

Post-fire Succession of Understory Vegetation in Scotch Pine Forests of Central Polissya of Ukraine

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ABSTRACT – Polisskiy Natural Reserve is one of the most important territories for biodiversity protection in North of Ukraine. Forests of mixed Scotch pine (*Pinus sylvestris*) with birch (*Betula pendula*) and other species forests are most common. Wildfires regularly occur within and outside protected area due to human activity. Usually the average size of fire does not exceed 0.5 to 5.0 ha. In May 2009 a large wildfire occurred and during two weeks burned about 1000 ha of forests, mainly by crown fires. We conduct a comparative study involved methods to determine species regeneration, its diversity, projective cover, dominance, constancy and similarity of burned and unburned forests. In total 32 plots that were established in 20 to 120 years-old Scots pine forests. Scorch height during fires was 0.1–4.6m and higher. It was found that four years after crown and intensive surface fires in 40–60-years old pine forests species as *Cladonia rangiferina*, *Dicranum congestum*, *Pleurozium schreberi* did not recover. Some species like *Hieracium villosum* and *Erigeron canadensis* newly appeared on sites after the fire. *Vaccinium myrtillus*, *Ledum palustre* and *Rhodococcum vitis-idaea* recovered successfully after medium-intensity surface fire (Sheight <1.5 m) and colonized 60% and more of area. The occurrence of *Polytrichum commune*, which was not present on the sites before the fire, was stimulated by fire. Species on post-fire areas are characterized by high constancy (50–67%) and low dominance (<25%). The projective cover of species whose constancy is equal or exceeding 50% varies within 5–9%. In the control (unburned) area species with high constancy overwhelmingly dominate, which is typical of undisturbed ecosystems. It was also found that after low-intensity surface fires there is a complete regeneration of pre-fire species composition, since the coefficient of similarity is 1.0. After a surface fire of medium intensity, the value of the coefficient varied from 0.11–0.43, and after a surface fire of high intensity – 0.13–0.15. In general, an increase of fire intensity leads to a decrease in the similarity of the vegetation between the burned and unburned areas.

Keywords: Post-fire succession; ground fire; species diversity; dominance; constancy; similarity

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