

Differences in shrub level food supply of ruminants as determined by the silviculture method

Introduction

In this study we conducted a comparative examination in order to determine whether old growth woodlots of beech (as preferred tree species) show any differences in biomass and composition of shrub and tree species compared to woodlots managed by individual and group selective cut and strip clear cut.

Material and methods

For our examination we selected woodlot segments in beech forests, where vegetation status reflected original nudum prior to any type of cutting, status where strip clear cutting was practiced, status where group selection and status where individual selection was done. Samples were taken from specified 3m wide strips. In each sample strip we counted and identified every stem of woody vegetation suitable as a food source for wild game. We collected shoots of each tree species and determined the biomass of each sampled tree species as well as a total value, which we then further extrapolated for the entire woodlot community and quantified it in kg/ha.

Results

Shoot-mass determination For the mass determination of shoot samples collected at the field and analyzed in the laboratory we determined the average shoot-mass in grams (g) to two tenth accuracy (microgram).

	Mass (g)	Diameter (mm)
Common Beech (<i>Fagus sylvatica</i>)	0.33	2.1
Sessile Oak (<i>Quercus petraea</i>)	0.36	3.2
Common Hornbeam (<i>Carpinus betulus</i>)	0.46	2.5
Sycamore Maple (<i>Acer pseudoplatanus</i>)	0.45	3.4
Hedge Maple (<i>Acer campestre</i>)	0.64	3
Common Ash (<i>Fraxinus excelsior</i>)	0.38	2.6
Black Elder (<i>Sambucus nigra</i>)	0.56	5.8
Rubus (<i>Rubus fruticosus</i>)	1.76	1.9

From our examination it was determined that the dry mass of wild blackberry shoots was the greatest, followed by the field maple and the blue elderberry.

Determined biomass In the nudum woodlots and in woodlots managed by strip clear cutting the biomass was largely represented by beech; whereas the presence of other plant species was insignificant.

	Nudum	Strip clear cutting	Group selective cutting	Individual selective cutting
Common Beech	9.42	25.74	0.44	20.38
Sessile Oak	0.00	0.00	0.00	0.00
Common Hornbeam	0.00	0.46	0.19	2.38
Sycamore Maple	0.17	2.45	0.49	4.49
Hedge Maple	0.00	0.41	0.00	0.03
Common Ash	0.00	0.00	0.25	0.48
Black Elder	0.00	0.30	0.00	0.05
Rubus	0.00	0.02	22.87	70.93

Summary

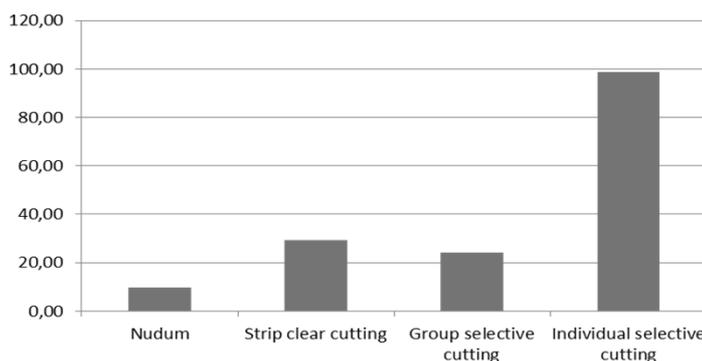
In nudum forests biomass was mostly composed of beech while other species were barely represented; in woodlots managed by selective cutting the biomass was most significantly composed of rubus. In terms of biomass of identified plant species, each species showed significant differences between measurements of the unmanaged nudum state woodlots. Compared to the nudum state forests, examined by our study, selective cutting management techniques of beech forests positively influenced understory vegetation in terms of available biomass and species composition soon after beginning of active management. This is clearly advantageous to wild game and forest managers alike.

It is important to expand this study in the future and examine all cutting management techniques further in order to scientifically validate their impact and effectiveness as well as to have reliable data for comparative examination of various management practices. Based on our current understanding it appears that biomass available to wild game for consumption shows a rapid increase at the early stages, which is first followed by an increase in plant species diversity (number of species), then followed by an increase of biomass per each newly appeared plant species. In order to effectively validate our results and its implications for the long term, future monitoring research is needed to validate our observations at depth which can help identify and scientifically evaluate the effects of selective cutting management techniques on wild game.

Acknowledgements

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

In woodlots managed by group selective cutting or individual selective cutting biomass of wild blackberry was the greatest; closely followed by beech in individual selective cut woodlots. In terms of identified species, biomass of the Sycamore Maple was most significant in both selective cut woodlots. In terms of total available biomass for feeding of wild game the lowest value was measured in unmanaged nudum beech forests.



In forests managed by strip clear cutting and group selective cutting the measured biomasses were greater, twice as high, compared to nudum state woodlots; whereas, in the case of individual selective cut woodlots the measured value was over ten times greater than that of the nudum state value. In terms of biomass of identified plant species, each species showed significant ($p \leq 0.01$) differences between measurements of the unmanaged nudum state woodlots and all other managed forests.