

Experimental Extinctions of Garlic Mustard (*Alliaria petiolata*) Populations: Implications for Weed Science and Conservation Biology

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Summary

An assumption of weed science and conservation biology is that small populations are more vulnerable to elimination and extinction than large populations. We tested this with the invasive biennial garlic mustard (*Alliaria petiolata*). We compared 61 experimental populations from which every flowering plant was removed for 4 years, with 56 control populations. Whereas the majority of the control populations continued to expand in size over the 4 years, experimental populations showed a strong experimental effect, remaining stable in size, declining in size, or going extinct. Small populations were far more vulnerable to extinction than large populations: 43% of small experimental populations (initially fewer than 10 individuals) went extinct, but only 7% of large populations (initially more than 50 individuals). However, some small experimental populations persisted, and in a few cases, larger experimental populations continued to expand even though every flowering individual had been removed. These results and a simple population model suggest the importance of buried seeds in allowing this species to persist despite attempts to eradicate it.

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