



depending on the investigator's sensorial capacities (size and colour of the remains, type of substratum, sighting distance).

Integrating the materials one can evaluate how applicable this approach is in the study of the scope, seasonality and causes of mortality among animals of different taxonomic groups and with different abundance levels. For some animal species (hedgehog, mole, shrews, possibly squirrel), this approach may be a promising method for express monitoring of long-term and, perhaps, seasonal dynamics of the abundance.



CHANGES AT THE TUNDRA-TAIGA INTERFACE

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One of the first distribution studies to take note of the effects of climatic warming in northern habitats was reported in 1956 from Finland where changes in distribution of both plants and animals in relation to climatic warming were already noticeable in the first half of the twentieth century (Erkamo, 1956). An outstanding finding of this Finnish study was the tendency of many species to migrate east rather than north, illustrating that one of the major effects of climatic warming was the extension of oceanic climates eastwards as warmer winters opened up suitable habitats in previously continental climatic regimes. Increasing oceanicity, as measured in the difference between summer and winter temperatures continues to be a feature of climate change (Crawford, 2008). Consequently, there are extensive areas in Labrador, Quebec and the West Siberian Lowlands where tree regeneration is being prevented by bog growth. Winter warming, increasing rainfall, containing higher nitrogen levels, favours moss growth. Paludification is therefore becoming a serious threat to forest survival in many cold-



climate habitats (Crawford *et al.*, 2003; Kirpotin *et al.*, 2009; Payette and Delwaide, 2004). The European situation differs from that in North America. A time series analyses of a 22-year record of satellite images, in which the American Arctic is widely defined in terms of latitude (60–90 °N), has shown that only about 15% of this extended region displays significant positive warming trends. of which just over half involved temperature-related increases in growing-season length and photosynthetic intensity. As well as areas affected by paludification, there are others where trees growing north of 60 °N were found to have suffered a decline in photosynthetic activity, possibly due to drought as there was no noticeable change in growing-season length (Goetz *et al.*, 2005)



ACCLIMATIZATION AND NATURAL DISPERSAL OF GAME ANIMALS IN THE EUROPEAN NORTH OF RUSSIA

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The issues discussed are the changes in the game fauna, range and abundance dynamics in the European North of Russia over the 20th – early 21st centuries. We assess the role of anthropogenic and natural factors in these processes: **acclimatization** (muskrat, Canadian beaver, raccoon dog, American mink, wild boar, roe deer, Sika deer, reindeer, white-tailed deer); **the set of factors modifying animal habitats** – clear-cutting of old-growth forests, construction of summer cottage communities, forest drainage, etc. (mole, brown hare, polecat, badger, wolverine, otter, taiga reindeer); **endogenous factors that trigger intrapopulation phenomena** such as multiannual periodic fluctuations of the species abundance and range or so-called “life waves” (brown