

BIOLOGICAL CONTROL OF PURPLE LOOSESTRIFE IN CALIFORNIA – CURRENT STATUS

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Purple loosestrife, *Lythrum salicariae* L. (Lythraceae), is an exotic, invasive weed of wetlands and riparian areas in many parts of the United States and Canada. It is native to Europe, Asia, and northern Africa and was introduced into the United States prior to 1800 because of its herbal and ornamental qualities. Once established, the plant produces millions of small seeds that can be spread by wind, transported by wildlife, and carried long distances by water currents. In California, purple loosestrife has been reported in a number of locations throughout the state. Many small infestations have either been eradicated or being controlled by herbicidal treatments by staff from the California Department of Food & Agriculture in cooperation with County Agriculture Departments. However, there are still some well established infestations in Butte, Kern, Shasta and Siskiyou Counties. In 1996 the Biological Control Program initiated a biological control program directed towards the largest infestations of purple loosestrife in California. To date four biological control agents have been released in the state. The agents include two species of weevils, *Hylobius transversovittatus* Goeze (Coleoptera: Curculionidae), a root boring weevil, and *Nanophyes marmoratus* (Goeze) (Coleoptera: Curculionidae), a flower-bud weevil, and two leaf-feeding beetles, *Galerucella californiensis* L., and *G. pusilla* (Dufft.) (Coleoptera: Chrysomelidae) which were approved for release in California in 1998. The root-boring weevil, *Hylobius transversovittatus* was the first agent released in California. The early releases involved the placement of weevil eggs in the loosestrife stems at two sites in Butte and Shasta Counties. Subsequent releases involved the releases of adult weevils in the same areas as well as Kern County from 2000-2004. The main damage is by the larvae, which can cause extensive damage to the loosestrife roots. To date there have been recoveries of the weevils only in Shasta County. The flower-bud weevil, *Nanophyes marmoratus* was first released in small numbers in Butte and Shasta Counties in 1997. The adult weevils feed on the foliage and terminal growth thus impacting flower and seed production by the plants. Furthermore, the larvae feed directly on the seeds. Additional weevil releases have been made in Butte, Shasta and Kern Counties in 2002-2004. Establishment has been confirmed at two sites in Shasta County since 2003. The focus of the releases of on purple loosestrife since 1998 has been the release of two species of leaf-feeding beetles, *Galerucella californiensis* and *G. pusilla*. These beetles damage the plant by the both the adults and larvae feeding on the foliage and the new tips. In many areas of Canada and the United States where these beetles have been released the damage to the foliage by the adults and larvae have been spectacular especially after about 5-6 years after the initial release of the beetles. There are also documented cases where the beetles are having an impact in reducing infestations of purple loosestrife. In California, the beetles readily established where they were released particularly in those sites that where spring generation releases were made. No signs of establishment have been observed where the summer generation of the beetles was released. Due to many factors involving improper site selection and low release numbers of the biological control agents, many of the early releases failed to establish particularly in Butte County. In 2001-2004 better site selection and large scale releases at fewer sites were made in Butte, Kern and Shasta Counties. Since spring 2003, good establishment by the two leaf beetles has been confirmed in Kern and Shasta Counties and it is hoped that this will lead to biological control of purple loosestrife in those areas.