

## The Effect of Slight Thinning of Managed Coniferous Forest on Landscape Appreciation and Psychological Restoration

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We investigated the influence of slight thinning (number of woods: 16.6%, basal area: 9.3%) on landscape appreciation and on psychological restorative effect in an on-site setting by exposing respondents for a particular period to an ordinarily managed coniferous woodland (Japanese larch and Japanese red pine in a second-growth forest).

The experiments were conducted in an experimental plot (0.25 ha; 50 m x 50 m) in the coniferous woodland in Fuji Iyashinomoroi Woodland Study Center in May (before thinning) and October 2013 (after thinning), with the mean temperature and relative humidity being almost constant during the two experimental periods. The respondents were the same fifteen individuals (eleven males, four female; aged twenties to forties) for the two experiments.

The respondents were individually exposed to the control setting (enclosed session), which was enclosed by a large tarp in a large tent, and the experimental setting (opened session), which was opened without the tarp in the same tent, at random for 15 min. In both the sessions, the respondents were required to answer three questionnaires to investigate the psychological restorative effect before and only after the experiment (feeling; POMS, affect; PANAS, subjective restorativeness; ROS). For landscape appreciation, the respondents were required to answer other two questionnaires after the experiment (scene appreciation (SD) restorative property of environment (PRS)).

As a result of the analysis, there was a statistical difference in subjective restorativeness before and after thinning ( $p < .05$ ), however, not for the other parameters such as feeling and affect before and after thinning in the psychological restorative effect. For the parameter of landscape appreciation, there was no statistical difference in scene appreciation and the restorative property of the environment, except for some indices (thermal sensation ( $p < .01$ ) and brightness ( $p < .05$ )).

Thus, to add to our current knowledge of psyops theory, when a planner wants to control the user's landscape appreciation and/or psychological restorative effect in the ordinarily managed coniferous woodland such as focused on this research, it is suggested that stronger thinning would be necessary. On the other hand, as the meaningful knowledge, although there is a possibility that scene appreciation, which was relatively warm and bright before thinning, would influence the score of the psychological restorative effect, if the week thinning is conducted, the psychological effect is not always enhanced; in contrast, it might decrease the subjective restorativeness of the user.

Lastly, this study provides new information about relationship of thinning with forest management and the possibility of it demonstrating health rest functions such as forest recreation and forest bathing.

Keywords: Landscape appreciation, Psychological restoration, Thinning, Forest management, Forest bathing, Recreational use