The impact of a man made habitat on the density and habitat use of American mink (*Neovison vison*)

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1. Introduction

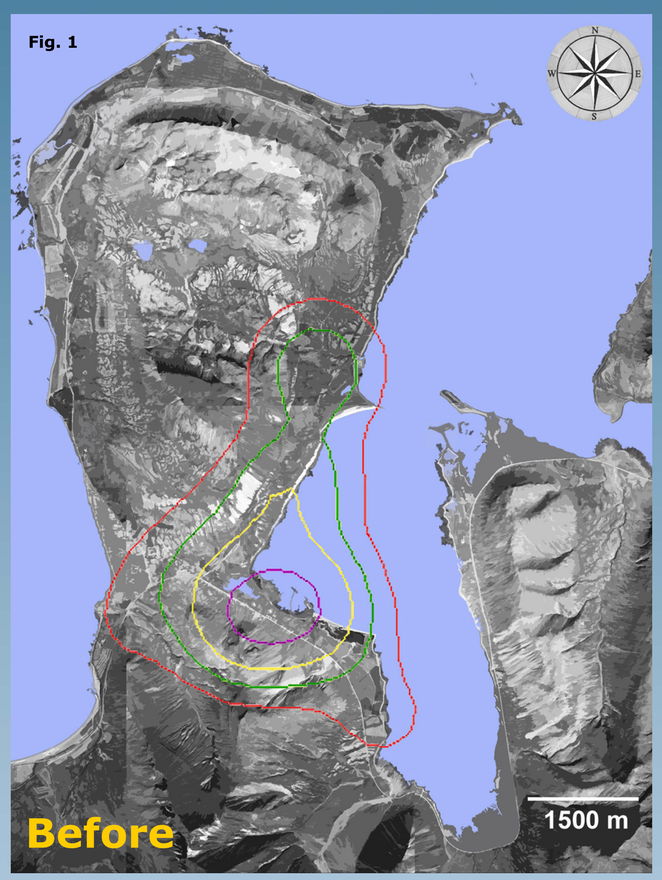
The American mink (*Neovison vison*) was first introduced into Iceland in 1931 for fur farming. Soon it escaped and now occupies most of the Icelandic lowlands. The mink is primarily found in habitats associated with water and is an opportunistic generalist in food choice [1]. Mink is believed to live a solitary live, defending home range against other individuals of the same sex [2]. It is considered invasive in Iceland and has had a negative effect on some native species. It can cause havoc in eider colonies and thus influence down harvesting.

We estimated the impact of a new 1.7 km long causeway and bridge crossing the fjord Kolgrafafjordur, W-Iceland, on the local mink density and land use, following the expression of concerns raised by eider down harvesters regarding a possible increase in mink numbers as the causeway might be ideal for mink dens.

2. Methods

Mink habitat in the study area consists primarily of rocky shores with a few minor streams. Birdlife, especially seabirds, is relatively abundant. The causeway is covered with big boulders and rocks on both sides.

The population density and habitat use of mink were studied by tracking mink tagged with intraperitoneal radio transmitters during autumn and winter. This was done before (2003) and after (2006) the construction of the causeway, which took place in the period from the end of the year 2003 until mid-year 2004. Home ranges were calculated using the fixed kernel method with h*ref* smoothing [3].



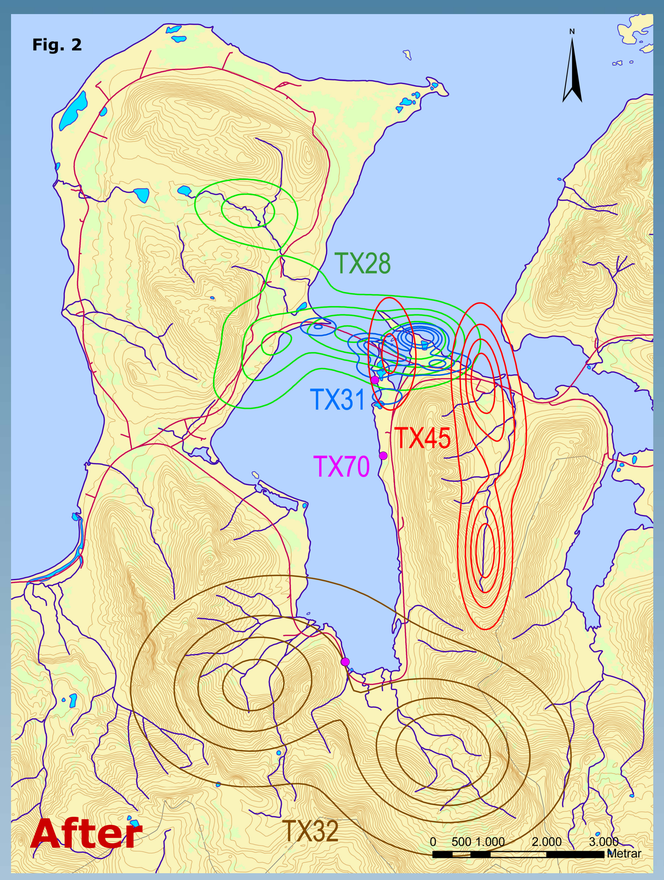


Fig. 1. *Land use of the only mink (male) occupying Kolgrafafjordur in autumn 2003, before the construction of the causeway. The isopleths represent 25, 50, 75 and 95% kernel probability estimates.*

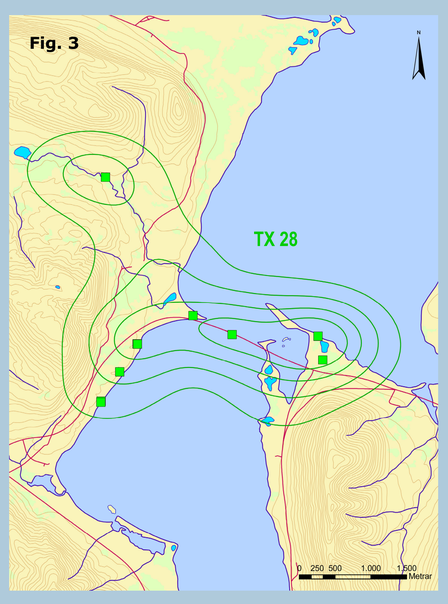
Fig. 2. *Land use of 4 mink (the males TX28 and TX31 and female TX45 were resident) in Kolgrafafjordur in autumn 2006, after the construction of the causeway. The isopleths represent 25, 50, 75 and 95% kernel probability estimates. All resident mink were using the causeway and surrounding area. (Map printed with license ©L07090030).*

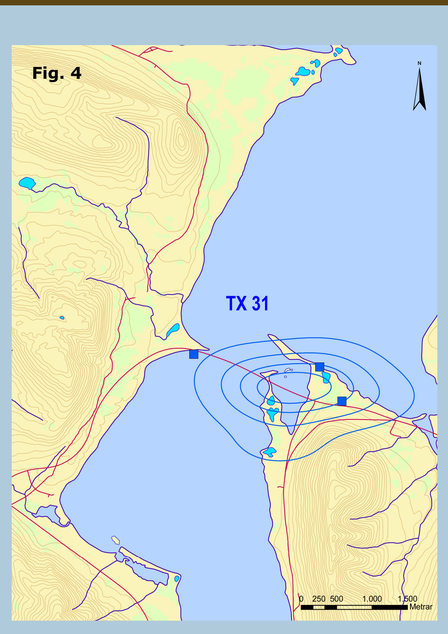
3. Results

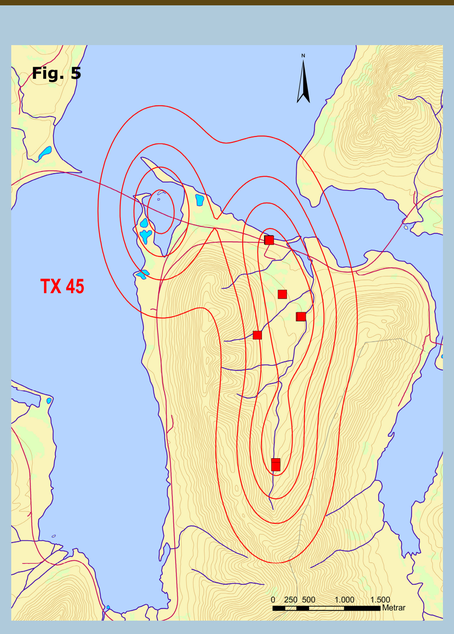
Before the construction (2003), only one mink (male) occupied the area. Its home range was limited to the western coast of the fjord. The part of the fjord in which the causeway was to be built was not a crucial part of its territory (**Fig. 1**).

In 2006, approximately two years **after** the construction was completed, at least three mink (two males and one female) were resident in the area. All of them had home ranges overlapping the causeway. The area used by the single mink in 2003 was apparently not used by any mink in 2006 (**Fig. 2**).

The causeway did not seem to be an important area for dens in this study ($\chi 2 = 18{,}9$, $p<0{,}001$). However, including only radio fixes when mink were active in the analysis, showed that the causeway or a part of it was included in the active core area of all three radio tagged mink in 2006, indicating an importance when foraging (**Figs. 3-5**).







Figs. 3-5. *Land use of three mink when active, after the construction of the causeway and bridge (red line crossing the fjord). Kernel probability estimates (25, 50, 75 and 95%) were calculated from active locations only and indicate important areas when foraging. Squares represent dens. (Map printed with license © L07090030).*

4. Discussion and conclusions

Local mink numbers grew and habitat use changed after the construction of the causeway. Even though it can not be concluded with certainty that the increase in mink numbers in autumn 2006 compared to 2003 was due to the new causeway, the observed change in land use and an overall decrease in mink density in adjacent areas strongly indicate an importance of the causeway and its surroundings for mink.

The foraging behaviour of mink in the area suggests that the causeway may provide more abundant food resources, where road kills and shelter for birds may play an important role. This change in land use of mink in Kolgrafafjordur reveals the ability of the species to exploit new resources in its environment and therefore underlines its opportunistic behaviour.

5. Acknowledgements

The study was carried out for and financed by the Icelandic Road Administration. We thank Sigrún Bjarnadóttir and Helen R. Jewell who did most of the fieldwork and Sigríður E. Elisdóttir, Björn Hallbeck, Óskar Hjartarson, Guðmundur G. Símonarson and Guðmundur Hallgrímsson for various assistance. Hersir Gíslason assisted in data analysis. We also thank the landowners for information and for allowing us to pass their land and mink hunters in the area for valuable information. The district veterinarian, Rúnar Gíslason, implanted the transmitters.

6. References

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