Effect of browsing on timber production and quality

Sandor, Gy., Náhlik, A., Tari, T. and Dremmel, L.
University of West Hungary, Institute of Wildlife Management and Vertebrate Zoology
E-mail: sandorgy@emk.nyme.hu

Introduction

The effects of increment loss and decrease of timber quality on seedling browsing was investigated. According to the Hungarian classification scheme definition of damage to quantity refers to those instances where wild game consumes acorn or seedlings at a rate at which these need to be compensated or entirely replanted. In case of damage to quality the wooded vegetation does not die but is damaged to various degrees which in turn affects its biological value and its usable timber quality (MÁRKUS, 1988). Damage to quality usually occurs as a result of chewing of forest plantations (NÁHLIK ET AL., 2007). We hypothesize that these damages influence quantity and quality of forest stands, trees and timber. All these bring about significant expenses to the owner of the forest who is forced to spend on replanting of seedlings, protective fencing, forest protection fines etc... According to some points of view, wildlife caused damage to forests can still attain expected yields and later mature forest state after proper forestry practices are performed (clearing, selective cutting), since these measures remove those damaged trees which are no longer suitable or viable. Our question concern about whether there is a difference in those forest stands that had been affected by wildlife damage versus those unaffected at the time of 10-15 years post afforestation. Is there a difference in yield of those harvest ready forests which had been affected by wildlife damage to various degrees? We conducted comparative analyses and made long-term prognosis in order to answer these questions.

Material and methods

Data was collected in the Bükk mountains of North Hungary. Sample territories were marked out in such beech (*Fagus silvatica*) and sessile oak (*Quercus petraea*) pole stands which had been previously browsed upon by red deer, roe deer and mouflon. The damage had been described to affect 80% of the sessile oak and 65% of the beech seedlings. The number of sample territories in each stand was 10, each of which measured 10x10m in size. Control territories of the same size were also set out in the stands which were unaffected woodlots protected by fencing. We registered tree numbers only in oak stands because in beech there was significant difference between the number of sampled seedlings and the control territories. Furthermore, in both species we measured diameter of stems at breast height (1.3m), tree height and stem malformations such as tortuosity and crotch located at lower than 2m (ZAMORA ET AL., 2001). In the next step we summarized the sampled forest segments into tree growth classes according to properties of our data and classification tables of SOPP (1974). Results were compared with forestry data collected in the same area from old growth forests and with other literature (BONDOR, 1986; BÉKY, 1989) outlining various parameters for the same growth area. Data was evaluated by *Student's t-test* and *Mann-Whitney U test*.

Results

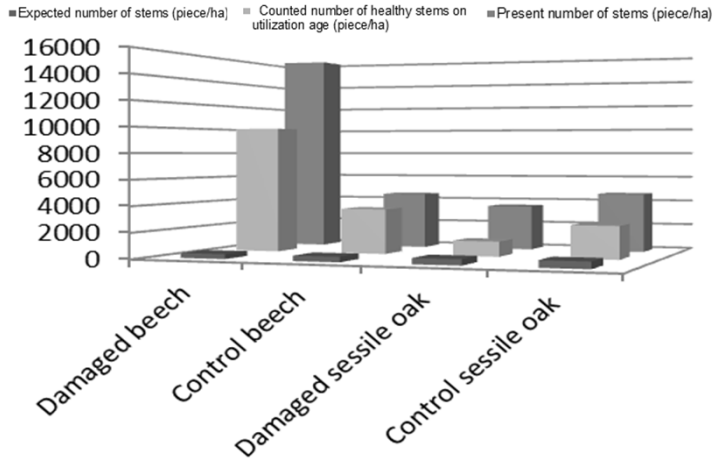
Stem number (p=0.00) and mean height of trees (p=0.00) were significantly lower in previously browsed oak stands.

	Diameter at breast $_{1.3}$ (cm)	Height (m)	Number of stems (piece/ha)	Crotched stems (%)	Tortuosity (%)
Damaged	5,7	6,5	3570	27,23	39,79
Control	5,9	7	4660	8,1	37,33
p	0,0996 *	0,0001 **	0,0001 **	0,0001 **	0,6171 NS

There was no significant difference between diameter (measured at breast height) of browsed oak trees versus non-browsed oak trees (p=0.09). Diameter at breast height of stems (p=0.01) and mean height of trees (p=0.01) were significantly lower in the previously browsed beech stand (p<0.01). The rate of crotched stems was significantly higher in previously damaged stands in the case of both tree species (oak p=0.00 and beech p=0.03).

	Diameter at breast $_{1.3}$ (cm)	Height (m)	Number of stems (piece/ha)	Crotched stems (%)	Tortuosity (%)
Damaged	2,3	1,8	15950	18,69	18,69
Control	3,5	6,7	4500	7,51	13,72
p	0,0001 **	0,0001 **	0,0303 *	0,0258 *	0,0558 NS

According to our calculations in both, the damaged as well as in the control areas, the number of healthy trees available for utilization grossly surpasses those yield numbers which would potentially be expected based upon literature reviews and other data from the region.



Summary

Browsing damage of seedlings did not appear to significantly affect stem quality of pole stands. During commercial treatments damaged stems can be removed, an action eased by the fact that damaged stems are usually evenly distributed. In contrast, browsing negatively affected tree growth which resulted in an economic loss to the timber owner.

Acknowledgements

This research was supported by the TÁMOP-4.2.1/B-09/1/KONV-2010-0006 "Intellectual, organizational and R & D infrastructure development in the West-Hungarian University" competition.

References

BÉKY A. (Ed.) (1989): A tölgy termesztése és hasznosítása. Mezőgazdasági Kiadó, Budapest
BONDOR A. (Ed.) (1986): A bükk. Akadémiai Kiadó, Budapest
MÁRKUS L. (1988): Az erdei vadkárok és értékelésük, Vadbiológia
NÁHLIK A., TARI T. ÉS SÁNDOR GY. (2007): Az erdei vadkár keletkezésének okai és következményei, a vadgazdálkodás időszerű kérdései 7.-Vadkár
SOPP L. (1974): Fatömegszámítási táblázatok – fatermési táblázatokkal. Mezőgazdasági Kiadó, Budapest
ZAMORA, R., GÓMEZ, J.M., HÓDAR, J.A., CASTRO. J., AND GARCÍA, D. (2001): Effect of browsing by ungulates on sapling growth of Scots pine in a Mediterranean environment: consequences for forest regeneration. For. Ecol. Manag. 144: 33–42.

TÁMOP 4.2.1/B-09/1/KONV-2010-0006

National Development Agency
www.ujszechenyiterv.gov.hu
06 40 638 638

HUNGARY'S RENEWAL

The projects are supported by the European Union and co-financed by the European Social Fund.