The effects of variation in fertility on mink (Neovison vison) population size

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Mink and mink hunting in Iceland

Mink was introduced to Iceland in 1931. It soon escaped from captivity and had spread throughout all lowland areas by 1975. Hunting statistics (Fig. 1) indicate that mink population size kept on increasing with minor downturns every 5-10 years. Since 2003 the population size seems to have been decreasing rapidly.

Why look at fertility?

Two factors control population growth rate: recruitment and survival. Can variation in population growth rate of the Icelandic mink population be explained by variation in fertility?

Results

Mink litter size peaked in 1999, four years prior to peak population size, but has decreased since then (Fig. 2). Average fertility explained 33% of the variation in population growth rate (r) between years. If the two years (2005 and 2007) with the far lowest population growth rate were excluded from the analysis, fertility explained 71% of the variation in r (Fig. 3). Our data indicate that for mink the equilibrium mean litter size in utero is 6.7 cubs in Iceland given the rate of mortality experienced in recent years.

Conclusion

It seems that changes in mink population size from 1996-2009 can largely be explained by variation in fertility, although additional factors, most importantly winter mortality, seem to be more important in some years (e.g. 2005 and 2007). The reasons for poor fertility in the last few years are unknown. This subject is currently being addressed in a study on changes in mink diet in the last decade (Rannveig Magnúsdóttir, unpubl.).

Methods

In the period 1996-2009, a sample of 3,554 mink carcasses received from mink hunters was investigated in an effort to elucidate the demographic basis for population changes. The data obtained include information on fertility (foetal and placental scar counts). The number of mink killed annually was used as an index of population size (Nt), assuming constant hunting effort between years. Population growth rate was calculated according to the formula

\[ r = \ln(N_{t+1}/N_t) \]

References