

## Short-term development of a multilayered forest stand after target diameter harvest in southern Sweden

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### Abstract

Harvest strategies that emulate natural disturbances are being promoted to restore multilayered forest heterogeneity, notably the harvest of largest trees. However, their use also increases management complexity, and more information on their practical feasibility and effects on forests is needed. Therefore, in this study, target diameter cutting treatments were applied to a heterogeneously structured stand in southern Sweden (exemplifying a conifer-dominated forest of the hemiboreal forest region in northern Europe) to assess their effects on gap dynamics, natural regeneration, and stand growth. The target diameter cutting resulted in an exponentially decreasing gap size distribution, with the largest canopy gaps measuring 0.1–0.2 ha. The gap closure rate was higher than reported rates for gaps in natural forests. After 5 years, sufficient numbers of seedlings had regenerated, but proportions of intermediate- and late-successional tree species were low. The observed stand growth exceeded rates simulated using the growth model Standwise in the Heureka forest planning software package. The findings from this case study are useful for refining the general concept of close-to-nature forestry, but they need to be complemented with the information available from other regeneration studies after partial harvest.

### Keywords

Sweden, multilayered forest, stand development, gap dynamics, close-to-nature forestry, hemiboreal forests in Europe.