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Stripe-necked Mongoose *Herpestes vitticollis* - Photo: M. N. Jayakumar, IFS, ARPS, AFIAP



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# Do European Mink use only rivers or do they also use other habitats?

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European Mink *Mustela lutreola* has been defined as a semi-aquatic mustelid linked to aquatic ecosystems (Youngman, 1982). Afterwards, several works on its ecology involving radio-metric studies bore out this statement (Palazón & Ruiz-Olmo, 1997; Maizeret *et al.*, 1998; Sidorovich *et al.*, 2000; Garin *et al.*, 2002a,b; Zabala & Zuberogoitia, 2003; Zabala *et al.*, 2003). Indeed, radio-tracking studies have shown a very close relation between European Mink and aquatic habitats (Palazón & Ruiz-Olmo, 1998; Garin *et al.*, 2002a; Zabala & Zuberogoitia, 2003; Zabala *et al.*, 2003).

However, it is possible to find indirect data about the use of non-aquatic habitats. Road kills are claimed to be the main mortality factor in the Spanish Mediterranean area (Palazon & Ruiz-Olmo, 1997) as well as it is in the neighbouring French area (Maizeret *et al.*, 1998). In this way, Palazón *et al.* (1997) report dead minks on roads far away from rivers. Moreover, during a study on distribution of carnivores in Biscay Aihartza *et al.* (1999) found three out of fourteen European Mink records (21,1%) to be a long way away from the nearest river (more than 1 km). Both arguments suggest that European Mink may leave river basins but do not show how often this event occurs. Similar behaviour has been already reported for other semi-aquatic species, which do so in order to increase their hunting territories, to establish their dens or to seek new areas (i.e. Otter *Lutra* see Kruuk, 1995; American Mink *Mustela vison* see Dunstone, 1993; Lodé, 1993; Niemimaa, 1995; Ferreras & MacDonald, 1999). The high number of road kills and casual sightings of European Mink far from rivers suggest that this takes place very often, whilst radio-tracking data contradict this hypothesis.

During a radio-tracking study of eight European Mink we gathered 1,092 locations, 406 of them belonging to active points and 686 to inactive points (nocturnal and diurnal resting sites). Five mink were never found out of streams or marshes. The other three (all of them males), were located at least once out of aquatic habitats, but always within 100 metres of the river. Altogether, minks were found out of aquatic habitats 10 times (2.46%) during activity and five times resting (0.84%). Out of the 10 times that minks were found out of streams, once is supposed to have been a short cut from a stream to the main river; and the other nine times, the mink presumably went out to forage (two locations were found in a chicken farm 30 m from a river). The conclusion that can be drawn from these results is that territorial minks use almost exclusively aquatic habitats, according with data reported by Palazón & Ruiz-Olmo (1997). However, the high number of road kills remains surprising. Therefore, either mink use non-aquatic habitats more often than reported, or studied mink are not representative of the whole population.

In our study area mink home ranges were almost exclusive with low overlap, and though intensively trapped (see Zabala *et al.*, 2001) no other mink but tracked individuals were found inside the home ranges (Garin *et al.*, 2002a). Besides, after the disappearance of a male, it was replaced by another one (a mature male) that came to occupy almost the same home range (Garin *et al.*, 2002a). This rapid substitution suggests the existence of a floating population

somewhere. Moreover, several studies have, hitherto, reported exclusivity of home ranges within sexes (Sidorovich, 2000; Garin *et al.*, 2002a) and in some cases there are clues of territoriality (Garin *et al.*, 2002a, Zabala & Zuberogoitia, 2003). On the other hand, Sidorovich *et al.* (2000) reported that when European Mink was attacked by American Mink, the former usually left the stream area and sheltered for up to 22 hours in habitats unusual for this species, such as forest or fields. In addition, behavioural experiments conducted in captivity showed that while the most common interaction between European Minks was an approach (40 % of the cases), there were also aggressive behaviours, defensive threats, escapes and chases between them (in total 60 % of the cases) (Maran *et al.*, 1998; Macdonald *et al.*, 2002). In the same way, it is very likely that outcast minks (young, weak or old individuals) are pushed by dominant European Minks out of main streams, to marginal streams or springs, and probably even out of aquatic habitats. Probably outcast minks move continuously seeking for new territories, waiting for a chance to occupy a vacant one, or to escape from territorial conflicts with conspecifics or American Minks. This would explain the rapid substitution of an adult male by another one after the disappearance of the former, our fail to detect more mink inside the home ranges (territories) of studied mink (Garin *et al.*, 2002a) and also the high number of road kills and observations of European Mink far from aquatic habitats. This would also imply the existence of a floating population of European Mink, that has not yet been studied. Further study on this topic is needed.

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