

ROCKFALL DEPOSITS IN FOREST

FIELD SURVEY AS BASIS FOR THE EVALUATION OF MINIMAL SLOPE LENGTH IN PROTECTION FORESTS

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INTRODUCTION

The NaiS protocol („Nachhaltigkeit und Erfolgskontrolle im Schutzwald“; Frehner et al. 2005) is the official Swiss guideline for the management of protection forests. Since the introduction of NaiS, a large experience was collected between practitioners on the use of the guidelines. Thereby, it was highlighted that especially for the target profile of protection forests in rockfall areas, the guidelines are not realistically applicable to all situations.

On the one hand, it is difficult to contain the width of canopy gaps below 20 m in deciduous forests, due to silvicultural reasons. On the other hand, the NaiS guideline doesn't consider the length of the transition zone to influence the efficiency of the designated silvicultural interventions.

METHODS

In order to ameliorate the existing definitions of target profiles of NaiS, the rockfall depositions on 18 vegetated hillslopes were mapped and analyzed in relation to the present forest structure. The detailed positions of the blocks and the characteristics of the forest stands were collected along 10 m large transects. In addition to the present vegetation, other relevant features of the stand such as laying dead wood or old rootstocks were collected.

Slope angle and slope length were considered as the primary factors influencing the deposition of rocks (Fig. 1). Furthermore, we included the basal area (G) in combination with the slope length for the analysis of the rocks deposition data.

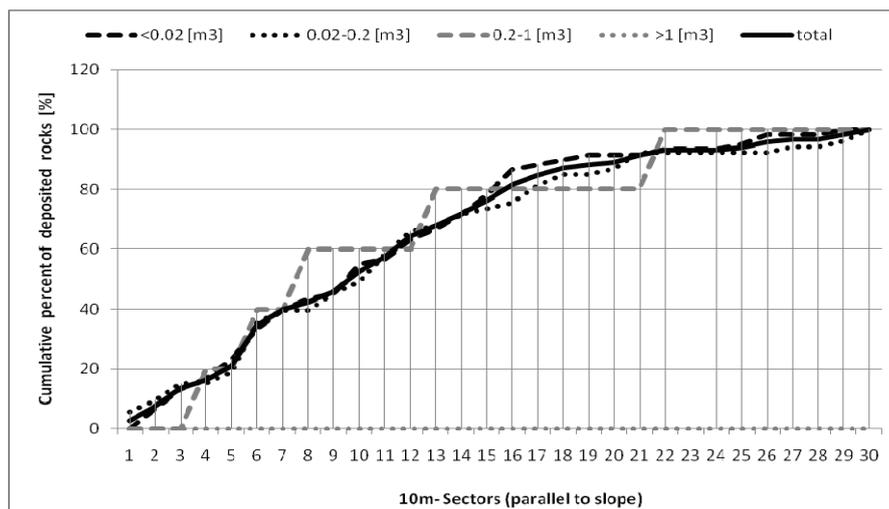


Fig. 1 Cumulative percentile curve of the rock deposition distribution for different classes of rock dimensions. Sample: „Les Evouettes 2“.

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FIRST RESULTS

In numerous cases, the deposition patterns of rocks could be explained through stand characteristics and „natural barriers“ present on the slope (Fig. 2).

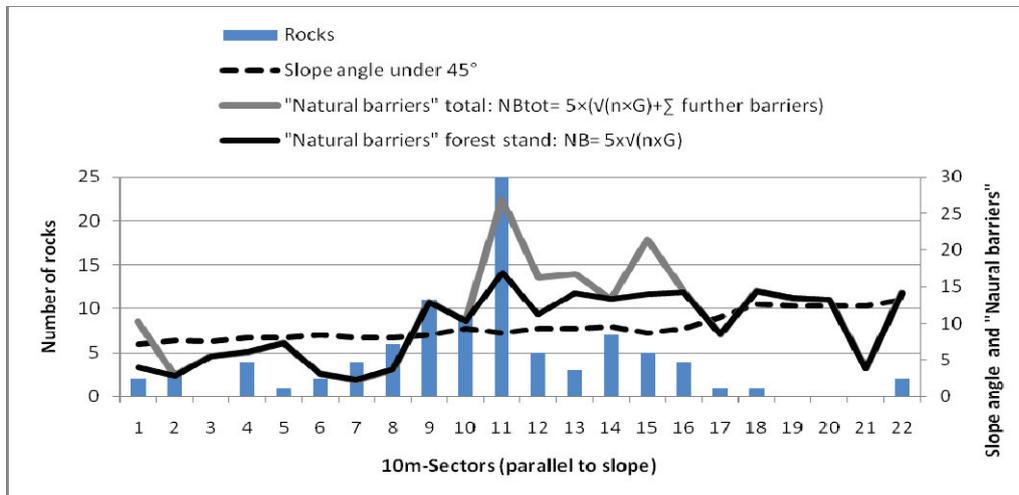


Fig. 2 Correlation of the rockfall depositions to the „Natural Barriers“ for the sample „Stöckalp“.

The first results confirm that the supposition, whereby forest are considered to have no protection function if the slope does not reach a minimal length, has to be refused.

OUTLOOK

Further analysis should consider correlating the variation of energy of the falling rocks with some forest stand characteristics.

REFERENCES

Frehner M., Schwitter R., Wasser B. (2005). Nachhaltigkeit und Erfolgskontrolle im Schutzwald: Wegleitung für Pflegemassnahmen in Wäldern mit Schutzfunktion, Vollzug Umwelt. Bundesamt für Umwelt, Wald und Landschaft, Bern. 564 S.

Keywords: Rockfall, protection forest, forest management, NaiS