

The observational study on natural regeneration of Norway spruce (*Picea abies*) was provided during seasons 2010 and 2011 in the windthrow area of High Tatra National Park. The main aim of this master thesis was to describe the distribution pattern in Norway spruce regeneration as well as to estimate the spatial scale, which most precisely describes the differences in its phenotypic variability. Following step was to determine the relative influence of abiotic and stand factors on the growth characteristics and abundance of spruce seedlings. The Main focus lied on stressing the role of biotic interactions, like intraspecific and interspecific competition, leading to certain discrepancies in the phenotype, as well as in abundance of spruce seedlings. The reponse in variability in spruce traits was recognized at each spatial level. The results showed clear causality between soil moisture and vegetation composition, which both directly modified not only the phenotype of spruce seedlings and plants, but have even influenced their counts on particular stands.