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Understanding forest protection against rockfall from a subjective stakeholder perception

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Mountain forests provide protection against different kinds of natural hazards. This protective function is clearly identified in the first paragraph of the Mountain Forest Protocol of the Alpine Convention of 1996 where it says that mountain forests provide the most effective, the least expensive and the most aesthetic protection against natural hazards. Although techniques for stand stability of protection forests are well exploited by the forest experts, systematic studies quantifying the protection effect of a forest against rockfall are limited. Hence, the collected national and international guidelines and recommendations as well as other relevant literature will act as base-line from which different point of views of different experts can be summarized and analyzed. Within the Interreg Alpine Space project RockTheAlps, we therefore performed an in-depth analysis of state of the art recommendations and guidelines for sylvicultural management that primarily protects against rockfall in the European Alps. To provide a foundation for a systematic study of the above noted relevant forest parameters we apply Q methodological approach. Q methodology enables us to identify and to describe the diversity expert's knowledge of forest protection management strategies against rockfall risk prevention. In this way various attitudes, experiences and observations are understood and shown as qualitative data, whereas not every relevant parameter is evaluated independently of the others, but all parameters are related to each other. To this end, the following parameters have noted to be highly relevant – meaning that they can be found in almost all researched policies: mean stand density [N/ha], basal area of living trunks [m2/ha], basal area of dead trunks [m^2/ha], ratio of coniferous/broadleaved trees [-], proportion of shrub forest originating from coppice (only if broadleaved) [$\%$], proportion of shrub forest (also Pinus mugo) [$\%$], proportion of coppice with standards [$\%$], proportion of high forest [$\%$] and amount of lying tree (alive or dead) [m^3/ha]. The listed parameters are all based on subjectivity - an expert's viewpoint, experience or opinion and of course due to our selection criteria. Distinguishing and consensus statements of the respondents can then be used to quantify and to highlight the differences and similarities between the relevant forest protection parameters against rockfall.