

TALL HERB SPRUCE FORESTS AS CLIMAX COMMUNITIES ON LOWLAND SWAMPS OF BRYANSK POLESIE

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Abstract. Nettle grey alder forests are a dominant forest type on lowland swamps in the Bryansk Polesie. They are formed as a result of repeated cuttings in the place of tall herb spruce forests. Tall herb spruce forests are very rare communities in the vegetation cover in this area due to clear cutting, melioration and peat extraction. An assessment of the succession status of tall herb spruce forests and nettle grey alder forests was carried out in this paper. The criteria of climax state and succession state of communities, developed for Eastern European forests, were used. These criteria are based on the degree of intensity of the following signs in the community: 1) the completeness of species composition of tree synusia; 2) the ontogenetic structure of tree species cenopopulation; 3) the gap-mosaic stand structure; 4) the diversity of microsites in soil cover; 5) the completeness of species composition and ecological-coenotic diversity of vascular species. We showed that tall herb spruce forest, as opposed to black alder forest, is close to communities of the climax type. This is evidenced by the following features of cenosis: firstly, all tree species in the area that covers the Bryansk Polesie and that are able to grow on lowland swamps are represented in the spruce forest (*Alnus glutinosa*, *Betula pubescens*, *Fraxinus excelsior*, *Padus avium*, *Picea abies*, *Salix pentandra*, *Sorbus aucuparia*, *Ulmus glabra*). Secondly, a steady turnover of generations is carried out in the cenopopulations of main edificators (*Picea abies* and *Alnus glutinosa*). This is evidenced by the complete and left-sided structure of their ontogenetic spectrum. Thirdly, a system of asynchronously developing gaps (parcels), which are formed on the site of old tree falls, is formed in the community. This ensures the continuous renewal of spruce and alder populations and creates conditions for the regeneration of other tree species. Fourthly, the structure of biogenic microsites has been formed in the soil cover: fallen logs, treefall pits and mounds, sedge tussocks, tree hummocks and substrate composed of the surface tree roots. These microsites determine the stable existence of species of contrasting ecological-cenotic species groups (from water-marsh and nitrophilous groups to wet-meadow, nemoral and boreal groups) in the community. Finally, thanks to the well-developed treefall gap structure and system of microsites, the parameters of the species and ecology-cenotic diversity of tall herb spruce forests are maximal among all forest types in the lowland swamp of the Bryansk Polesie. All this suggests that tall herb spruce forests are the climax (final) stage in the development of black alder forests in lowland swamps within the areas of *Picea abies* and *Alnus glutinosa*. We showed that the derivative nettle black alder forest, in contrast to the tall herb spruce forest, is in the first stages of restoration. This is indicated by the following signs: firstly, in the black alder forests, not all tree species that can grow on the lowland swamps of the Bryansk Polesie are present. This is often due to the fact that seed sources (generative trees) are absent in the immediate surroundings. Secondly, there is no normal turnover of generations in the cenopopulations of all tree species. Thirdly, a treefall gap structure (parcel mosaic) is not formed in the communities, which is necessary for the stable turnover of generations in tree populations. Fourthly, the system of biogenic microsite is not developed in the soil cover. Because of this, the composition of the ground cover is limited mainly by plant species of the water-marsh and the nitrophilous groups that are tolerant to the swampy substrate. Fifthly, black alder is distinguished by relatively low indicators of species richness and ecological-coenotic diversity. This is due to the undeveloped mosaic of parcels and microsites. It should be emphasised that the low age of felling (60–70 years) is the main reason for the «eternal» succession youth of black alder forests. Felling does not allow the community to reach the final stages of succession with the maximum structural, species and ecological-cenotic diversity.

Key words: tall herb spruce forest, nettle grey alder forest, lowland swamp, climax, succession, coenopopulations, microsites, species diversity, Bryansk Polesie.