre, A., Wright, P., MacPherson, J., McDevitt, A. D., Carter, S. P., Harrington, L. A. (2022). **Mink on the brink: Comparing survey methods for detecting a Critically Endangered carnivore, the European mink *Mustela lutreola*.** – *Preprint*. Doi: <https://doi.org/10.1101/2022.07.12.499692>
- Van Leeuwen, P., Schulte-Hostedde, A., Fournier-Chambrillon, C., Fournier, P., Pigneur, L-M., Aranda, C. M., Fermín, U-M., Michaux, J. R. (2022). **A microbial tale of farming, invasion and conservation: on the gut bacteria of European and American mink in Western Europe.** – *Preprint*. Doi: <https://doi.org/10.21203/rs.3.rs-912230/v1>

This newsletter was compiled with the input of many dedicated European mink conservationists. We thank all of them for sharing their knowledge and experience! Everybody who is willing to play part in the conservation of this critically endangered species is invited to contact us.

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