

Forest understory restoration following the removal of an invasive shrub, Amur honeysuckle (*Lonicera maackii*)

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ABSTRACT-

Amur honeysuckle, *Lonicera maackii*, is a non-indigenous shrub that has aggressively invaded the midstory of many forests in southwestern Ohio. This has had a negative effect on the recruitment, growth, and overall diversity of native plants. The objectives of this study were to assess honeysuckle control methods and to evaluate the effect of honeysuckle removal on the growth and survival of native seedlings. To account for heterogeneous environments this study used a randomized complete block design (N = 8) with three treatments: control (unmanipulated), cut (honeysuckle cut, stumps herbicided), and injection (honeysuckle stems injected with herbicide). In each treatment plot, ten seedlings of six species were planted. Half of the seedlings were grown in browse tubes to evaluate the extent of deer herbivory. Modes of mortality were assessed and categorized as death due to drought, browsing, transplant shock, or fungal pathogen. The species used and their respective survival rates are as follows: *Fraxinus pennsylvanica* (85.0%), *Quercus muhlenbergii* (60.4%), *Juglans nigra* (54.2%), *Prunus serotina* (47.9%), *Cercis canadensis* (36.3%), and *Cornus florida* (15.0%). Honeysuckle mortality was similar in the two treatments (99%), suggesting that both are efficacious control methods. Overall, seedling survival was low (49%) due to a severe drought (PDSI < -3). Seedling survival in the two treatments (cut, 57.4%; injection, 53.1%) was not significantly different from each other but was significantly different than in the control (40.4%; $P < 0.05$). Survival was also significantly different ($P < 0.01$) among treatments, species, and browse tubes. Two-way interactions between species \times tubing treatment and species \times mode of mortality were found to be significant ($P < 0.05$). Overall, the data suggest that multiple factors contributed to the survival of the seedlings.

KEYWORDS: *Lonicera maackii*, invasive species, restoration