Purple loosestrife

Introduction

Purple loosestrife, *Lythrum salicaria* Lythraceae, is an exotic invasive plant from Eurasia that infests wetlands and riparian zones in North America. After its arrival in the early 1800's, and without natural enemies to keep it in check, it has since spread across much of the middle and northern latitudes of the U.S. (Thompson et al. 1987, Mullin 1999, Piper et al. 2004). The plant reproduces by seed and fragmentation of plants, allowing infestations to proliferate and spread.

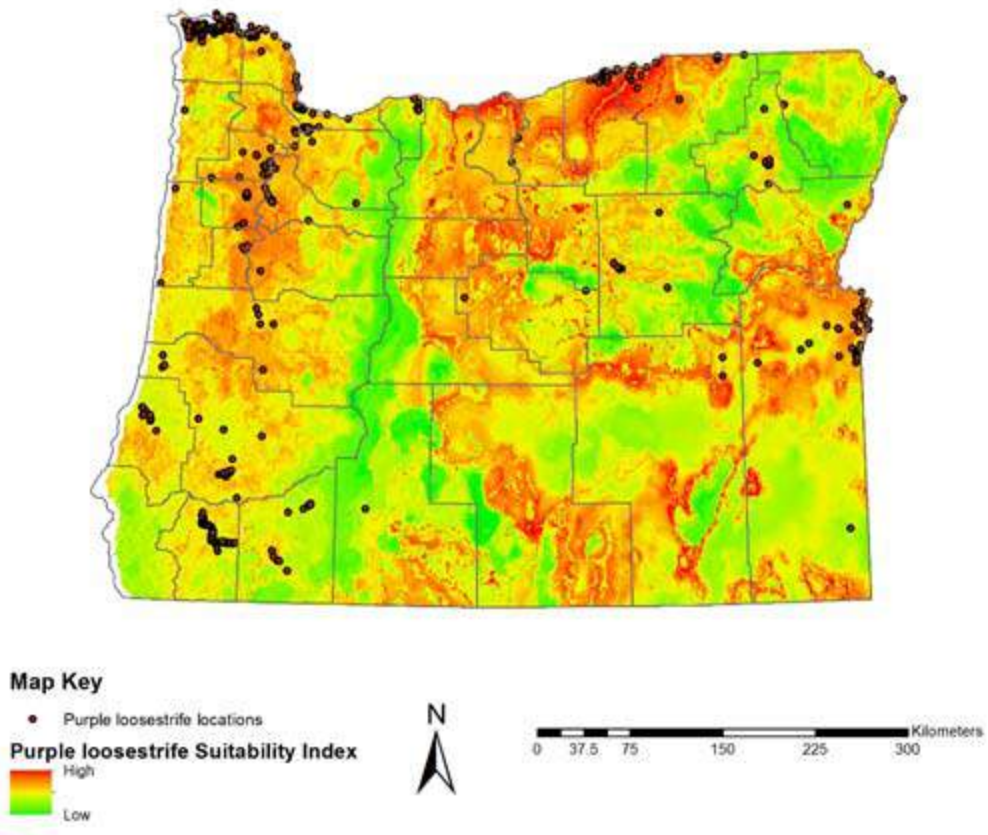
Identification

Purple loosestrife is a semi-woody herbaceous plant with long showy spikes made of showy purple flowers consisting of 5-6 petals. The seeds are very small, and large plants can produce over one million seeds. Stems are four to six sided and leaves are lance-shaped with smooth margins. Plants can be 3-10 feet tall, and have a single flowering spike or many, depending on age and habitat.


Purple loosestrife flower (L) and infestation at Horseshoe Lake, Marion County (R).

Current Status & Distribution

Purple loosestrife is widely established in Oregon, occurring along rivers, streams, ponds, marshes, wetlands, seeps and wet meadows. Sites where the native wetland vegetation have been disturbed and created wetlands lacking natural wetland flora are particularly vulnerable to loosestrife infestation.



Known infestations of purple loosestrife (dots) and predicted vulnerable areas (shaded) based on known habitat features and requirements (Weedmapper 2013).

Control and Management Options

Because purple loosestrife inhabits wetlands and riparian zones, control options are often limited because of the sensitive nature of the infested habitats. Intensive management of purple loosestrife can be a difficult problem, in that water quality can be severely impacted, threatening ecosystem function and services. For small infestations (<0.1A), manual control may be sufficient. Some chemical control has been implemented using a limited number of approved aquatic herbicides can be sporadically effective, but reinfestation from seeds is often the result, along with loss of susceptible plant species. For most sites more than 0.25A, biological control (the use of four beetles which are host specific natural enemies) has been the priority control measure in Oregon since 1992. Successful control of purple loosestrife was manifested as early as 1997 at multiple sites in eastern and western Oregon, especially in areas that have less than one foot of standing water during the flood season. Purple loosestrife in tidally influenced rivers and marshes (i.e. lower Columbia and Umpqua rivers and Coos Bay tidal marshlands), and in streams that experience high intensity and short duration flooding in the spring (Rogue and Umpqua rivers and selected tributaries) are not as suitable for biological control.

Economics

The primary economic impacts of purple loosestrife occur when infestations interfere with ecosystem products and services (i.e. water quality, hunting, fishing, species diversity of wetlands, etc.). Purple loosestrife has a low ecological amplitude when compared to its potential distribution in Oregon. Once entrenched, purple loosestrife can form thick stands that exclude desirable flora and its important associated fauna (Schooler et al. 2009). Loosestrife infestations can also negatively impact the cycling of nutrients in aquatic systems (Schooler et al. 2006). The implementation of biological control may well prevent purple loosestrife from ever achieving its full biological potential in Oregon, saving millions of dollars in ecological and socioeconomic impacts and improving water quality in the state.

Current Infestation		Susceptible Infestation	
Acres	Economic Impact	Acres	Economic Impact
7,000	$12,000	15,276,000	$28,444,000

Notes: The susceptible acres are from the KRESS model environmental variables using the "mean" statistical assumptions. Annual economic impact is measured by personal income in 2012 dollars and includes the "multiplier" effect.

Conclusion

Purple loosestrife is a difficult weed to control by nature of the unique and vulnerable habitats in which it occurs in Oregon. Small infestations are best handled with intensive control measures like manual and chemical control. Once infestations are too large for intensive control measures, biological control is the best option, achieving 50-95% control ability at inland sites. Coastal sites in tidal zones are especially difficult, and experiments are continuing to develop nursery sites in the upper elevational zones to maintain colonies of biocontrol agents.

Literature Cited

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