Cost Action FP1301
EuroCoppice

cost
EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

Innovative management and multi-functional utilization of traditional coppice forests
24-26 February, Florence, Italy

PRODUCTIVITY AND STRUCTURE OF COPPICE BEECH FOREST IN THE SARAJEVO CANTON AREA

Besim Balić, Sead Vojniković, Ćemal Višnjić, Jusuf Musić, Admir Avdagić
Faculty of Forestry, University Sarajevo

ABSTRACT

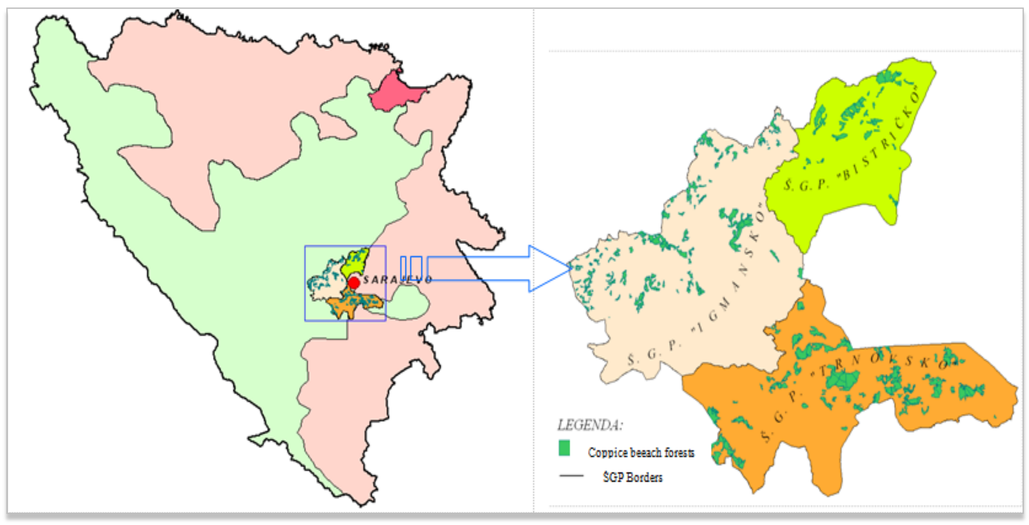
According to inventory data, the total area of forests and forest land in Sarajevo Canton area is 71.501 ha, of which the coppice forest occupies 10.696,60 ha. The largest part of coppice forests belong to beech coppice forests (6.510,50 ha). Due to the size of the forest complex, it can be concluded that there is a high heterogeneity and variety in terms of climate, habitat and orographic factors, which ultimately results in the existence of different formations and shapes of forests and forest communities from different production and structural characteristics. The main goal of this research is determining their size and distribution shape.

Picture 1. Typical beech coppice forests with absentee silvicultural treatment (Vojniković, S.)

METHODS AND MATERIAL OF RESEARCH

Simple systematic samples were used as the model for terrestrial assessment. Sample plots were arranged in quadratic grid with 200 m wide home squares. For spatial analysis we used the *WinGIS XT* GIS software application. Reambulation centers of sample plots were achieved by using a *GPS* receiver. Analytical and graphical computational method was used for data processing and their graphical interpretation. For the calculation of basic statistical parameters for different data types and levels of grouping, we used *Statistics 8.0* software and the statistical package in *MS Excel 2007*.

Picture 2. Coppice beech forests (Višnjić Ć.)



Picture 3. Research areas within the borders of Bosnia and Herzegovina with the forest management areas and areas of beech coppice forests in the Sarajevo Canton

RESULTS

With the analysis of collected data, we determined the average sizes of basic elements of beech coppice forests in Sarajevo Canton. They are presented in the attached table, which contains the distribution of these indicators per diameter classes, in absolute and relative terms. The accompanying graphs present the percentage distribution, expressed by the average stock per hectare. (Shares of trees in the average growing stock per hectare according to: origin, silvicultural role in the stand, the proportion of marked trees for cutting, shares of assortments in stock, shares of assortments in marked trees for cutting, and the percentage distribution of the coppice forests area according to: the depth of soil, method of conversion and established category.)

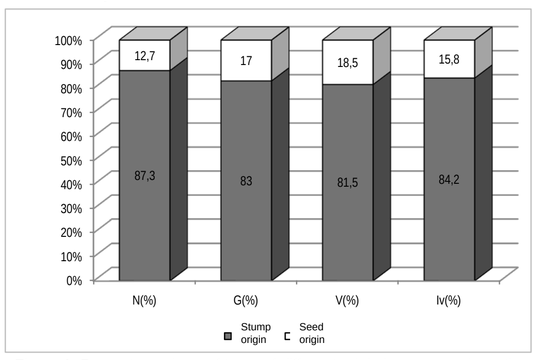


Figure 1. Percentage share of trees of different origin in average sizes: the number of trees (N), basal area (G), volume (V) and volume increment per hectare coppice beech forests (Iv)

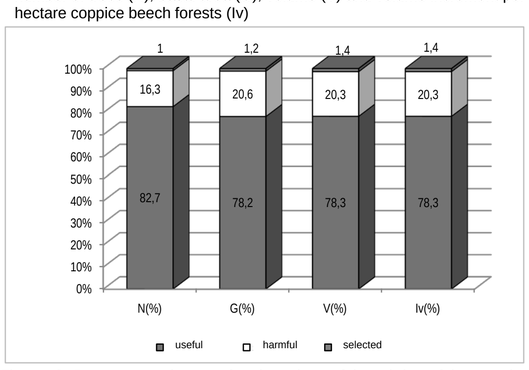


Figure 2 Percentage shares of selected, useful and harmful trees in average sizes: the number of trees (N), basal area (G), volume (V) and volume increment (Iv) per hectare coppice beech forests

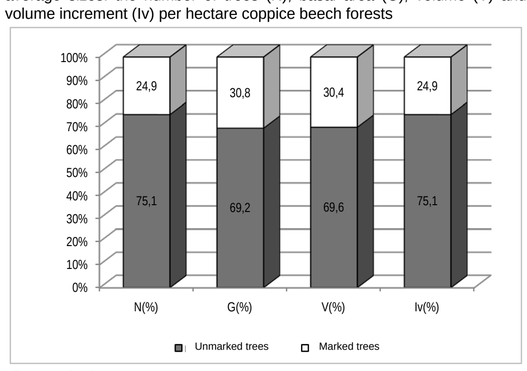


Figure 3. Percentage shares of marked trees and unmarked trees for cutting in average sizes: the number of trees (N), basal area (G), volume (V) and volume increment (Iv) per hectare coppice beech forests

Diameter class	Height	Diameter increment	Inventory elements per hectare							
			Number of trees		Basal area		Volume		Volume increment	
			No./ha	%	m²/ha	%	m³/ha	%	m³/ha	%
2,5	3,7	2,7	855	45,6	0,54	2,6	3,18	1,6	0,46	7,4
7,5	6,9	2,6	491	26,2	2,04	9,7	13,72	6,7	0,84	13,6
12,5	10,4	2,9	221	11,8	2,81	13,4	21,51	10,5	0,99	16,0
17,5	12,9	3,2	135	7,2	3,21	15,3	28,83	14,1	0,96	15,5
22,5	15,3	3,4	79	4,2	3,13	14,9	30,82	15,1	0,89	14,4
27,5	17,3	3,2	43	2,3	2,52	12,0	26,46	13,0	0,64	10,3
32,5	19,2	3,6	20	1,0	1,62	7,7	18,31	9,0	0,41	6,7
37,5	20,1	3,6	13	0,7	1,46	6,9	16,82	8,2	0,34	5,5
42,5	20,4	3,7	8	0,4	1,12	5,4	13,10	6,4	0,24	3,9
47,5	20,9	3,6	4	0,2	0,76	3,6	9,00	4,4	0,14	2,3
52,5	21,9	3,8	2	0,1	0,36	1,7	4,37	2,1	0,07	1,1
57,5	22,7	3,8	2	0,1	0,39	1,8	4,80	2,3	0,07	1,1
62,5	23,8	2,9	1	0,0	0,29	1,4	3,75	1,8	0,04	0,6
67,5	24,0	3,5	1	0,0	0,27	1,3	3,56	1,7	0,04	0,7
72,5	22,9	3,5	1	0,0	0,21	1,0	2,66	1,3	0,03	0,5
77,5	24,2	3,1	0	0,0	0,11	0,5	1,37	0,7	0,01	0,2
>80	25,1	4,9	0	0,0	0,15	0,7	1,98	1,0	0,02	0,3
TOTAL			1875	100,00	20,98	100,0	204,24	100,0	6,18	100,0
Relative error (%)			5,2		2,0		2,4		2,2	
Coefficient of variation (%)			138,5		52,8		63,4		58,2	

Table 1. Average sizes of basic elements of beech coppice forests in Sarajevo Canton

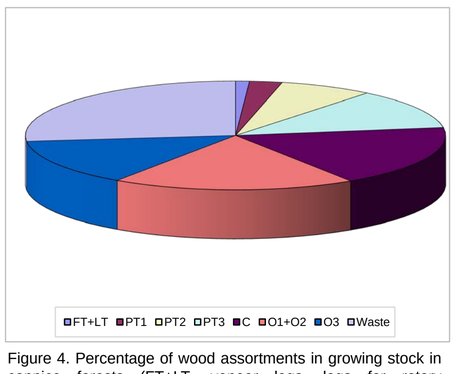


Figure 4. Percentage of wood assortments in growing stock in coppice forests (FT+LT- veneer logs, logs for rotary cutting, PT1+PT2+PT3-saw logs of three classes, C-cellulose, O1+O2+O3-fire wood of three classes)

Picture 4. Hornbeam coppice within coppice beech forests - a frequent occurrence Balić, B.)

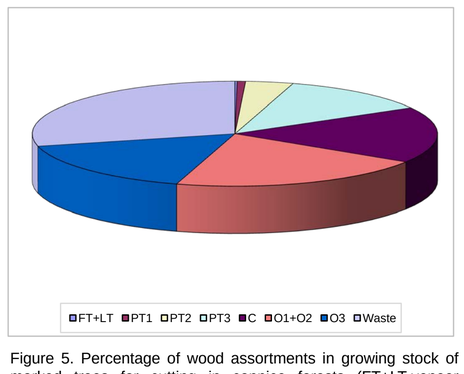


Figure 5. Percentage of wood assortments in growing stock of marked trees for cutting in coppice forests (FT+LT-veneer logs, logs for rotary cutting, PT1+PT2+PT3-saw logs of three classes, C-cellulose, O1+O2+O3-fire wood of three classes)

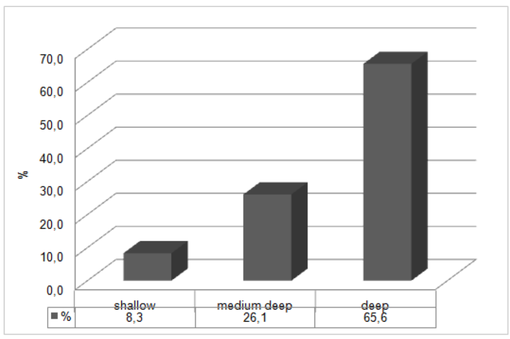


Figure 6. Percentage distribution of surface coppice beech forests by soil depth

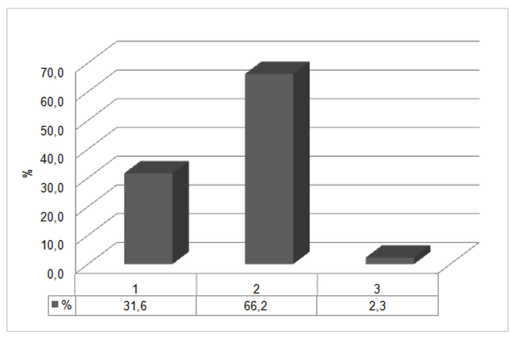


Figure 7. Percentage distribution of surface coppice beech forests by forest category (1- good quality stocks on good quality soil, 2- poor quality stocks on good quality soil, 3- poor quality stocks on poor quality soil)

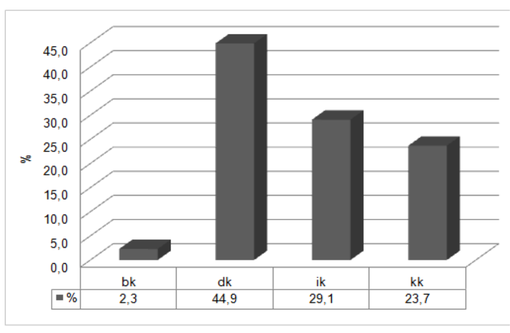


Figure 8. Percentage distribution of surface coppice beech forests by conversion method (bk-without,dk-direct, ik-indirect, kk-combined)

CONCLUSION

The knowledge of the most productive and structural indicators as an expression of the state and structural construction of coppice forests provides a forestry expert a good starting point for making the right guidance in the planning and management of coppice forest. Arguments for abandoning the present method of felling, which mostly favor direct conversion (common substitution of existing species with other) are the presence of trees with seed origin and presence of other tree species on the soil with favorable production potential. Also, the different quality and diameter structure in coppice forests is one of the arguments. The largest part of coppice forests should be, in the next period, gradually translated into a higher silvicultural form, using the methods of indirect and/or combined conversion.