



## THE EFFECT OF POPULATION DENSITY AND CLIMATE ON CONCEPTION DATE OF MOOSE IN ESTONIA

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Phenological events such as conception or parturition dates may have profound impact on several key life-history traits of ungulates at individual as well as population level.

However, relatively little is known about the causes of variation in the timing of reproduction. Based on twelve-year survey of reproductive tracts, we investigated the effect of population density, climate and age of female on the conception date of female moose (*Alces alces*) harvested in Estonia.

The total duration of conception period over the years was thirteen weeks. The peak of conception period was 19.-25. September, when 1/3 of all conceptions took place. However, the conception dates differed between years and was negatively related to population density and mean air temperatures in April. In contrast, the mean air temperatures during the rut (in September) had only a modest positive effect on conception date. Two regional winter climate indices including the NAO and MIE (the maximal extent of sea ice in the Baltic Sea) had no direct effect on the timing of conception in the following autumn. As expected, the female age also affected the timing of conception. Yearlings we conceived significantly later as compared to prime-aged females.

Our findings corroborate the importance of density-dependent as well density-independent processes on the conception date of this ungulate species. We also suggest that the effect of density on the



timing of reproduction of moose may be phase-dependent, negative effects emerging only close to carrying capacity.



## ON THE ECOLOGY OF WATER VOLE (*ARVICOLA TERRESTRIS* L.)

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Water vole is included in the list of game animals of the taiga zone of the European North of Russia provided in the book “Game Animals and Hunting for Them” (1970) published by the Western Division of the Hunting and Animal Breeding Research Institute. In the former USSR its utilization as a fur animal, alongside with mole and common rat, began only in the 1920s-1930s, but harvesting of these species in the north stopped in the 1980s (Danilov, 2005).

The territory of Karelia is the range of the Karelian-Finnish geographic population of water vole, which is noted for uniform habitat selection and relatively low abundance, in spite of the multitude of lakes and rivers in the region (Panteleev, 1968).

In the mid-20<sup>th</sup> century, water vole abundance in Karelia was estimated as high (5-15 inhabited burrows and 10-20 feeding stations per 1 km of shoreline) (Ivanter, 1975). Surveys carried out in the same sites in 1975-2005 (Kutenkov, 2006) showed water vole abundance to be very low.

At present, no *ad hoc* water vole censuses are carried out, and the species rarely occurs in the catches obtained within standard monitoring, at research stations and during expeditions. Its abundance in Pryazhinsky District was 0.49 (2008) and 3.26 (2009) individuals per 10 ditch trap-days. One may presume 2009 was a peak abundance year for the species.

