

Spatial Monitoring of the Dispersal, Target and Non-Target Impact of the Unintentionally Introduced Biological Control Agent *Mogulones cruciger* in the Northwestern USA

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Abstract

The root-mining weevil *Mogulones cruciger* Herbst. was released for the control of the rangeland weed *Cynoglossum officinale* L. in Canada in 1997. In the USA, concerns about the risk of non-target plant feeding on rare and endangered confamilials of *C. officinale* were raised and the permission for field release was ultimately denied by regulatory authorities in 2002. Differences in the environmental safety assessment of *M. cruciger* between the two countries may be attributed to the much larger number of native confamilials of *C. officinale* in the USA, especially the number of federally protected species (9 in the USA), and the weevil's fundamental host range, which does include some of the federally protected species. The weevil has successfully controlled *C. officinale* in south-central British Columbia but its widespread distribution has led to its inadvertent introduction in the USA most likely during 2008. In 2010, regulatory authorities issued a pest alert for the insect in the USA because of the non-target plant feeding risks and to avert any anthropogenic distribution of *M. cruciger*. The weevil occurs less than 100 km distant from the federally protected confamilial *Hackelia venusta*, that it is able to feed on. We began a project in 2010 to monitor weevil abundance and attack on *C. officinale* and all sympatric confamilials (currently 4 native and 6 exotic species) in a 50 km by 100 km area in northern Washington and a 20 km by 50 km area in northern Idaho where the weevil occurs. We use Global Positioning System (GPS) and Geographical Information System (GIS) tools to track abundance and weevil attack with regard to *C. officinale* and non-target plant densities. Currently weevils can be found up to 40 km south of the border. *M. cruciger* does disperse faster than previously assumed. Non-target feeding thus far is rare and occurred on 2 native confamilials.