

Local Spatial Structure of Dalmatian Toadflax (*Linaria dalmatica*) and its Effect on Attack by the Stem-Mining Weevil (*Mecinus janthinus*) in the Northwestern United States

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Abstract

The stem-mining weevil, *Mecinus janthinus* Germar was introduced into North America in the mid 1990s as a biological control agent of the herbaceous perennial Dalmatian toadflax, *Linaria dalmatica* (L.) P. Mill. Although considerable emphasis has been placed on assessing impact of *M. janthinus* to stem density and reproduction at the local scale, less emphasis has been placed on assessing how the spatial structure of the weed affects weevil attack and persistence. Moreover, it is unclear whether weevil attack affects the spatial distribution and age structure of Dalmatian toadflax. These factors may in turn affect host-finding ability, local population growth, and effectiveness of *M. janthinus*. This study was initiated to evaluate local spatio-temporal dynamics of Dalmatian toadflax biological control. Four sites displaying substantial population-level variation in toadflax and weevil abundance within the northwestern US (Idaho, Washington, and Oregon) were chosen for study. After the first year of sampling it became apparent that despite variation in spatial structure of Dalmatian toadflax and weevil abundance among sites, activity of *M. janthinus* (adult presence, oviposition, and feeding damage) was aggregated in areas of high stem density. Although further sampling is needed, it appears that toadflax populations are less dense, but more spatially aggregated at sites that have been exposed to *M. janthinus* the longest. Sampling is ongoing at these sites to continue evaluating the local spatial population dynamics of *M. janthinus* and its effect on Dalmatian toadflax.