

Mustela lutreola (European Mink)



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Mustela lutreola

NOT EVALUATED	DATA DEFICIENT	LEAST CONCERN	NEAR THREATENED	VULNERABLE	ENDANGERED
NE	DD	LC	NT	VU	EN

CRITICALLY ENDANGERED	EXTINCT IN THE WILD	EXTINCT
CR	EW	EX

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Taxonomy

Kingdom **Phylum** **Class** **Order** **Family**
ANIMALIA CHORDATA MAMMALIA CARNIVORA MUSTELIDAE

Scientific Name: *Mustela lutreola*

Species Authority: (Linnaeus, 1761)

Common Name(s):

English – European Mink

French – Vison d'Europe

Spanish – Visón Europeo

Synonym(s): *Viverra lutreola* Linnaeus, 1761

The species occasionally hybridizes with *Mustela putorius* (Tumanov and Abramov 2002, Ternovsky 1977, Davidson *et al.* 2000, Cabria *et al.* 2011). Both hybridization and genetic introgression occurs at low levels (3% and 0.9% respectively) and the hybridization is asymmetric, as only pure Polecat male mate with pure European Mink females. Backcrossing and genetic introgression has been detected only from female first-generation (F1) hybrids of European Mink to Polecats. Hybridization and genetic introgression between the two species can be considered a rather uncommon event (Cabria *et al.* 2011).

Taxonomic Notes:

Genetic studies have shown that the western populations (Spain and France) have very low genetic variability and the southern population slightly higher genetic variability, whilst the eastern populations have the greatest variability (Lodé 1999; Davidson *et al.* 2000; Michaux *et al.* 2004, 2005; Cabria 2009).

Assessment Information

Red List Category & Criteria: Critically Endangered A3ce [ver 3.1](#)

Year Published: 2011

Date Assessed: 2011-07-19

Assessor(s): Maran, T., Skumatov, D., Palazón, S., Gomez, A., Pödra, M., Saveljev, A., Kranz, A., Libois, R. & Aulagnier, S.

Reviewer(s): Duckworth, J.W. & Belant, J.L.

Justification:

This species is listed as Critically Endangered due to an ongoing population reduction. In the last three generations this is inferred to have resulted in the loss of over half the population, and it is predicted to intensify in the next three generations to result in a decline rate exceeding 80% over the next 10 years due to habitat degradation/loss and the effects of introduced species.

History: 2007 – Endangered
1996 – Endangered

1994 – Endangered (Groombridge 1994)

1990 – Vulnerable (IUCN 1990)

1988 – Vulnerable (IUCN Conservation Monitoring Centre 1988)

Geographic Range

The historical range of the European Mink extended from Finland to east of Ural Mountains, to northern Spain and Caucasian Mountains (Novikov 1939, Heptner *et al.* 1967, Youngman 1990, Maran 2007). The relatively recent discovery of mink in France (1839) and in eastern Spain (1951) suggests late expansion of the species to the west (Youngman 1990, Michaux *et al.* 2005). However, over the last 150 years it has severely declined and been extirpated or greatly reduced over most of its former range (Maran 1999, Maran 2007 and references therein).

The current range consists of few isolated fragments: in northern Spain and western France, in Danube delta in Romania, in the Ukraine and Russia (Maran 2007 and references therein). It occurs from sea level to 1,120 m (Palazón *et al.* 2003).

Range

Description:

The species is still extant in only a minor part of its former range and is in decline even in its currently remaining range enclaves. Only Romania and Vologodsk Region and Arkhangelsk Region can, perhaps, be regarded as exceptions. In Romania, the presence of the European Mink in Danube Delta was confirmed relatively recently (Gotea and Kranz 1999). The European Mink seems to be still widespread there. Repeated live-trapping surveys since 2001 indicate that mink inhabit the area of no more than 2,500 km² (e.g., Kranz *et al.* 2006). In Vologodsk Region, considering the rapid decline of the species in the neighbouring regions and the presence of the American Mink, it is not likely that the European Mink populations will hold there for long. In the Arkhangelsk Region, the population seems to exist in the northwest of the region, which is close to the northern limit of the range with very low abundance of the species. The presence of the American Mink (*Neovison vison*) is likely to pose a serious threat to its long-term existence also there (Skumatov 2005, Maran 2007 and references therein).

Native:

France; Romania; Russian Federation; Spain; Ukraine

Regionally extinct:

Countries:

Austria; Belarus; Bulgaria; Croatia; Czech Republic; Estonia; Finland; Georgia; Germany; Hungary; Kazakhstan; Latvia; Lithuania; Moldova; Montenegro; Netherlands; Poland; Serbia (Serbia); Slovakia; Switzerland

Range Map: [Click here to open the map viewer and explore range.](#)

Population

Population: Its range has reduced by over 85% since the mid-19th century. The remaining population is small, fragmented and declining. The most viable population in Western Europe is in the Danube Delta. The current European Mink range in

Russia consists of isolated distant habitats patches of different size. These fragmented populations are scattered across western Russia, the Urals, and the northern Caucasus. The only parts of the range where the American Mink is absent are rivers in the Archangelsk Region and Komi and probably also in Northern Caucasus. Everywhere else the populations of European Mink are vanishing or becoming increasingly fragmented and localized. The Russian population of European Mink has been estimated at *ca.* 20,000 (Tumanov 2003, 2006), but this is not based on quantitative data as no large-scale census has been done. Hunting bags suggest that the European Mink is rapidly becoming less abundant by comparison with the American Mink: for instance, in Vologda and Kostroma regions the proportion of European Mink skins in the hunting bag of the two mink species decreased from 50–70% to 1–10% within the last 5–7 years (to 2006). For the whole of Russia, recent records refer only to the capture of single individuals or to local populations consisting of some ten of individuals (Skumatov and Saveljev 2006). The number of 20,000 mink in Russia seems to be extensive overestimate of present population size.

Due to the intensive American Mink control measures during last decade the population in Spain (in Mediterranean basin) is quite stable. Still, remarkable fragmentation has been observed in its range in the north (Basque Country) and the population disappears because of the American Mink. At the same time slight expansion the range to south and south-east has been observed in Aragon in Ebro River basin (Gomez *et al.* in press).

The overwhelming majority of remaining populations are in decline and of low density. Therefore the size of the species' range leads to overestimation the population status. It is likely that the overall number of mink has declined more than 90% since the beginning of 20th century. Also, the presence of the American Mink in most of range fragments confuses the reports and makes the status projections to the future rather pessimistic.

Some national estimates of population abundance:

- **Spain:** 500–1,000 individuals (Palazón *et al.* 2003).
- **France:** several hundred (S. Aulagnier and R. Libois pers. comm. 2006).
- **Danube Delta:** since 2003 until 2010 a total of 70 European Mink were life captured in the Romanian part of the delta; trapping success changed dramatically between years, the best year was 2010 with 24 mink captured. Hence for the last decade there are no signs of decline, neither in range nor in number as far as the Romanian part of the Danube Delta and adjacent lagoons in the south are concerned (A. Kranz pers. comm. 2006).
- **Belarus:** the species is considered to be extinct in former two small range fragments (Sidorovich pers comm. 2011).
- **Ukraine:** the European Mink was recently re-discovered in Danube and Dniester deltas (de Jongh *et al.* 2007).
- **Russia:** in most of the country 61 regions (subcountry units) within the species historical range it is extinct or believed to be extinct (40 regions, 66%). In seven regions that species is known to be extant, and in nine regions is believed still to survive. From those only for 12 regions the

European mink is expected to survive for longer than 10 years. The American Mink is now present within the whole remaining range of the European Mink, though may be absent or very low in number in Northern Caucasus and in the north - approximately 64°–66°N, 44°–52°E (near Timanskiy kriazh, to Polar ring).

Population Trend: ↓ Decreasing

Habitat and Ecology

Habitat and Ecology: European Mink have specialised habitat requirements. They are semi-aquatic, inhabiting densely vegetated banks of rivers, streams and sometimes, during warm season, they may inhabit lake-banks. It is rarely found more than 100 meters away from fresh water. There are no records of its presence on sea coast.

Ecology: They hunt both in riparian zones and in the water for amphibians, crustaceans (crayfish), fish, small mammals, insects and birds (Sidorovich *et al.* 1998; Maran *et al.* 1998; Palazón *et al.* 2004, 2008). Females become mature for the next breeding season at 11 months (Maran unpublished).

Systems: Terrestrial; Freshwater

Use and Trade

Use and Trade: The species was largely in fur trade during the first half of 20th century. At present, there is not data on trade. The higher quality of farmed American Mink fur makes it highly unlikely that the trading could become an issue in European Mink conservation.

Threats

The decline and extinction of the European Mink cannot be explained with single universal factor. The main factors operating the extinction have been (1) habitat loss, (2) over-exploitation and (3) impact of alien American Mink.

Major Threat(s): In the European continent, human activities have resulted in large-scale alteration of landscapes, which has had a substantial impact on various habitats and their species. The European Mink has proved to be sensitive to human-induced environmental change and disturbance. As the type and extent of human influence on the species and its biotope has varied in time and between regions in Europe, also the set of factors contributing to the extinction has varied.

Several factors have often been acting in concert with a cumulative effect. The course of decline during the first half of 20th century in central regions of Russia is a perfect illustration to this. There, the effect of over-exploitation was noticed almost throughout the entire European Mink range (this even resulted in a moratorium of hunting in several regions and even in reinforcement efforts in Jaroslav Region, where around 130 European Mink were translocated with the hope to recover the original, depleted population). In addition, extensive change

of habitats in the mid-20th century further contributed to the decline. Thereafter, the invasion of the American Mink posed a very serious threat to the native mink. Large-scale introduction of American Mink in Russia, first planned to be conducted only in regions outside the European Mink's natural range, were ultimately performed also inside the native mink range. The reason for this was twofold: (1) the original mink has become too scarce for the fur-trapping industry, (2) higher value of American Mink fur in the market (Pavlov and Korsakova 1973). It is important to note that in these times the American Mink and European Mink were not regarded by the relevant authorities to be two distinct species. In the course of the introduction operation, 20,400 American Mink were released in the USSR until 1971, with around 4,000 of them being released into the range of the European Mink (Pavlov and Korsakova 1973). The intentional introduction of the alien species was strongly supported by rapidly developing mink fur-farming in the former Soviet Union – escapees from farms formed a continuous source of new founders for introduction. American Mink farming started in the 1920s; in 1972, 1.9 million female American Mink were kept in fur-farms and in 1973, 4.9 million mink were raised in 146 farms in the former Soviet Union (Abramov 1974). As the native mink populations were small and highly fragmented by over-exploitation and habitat loss, the fur-farm escapees, being ecologically more flexible (Maran 1991) easily invaded into the freely available ecological niche, thus making it impossible for the depleted European Mink to recover. Even more, the remaining European Mink groups were an easy target for intra-guild aggression (Maran *et al.* 1991, 1998; Sidorovich *et al.* 1999, 2001). The magnitude of the effect of mink farming on the native mink is well illustrated by a recent study in Denmark (a country with a very high number of mink farms), which concludes that 86% of free-living American Mink are escapees from farms (Hammershoj *et al.* 2005).

Local key factors have changed with time also in many other countries. For instance the impact of over-hunting and/or habitat change weakened the populations and accelerated the impact of the subsequent spread of the American Mink and/or the impact of other factors. It might well be that sometimes the interchange of key factors in time and/or the concurrent impact of several factors has led to a synergistic effect on the European Mink. Further, the time from the introduction of the threat to the extinction of the species can be highly variable, resulting in the so-called extinction or decline lag (Baillie *et al.* 2004). This, along with the interwoven effect of numerous factors, is likely to result in situations when it is hard or, in some cases, even impossible to identify the actual causes behind the extinction process.

The role of the alien American Mink deserves a special attention. Its role has been noted in several reports as a secondary or not at all important factor, usually emphasizing that the decline of the European Mink started before the invasion of American Mink (Lodé 2002, Lodé *et al.* 2001, Rozhnov 1992, Schubnikova 1982). Still, there are several records about local extinction of the European Mink concurrent with rapid expansion of the American Mink, e.g., in Estonia, Tver Region in Russia, Basque country (Zadorra river basin and northern Bizkaia) in Spain, Belarus (Cena *et al.* 2003; Katchanovsky 2002; Maran 1991; Palazón *et al.* 2002, 2004; Sidorovich 1991, 1993). Further, although there are “time-shot” records on the co-existence of the two mink species, no records demonstrating

long-term sympatric coexistence of the two mink species have been traced. Numerous records reveal the local replacement of the European Mink with the American Mink, but no opposite events have been reported. Records on replacement of the European Mink with the American Mink are further supported by studies of behavioural interactions between the two mink species in the wild and well as in experimental conditions. All this evidences that the American Mink has played a special role in the demise of the European Mink. While most of the other agents which have been operating the extinction are relatively easy to stop by conventional conservation management, there is very little one can do to prevent the spread of the alien American Mink. This means that the presence of the American Mink in wide territories across Europe makes the efforts for species recovery a very complicated task.

In addition to the main factors behind the decline of European Mink populations number of other factors may pose local threat the remaining small populations, like hybridization, road casualties, Aleutian disease, secondary poisoning etc.

Habitat loss and degradation is still serious threat especially in western population, both in France and in Spain (mostly in Cantabric rivers).

Conservation Actions

It is legally protected in all range states (Schreiber *et al.* 1989). In the Russian Federation only the caucasus subspecies is Red listed (Red Data book of Russian Federation 2001). At least part of the population occurs within protected areas.

The following conservation actions are ongoing as of in 2011:

Conservation Actions:

1. General: conservation breeding program in the form of European Mink EEP program with about 250 mink in captivity is on-going since 1992. Program is coordinated by Tallinn Zoological Gardens and Foundation Lutreola (Estonia).
2. Spain: (a) conservation breeding program since 2004, (b) pilot reinforcement since 2008 in Alava, (c) special program to control American Mink within and around of the European Mink range is on-going, (d) monitoring of European Mink in different autonomous communities as La Rioja (2007 and 2011), Alava (2007, 2009) and Aragon (2008, 2009, 2010, 2012), Navarra 2004-2005, Castilla y León (Burgos 2004, 2010 and Soria 2007, 2010), (e) habitat restoration in Navarra (EU LIFE project), (f) road casualties study in La Rioja (2007), studies on the effect of road casualties, population dynamics.
3. France: in 2010 government program for conservation breeding and reintroduction was started for six years.
4. Germany: (a) conservation breeding program in Osnabrück managed by Association Euronerz under European mink EEP program, (b) two reintroduction programs: in Saarland and at Steinhuder Meer, Lower Saxony.
5. Estonia: (a) establishment of island population in Island Hiiumaa (Dagö) since 2000. At present small core population exists in the

islands, but it is not yet viable; (b) studies on reproductive physiology of the species; studies on survival and adaptation of the species in reintroduction programs, studies on genetics, studies on the impact of captive conditions to the stress of mink; (c) regular monitoring of the results of establishment of island population in Hiiumaa.

6. Romania: (a) since 2001 regular monitoring has been conducted in Danube delta, (b) in 2011, the strategic plan for European Mink conservation was elaborated in the European Mink handbook for the Danube Delta Biosphere Reserve (Marinov *et al.* 2011)

Studies have been undertaken to determine the mink's ecological requirements, to analyse the causes of its decline, and to assess the genetic variability, the survival of released captive-born European Mink. New studies have been launched to study reproductive physiology, impact of captive conditions, options for artificial insemination, effect of behavioral personality types in mink to conservation breeding and reintroduction. There is an urgent need for species action plan in European Union for European Mink for better collaboration between different on-going conservation activities. Clearly national and regional authorities need to increase attention and allocate sufficient and continued resources for European Mink conservation, otherwise this species will disappear soon. There is a need for large-scale coordinated efforts to secure the survival of the last small remaining populations in different areas inside of the historical range of the species, but also restoration and/or establishment of new populations is required.

Conservation breeding of the species needs all-European coordination so that all single-country initiatives collaborate. Current tendency for isolated one-country breeding efforts will lead to ineffective use of resources and of competence, but also to inability to reach to the captive population size sufficient to maintain genetic diversity in captivity. For remaining in situ populations, the maintenance or restoration of sufficiently large areas of suitable habitats has to be secured by designation of new protected areas and improvement of management of existing protected areas.

The impact of the American mink on local European Mink populations has to be monitored and controlled, and whenever possible and feasible the alien mink populations should be removed. Local authorities have to pay more attention to the effects of the American Mink on the local fauna, including the European Mink. They should support further studies and actions to mitigate the effect of alien mink to the native mink species. For example, intensive control of American Mink is on-going in Spain since 2001. More than 3,000 American Minks have been eradicated around and inside of European Mink distribution area. It is likely that without such a control of alien mink the native mink population in Spain would have vanished already (Gomez and Palazon pers. comm.).

For French and Spanish wild populations which appear to be highly inbred further research needs to be carried out to identify whether these seemingly genetically highly uniform populations suffer from inbreeding depression. The introduction of individuals from *ex situ* stock from genetically diverse eastern populations has to be considered as a potential conservation measure,

if further research confirms the need for this. In addition to genetic studies, comparative studies on ecology and behaviour of the disjunct mink populations (Spanish/French, Romanian and eastern European) should also be conducted to support the findings of genetic studies. The *ex situ* conservation breeding program has to be enhanced and promoted, as it guarantees the survival of the species in case *in situ* efforts temporarily fail. It also provides opportunities for the restoration of already vanished wild populations and reinforcement of existing populations whenever needed. Better coordination between different *ex situ* actions over political borders is needed. Special studies have to be conducted to find the most feasible way how to incorporate the western low-variability populations into the joint program with high-diversity eastern population.

There is also a need for developing an all-European conservation breeding program with secured long-term funding. Further studies are needed about the current the status of the European mink in Romania, Ukraine and elsewhere in eastern part of Europe.

Bibliography

Abramov, M.D. 1974. *Mink fur-farming*. Kolos, Moscow.

Baillie, J.E.M., Hilton-Taylor, C. and Stuart, S.N. 2004. *2004 IUCN Red List of Threatened Species. A Global Species Assessment*. IUCN, Gland, Switzerland and Cambridge, UK.

Cabria, M.T. 2009. Desarrollo y aplicacion de marcadores moleculares para el estudio de la biologia y la conservacion del vison europeo, *Mustela lutreola* (Linnaeus, 1761).

Cabria, M.T., Michaux, J.R., Gomez-Moliner, B.J., Skumatov, D., Maran, T., Fournier, P., Lopez De Luzuriaga, J. and Zardoya, R. 2011. Bayesian analysis of hybridization and introgression between the endangered european mink (*Mustela lutreola*) and the polecat (*Mustela putorius*). *Molecular Ecology* 20(6): 1176-1190.

Cena, J.C. 2003. The European mink in Spain: Ecology, population locations, and aspects of conservation. International Conference on the Conservation of the European mink. *Thesis*.

Davidson, A., Birks, J.D.S., Maran, T., MacDonald, D.W., Sidorovich, E. and Griffith, H.I. 2000. Conservation implications of hybridisation between polecats, ferrets and European mink (*Mustela* spp.). In: Mustelids in a modern world: management and conservation aspects of small carnivore: human interactions. *Backhuys Publishers, Leiden*: 153-163.

Davidson, A., Griffith, H. I., Brookes, R. C., Maran, T., MacDonald, D. W., Sidorovich, V. E., Kitchener, A. C., Irizar, I., Villate, I., Gonzales-Esteban, J., Cena, A., Moya, I. and Palazon Minano, S. 2000. Mitochondrial DNA and paleontological evidence for the origin of endangered European mink, *Mustela lutreola*. *Animal Conservation* 3: 345–357.

de Jongh, A.W.J.J., Tokar, G.A., Matvyeyev, A.S. , de Jong, T. and de Jongh-Nesterko, L.V. 2007. European mink (*Mustela lutreola*) still surviving in Ukrainian deltas of the Danube and Dniester. *Lutra* 50(11): 33-36.

- Fournier, P. and Maizeret, C. 2003. Status and conservation of the European Mink (*Mustela lutreola*) in France. International Conference on the Conservation of the European Mink, Logroño (La Rioja, Spain) (5 - 8 November 2003): 21-24.
- Fournier, P. and Mazairat, C. 2006. Status and Conservation of the European mink in France. International Conference on the conservation of European mink. Proceeding Book. Gobierno de la Rioja. P.: 95–100.
- Gómez, A., Orea, S., Podra, M., Sanz, B. and Palazón, S. 2011. Expansión del visón europeo hacia el este de su área de distribución en España: primeros datos en Aragón. *Galemys* (in press).
- Gotea, V. and Kranz, A. 1999. The European mink in the Danube Delta. *Small Carnivore Conservation* 21: 23-25.
- Hammershoj, M., Pertoldi, C., Asferg, T., Moller, T.B. and Kristensen, N.B. 2005. Danish freeranging mink populations consist mainly of farm animals: Evidence from micro-satellite and stable analyses. *Journal of Nature Conservation* 13: 267–274.
- Heptner, V.G., Naumov, N.P., Yurgenson, P.B., Sludsky, A.A., Chirkova, A.F. and Bannikov, A.G. 1967. *Mammals of the USSR*. Moscow.
- IUCN. 2011. IUCN Red List of Threatened Species (ver. 2011.2). Available at: <http://www.iucnredlist.org>. (Accessed: 10 November 2011).
- Katchanovsky, V.A. 2002. On the fragmentation of the centers of the European mink (*Mustela lutreola*) in the Tver Region. The European mink Second Workshop. Central Forest Biosphere Reserve. Nelidovo.
- Kranz, A., Toman, A., Polednikova, K., Polednik, L. and Kiss, J. B. 2004. Distribution, status and conservation priorities of the European mink in the Romanian Danube delta. *Scientific Annals of the Danube Delta Institute for Research and Development, Tulcea – Romania 2003–2004*, pp. 38–44.
- Kranz, A., Toman, A., Polednikova, K., Polednik, L. and Kiss, J. B. 2006. The European mink in the Romanian Danube Delta and adjacent lagoon complexes: distribution, status and conservation priorities. *International Conference on the conservation of European mink. Proceeding Book*, pp. 103-112. Gobierno de la Rioja, Spain.
- Lodé, T. 1999. Genetic bottleneck in the threatened western population of European mink, *Mustela lutreola*. *Italian Journal of Zoology* 66: 351-353.
- Lodé, T. 2002. An endangered species as indicator of freshwater quality: fractal diagnosis of fragmentation within a European mink, *Mustela lutreola*, population. *Archiv fuer Hydrobiologie* 155(1): 163–176.
- Lodé, T., Cormier, J.P. and Le Jacques, D. 2001. Decline in endangered species as an indication of anthropic pressures: the case of European mink, *Mustela lutreola*, Western Population. *Environmental Management* 28(4): 727-735.

- Maizeret, C., Migot, P., Rosoux, R., Chusseau, J.-P., Gatelier, T., Maurin, H. and Fournier-Chambrillon, C. 2002. The distribution of the European mink (*Mustela lutreola*) in France: towards a short term extinction? *Mammalia* 66(4): 525-532.
- Maran, T. 1991. Distribution of the European mink, *Mustela lutreola*, in Estonia: a historical review. *Folia Theriologica Estonica* 1: 1-17.
- Maran, T. 1999. *Mustela lutreola*. In: A. J. Mitchell-Jones, G. Amori, W. Bogdanowicz, B. Kryštufek, P. J. H. Reijnders, F. Spitzenberger, M. Stubbe, J. B. M. Thissen, V. Vohralík and J. Zima (eds), *The Atlas of European Mammals*, pp. 332-333. Academic Press, London, UK.
- Maran, T. 2006. Conservation of the European mink, *Mustela lutreola*, in Estonia: an update 2001 – 2003. In: Gobierno de la Rioja (ed.), *International Conference on the conservation of European mink. Proceeding Book*, pp. 131 – 142.
- Maran, T. 2007. Conservation biology of the European mink, *Mustela lutreola* (Linnaeus 1761): decline and causes of extinction. Tallinn University Dissertations on Natural Sciences vol 15., TLÜ Kirjastus. Tallinn.
- Maran, T. and Henttonen, H. 1995. Why is the European mink, *Mustela lutreola* disappearing? - A review of the process and hypotheses. *Annales Fennici Zoologici* 32: 47-54.
- Maran, T., Kruuk, H., MacDonald, D.W. and Polma, M. 1998. Diet of two species of mink in Estonia: displacement of *Mustela lutreola* by *M. vison*. *Journal of Zoology* 245: 218-222.
- Maran, T., MacDonald, D. W., Kruuk, H., Sidorovich, V. and Rozhnov, V. V. 1998. The continuing decline of the European mink, *Mustela lutreola*: evidence for the intra-guild aggression hypothesis. *Symposia of the Zoological Society of London* 71: 297-324.
- Marinov, E.M., Botond, K.J., Valise, A., Mihai, D., Nichifor, C., Dorosencu, A., Condac, M., Gal, A., Losif, N., Bacescu, G., Bucur, G., Cirpaveche, P. and Arsenic, T. 2011. *European Mink Handbook*. Manuscript in Danube Delta Institute.
- Michaux, J. R., Hardy, O. J., Justy, F., Fournier, P., Kranz, A., Cabria, M., Davison, A., Rosoux, R. and Libois, R. 2005. Conservation genetics and population history of the threatened European mink, *Mustela lutreola*, with an emphasis on the west European population. *Molecular Ecology* 14(8): 2373–2389.
- Michaux, J. R., Libois, R., Davidson, A., Chevret, P. and Rosoux, R. 2004. Is the western population of the European mink, (*Mustela lutreola*) a distinct Management Unit for the conservation? *Biological Conservation* 115: 357–367.
- Novikov, G.A. 1939. The European mink. Izd. Leningradskogo Gos. Univ..
- Palazón, S. and Cena, J.C. 2002. *Mustela lutreola* (Linnaeus, 1761). Visión europeo. In: J. Palomo and J. Gisbert (eds), *Atlas de los Mamíferos Terrestres de España*, pp. 254-257. DGCNA-MMA, SECEM & SECEMU, Madrid.
- Palazón, S., Cena, J.C. and Gómez, A. 2007. *Mustela lutreola* (Linnaeus, 1761). Visión europeo. *Atlas y Libro Rojo de los Mamíferos Terrestres de España*, Dirección General para

la biodiversidad-SECEM-CECEMU, Madrid.

Palazón, S., Cena, J.C., Mañas, F., Cena, A. and Ruiz-Olmo, J. 2002. Current distribution and status of the European mink (*Mustela lutreola* L. 1761) in Spain. *Small Carnivore Conservation* 26: 9-11.

Palazón, S., Cena, J., Ruiz-Olmo, J., Cena, A., Gosáblez, J. and Gomez-Gayubo, A. 2003. Trends in distribution of the European mink (*Mustela lutreola*) in Spain: 1950 - 1999. *Mammalia* 67(4): 473-484.

Palazón, S., Ruiz-Olmo, J. and Gosálbez, J. 2004. Diet of European mink (*Mustela lutreola*) in the Iberian Peninsula. *Mammalia* 68(2-3): 159-165.

Palazón, S., Ruiz-Olmo, J. and Gosálbez, J. 2008. Autumn-winter diet of three carnivores, European mink (*Mustela lutreola*), Eurasian otter (*Lutra lutra*) and small-spotted genet (*Genetta genetta*), in northern Spain. *Animal Biodiversity and Conservation* 31(2).

Palomo, L. J. and Gisbert, J. 2002. Atlas de los mamíferos terrestres de España. Dirección General de Conservación de la Naturaleza. SECEM-SECEMU, Madrid, Spain.

Pavlov, M.P. and Korsakova, I.B. 1973. American mink. *Acclimatization of game animals and birds in USSR*, pp. 118–177. Kirov.

Shubnikova, O.N. 1982. On the results of the introduction of the American mink, *Mustela lutreola*, to Russia and on the problems of its relation with the original species, *Mustela lutreola*. In: V.A. Zabrodin and A.M. Kolosov (eds), *Game animals in Russia: spatial and temporal changes in their range*, pp. 64-90. Central Government of Hunting Industry & Nature Reserves at the Council of Ministers of the RFSR, Moscow.

Sidorovich, V.E. 1991. Distribution and status of minks in Byelorussia. *Mustelid & Viverrid Conservation* 5: 14.

Sidorovich, V.E. 1993. Reproductive plasticity of the American mink, *Mustela lutreola*, in Belarus. *Acta Theriologica* 38(2): 175–183. 38(2): 175-183.

Sidorovich, V.E. 2001. Study on the decline in the European mink *Mustela lutreola* population in connection with the American mink *M. vison* expansion in Belarus: story of the study, review of the results and research priorities. *Säugetierkundliche Informationen* 5(25): 133-154.

Sidorovich, V. E. 2006. The European mink (*Mustela lutreola*) in Belarus: past and present, the population decline, urgent questions, conservation initiatives and problems. International Conference on the conservation of European mink: 231–251.

Sidorovich, V.E., Kruuk, H. and MacDonald, D.W. 1999. Body size, and interactions between European and American mink (*Mustela lutreola* and *M. vison*) in Eastern Europe. *Journal of Zoology* 248: 521-527.

Sidorovich, V.E., Kruuk, H., MacDonald, D.W. and Maran, T. 1998. Diets of semi-aquatic carnivores in northern Belarus, with implications for population changes. In: N. Dunstone and

M.L. Gorman (eds), *Behaviour and Ecology of Riparian Mammals*, pp. 177-190. Symposia of the Zoological Society of London.

Skumatov, D. V. 2005. European mink in Russia (current status, perspectives for preservation in conditions of continued industrial hunting). Thesis.

Skumatov, D. V. and Saveljev, A. P. 2006. *The distribution of the European mink in Russia and the estimation of the trapping impact*. Gobierno de la Rioja.

Ternovskij, D.V. 1977. *Biology of Mustelids (Mustelidae)*. Nauka, Novosibirsk.

Tumanov, I. 2003. Situation and distribution of the European mink (*Mustela lutreola* L.) in Russia. In: G. de la Rioja (ed.), *International Conference on the conservation of European mink*, pp. 281-287. Proceedings Book.

Tumanov, I. 2006. *Biological characteristics of carnivores of Russia*. Saint-Petersburg "NAUKA" 2003.

Tumanov, I. and Abramov, A.V. 2002. A study of the hybrids between the European mink *Mustela lutreola* and the polecat *M. putorius*. *Small Carnivore Conservation* 27: 29-31.

Volokh, A. 2004. Distribution and amount of the European mink (*Mustela lutreola* L., 1766) in Ukraine. *Visnyk of L'viv univ. Biology series* 38: 118-128.

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