

To
PrF UK
Study Department
V. Smidova
Albertov 6
128 00 Praha 2, Czech Republic

Datum: 13 September 2019

Evaluation of the PhD thesis
of Eva Horčíčková

Effects of wild ungulates on vegetation in an abandoned landscape
Submitted August 2019

Ungulates can have strong and long-lasting effects on the vegetation through different activities including grazing, browsing and trampling. We know this well from ecosystems such as savannahs, steppes and tundras, but also from pastures in temperate ecosystems which are considered to be shaped and maintained by animals like sheep, horses and cows. The impact of ungulates on the vegetation and the intricate relationships between plants, grazers/browsers and predators have become obvious for example in the Yellowstone National Park where the re-introduction of wolves has triggered changes in the abundances and feeding behaviors of ungulates affecting the regeneration of woody species.

In Central Europe the effects of wild ungulates – mainly wild boar, red deer and roe deer – on the vegetation has mostly been studied in forest ecosystems. Large herbivores can create disturbances, feed, often in a selective manner, on especially young woody plants and transport diaspores. In open landscapes the effects of wild ungulates are supposed to be minor, and most scientific studies in semi-natural grasslands have focused on the impact of domestic animals, for example by asking about the relationship between species richness and grazing pressure (disturbance intensity) or about the different effects of grazing and mowing. However, since the famous publication by Vera (2000) there is a discussion about the historical (and current) role of wild ungulates in shaping heterogeneous landscapes consisting of a mosaic of forest and open, grass-dominated patches. Despite this discussion, the number of studies on the effects of wild ungulates in open landscapes is surprisingly low, and the thesis of Eva Horčíčková contributes to filling this knowledge gap.

The candidate has presented a thesis including 179 pages, structured into a general overview and the collection of separate papers. The general, part first introduces the different paradigms concerning the natural proportions of forests and open habitat types in temperate landscapes, stressing also on the importance of this discussion for nature conservation of open habitat types. After introducing the role of ungulates in

Prof. Dr.
Martin Diekmann
Institut für Ökologie
AG Vegetationsökologie und
Naturschutzbiologie

Fachbereich 2
Biologie / Chemie

Leobener Straße 5
NW 2, Raum B3140
28359 Bremen

Telefon (0421) 218 - 62920
Fax (0421) 218 - 62929
eMail mdiekman@
uni-bremen.de
www www.uni-bremen.de/
vegetation

shaping and maintaining forests, open patches or mosaics of both the main research aims of the thesis are presented:

- (1) Are open habitats used by wild ungulates for feeding?
- (2) What are the effects (focusing on soil disturbances, grazing and browsing) of free-ranging herbivores for the species richness and composition of dry grasslands?
- (3) Are ungulates able to influence the process of secondary succession in abandoned grasslands?

The general part then presents the methods and the study area, followed by a summary of the main results and final conclusions. Despite some minor linguistic shortcomings, this part of the thesis is well-structured and -written. It gives a nice overview about the state of knowledge and the gaps in our understanding of the effects of ungulates on the vegetation. It also convincingly shows that the current impact of herbivores is likely not the same as the one we would have observed several thousand years ago when humans were less abundant and natural predators more common. The results of the thesis show that free-ranging ungulates, namely wild boar and different species of deer, affect the vegetation composition also of open habitats and are able to slow down succession in abandoned grasslands.

The specific part of the thesis contains three separate papers, one published, one in review, and one in the form of a manuscript. All papers have clear research questions, are written in a good and concise way, are well-illustrated, and use excellent and convincing statistical methods. I would like to highlight especially three strengths: (1) the meaningful combination of different experimental methods, including the creation of artificial disturbances and manipulative exclosures combined with controls in a paired design. (2) The extensive use of camera traps to quantify the abundance and different feeding types (just walking and trampling, browsing, grazing) of the ungulates in the region. (3) All experiments were conducted over the course of several years, showing how long-lasting the effects of the herbivores are on the grassland vegetation and how succession is altered by grazing and browsing.

In summary, the PhD thesis of Eva Horčíčková is a nice and important contribution to the effects of wild ungulates in open landscapes. It offers many new results and is without doubt suitable for the defense and fulfills all criteria necessary for obtaining the PhD degree. I can without reservations recommend the thesis of Eva Horčíčková to the committee.

For the oral defense, however, I would like to pose some questions to be discussed between the candidate and the committee.

Paper 1:

- Given that 98.7 % of the grassland are predicted to be undisturbed by wild boar, is it likely that the animals have a significant effect on the grassland vegetation on a landscape scale?
- Despite the fact that wild boar has a positive effect on total species richness, may there be a negative impact on single taxa (possibly rare species, for example orchids) preferably eaten by the animals?
- Can an artificial disturbance really mimic the disturbances created by wild boar?

Paper 2:

- The stronger presence of woody seedlings outside the exclosures was an unexpected result. Would this result be likely to differ under higher densities of deer?

- Is there a convincing explanation for the fact that deer are more associated with the drier vegetation patches in the semi-dry grasslands?

Paper 3:

- Is the frequency of observations of ungulates in open grass-dominated habitats a good indication of their feeding preference (grazing vs browsing)?
- Do the different species of deer (red, roe, sika) compete with each other?

General:

- How would all these interactions change if wolves would re-settle the region? Would this speed up or halt the succession of grassland patches to forest?

Martin Diekmann