

ON POSSIBLE DIRECTIONS OF DEVELOPING MATHEMATICAL ECOLOGY

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Abstract. The problem of joint use of population and mass energy approaches in modeling ecosystems is discussed. On the example of three problems: modeling of vegetation dynamics under climate change; modeling of connection between species number and individual metabolism; modeling of population mobility, the problem of mathematical description of ecological objects is discussed. The central questions are whether typical variables – population size and nutrient concentrations – are sufficient to describe ecological systems, and whether they can be measured together simultaneously. The opinion is expressed that in the study of ecological systems it is necessary to borrow methodological developments of modern physics, but at the same time systematically and carefully coordinate the systems of concepts used for environmental studies with physical and mathematical systems of concepts.

Key words: population models, nutrient cycling models, matching principle, migration of individuals.