

Overall natural conditions, and the application of silvicultural and regenerative measures affect quality and structure of natural regeneration. With rising forest stand density of 0.5 to 1.0 increases the number of individuals with poor quality, especially in fir. Of great importance for the survival and future sustainable development of beech and fir forests on the Korab mountain is to grow quality and numerous natural regeneration of both tree species without compromising the quality structure of the parent trees and without jeopardizing the ecological, economic, landscape and other features of these forests.

Keywords: beech, fir, developmental stages, Korab Mt.

Development, management and sustainability of Macedonian Pine forests in National Park Pelister

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Macedonian pine, *Pinus peuce* Gris. is a tertiary relict and an endemic species for the Balkans, identified in 1839 by German botanist Griseb. Besides its economic and ecological value, this species is of cultural and national importance for Macedonia and was the main factor for the establishment of the National Park Pelister (NPP) in 1949. Despite this status, environmental changes, succession processes and management methods endanger sustainability of these forests. Modern society, progress of technology and industry as well as new knowledge, should create and provide conditions for development and sustainability for this species as well as for the stands of *P. peuce* at NPP.

The main goal of our research was to investigate the development and sustainability of Macedonian pine forests at NPP. Since the establishment of NPP until today thinning have been exclusively applied without regard to the age of the stands. Regarding stand development, we analyzed diameter and height development. From the aspect of renewal of the stands, an analysis was made of the natural regeneration of these stands and the crown covered area.

Investigations were executed on 41 circular experimental plots (EP) with radius of 12,62m, and area of 500m². Of the total 41 EP, 10 were considered as main, while the remaining 31 were cluster plots of the main EP's. EP's were placed in stands of Macedonian pine at different altitudes and different ages. According to altitude, EP's were categorized into 3 groups (from 1050mHsl to 1250mHsl, from 1251mHsl to 1450mHsl and from 1451mHsl to 1650mHsl, first to third respectively). According to age, EP's were established on stands in 4 age groups - 40, 60, 90 and 140 years old. In the investigated stands, we measured the diameter at breast height and the height of all trees in all experimental plots. In main EP's natural regeneration plants were counted and categorized in three groups by height (up to 30cm; 31 to 130cm and above 130cm). Also, 4 radii (perpendicular one to the other) of all trees were measured, and data were used for determination of crown covered area. From the analyses and the results obtained, it can be concluded that the stands of *P. peuce* in the National Park Pelister have good growth in diameter and height, while the regeneration is very low as we registered extremely low numbers of seedlings. Crown covered areas in the investigated stands range from 0,39 to 0,68 independently of age. From our data and results, we have concluded that the management system is not serving well for regeneration, therefore in general for the sustainability of these stands.

Keywords: Macedonian pine, *Pinus peuce*, growth, diameter, height, regeneration, management system.