Mendel University in Brno
Czech Society of Landscape Engineers – ČSSI, z.s.

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MENDEL UNIVERSITY IN BRNO

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and

Department of Landscape Management
Faculty of Forestry and Wood Technology
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of prof. Dr. Ing. Libor Jankovský, the Dean of the Faculty of Forestry and Wood Technology, Mendel University in Brno,
of doc. Ing. Tomáš Vrška, Dr., the Director of Training Forest Enterprise Masaryk Forest Křtiny, Mendel University in Brno,
of Ing. Dalibor Šafařík, Ph.D., the Chief Executive Office, Forests of the Czech Republic,

of JUDr. Markéta Vaňková, the Mayor of the City of Brno,

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Contents

INFLUENCE OF RECREATIONAL ACTIVITIES ON THE DISTRIBUTION OF FOREST WILD BOAR ROOTING

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Abstract

The wild boar is a widely distributed and locally very numerous animal. The same is true in the conditions of Central Europe. Outside the growing season, it concentrates in forests, where it also actively searches for food sources. During this activity, it disturbs the soil surface, thereby significantly affecting the dynamics of the ecosystem. From an economic point of view, it limits the natural renewal of tree species, but from an ecological point of view, it changes habitat conditions and thus helps to increase biodiversity. Factors influencing the distribution of rooting across forest stands may be different. In this paper, we focused on the human factor and its influence on the rooting activity of wild boar in the Hodonínská Dúbrava, National natural monuments.

Key words: Disturbance, wildlife, soil surface, animal activity, diversity

Introduction

The wild boar (*Sus scrofa*) is one of the species that has the potential to significantly influence its environment through its feeding behaviour in conjunction with high abundance and adaptability (Schley and Roper 2003, Massei et al. 2015, Drimaj et al. 2015). In places with a high number of wild boars, both human economic activities and the diversity and stability of ecosystems are affected. Given that there is only partial information on the consequences of higher numbers of wild boars on ecosystems, monitoring the long-term consequences of the existence of pigs in model environments is very important. Only on the basis of verified data is it possible to determine the necessary level of regulation of the wild boar population and other management measures (Keuling et al. 2016, Kamler and Drimaj 2021). The study is therefore primarily focused on understanding the importance of wild boars for the forest ecosystem and the impact of their existence on the composition of the vegetation. Indeed, wild boars rooting the soil surface to a large extent and thereby significantly interfere with the pedological conditions of habitats and the development of plant communities (Fattorini and Ferretti 2020, Matas et al. 2021). This contribution aims to evaluate the distribution of wild boar rooting in the context of linear constructions and recreational activities in Hodonínská Dúbrava, National natural monuments.

Materials and methods

The study area is located northwest of the town of Hodonín and has an area of 970 ha (48.8741272N, 17.0870033E; between the town of Hodonín, ponds around the river Kyjovka, and the road between the town of Hodonín and the village of Mutěnice). Part of the territory is included in the protected area of the Hodonínská Dúbrava, National natural monument. The primary communities are the heat-loving Pannonian oak forests on the sand, the commercial forests are made up mainly of oak (*Quercus* sp.), Scots pine (*Pinus sylvestris*), ash (*Fraxinus* sp.), hornbeam (*Carpinus betulus*) and other deciduous trees are mixed in. The geological subsoil consists of Tertiary clays, gravels and sands. The relief is flat to slightly wavy. The study area is interwoven with a dense network of forest roads, hiking trails and waterways. Of the large mammals, wild boar, roe deer (*Capreolus capreolus*) and hare (*Lepus europaeus*) are found here all year round.

The entire site of interest was covered by a system of parallel lines on which data collection took place. A strip 6m wide was monitored along the lines. All engraving from the wild boar was recorded in this belt. In the ArcMap 10.2 (ESRI) program, the strips were subsequently cut into sub-plots measuring 6×6m (36m^2). Some of these plots contained a certain proportion of irrigated area (N = 1,643) and some did not (N = 20,145). Distances from hiking trails, roads and watercourses (i.e. the tested factors) were also calculated using the ArcMap program. Subsequently, it was determined whether these factors have an effect on the intensity of engraving in a forest environment.

Due to the extensiveness of the data set, the Kolmogorov–Smirnov test was used to test normality. Differences between the sets of rooted and unrooted sub-plots (distance from hiking trails, public roads, forest paths and water courses) were evaluated by Mann-Whitney U-test. GLMs were created to determine the dependence between the proportion of the plot and the distance from the above-mentioned elements. All tests were performed at a confidence interval of $\alpha = 0.05$.

Results

The results showed that the distance from the individual factors did not play any role in deciding whether a wild boar would root in a given subarea or not ($p = 1.00$). However, distance had an effect on rooting intensity for some factors. One of these factors was the distance from the public roads, where the damage to the subsurface by rooting increased with increasing distance ($r^2 = 0.02$, $p = 0.001$). The second significant factor was the effect of the distance to the water courses, when the proportion of the rooted area decreased with increasing distance ($r^2 = 0.03$, $p = 0.001$). The distance from the hiking trails or the forest paths had no effect on the engraving from the wild boar.

Discussion

Hiking trails do not affect the rooting activity of wild boars in any way, which may be due to the fact that wild boars are active mainly at night, when there are no people on these trails. Of course, these trails are scented by humans, but wild boars are able to evaluate the riskiness of a given smell very well, so they do not feel threatened in the vicinity of these trails. In the same way, forest roads, which are mainly used for the movement of forest equipment during the day, do not pose any risk to them.

On the contrary, public roads are intensively used even during the night, so wild boars are disturb and occur at greater distances from the road. A positive effect on rooting has been demonstrated at water courses. Water courses represent a sought-after source of water and food in the drying environment there (on the sand), because the presence of a large number of plants and animals is linked to the increased humidity.

This study is the first result of extensive and long-term research focused on the importance of wild boar rooting for the forest ecosystem. We will continue to process and evaluate the obtained data and try to clarify the positive and negative impacts of this activity on the biodiversity of valuable ecosystems as well as common economic forests (and not only in them).

Conclusion

Our study showed that damage to the soil surface by wild boar rooting is not affected by the presence of hiking trails and forest paths. On the contrary, the distance from public roads and waterways has a certain influence.

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Souhrn
Prase divoké je hojně rozšířeným a lokálně velmi početným velkým kopytníkem. Stejně tak je tomu i v podmínkách střední Evropy. Mimo vegetační období se soustřeďuje v lesích, kde také aktivně vyhledává zdroje potravy. Při této činnosti narušuje povrch půdy, čímž výrazně ovlivňuje dynamiku ekosystému. Z ekonomického hlediska omezuje přirozenou obnovu dřevin, ale z ekologického mění stanovištní podmínky a napomáhá tak ke zvýšení biodiverzity. Faktory ovlivňující distribuci rytí napříč lesními porosty mohou být různé. V tomto příspěvku jsme se zaměřili na vliv veřejných cest, turistických tras a vodních toků na intenzitu rytí divokými prasaty v NPP Hodonínská Dúbrava. Z hodnocených faktorů se jako významné ukázaly vzdálenosti od veřejných cest a vodních toků. Naopak vzdálenost od turistických tras či lesních cest neměla na disturbanci půdního povrchu žádný vliv.

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