

Original article

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Ecological and Economic Assessment of Biological Diversity Preservation during Wood Harvesting in the Vologda region

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Abstract. This article examines the identification and conservation of biodiversity hotspots – key biotopes – under conditions of excessive soil moisture in logging areas during clearcutting by logging complexes (harvesters and forwarders) in the middle and southern taiga subzones of the Vologda Region. The results of the scientific study show that clearcutting leads to changes in the structure of biogeocenoses, the age and species composition of tree stands, the diversity and abundance of young growth, undergrowth, and living ground cover. Identifying key biotopes as non-exploitable areas during logging operations is an effective measure for preserving biodiversity at the local level. The number of plant species in preserved key biotopes with temporary excessive moisture is, on average, 1.5 times greater than in the adjacent forest stand, and 1.8 times greater than in the adjacent clearcut area 1–5 years ago. In areas with permanently over-wetted biotopes, this indicator is 1.7 and 1.8 times higher, respectively. The study's results suggest the environmental and economic feasibility of preserving local biodiversity during clear-cutting. Preserving key biotopes in over-wetted conditions is a cost-effective measure (33.2–62.5%) during logging operations.

Key words: biological diversity, clear-cutting, timber harvesting, main biotope, biotope core, biotope buffer zone, economic efficiency.

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