**UDC 630*53*2:582.681.81(477.8)**

# BIOTIC AND ENERGY PRODUCTIVITY OF NATURAL BEECH FORESTS OF UKRAINIAN CARPATHIANS

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At present the Ukrainian Carpathians remain one of the few national natural heritages and are the center of biodiversity, the territory of intact primeval forests and unique mountainous landscapes. Being settled in the center of Europe, forest expanse of the Carpathian land is more and more often come out as the object of international contracts concerning environmental protection and numerous scientific projects in the ecological and resource spheres. In this context beech forests take specific attention.
The State account of the Ukrainian forests carried out 1.01.2011 showed that the beech forests, that are in the departmental submission of the State Forest Resources Agency of Ukraine, in four regions (Zakarpats'ka, Ivano-Frankivs'ka, L'vivs'ka, Chernivets'ka) the territory of which mostly belongs to the Carpathian region of Ukraine take 559 thousand ha of forest plots covered by forest vegetation. We must just note that the division of these forests area between the administrative regions is quite irregular, they are concentrated mostly in Zakarpats'ka (50.6 %), L'vivs'ka (17.2 %) and Ivano-Frankivs'ka (17.0 %) regions. We have less of them in Chernivets'ka (7.6 %).

The process of the regulatory and information tables design concerning biotic and energy productivity of the natural modal beech forest stand included the following stages: studying of the phytomass investigation experience; collecting, processing and data analysis; stock and total productivity modeling; setting qualitative indices of the phytomass components; modeling of conversion coefficients of the phytomass components and checking models; design of the corresponding standards and their verification.

Dynamics modeling of stock and total productivity of the forest stand under investigation was conducted with the help of the Bertalanffy growing function, in silvicultural publications knowing as Drakin Vuevsky function.

For modeling of conversion coefficients of the phytomass components the allometric equation $Y=aX^b$ was applied, in which as factors the following indications were included: age *(A)*, site index class *(Б)* and relative stocking *(P)* of the stands.

Modeling of conversion coefficients dynamics (*Rv*) that represent the ratio of the mass of one or the other fraction of the forest stand to his stock in the bark was conducted to such components as trunk in the bark, branches and leaves. As for the root systems, understorey vegetation and green forest floor, for the estimation of the indicated components their multiple regression equations were adjusted taken from the scientific literary sources.

As a result of the conducted modeling we got the mathematic models that link the phytomass of some beech stands components with their stem stock. The next step was putting the received dependences into the regulatory and information tables of the bioproductivity and energy productivity dynamics of the modal natural beech forest stands of the Ukrainian Carpathians.

The current state of the regulatory and information provision of the forest industry needs considerable extension in estimating energy productivity and some ecological functions of forests. In this context, regulatory and information tables of the bioproductivity and energy productivity of the modal beech plantations, introduced in the article, can be instruments in ecological prognostication and monitoring of forests ecosystems of the Ukrainian Carpathians, and what is more, in estimation energy potential of the arboreal biomass while accomplishing scientific, ecological, forestry and feasibility study of advanced utilization of the forest energy resources of the region.