Influence of Patch Size on Saproxylic Beetles of Boreal White Spruce Stands

Lead by: Seung-Il Lee

Theme: Arthropod Diversity

Status: Continuing

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Participants

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Background

Saproxylic beetles (i.e. beetles that depend on dead or dying wood during some part of their lifecycle) are a diverse group of organisms that provide essential ecosystem functions. They have important trophic role such as bark- and wood-feeder, fungivores, predator, and scavenger. Their sensitivity to environmental changes results because many saproxylic beetle species have strong relationships with specific microhabitats, especially quality and quantity of dead wood. The dead wood habitat of saproxylic beetles is a basic functional component of forest ecosystems. It provides unique structural characteristics as a specific habitat for many species, as well as essential ecological elements of forests.

Objectives

My specific objectives are to: (1) describe the saproxylic beetle assemblages using logs and snags of various size and decay classes of white spruce, (2) compare the saproxylic beetles among two sizes of clumped retention patches (0.20 ha and 0.46 ha) within different retention level of matrix and CWD profiles on the EMEND landscape, (3) determine if there is a threshold for forest retention patch size to minimize landscape impacts on saproxylic beetles identifying edge effects, (4) examine saproxylic beetles in white spruce downed dead wood ranging from freshly dead to well decayed.

Key Results

Based on the preliminary result collected by emergence traps, I found 2873 beetles representing 31 families and 112 species, of which 136 individuals from 11 families and 15 species were larvae. Curculionidae was the most abundant family occupying 88.1% of the total abundance, followed by Nitidulidae (2.2%), Colydiidae (2.0%), Staphylinidae (0.9%), Cleridae (0.8%), and etc. Wood-borer was dominant in the DC 2 (freshly dead wood) white spruce logs occupying 92.2%, followed by predator (2.3%) and fungivore (2.0%), but predator was the most abundant feeding group in the DC 4 logs occupying 44.4%, followed by fungivore (31.3%) and wood-borer (17.1%). Species richness and abundance of saproxylic beetles in the large ellipse were higher (72 species, 1787 individuals) than those in the small ellipse (56 species, 868 individuals).