

Lepidoptera diversity of residual forest stands

Lead by: Louis Morneau

Theme: Arthropod Diversity

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Participants

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Background

Moths and butterflies (Order Lepidoptera) play key functional roles in the ecosystem, such as vegetation consumers in their larval stage, food source for birds, bats, mammals and other insects, and they act as pollinators. They are good indicators to study biodiversity as they are taxonomically well described, well studied ecologically, numerous, easily sampled and most importantly, sensitive to disturbance.

Objectives

1) To compare diversity of macrolepidoptera, including significant forest pests, in different undisturbed forest types; 2) To compare the impacts of fire and forest harvest on a boreal lepidopteran community.

Key Results

Moth assemblages were compared among logging treatments and forest types in terms of diversity, abundance, habitat use, seasonal pattern, host-plant range and feeding guild. Assemblages were similar

across forest types and dominated by habitat use generalists and polyphagous species. Partial cutting resulted in significant decreases in both moth trap catch and species richness (Table 1). Moth assemblage was also affected by disturbance (Figure 1). Moth assemblages in control sites clustered tightly together in comparison to those in the disturbed sites plotted in the ordination space. The 50% residual structure compartments (RSC) were almost all located between the two other treatments, leaving 20% RSC farther away from the control and more dispersed in the ordination space than the traps from the other sites. Moth assemblages were thus least similar between the control compartments and those subjected to the highest level of disturbance. Moth populations from some families responded differently, possibly reflecting structural features that characterize moths within a family. Logging treatments negatively affected trap catch of Noctuidae, Geometridae, Uraniidae and species richness of Geometridae and Notodontidae. Early- and late-season species assemblages differed considerably in composition but their respective responses to disturbance were similar. Finally, logging treatments increased abundance of generalist, herb, grass and pioneer plant feeders but decreased abundance of deciduous tree, conifer, woody plant and lichen feeders.