

21.

CONSERVATION OF THE EUROPEAN MINK (*MUSTELA LUTREOLA*) IN THE DANUBE DELTA BACKGROUND INFORMATION AND PROJECT PLAN

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GENERAL INFORMATION ON THE SPECIES

The European mink (*Mustela lutreola*) is a small semi-aquatic mustelid (Stubbe 1993). Males weight about 1kg and females only half of the males. The dense fur is dark brown with white patches around the upper and lower lip and expanding to the throat. Their appearance is very similar to the feral American mink (*Mustela vison*) except the white upper lip, which is missing in *M. vison*. In addition, the American mink, although very similar in size, has twice the weight of the European mink. Hybridisation between the two species is not possible. In contrast in some parts of the range, hybridisation between the European mink and the polecat (*Mustela putorius*) does occur (e.g. Davison *et al.* 2000). The polecat is another small mustelid, but less specialised in a semi-aquatic life style than the two mink species. General characteristics between these three species and the Eurasian otter (*Lutra lutra*), the most specialised aquatic terrestrial carnivore in the fauna of Europe, are listed in table 1.

Table 1. Comparison of general characteristics of four semi-aquatic mustelid species

	Total Length	Weight	Main Food
European mink	60 cm	0,5-1 kg	Amphibians etc.
American mink	60 cm	1-2 kg	Generalist
Polecat	70 cm	0,8-1,5 kg	Small mammals etc.
Otter	120 cm	5-10 kg	Fish etc.

DISTRIBUTION

In Fig. 1 the historic and the present distribution of the European mink are outlined. It is based on maps provided by T. Maran and S. Palazon and does reflect the present state of knowledge. However the historic distribution is mainly based on assumptions. Very little is know about the actual distribution, because fossil bones are generally extremely rare in the species and because the animal vanished from many areas in or before the 19th century (Youngman 1982). Perhaps there was once a continuous distribution from the Atlantic coast eastwards throughout Europe to the Ural Mountains. There is no evidence that the species occurred in the Alps, in Great Britain or in Sweden and Norway.

Today the occurrence of the European mink is known from the following areas (Fig. 1):

- South-western France and the adjacent area in Spain
- North-western Russia two distinct populations
- Southern Belarus and north-eastern Belarus and adjacent Russia
- The Danube Delta.

HABITATS

A very brief comparison of the remaining mink habitats shows the wide range of possible habitats and the adaptability of the species. In France, European mink are mainly found along small forest streams (Lodé *et al.* 2001). In Spain (Palazon and Ruiz Olmo 1998) they are found on small but also medium sized rivers like the upper Ebro River (40m wide) or the River Ega (10m wide). It is a mainly agricultural landscape. In Russia and adjacent Belarus they are found along glacial lakes and small to medium sized rivers mainly in forested areas (Sidorovich 1997). In context with Western European mink habitats, the Russians and Belarusians are very natural. In the Danube Delta they are living in a landscape dominated by water and reed. There are of course many parts of the Delta altered by man, but the minks appear to be restricted to the most pristine areas.

CARNIVORE ASSEMBLY

The carnivore assembly may be of interest because of competition for food or shelter, because of hybridisation, intra-guild aggression, predation and the risk of by-catch by man. In respect of other semi-aquatic mustelids, the French European mink habitat is at least partly used by the American mink, the European polecat and the otter. *Mustela nivalis* and muskrat (*Ondatra zibethicus*) are intensively trapped, which results in a high by-catch rate of European mink (Lodé *et al.* 2001). In Spain the European mink had no competitors until recently, otters, polecat and American mink were absent (J. Riuz-Olmo, pers. com.), now the American mink is invading the area (S. Palazon, pers. com.). The occurrence of fox (*Vulpes vulpes*) and genet (*Genetta genetta*) does not seem to have any effect on the mink.

In Belarus the entire natural carnivore community and the alien American mink and the racoon dog (*Nyctereutes procyonoides*) are present (Sidorovich 1997). Both, hybridisation between the declining European mink and the polecat, and intra-guild aggression between the two mink species were observed. Negative effects of the thriving racoon dog populations upon the European mink are assumed. American mink are intensively trapped and by-catch of European mink was common as long as the species was common too (V. Sidorovich, pers. com.).

The Delta itself is not inhabited by the polecat, which might weaken a decreasing mink population by hybridisation. The fact that polecat are absent from the Delta is remarkable, since this cannot be seen as a low adaptation of the polecat, because weasels (*M. nivalis*) and stoat (*M. erminea*) are common there. It might rather be the outcome of competition between the two similar species – mink and polecat. Till now, the American mink is not present or not widespread in the Delta. According to mink furs provided by fishermen, European mink are perhaps considerably larger in the Delta than in Russia and Western Europe, which might be an advantage in competition with other carnivores. Racoon dog are very common in the Delta, but there is no evidence so far that they have a negative impact on European mink (B. Kiss, pers. com.). Jackals (*Canis aureus*) negative effect on mink in some areas (e. g. Sacalin Islands, B. Kiss, pers. com.) is discussed.

POPULATION STATUS AND REASONS OF DECLINE

In France, Belarus and Russia the populations are rapidly declining. In France it is believed to be due to a combination of three factors (Lodé *et al.* 2001): habitat loss, changes in the environment (water quality etc.), trapping (mainly by-catch). Interestingly, the American mink, although partly living sympatrically is not considered as a threat for *M. lutreola* in France.

In contrast, in Belarus and presumably adjacent Russia the invasion of the American mink is thought to be the main reason for the decline of the European mink (intra-guild aggression hypothesis; Maran *et al.* 1998). In Spain there was no evidence for a decline until recently, but this might change rapidly with the invasion of the American mink.

In the Danube Delta, the European mink may have been quite numerous until recently (Youngman 1982) and even in 1999 R. Suciú and G. Băcescu (both pers. com.) estimated the by-catch of European mink in muskrat traps to be 500 individuals per season. This would indicate quite a big population, however the figure originates from an extrapolation and should be treated with caution. Gotea (Gotea and Kranz 1999) found mink signs only in two areas and additional explorative investigations in the following years have indicated that the species is absent at least from large areas in the west of the Delta.

The ongoing continuous decline during centuries and in particular the disastrous development of most European mink populations within the last three decades put the species at the verge of global extinction and all possible means have to be undertaken to save the species. The situation in the Danube Delta is unclear and basic information is urgently needed to take adequate conservation measures.

AIMS OF THE PROJECT

Besides traditional ecological knowledge of local people, very little is known about the habitat, the mink population and actual threats. But it is for sure that the habitat differs significantly from that of other European mink populations, it is a very natural unchanged habitat, which may offer special possibilities for a long-term survival. The project has two approaches. One is science based, to identify the drivers

of ecological processes and this includes also actual threats. The other is humans dimension orientated: a profound public relations and education campaign to minimise negative interactions between mink and man in future.

1. Map the distribution of the European mink in the Delta and adjacent areas to identify its actual distribution. In addition, it is necessary to clarify the presence and eventual distribution of the American mink in the area.
2. Analyse the distribution of the European mink in context with habitat types in order to identify critical habitat requirements.
3. Quantify basic ecological features such as diet, resting sites, use of space, competition within other carnivores and human caused reasons of mortality.
4. Identify the genetics of the Danube Delta population in comparison with the other populations.
5. Public relations and education campaign.
6. Formulate a science based action plan for the necessary steps to allow the long term survival of this population and doing this contributing significantly to the world wide survival of the species in the wild.

PILOT INVESTIGATIONS

Since summer 1999, the Delta was visited six times, covering all seasons and a wide range of water level conditions. The aim of these trips was to establish links with scientists, conservationists in the Danube Delta, to collect first information about the distribution of the mink, to collect scats for diet analysis and to get familiar with the habitat and the specific work conditions in the Delta.

According to tracks and scats found, European mink occur mainly in the central part of the Delta, both in plaur (temporary swimming reed (*Phragmites australis*) islands) and in old grown willow (*Salix* sp.) forests. However, it should be kept in mind that tracks and scats do not provide a sound base to distinguish European and American mink and the signs found so far could originate also from *M. vison*, although furs (n = 18) provided by local people were all from European mink.

Mink scats, collected so far, were analysed. Figure 2 and Fig. 3 show the findings, which are expressed in relative frequency of occurrence. Fish (*Misgurnus fossilis*, *Esox lucius*, *Rutilus* sp., *Lepomis gibbosus*, *Leucaspius delineatus*, *Carassius* sp., *Cyprinus carpio*, *Perca fluviatilis*) was most frequently found comprising almost 38%, followed by mammals with 22%, birds 20%, amphibians 11% and invertebrates 7%. Most of the scats were found in two different locations, Lakul Miazazi (n = 44), which is characterised by plaur and Uzlina (n = 30), which is an old grown willow stand. In Uzlina the diet was composed mainly from birds and several fish species whereas in Lakul Miazazi it was composed mainly from mammals and one fish species (*Misgurnus fossilis*).

For public relations a set of postcards was produced to raise attention to the project, the endangered European mink and the Danube Delta in general. A folder with basic information about the European mink is under preparation, mainly for people living in and around the Delta.

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FIGURES

Fig. 1: Historic and recent distribution of the European mink

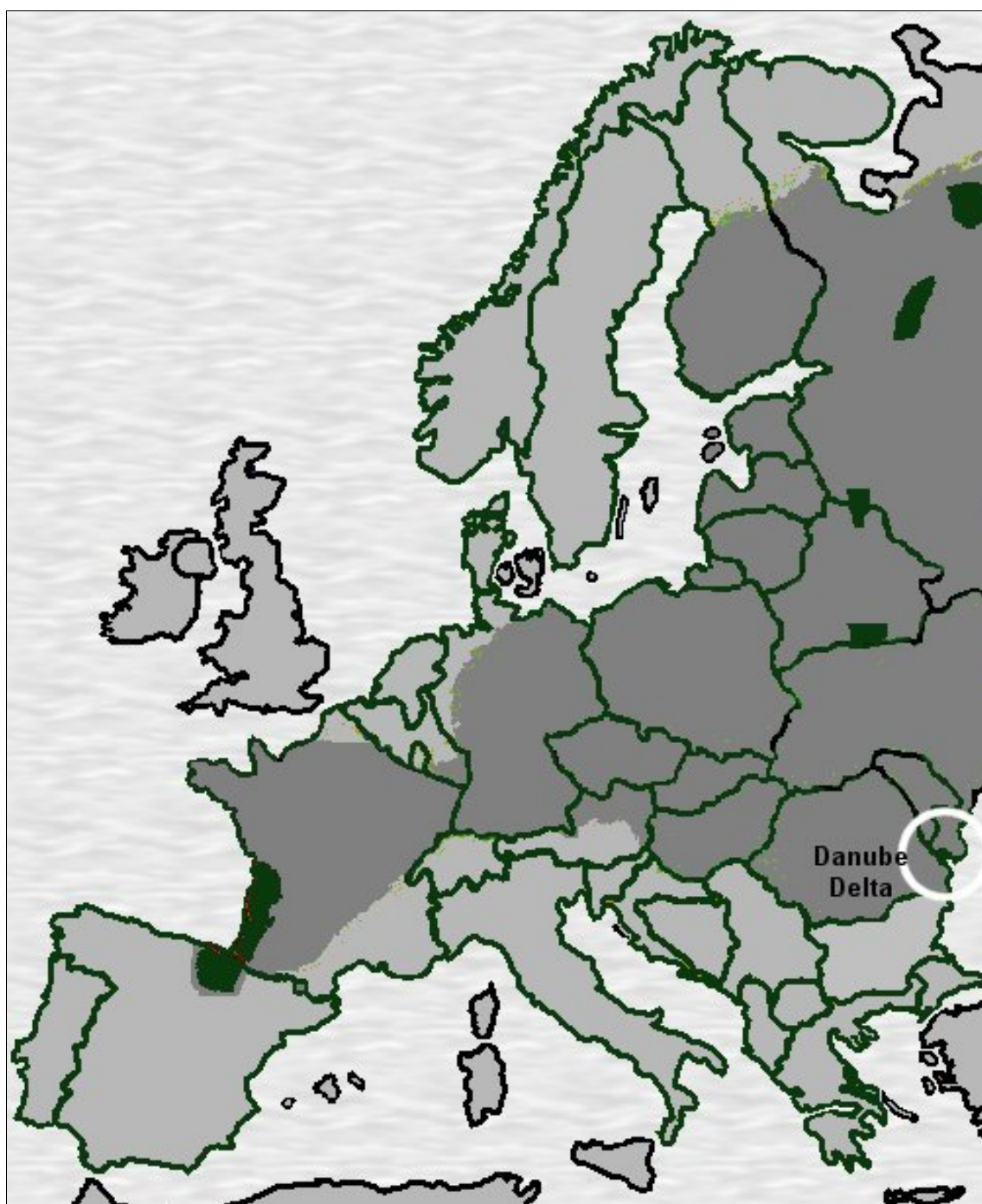


Fig. 2: Diet of the European mink in the Danube Delta (n = 131 scats)

	Anura	Aves	Caudata	Carassius	Coleoptera - adults	Crayfish	Cyprinidae	Cyprinus carpio	Esox lucius	Insecta - larvae	Lepomis gibbosus	Leucaspilus delineatus	Mammalia	Misgurnus fossilis	Mollusca	Perca fluviatilis	Percidae	Rutilus	Trichoptera - adult	Unidentified fish	Unidentified prey	Total
Total	25	41	4	1	5	3	10	1	7	7	4	3	45	38	26	1	6	6	1	2	4	240
Number of occurrences	19	41	4	1	5	3	10	1	6	4	4	3	45	38	2	1	6	5	1	2	4	205
Relative frequency of numbers (%)	10,4	17,1	1,7	0,4	2,1	1,3	4,2	0,4	2,9	2,9	1,7	1,3	18,8	15,8	10,8	0,4	2,5	2,5	0,4	0,8	1,7	
Frequency of occurrence (%)	14,5	31,3	3,1	0,8	3,8	2,3	7,6	0,8	4,6	3,1	3,1	2,3	34,4	29,0	1,5	0,8	4,6	3,8	0,8	1,5	3,1	
Relative frequency of occurrence (%)	9,3	20,0	2,0	0,5	2,4	1,5	4,9	0,5	2,9	2,0	2,0	1,5	22,0	18,5	1,0	0,5	2,9	2,4	0,5	1,0	2,0	

Summary According to Classes

	Amphibia	Aves	Mammalia	Fish	Invertebrates	Unidentified Prey	Total
Suma	29	41	45	79	42	4	240
Number of occurrences	23	41	45	62	15	4	190
Relative frequency of numbers (%)	12,1	17,1	18,8	32,9	17,5	1,7	-
Frequency of occurrence (%)	17,6	31,3	34,4	47,3	11,5	3,1	-
Relative frequency of occurrence (%)	12,1	21,6	23,7	32,6	7,9	2,1	-

Main Categories (>5%)

	Amphibia	Aves	Mammalia	Fish	Invertebrates	Total
Suma	29,0	41,0	45,0	79,0	42,0	240
Number of occurrences	23,0	41,0	45,0	77,0	15,0	205
Relative frequency of numbers (%)	12,1	17,1	18,8	32,9	17,5	-
Frequency of occurrence (%)	17,6	31,3	34,4	58,8	11,5	-
Relative frequency of occurrence	11,2	20,0	22,0	37,6	7,3	-

Main Categories (>5%) in Two Different Habitats

Uzlina - Autumn 2000 (n=30 scats)

	Aves	Cyprinidae	Esox lucius	Insecta - larvae	Mammalia	Misgurnus fossilis	Percidae	Others	Total
Suma	24	5	7	7	1	4	3	5	56
Number of occurrences	24	5	6	4	1	4	3	5	52
Relative frequency of numbers (%)	42,9	8,9	12,5	12,5	1,8	7,1	5,4	8,9	
Frequency of occurrence (%)	80,0	16,7	20,0	13,3	3,3	13,3	10,0	16,7	
Relative frequency of occurrence (%)	46,2	9,6	11,5	7,7	1,9	7,7	5,8	9,6	

Lacul Miazăzi - Autumn 2000 (n=44 scats)

	Aves	Cyprinidae	Esox lucius	Insecta - larvae	Mammalia	Misgurnus fossilis	Percidae	Others	Total
Suma	2	0	0	0	36	24	0	4	66
Number of occurrences	2	0	0	0	36	24	0	4	66
Relative frequency of numbers (%)	3	0	0	0	54,5	36,4	0	6,1	
Frequency of occurrence (%)	4,5	0	0	0	81,8	54,5	0	9,1	
Relative frequency of occurrence (%)	3	0	0	0	54,5	36,4	0	6,1	

Fig. 3: Comparison of European mink diet in two different habitats in the Danube Delta

