

REVEGETATION OF SKI RUNS IN SERBIA: CASE STUDIES OF MTS. STARA PLANINA AND DIVČIBARE

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Abstract - Revegetation is the most sustainable method of soil stabilization at ski runs. In order to establish a stable plant community, it is recommended to use native species. However, non-native species are most often used. In this paper the revegetation of ski runs at two ski resorts is investigated: Divčibare and Stara Planina. Seven species were used for the revegetation of the ski run at the Divčibare ski resort of which six species were native. Six species were used for the revegetation of the Stara Planina ski resort, of which two species were native. It was established that the plant species used in the seed mixtures were suitable for erosion control at the investigated ski resorts.

Key words: Revegetation, ski runs, autochthonous plants, seed mixture, MT. Divčibare, MT. Stara Planina.

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INTRODUCTION

The construction of ski resorts is considered a major factor in environmental degradation in the world's mountainous regions (Titus and Tsuyuzaki, 1998; Urbanska, 1995; Ruth-Balaganskaya and Myllynen-Malinen, 2000; Wipf and others, 2005). The development of alpine skiing and mountain tourism has contributed to several negative impacts on mountain ecosystems (Pintar et al., 2009). Winter tourism today represents one of the most important economic sectors in a large part of the world's mountain areas (Abegg et al., 1997; Elsasser and Messerli, 2001; Rixen et al., 2003). Several ski resorts are influenced by both winter and summer tourism. In winter the soil and vegetation are affected by ski-run preparation and especially snowpack compression, machine grading and leveling (Ruth-Balaganskaya and Myllynen-Malinen, 2000). In particular, machine grading

for winter sports causes important problems such as erosion that has a negative effect on biodiversity (Chambers, 1995). Soils are disturbed by the construction of ski-runs and ski-lifts, by the passage of skiers and snowcats managing the snow (Ferrari, 2005). Damage caused by skiers is more clearly seen in the middle of the ski runs (Ries, 1996), where the machines create undesirable effects over the entire soil surface. The high level of snow compaction produces a denser snow layer, with a reduction in snow-insulating properties, a higher probability of soil freezing, a decrease in gas permeability, alteration of bio-geochemical cycles, and a decrease in micro-porosity (Gros et al., 2004; Wipf et al., 2005). All of these changes can dramatically affect the vegetation of ski runs (Rixen et al., 2003).

To rehabilitate these areas, the degraded ecosystem must be compared with its undisturbed

