

The European mink (*Mustela lutreola*) in the Danube Delta

Valer GOTEA¹ and Andreas KRANZ²

Abstract

The European mink (*Mustela lutreola*) is considered to be the most threatened terrestrial carnivore in Europe. One of the last strongholds of this species may be the Romanian Danube Delta. However, until recently, the scientific community and conservationists have not acknowledged its existence there. In order to prove the presence of the European mink, preliminary field investigations have been carried out since 1998. The evidence gained so far indicates that European mink inhabit the Delta. It is however uncertain whether this is also true for the American mink. The status of both species shall be investigated systematically. Additionally, a comprehensive study over the following years will highlight the basic ecology and main threats for the European mink.

Introduction

The European mink is the most threatened small carnivore in Europe. This species has been in a rapid decline during the last fifty years (Maran & Robinson, 1996), which is thought to be due to several factors including direct persecution and competition from other small carnivores like the American mink (*M. vison*) or even the polecat (*M. putorius*). The European mink is still present in some European countries. In spite of certain references (Youngman, 1982; Negrutiu, 1983; Nania, 1991), at present there is almost nothing known about this species in Romania. However, the Danube Delta might be one of the last refuges of the European mink. This paper presents some aspects of the Danube Delta as a natural habitat, the results gained with the research done so far, and also plans for the future conservation of this species in the Danube Delta.

Research done so far

From the point of view of the European mink, data from the Danube Delta are very scant or are completely unavailable. Only a few authors (Youngman, 1982; Negrutiu, 1983) mention the presence of the European mink in the Danube Delta. Youngman's evidence is based on skeletons and furs from certain European museums, showing that mink were still caught by local trappers in different regions of the Delta (Murariu cited in Youngman, 1982). Negrutiu's evidence is based on the mink annual harvest in the Delta. He also suggested that the European mink should be protected there. In recent literature, only the possibility that a small population still survives in the Danube Delta is mentioned (Murariu & Ionescu in Maran, 1995). Taking into consideration the rapid decline of the European mink world wide, the necessity for urgent conservation actions and the data above, a pilot study was started in October 1998 with the approval of the Danube Delta Biosphere Reserve (DDBR) authority.

The main objective of this project was to prove the existence of the European mink within the Danube Delta on the base of live trapping. It was also supposed to find out whether the American mink is either present there or not, and to investigate the necessity and possibility to set up a larger conservation project for the European mink in the Danube Delta.

Until now, five field investigations were carried on, as follows:

- October 5 - 10 and November 20 - 26, 1998: investigations on the left bank of the St. Gheorghe branch of the Danube at Km 57 and the area of the Perivolovca channel;
- December 16 - 23, 1998: investigations within Babina and Cernovca polders (Chilia branch of the Danube);
- April 19 - May 3, 1999: investigations in proximity of Uzlina agricultural polder (St. Gheorghe branch of the Danube);
- July 23 - 28, 1999: investigations in Uzlina region (St. Gheorghe branch of the Danube).

During the first two expeditions only basic observations were possible. Field observations continued in December, when live trapping started. In conditions of freezing time and foul weather, live trapping was unsuccessful, in spite of the 70% of the partially or completely eaten bait. In the same time, an undercover investigation of accidentally caught mink was conducted in two villages: Chilia Veche and Periprava.

Live trapping was still unsuccessful during both April and July expeditions. In Uzlina region, mink excrements were abundant in one old willow marsh area, but were absent in another one just one km apart. This might be due to a different hunting pressure of muskrat trappers. In the same time, major aspects for a future larger project were possible to be outlined on the base of all the experience, information and proofs gained so far.

The Danube Delta as a natural habitat for the European mink

With a surface area of about 4152 km² (not considering lagoon complex Razim-Sinoie and the lakes situated north of the Chilia branch), the Danube Delta is the second largest delta in Europe, is among Europe's last largely natural landscapes and one of the world's largest wetland areas.

Although not subject to major interventions by man, the Danube Delta was subject to some measures meant to improve its navigability and agricultural efficiency. However, it still holds an amazing amount of species and the wetland dynamics are still in action. Situated at the intersection of the main European bird migration routes, the Danube Delta is a real paradise for birds, offering breeding, feeding and resting places for large populations of 325 bird species.

One of the most extended ecosystems in the Danube Delta is constituted by the flooded reed beds, which are situated mainly under the sea level. This ecosystem, with the reed (*Phragmites australis*) as the main component, gives a characteristic aspect for the most of the delta territory. Because it is situated under the water throughout the year and because of lack of tree species, this ecosystem might not offer good housing and resting conditions for mink, except the areas where willows are still present. On the other hand, it is very difficult to investigate those areas because of the high and dense vegetation.

Unlike flooded reed beds, floating reed beds offer good breeding, feeding and resting conditions for mink, but their extent is far behind the first ecosystem described. This ecosystem is situated within flooded reed beds or close around the lakes.

Another important ecosystem for mink is constituted by riparian willow formations. These are situated mainly along the Danube branches, and it benefits by the presence of many old willow trees, mainly representing three species: *Salix alba*, *S. fragilis* and *S. pentandra*. The proximity of the Danube, which could offer the possibility of feeding during the strong freezing winter periods, when small channels are completely covered by ice, and the presence of the old willow trees for breeding and resting is thought to allow mink to live there in very good conditions.

However, a great part of these riparian formations have been replaced with poplar plantations (*Populus* sp.) before 1989, in order to increase the wood production in the delta. Fortunately, this process has stopped as well as any other major landuse changes of the Delta, and only actions for ecological restoration of disturbed areas are being carried out at present.

Preliminary results

According to an expert of the Danube Delta Institute (Kiss, 1996), mink are present in many regions of the delta. The estimation of the population size is based on declarations of the local muskrat trappers who have accidentally caught mink in their traps. Being aware of the fact that only incomplete declarations were available and local people do not distinguish between the European and the American mink, we can only give the estimated mink population size in the Danube Delta which is presented in Table 1.

While having in mind that these estimations may be far too low (according to the bycatch of muskrat trappers, every winter about 500 mink are thought to be caught), they still are a proof of the existence of the mink in the Danube Delta. All these mink are considered to be European mink, and there is no mention of any American mink. The presence of mink in the Danube Delta was proved during the field investigations done so far. Many footprints and faeces were found in all investigated areas, but it was impossible to decide if either European or American mink were present there.

Year	Estimated number of minks
1993	225
1994	226
1995	322
1996	371

Table 1: European mink population estimate for the Danube Delta

Region	Number of analysed furs
Matita Lake	1
Crisan	4
Uzlina	3
Caraorman	2

Table 2: European mink furs found during an undercover investigation in winter 1998/1999

So far, the confirmation of the presence of the European mink there was possible only through the analysis of the furs of some accidentally caught mink during the winter 1998-1999 hunting season (Table 2). The white patch was very present on both upper and lower lips of every fur, and a genetic analysis of the furs is in preparation.

The following factors are thought to be possible threats for the European mink in the Danube Delta:

1. Local muskrat trappers, who are still using unselective traps, into which the minks are accidentally caught. According to the DDI specialists, the number of mink accidentally caught is up to 1% of the entire harvest, which is up to 50.000 muskrats per year (J.B. Kiss, pers. comm., 1999).
2. Fish traps are set for big fish and therefore they have no stop grids to hinder otters or mink to enter the traps. They are mainly used in places with stagnant water, like interior small lakes or in the neighbourhood of interior willow formations or flooded reed beds.
3. The American mink could be a serious threat for the local European mink, as it is in many other places. Although there is no proof yet for its presence there, the American mink could spread within the Danube Delta from the fur farm from Izmail, Ukraine, in the north of the Delta (E. Schneider, pers. comm., 1998).
4. Cutting of willows situated on the banks of the interior channels occurs when a channel is cleaned from mud. The technology used at present may have a strong negative impact on mink populations as this habitat is thought to be of a particular importance for the species.

Conclusions

On the base of the research done so far, a very important question was answered: are there European mink in the Danube Delta? The visual analysis of the 10 furs has shown that all of them were European mink. However, there are other important questions still unanswered:

- How common are the European mink within the Danube Delta? What is their distribution there?
- Are there American mink? How seriously do the possible threats acknowledged so far affect the mink population?

All the information and experience gained so far guide to the conclusion that a future larger project is needed to answer all these questions and many others, like details of the ecology of the species. Successful conservation strategies could be developed only after all these questions have been answered. In order to be able to answer the questions asked, specific activities should be scheduled for the next months and years, as follows:

1. Periodical footprint and scat samplings within different areas: in this way a draft of the distribution map could be shaped;
2. Development of the live trapping techniques: it is strictly necessary for catching mink, in order to prove or invalidate the presence of the American mink within the Delta, and also for the telemetry project;
3. Meetings with local muskrat trappers to convince them to use selective traps instead of traditional unselective ones in some experimental areas. A promotional folder and field signs could help in this attempt. The effect of the unselective traps on mink population could be quantified on the base of the study of the population size in following years;

4. A telemetry project which could answer several questions regarding details of the ecology of the species, possible sympatric occurrence of both mink species in certain areas, resource competition and intraguild aggression.

These actions are intended to be integrated in a European wide research effort, which will contribute to the conservation of the European mink.

Acknowledgements

This pilot study is a result of the collaboration between the WWF Auen Institut from Rastatt, Germany, the Danube Delta Institut from Tulcea, Romania and SILVA The Forestry Students' Organisation from Brasov, Romania. Several persons have to be acknowledged here for their contribution: Emil Dister and Erika Schneider from the WWF Auen Institut who made possible the start and the financial support of the study in the frame of the DDI-WWF restoration project; Radu Suciuc from the Danube Delta Institut for the great logistic and moral support during the field investigations, Boyd Kynard from the University of Massachusetts, USA, for providing the live traps and PIT tagging equipment; Mihai Marinov and the crew of the "Gr. Antipa" research boat of the Danube Delta Institut who made possible the winter expedition (December 1998) on the Chilia branch of the Danube; Andrei Svoronos, the governor of the Danube Delta Biosphere Reserve for the approval of this study; Tiit Maran from Tallinn Zoo, Estonia and Christian Seebass from the University of Osnabrück, Germany for their important moral and informational support.

References

Kiss, J. B. 1996. Cercetari asupra populatiilor speciilor de interes cinegetic pentru gestionarea durabila a resursei in RBDD. Referat stiintific al ICPDD Tulcea la tema B6 / Contract MCT: 22 pp.

- Maran, T. & Henttonen, H. 1995. Why is the European mink (*Mustela lutreola*) disappearing? - A review of the process and hypotheses. *Ann. Zool. Fenn.*, 32(1): 47-54.
- Maran, T. & Robinson, P. 1996. European mink *Mustela lutreola* captive breeding and husbandry protocol. European mink Conservation & Breeding Committee and Tallinn Zoological Gardens. Volume 1: 33 pp.
- Nania, I. 1991. *Vanatul pe teritoriul Romaniei*. Editura Sport-Turism, Bucuresti: 309-314.
- Negrutiu, A. 1983. *Vanatoare si salmonicultura*. Editura Didactica si Pedagogica, Bucuresti.
- Schneider, E. *et al.* 1997. Reconstructie ecologica in Rezervatia Biosferei Delta Dunarii, Romania. Ostroavele Babina si Cernovca. ICPDD Tulcea & WWF Auen Institut, Rastatt, Germany.
- Youngman, P.M. 1982. Distribution and systematics of the European mink *Mustela lutreola* Linnaeus 1761. *Acta Zool. Fen.* 166: 1-48

**¹SILVA The Forestry Students' Organisation,
Brasov, Romania**

**²Department of Wildlife Biology and Game
Management, BOKU Wien, Austria**

**¹Str. Republicii, nr. 1A, Ro - 4281 Gurghiu, Jud.
Mures, Romania Tel.: +40-65-536032
Fax: +40-68-271814 E-mail: vgotea@yahoo.com**

**²Peter Jordanstr. 76, A - 1190 Vienna, Austria
Tel.: +43-1-47654 4450 Fax: +43-1-47654 4459
E-mail: kranz@mail.dacice.cz**

Request for hair and tissue samples

Despite their diversity, scientific and ecological importance, the viverrids remain the least known carnivores. In order to maintain their biological diversity, an improved understanding of their phylogeny and evolution is of major importance.

In order to pursue our clarification of the phylogeny of the Viverridae (Veron & Catzefflis, 1993; Veron 1995; Gaubert *et al.*, 1999; Veron & Heard, submitted; Yoder *et al.*, in prep.), we are searching for hair and tissue samples suitable for molecular analyses.

Hairs (with root bulbs) and tissue of living or freshly dead animals could provide DNA for our studies. They must be put in alcohol but hairs can also be sent dry. Biopsies could also be of great interest for chromosomal studies as well as for molecular analyses (material to preserve biopsies could be sent on request).

A great number of researchers doing field studies provide us with samples, particularly hairs samples, so that, added to those coming from several other sources, we have material for most of the viverrids species, but we hope to enlarge our sampling by new contributions coming from all the parts of the viverrids range, in order to initiate new molecular phylogenetic studies. Anyone who has access to viverrids hairs or tissues is welcome to collaborate.

References :

- Veron, G. & Catzefflis, F., 1993. Phylogenetic relationships of the endemic Malagasy Carnivore *Cryptoprocta ferox* (*Aeluroidea*): DNA/DNA hybridization experiments. *J. Mamm. Evol.*, 1: 169-185.
- Veron, G., 1995. La position systématique de *Cryptoprocta ferox* (*Carnivora*). Analyse cladistique des caractères morphologiques de carnivores *Aeluroidea* actuels et fossiles. *Mammalia* 59: 551-582.
- Gaubert, P., Veron, G. & Tranier, M., 1999. Phylogeny of the Viverrinae (*Carnivora*, *Viverridae*) and interspecific discrimination within the genus *Genetta*: new morphological characters contribution (poster). Abstracts of the 8th international Symposium on Small African Mammals, Paris 4-9 July 1999, p.51.

For further information please contact:

**Géraldine Veron or Philippe Gaubert
Laboratoire de Zoologie, Mammifères et Oiseaux
Muséum National d'Histoire Naturelle
55, rue Buffon 75005 Paris France
Fax: (33)1.40.79.30.63
e-mail: veron@mnhn.fr or gaubert@mnhn.fr**