

ECOLOGY OF EUROPEAN MINK IN DANUBE DELTA BIOSPHERE RESERVE (ROMANIA)

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Introduction

European mink (*Mustela lutreola* L.) is a small semi-aquatic mustelid, with dark brown coat and white patches around the upper and lower lips. Despite very similar general appearance to the American mink (*Neovison vison*) his closest relatives are western and steppic polecats (*Mustela putorius* and *M. eversmanii*), kolonoks (*Mustela sibirica* and *M. itatsii*) and black footed ferret (*Mustela nigripes*) (Satto *et al.* 2013).

European mink originally inhabited rivers and streams across the whole Europe. However, even during the historic time the species occurrence diminished and a decrease of its range has continued even more rapidly with the establishment of the feral populations of the American mink on the European continent. Recently, only few populations have been proven to exist. European mink occurs in the northern Spain and western France, Danube Delta (Romania and Ukraine) and most likely in some areas of Russia as well as having been reintroduced in the northern Germany and two islands of Estonia (Hiiumaa and Saaremaa). Nowadays the species is considered as critically endangered and listed in Annex II and IV of Fauna and Flora Habitat Directive.

The present contribution is summing up the effort of several expeditions conducted by authors in the Romanian part of the Danube Delta during the years 2003- 2011 (Gotea & Kranz 2000, Kranz *et al.* 2002, Kranz *et al.* 2003, Kranz *et al.* 2004, Marinov *et al.* 2012).

Study area

Danube Delta is located in the north-western part of the Black Sea at the mouth of the River Danube. It spreads over territories of two states, Romania and Ukraine. The Romanian part is included into the protected area Danube Delta Biosphere Reserve

and, apart from the Delta itself, it encompasses also an adjacent brackish lagoon complex. The Delta is a huge wetland area with total area of about 5 800 km². It consists of various habitats such as extensive reed beds, freshwater lakes and canals lined by old trees, sand dunes with oak forests and brackish lagoons providing the space for over 5 000 different plant and animal species.

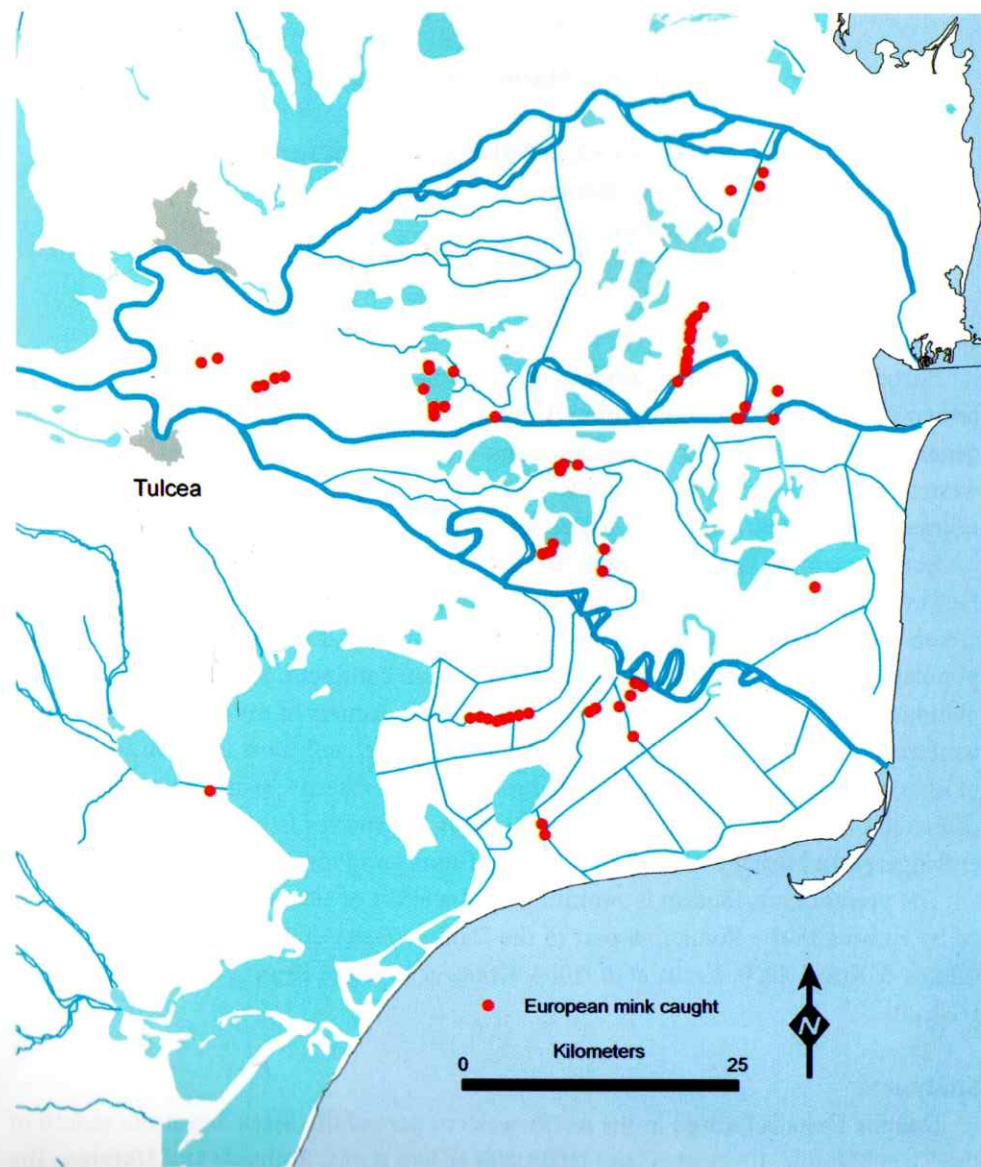


Fig.1 Study area.

Methods

In order to prove the presence of the species within the area, life trapping using one door wire cage traps with dimensions of 50 x 16 x 16 cm, baited with the sardines in vegetable oil were used. The trapping occurred in late winter/early spring (February, March, April), depending on the local weather conditions.

Caught mink were determined according to their sex, weighted and tissue sample was taken for further genetic analysis.

In some animals the blood sample was taken in order to analyse the blood plasma for presence of diseases such as Aleutian disease.

Apart from the life trapping, extensive search for the tracks and scats within the trapping area was conducted. Collected scats were analysed in order to reveal the diet composition of the mink.

Results

Long-term monitoring of the species conducted since 2003 shows that the local population of European mink in Danube Delta is still widespread in the area. In total 74 individuals were caught (56 males and 18 females). However, trapping success fluctuated between years and areas without any clear reason (Table 1). The presence of the mink was proven in different habitats of the Delta area including canals of various sizes, lakes and brackish lagoons (Fig. 1). No American mink was found within the Romanian part of Delta.

Table 1. The number of caught European mink in different years.

Year	2003	2004	2005	2006	2007	2008	2010	2011
Number of mink	28	7	0	2	6	2	25	4

Significant weight differences between sexes were found. While the average male weighted 904 grams (450-1250 g, N=52), female individuals weighted only 475 grams (380-600 g, N=17), being slightly heavier than the mink from Spain.

During the autumn of the year 2000 two different habitats were surveyed for the scats of the European mink: the lake Miazazi characterised by plaur (extensive floating of reed islands) and area around the village Uzlina constituting a network of canals fringed by old grown willow stands. In total 74 scats were analysed of the main prey species (Uzlina 30 scats, lake Miazazi 44 scats). Fish (*Misgurnus fossilis*, *Esox lucius*, *Rutilus* sp., *Lepomis gibbosus*, *Leucaspis 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%. While in Uzlina the diet was composed mainly of birds and several fish species, in the lake Miazazi it was composed mainly of mammals and one fish species (*Misgurnus fossilis*) (Kranz *et al.* 2002).

Analyses of 34 genetic samples of the mink from Danube Delta showed high genetic homogeneity of the population and closer relatedness to the population of Russian mink than to other populations in Europe (Michaux *et al.* 2005).

Blood samples of 4 caught European mink were scanned for the presence of Aleutian disease with negative result.

Discussion

To date, the results show that European mink is widespread in the Romanian part of the Danube Delta, occupying all available range of the wetland habitats there. Despite intensive trapping efforts no single individual of American mink has been found there and the population of the European mink is not at serious risk of extinction due to the presence of the American mink. However the American mink occurs in surrounding areas of the Delta, including the Ukrainian part of Danube Delta, so the situation can change rapidly and regular monitoring of the potential presence of the American mink should be conducted. Other serious risks including by-catch, poaching, habitat destruction and generally low genetic diversity have been defined but their effect on the population should be further investigated.

Abstract

European mink (*Mustela lutreola* L.) is a critically endangered species listed in Annex II and IV of Fauna and Flora Habitat Directive. Danube Delta, including Biosphere Reserve in the Romanian part, is one of the few last refuges of the species. Long-term monitoring of the species conducted since 2003 shows that the local population of European mink in Danube Delta is still widespread in the area. In total 74 individuals were caught, however, trapping effort fluctuated between years and areas without any clear reason. Significant weight differences between sexes were found. Analyses of 34 genetic samples of the mink from Danube Delta showed high genetic homogeneity of the population and closer relatedness to population of Russian mink than to other populations in Europe. No American mink was found within the Romanian part of the Delta, however, the species occurs in surrounding areas including the Ukrainian part of Danube Delta. Other serious risks which have been defined include: by-catch, poaching, habitat destruction, low genetic diversity.

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