LEGACY EFFECTS OF EMERALD ASH BORER, *AGRILUS PLANIPENNIS*, ON STREAM ECOSYSTEM FUNCTION

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Emerald ash borer (EAB), *Agrilus planipennis* Fairmaire, has killed millions of ash trees (*Fraxinus* spp.) since it was first identified in North America in 2002, propelling this invader to the forefront of natural resources issues. Despite the prominence of this problem, information about the impact of widespread ash mortality on aquatic ecosystems is scarce. Mortality of ash trees along stream corridors can result in canopy light gaps, potentially affecting primary production, food webs or aquatic invertebrate communities. We hypothesized that the stream metacommunity would undergo a functional shift, with differential coupled macroinvertebrate and microbial community response occurring directly below the canopy gaps and downstream from the gaps. In 2015, we identified riparian plant communities and canopy gaps associated with dead ash trees in nine headwater streams in southern Michigan. Leaf litter and communities of aquatic macroinvertebrates and microbes were sampled upstream, downstream and beneath two light gaps per stream before, during and after autumnal leaf senescence. The internal microbiome of representative macroinvertebrates was characterized to match the leaf microbial communities to the macroinvertebrates that feed on them. Preliminary results suggest that EAB-related ash mortality may facilitate shifts in riparian plant communities, including an increase in the invasive species Japanese barberry (*Berberis thunbergii*). Microhabitat conditions may also be altered. Root wad presence, which serves as a habitat and food source for stream insects, was significantly decreased beneath canopy gaps. These changes result in shifts in stream biofilm communities, which in turn influence insect gut microbiomes and life history traits.