

Biological control of purple loosestrife



**Before biocontrol insects released:
Purple loosestrife infested Pig's Eye
Lake, St Paul, 2000.**



**After biocontrol insects released:
New growth of natives and
defoliated purple loosestrife in Pig's
Eye Lake, St Paul, 2004.**

Finding and selecting biological controls

Prior to any introduction of a biological control agent, intensive testing is conducted to ensure that a safe and effective agent is selected. Testing is carried out by researchers in Europe in collaboration with North American scientists. This enables controlled laboratory testing and natural field testing to be conducted in the insects native range.



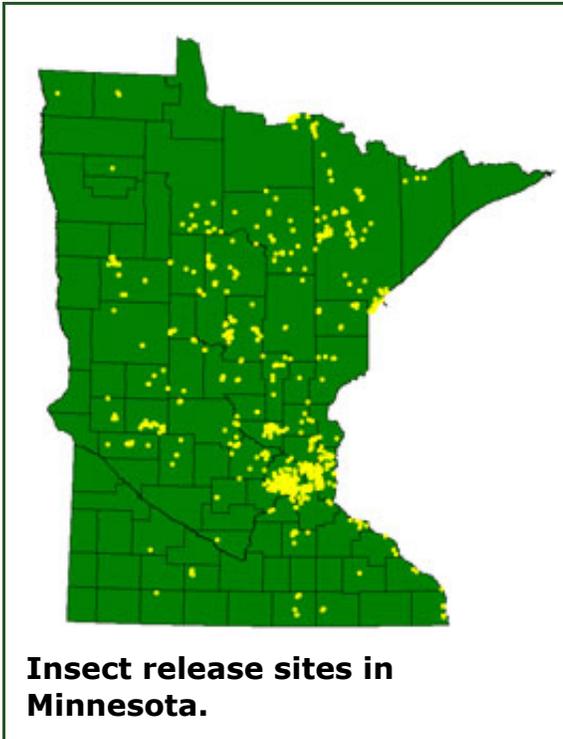
In the mid-1980s, biologists began to conduct a search for biological control agents of purple loosestrife. Of the more than 100 insects that feed on purple loosestrife in Europe, several species were thought to have had excellent potential. Testing began in Europe and was completed in North America between 1987 and 1991 prior to the insects being approved for release. Included in the tests were "feeding trials" which exposed the insects to approximately 50 species of plants including wetland species native to North America, and important commercial and agricultural species.

Following the rigorous testing process and evaluation of the test results, four species of beetles were introduced into Minnesota after receiving approval for release from the United States government. This includes two leaf-feeding beetles, one root-boring weevil and one flower-feeding weevil. ***Galerucella pusilla*** and ***G. californiensis*** are leaf-eating beetles which seriously affect growth and seed production by feeding on the leaves and new shoot growth of purple loosestrife plants. ***Hylobius transversovittatus*** is a root-boring weevil that deposits its eggs in the lower stem of purple loosestrife plants. Once hatched, the larvae feed on the root tissue, destroying the plant's nutrient source for leaf development, which in turn leads to the complete destruction of mature plants. The flower-feeding weevil, ***Nanophyes marmoratus***, severely reduces seed production of purple loosestrife.

Implementation of purple loosestrife control in Minnesota

The first biological control agents were released in 1992. Since then, all four species have been released and are established in the state. Efforts have focused on rearing and releasing the leaf-feeding beetles statewide. To accelerate the introduction of the leaf-eating beetles, the Minnesota Department of Natural Resources recruited partners to rear

insects statewide. Insect rearing "starter kits" were provided to rearing partners including County Agricultural Inspectors, Minnesota Department of Agriculture staff, Minnesota Department of Transportation staff, DNR Area Wildlife Managers, U.S. Fish and Wildlife Service, Nature Centers, schools, 4-H and Garden clubs.



A starter kit is composed of pots, potting soil, insect cages, leaf eating beetles, and other materials necessary to rear 20,000 leaf-eating beetles. The insects were then released on high priority areas. Since 1997, cooperators have reared and released millions of the leaf-eating beetles statewide. All insect-rearing was completed outdoors for ease of production and to produce hardier insects. To date, more than 8 million leaf-feeding beetles have been reared and released on more than 700 purple loosestrife infestations statewide.

With success of insect establishment in the field, rearing efforts are coming to an end. Resource managers are now able to collect insects from established release sites and move them to new infestations. This "collect and move process" will reduce the effort needed to get insects released into new sites.

Effectiveness of biological control

The long-term objective of biological control is to reduce the abundance of loosestrife in wetland habitats throughout Minnesota. Biological control, if effective, will reduce the impact of loosestrife on wetland flora and fauna. Purple loosestrife will not be eradicated from most wetlands where it presently occurs, but its abundance can be significantly reduced so that is only a small component of the plant community, not a dominant one. Recent assessments demonstrate that the leaf-feeding beetle introductions have caused severe defoliation of loosestrife populations on over 20% of sites visited. The DNR will continue to track these wetlands to assess how loosestrife abundance changes over time and to determine what combinations of biological control agents provide the desired level of control.

Biological control insects released between 1992 and 2002 have established reproducing populations at more than 90% of the sites visited. The leaf-feeding beetles also dispersing from release site and finding new purple loosestrife sites on their own. A recent study by the University of Minnesota and the DNR found the leaf-feeding beetles more than 12 miles away from where they were released on unmanaged purple loosestrife infestations.

Additional Resources

- For additional information on purple loosestrife biocontrol, contact your local [**aquatic invasive species specialist**](#)
- [**Biological Control of Invasive Plants in Minnesota brochure**](#) 





Before biocontrol insects released: Purple loosestrife infested wetland near Winona, MN, 1997.



After biocontrol insects released: Defoliated purple loosestrife wetland near Winona, MN, 2000.