

Abstract

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The aim of this thesis, which is based on six papers (*I-VI*), was to study effects on forest arthropod populations (beetles and spiders), from harvest of logging residue (slash) for biofuel in clear-cuts, in temperate forests of Sweden. The major results show, short term (1-yr) and long term (5-7-yrs) effects on abundance and species richness of certain arthropods, as well as effects on the microhabitat choice of arthropods.

Arthropod data were gathered in the southern parts of Sweden during May-September, 2001-2004, by use of three different sampling techniques. Ground-active beetles and spiders were collected by pitfall trapping (*I, III-VI*). Wood-living beetles were collected by window-trapping (*VI*) or by rearing from collected woody material (*II*).

The results show that: 1) The height of slash piles left on the ground after clear-cutting, can be used for measuring ground-layer structural complexity (*I*). 2) Logging residue serves as an important habitat/substrate to several arthropods in managed forest systems (*I-VI*). 3) In a short term (1-yr) perspective, both abundance and species richness of the entire ground-living beetle fauna are negatively affected by slash removal in clear-cuts (*I*). 4) Experimental additions of slash, on the ground of clear-cuts, have a positive effect on the abundance of ground-active carabid beetles, but no such effect is found for lycosid spiders (*III*). 5) Manipulations of slash in the laboratory affect the microhabitat choice of two species of ground-living carabid beetles (*IV*). 6) In a long term (5-7-yrs) perspective, species richness and diversity of carabid beetles are positively affected by slash removal. Moreover, slash removal causes a shift in the carabid community by increasing the number of generalist species and reducing the number of forest species (*V*). 7) In comparison to the mature forests; the abundance of ground-living carabid beetles is negatively affected and species richness is positively affected by slash removal in clear-cuts, within a short term (1-yr) perspective. However, for longhorn beetles the abundance is positively affected and the species richness is unaffected by slash removal, in comparison to the mature forest, in a short term perspective (*VI*).

To conclude, this thesis presents consistent results showing that slash is an important habitat/substrate for several ground-living and wood-living arthropod species in temperate forests. The results also show short term and long term effects on abundance, species richness and microhabitat choice of certain forest arthropods from slash harvest in clear-cuts. Consequently, in order to safeguard forest arthropod biodiversity in the future, the results suggest that slash harvest in managed forests should be performed with increased environmental consideration.

Keywords: biodiversity, beetles, biofuel, Carabidae, Cerambycidae, Coleoptera, forestry, habitat structure, logging residue, Lycosidae, microhabitat choice, slash, species composition, species richness, spiders, structural complexity, whole-tree harvest.