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Evolution of Vegetation on the Left Bank of the River Unzha (Kostroma Region, Russia) after the Fire of 1972 - Results of 30 Years of Observation

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Abstract

On the left bank of the Unzha River, in the Makaryev and Manturovo Districts of Kostroma Region, a forest plot measuring roughly 30 km by 40 km was destroyed by fire during the hot summer of 1972. In 1988, a transect about 2.5 km long was laid from the edge of the river floodplain to the watershed, to observe regeneration in the fire zone. The crowns of the trees burned during the fire, but the trunks remained. Over the next 5 years, the trees were cut down. The dead trunks began to rot and tree felling stopped. In 1978, when the authors first visited the site, it was an open space, mostly overgrown with polytrichum mosses. There were a few small areas of unburned forest, which had mostly been affected by ground fire. Here and there one could see groups of standing dry trees. We subdivided the transect into three parts: dry, boggy, and channel (catchment hollow). During the observation period (1988, 1993, 1997, 2013-14, 2019) the polytrichum cover in the dry part changed: the polytrichum was replaced with lichens; pines began to grow; and the grass-shrub cover diminished with a simultaneous increase in the proportion of bearberry in it. On the boggy part, the height of the pines increased by 2–3 times, while birches grew more slowly. The size of the Ledum palustre and lingonberry cover increased and heather began to disappear. The vegetation in the channel zone was distinguished by high diversity and species richness. The forest stand increased in height but became less dense. When observations in the forest stand began, the prevailing species was Betula alba with some black alder and aspen. The proportion of black alder and aspen has now increased, and pine trees and individual spruce trees have appeared.

Keywords: Burning overgrowth, pyrogenic succession