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## Evaluating replacement tree species in black ash forests threatened by EAB and climate change

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Emerald ash borer is devastating ash species in forests of the Midwestern U.S., but has yet to reach wetlands of the western Great Lakes region, where black ash is a foundational species. In Minnesota alone, black ash wetlands cover over 400,000 ha, forming near mono-specific stands. Loss of ash from these forests will have profound impacts on ecosystem function. Here we discuss an operational-scale experiment designed to increase understanding of the ecological impacts of EAB and loss of black ash. Treatments include clearcutting, group selection, and girdling to simulate EAB. A component of this research is evaluation of “replacement” tree species, including those currently in this ecosystem, as well as future climate-adapted species. Survival and growth results show promise for several species, including balsam poplar and future climate-adapted swamp white oak. Survival and growth were often best in the group selection, where a water table rise with loss of trees was muted. Survival and growth were lowest in with clearcutting, due to a delay in water table drawdown and a shallower depth to water. Results suggest that preemptive removal of ash through clearcutting, as well as doing nothing by leaving ash to die, may be insufficient for sustaining trees in these wetlands. Strategies to mitigate hydrologic change may be needed to establish replacement species. Findings from this experiment are providing critical information for management aimed at mitigating impacts of EAB and for identifying replacement tree species that can transition these ecosystems into the future.

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**Science & Management of Ash Forests after Emerald Ash Borer**

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