



Post forest disturbance vegetation and soil dynamics in karst areas

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Karst areas of the montane and subalpine vegetation belts in the Calcareous Alps are dominated by forests. Disturbances by windthrow and bark beetle have intensified in the recent decades, posing a significant threat to forest and soil functions. Lithic and Rendzic Leptosols and Folic Histosols, the latter sometimes comprised solely of organic surface layers, cover ca. 40 % of the Karst area. Investigations along salvage logged disturbance chronosequences revealed a 60 % carbon loss from organic soil layers, resulting in a significant decrease of thickness and an increase in visible bare rock outcrops within a few years post-disturbance. At experimental sites, changing soil climate, particularly increased soil temperature, accelerated soil C losses via soil respiration. The changed soil conditions will have long-term effects on ecosystem functions. Ungulate herbivory is a main cause for the delay of vegetation recovery. Ungulate exclosures at windthrow sites resulted in a distinct difference in vegetation cover, soil carbon dynamics and soil climate between fenced and non-fenced plots. Non-fenced sites were dominated by grasses and showed ongoing high soil C-losses while under established tree regeneration within fences a recovery of the litter layer was observed. The studies indicate that proactive forest management, promoting tree regeneration is necessary to alleviate negative effects of forest disturbances on soil functions.