



OS I-08

## The impacts of emerald ash borer and silvicultural management strategies on black ash forest ground-layer communities

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The invasive insect, emerald ash borer (*Agrilus planipennis*, EAB), threatens black ash (*Fraxinus nigra*) wetland forests. Canopy treatments, such as clearcutting and group selection, are being evaluated to promote regeneration of non-ash tree species to maintain forest functions. Previous observational studies suggest clearcutting could raise water tables, lower natural tree regeneration, and shift the composition of woody and herbaceous ground-layer plant communities. To test this theory, we used a field experiment in northern Minnesota *F. nigra* wetlands to examine the response of ground-layer communities to four overstory treatments: clearcutting, group selection, *F. nigra* girdling, and unharvested forest. Our objectives were to determine: 1) to what degree established regeneration of non-ash tree species can be expected to contribute to post-EAB maintenance of forest cover under different canopy conditions; 2) the response of the black ash shrub layer to EAB and overstory management; and 3) the impact of canopy changes on herbaceous community height and composition. We found that regeneration density of associated tree species varied by treatment and fell short of stocking guidelines. Background variation in experimental blocks, likely reflecting differences in site hydrology, exerted a larger influence than treatment on overall woody community composition. Treatment influenced herbaceous layer height, and species richness and diversity increased in all treatments. The clearcut and group selection increased in graminoids, while the control and girdling treatments increased in wetland indicator species. Our findings suggest artificial regeneration, combined with herbaceous and shrub control treatments, will be necessary to restock *F. nigra* forests following EAB invasion.

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