

## Abstract

This review is focused on the surviving species of Pleistocene megaherbivores in the Palearctic realm. It describes a basic classification of herbivores depending on their trophic niche, the adaptations associated with diet and an application of Cope's rule in evolution of ungulates. This is followed by a description of different approaches in defining megafauna and causes of large animals extinctions at the end of the Pleistocene and during the Holocene. At the end of the general part of this work, the importance of megafaunal elements as keystone species and concepts of downsizing, associated trophic downgrading and the idea of rewilding are being emphasized.

In the second part of the work, Pleistocene history, phylogeography and marked reduction of range during the Holocene are described for elk (*Alces alces*), European bison (*Bison bonasus*) and Przewalski's horse (*Equus przewalskii*) according to the available literature. Finally, a history of the efforts to save the species and current knowledge on conservation genetics related to an overcome bottleneck effect are ascertained.

**Key words:** Pleistocene megafauna, bottleneck, reintroduction, rewilding, browsing, grazing