Distribution and fecundity of invasive garlic mustard (Alliaria petiolata) in Edmonton and St. Albert

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Abstract

Garlic mustard (Alliaria petiolata) is one of the most problematic invasive plant species in North American forests. First discovered in 2010 in Alberta, it is known to inhabit two urban ravines in Edmonton (Mill Creek and Westmount) and one in St. Albert (Forest Lawn) (Personal communications: Daniel Laubhann, City of Edmonton; Kevin Veenstra, City of St. Albert). A random stratified transect survey with adaptive cluster sampling was employed to map these garlic mustard populations, to detect new areas of infestation, and to quantify the area of infestation. In Mill Creek Ravine 5 previously known patches were mapped as well as an additional 24 new patches of infestation with a total approximate area of 114,253.72 m2. The patch in St. Albert was mapped and covered a total area of approximately 82.034.30 m2. We confirmed this infestation had not spread to the adjacent ravine systems. Finally, the Westmount ravine patch was mapped and included a total area of approximately 97,616.32 m2. In total, the known garlic mustard infestation in Alberta includes an area of approximately 293,904.34 m2. Garlic mustard reproduces exclusively by seed (Becker et al., 2013). Seed production can vary widely between plants (Meekins, 2000) and has not been reported in this region. We assessed the impact of patch position (centre vs. edge) on fecundity. We found fecundity was significantly higher in edge plants, compared to centre, and is correlated to plant height. Effective management of this highly invasive species is dependent upon regular monitoring and effective control and is informed by an understanding of the population biology of this species in this region.