

Purple Loosestrife Biocontrol with *Galerucella* sp. Beetles



Lythrum salicaria (purple loosestrife) is a perennial invasive plant commonly abutting wetlands and roadways in the upper Midwest. Concerns regarding purple loosestrife's increased presence are warranted as this plant grows quickly and can outcompete native species (Lavoie 2010). Although herbicide application can be effective in controlling small populations of purple loosestrife, homeowners, land managers, and other conservation-minded individuals have turned to a natural, ecological, and long-term approach to managing this problematic nuisance plant: *biocontrols*.

Biocontrols are a natural management approach utilizing specialist species of *Galerucella* sp. beetles that feed almost exclusively upon purple loosestrife. In their native ranges with habitable over-winter conditions, this selective feeding has been shown to be highly effective in managing their preferred food source (Gettys *et al.* 2014). Notably, *Galerucella* beetles will not eradicate purple loosestrife, but can manage the plant such that native vegetation may re-establish (Wilson *et al.* 2010).



Galerucella californiensis was first released in Saginaw Bay by the Michigan Department of Natural Resources (MDNR) in 1994. Throughout all life stages, these beetles defoliate purple loosestrife leaves and prevent flowering and seed production (Blossey *et al.* 2001). By 2003, analyses by Landis *et al.* (2003) confirmed substantial reduction of purple loosestrife in Saginaw Bay wetlands with these authors concluding overall success with biocontrols.

Since 2013, K&A has been rearing and dispersing populations of *Galerucella* sp. across Michigan for

private, commercial, conservation, state and federal partners. The biocontrol process begins in spring with collection of early-growth purple loosestrife and ends in late-June with delivery to clients of fully

beetle-infested, mature potted plants. In mid-April, non-beetle infested purple loosestrife plants are harvested from local riparian areas and potted with growth



media. These potted plants are netted and placed in small pools to mimic the shallow wetland habitat that purple loosestrife commonly infests to allow growth consistent with populations in the wild.

By mid-May, *Galerucella* beetles emerge from the soil and begin feeding, mating, and living upon stands of purple loosestrife where these beetles have established populations. Once a sufficient number of adult beetles have emerged and mated, K&A staff harvest adult beetles from the established populations and place up to ten individual adults on the uninfested potted purple loosestrife plants. With netting, this provides a



controlled environment in which a new generation of beetles becomes established. By mid-June, each potted

plant, largely defoliated, contains approximately 300-400 *Galerucella* sp. adults, larvae, pupae, plus a large number of eggs.

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K&A staff then deliver these potted loosestrife plants to clients for simple pot placement within sufficiently dense areas of uninfected purple loosestrife stands. This biocontrol application is most effective for “heavy” densities of purple loosestrife (100 plants or more in one-quarter acre area). K&A recommends 3-4 potted plants infested with beetles for every ¼ acre of heavy purple loosestrife coverage. Beetles slowly disperse from their respective rearing pots and may travel upwards of 800m away from their original location to find healthier loosestrife for forage (Blossey *et al.* 2001).

The survival rate for over-wintering adults is highly dependent on several environmental factors but mainly soil moisture. Areas prone to flooding or containing saturated soils for most of the year are not recommended for plants due to risk of over-wintering adults drowning. Purple loosestrife surveys are recommended to assess the year-to-year success of stocking efforts and if a sustained population of beetles has been established. Multiple rounds (i.e., annual stocking events) may be necessary to establish a sustained population.

With an established population of *Galerucella* sp. beetles, purple loosestrife can be selectively managed without the need for expensive annual applications of contact herbicides that can harm native vegetation. To ensure that this process is sustainable, K&A also places pots back in the original adult beetle harvest zones re-populating source areas by 100-fold.

If you are interested in trying this biocontrol option for invasive purple loosestrife management, contact Zach Harrison at Kieser & Associates, LLC (zharrison@kieser-associates.com).

To learn more on how K&A can assist you, visit us at: www.kieser-associates.com, or call (269) 344-7117.



References

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