

Impacts of forest harvesting on micro-climate and sediment transport in a mountain area

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Most of knowledge on the sediment transport in forests has been obtained by many field studies conducted in low mountain areas. In contrast, only few studies on the sediment transport have been conducted in deep mountain areas, because of the difficulties in monitoring. Mountain areas can be characterized as colder climate as well as steeper topography. Effect of these characteristics on types and timing of sediment transport is not sufficiently clarified. Therefore, we have conducted field observations on the sediment transport and the micro-climate in Ikawa University Forest, Akaishi Mountain Range, central Japan. We also harvested part of trees in our study site and observed changes in the sediment transport and the micro-climate to discuss impact of forest harvesting on them. The study site is located in 38-year-old hinoki (*Chamaecyparis obtusa*) artificial forest. In June 2011, six sediment traps were set up to investigate spatial distribution of sediment transport in the forest. We collected and weighed sediment captured by traps once in a month. We also monitored micro-climate (e.g., temperature, amount of radiation, soil moisture) near sediment traps. Clear cutting of trees was conducted around three sediment traps from March 2012 to September 2012. Our observation results show that the sediment transport rate is largely different among sediment traps. Spatial variability of slope morphology and grain size may result in wide range of the sediment transport rate. In autumn (non-freezing season), sediment transport rate was high in the periods with larger rainfall events (i.e., daily rainfall > 50 mm). Sediment transport was also observed in the winter when freeze-thawing occurs. Daily variation of the ground temperature and amount of soil moisture became larger after clear cutting of trees. However, the sediment transport rate did not change clearly (or decreased) by the cutting. By field surveys, we found that sediment coming from upper slopes was captured by leaves and branches of harvested trees left on the ground surface. Thus, sediment transport rate is influenced by combination of various factors (i.e., changes in micro-climate and covering of ground surface) resulting from clear cutting of trees.

Keywords: forest harvesting, sediment transport, micro-climate, mountain area