

CHARACTERISTICS OF UN-MANAGED NORWAY SPRUCE STANDS IN WINDTHROW AREA IN SLITERE NATIONAL PARK, LATVIA

Endijs BADERS, Karlis TAUKACS, Baiba DZERINA, Aris JANSONS

Latvian State Forest Research Institute "Silava"

Rigas 111, LV-2169, Salaspils, Latvia

Email: aris.jansons@silava.lv

Abstract. Majority of forest areas in Latvia are or has been affected by human activities and there is lack of reference of un-managed forests. It can be assumed, that large-scale disturbance (like forest fire or storm) minimizes the effect of former forest management, and after its influence semi-natural stands emerge. Aim of our study was to quantify parameters of such stands forming after large-scale wind storm in absence of any management. Study site was located in north-western region of Latvia (57°38'N, 22°17'E), part of Slitere National Park that has been excluded from management activities since year 1923 and has been severely affected by wind storm in November 1969. Areas for the study were randomly selected from list of compartments in two forest sites types on fertile soil *Myrtilloso-sphagnosa* and *Oxalidosa*, where less than 10% of trees have survived after the storm based on forest inventory data. Circular sample plots with radius 12.62 m (area 500 m²) were established in for stands on wet mineral soil (*Myrtilloso-sphagnosa*) and two stands on dry mineral soil (*Oxalidosa*), altogether 9 and 8 plots respectively. Tree height and diameter were measured for all standing trees, greater than 6.1 cm. Norway spruce was the dominant tree species (70-97% from total basal area) in both forest types independently from the dominant species (Scots pine, silver birch or Norway spruce) in the stand after the storm. Admixture consisted of silver birch, common aspen and black alder, but Scots pine was not present. Mean stand density was 1978 trees ha⁻¹ and 1544 trees ha⁻¹ on wet and dry mineral soils, respectively. The density corresponded to basal area of 18 m² ha⁻¹ and 37 m² ha⁻¹, respectively and was notably and significantly higher than in managed Norway spruce stands at the same age, where, based on data from National Forest Inventory, the figures were 16 m² ha⁻¹ and 23 m² ha⁻¹, respectively. Nevertheless, the diameter of trees was notably and significantly smaller in un-managed stands than in managed both on dry and wet soil (16.0±7.8 cm vs. 18.9±5.53 cm and 11.9±4.67 cm vs. 17.4±5.21 cm); also the diameter distribution differed significantly. Results demonstrate, that Norway spruce that is considered to be a climax species has a significant potential to regenerate after large scale natural disturbance on fertile mineral soils, forming dense young stands. Further studies shall analyse the age structure of these stands to assess the success of each establishment types: from advanced regeneration and from seeds. Study was carried out in European Social Funds (ESF) project "Management of vital Norway spruce stands: ecological and technological aspects" (No. 2013/0022/IDP/1.1.1.2.0/13/APIA/VIAA/052). Research permission from administration of Slitere National Park is acknowledged.

Key words: natural regeneration; *Picea abies*; storm; large-scale disturbance.