Dynamics of natural regeneration following the 2006 windstorm in the mountain forests of the Slovenian Alps

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ABSTRACT

Natural disturbances play a major role in the dynamics of forest structure and composition. For close-to-nature silviculture understanding the resilience to and recovery after devastating natural disturbances is crucial. In 2006 a severe windstorm damaged 160 ha of mature pure secondary Picea abies stands in the Julian Alps growing in sites with the potential natural forest vegetation of Fagus sylvatica, Picea abies and Abies alba with admixture of some minor tree species. On the 125 ha of totally damaged forest a systematic grid of 81 permanent plots (size of each 4 × 4 m; grid 100 × 200 m) was established for a long-term monitoring of tree species regeneration dynamics (i.e. regeneration density, tree species composition, height structure, and browsing damage). Four consecutive inventories of natural regeneration were

conducted between 2008 and 2025. To identify predictors of occurrence and abundance of natural regeneration the Tobit censored regression model were developed, the independent variables being various site and stand parameters (i. e. inclination, microrelief, soil type, canopy closure, distance to stand edge). In the observed period significant changes in the abundance of natural regeneration and its tree species composition are evident. The proportion of Norway spruce in natural regeneration has declined, while the proportion of light-demanding broadleaved tree species (Acer pseudoplatanus and Sorbus aucuparia) has increased. Browsing pressure, particularly on Abies alba and Sorbus aucuparia, negative affected regeneration dynamics. Our findings provide an insight into forest recovery after a large-scale high-severity disturbance and have direct implications for close-to-nature and multipurpose forest management of mountain forests. The study was partially funded by the JeloviZA, SOILOurInvisibleAlly and MOSAIC projects.