GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Lythrum salicaria***

Lythrum salicaria 简体中文 正體中文 **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Myrtales	Lythraceae

Common name Blutweiderich (German), purple loosestrife (English), spiked loosestrife (English), rainbow weed (English), salicaire pourpre (French)

Synonym *Lythrum salicaria* , var. *gracilior* Turcz.
Lythrum salicaria , var. *tomentosum* (P. Mill.) DC.
Lythrum salicaria , var. *vulgare* DC.

Similar species *Lythrum alatum, Epilobium angustifolium, Verbena hastata, Liatris spp., Spiraea douglasii*

Summary Lythrum salicaria is an erect perennial herb with a woody stem and whirled leaves. It has the ability to reproduce prolifically by both seed dispersal and vegetative propagation. Any sunny or partly shaded wetland is vulnerable to L. salicaria invasion, but disturbed areas with exposed soil accelerate the process by providing ideal conditions for seed germination.

view this species on IUCN Red List

Species Description
Lythrum salicaria is an erect, perennial herb with a woody four-sided stem and whorled leaves. Plants are usually covered by a soft down. Leaves are generally opposite, lance-shaped but heart-shaped or rounded at the base. Mature plants can have 30 to 50 stems emerging from a single rootstock and are prolific seed producers. *L. salicaria* can grow from 1.2 to 3 m high, depending upon conditions. Showy, trimorphic, magenta-coloured flowers, with five to seven petals, are produced throughout most of the summer. Woody stems of plants remain standing during the winter, when the plant is readily identified by its brownish colour and spiral-shaped capsule clusters.

Lifecycle Stages
Seeds can remain viable in the soil for many years and those submerged in water can remain viable for about 20 months.

Uses
Lythrum salicaria is grown for medicinal uses and planted by beekeepers for its nectar-producing capabilities. It has been used as a herb for diarrhea, dysentery and dried leaves were used to heal wounds, ulcers and sores. *L. salicaria* is also widely sold as an ornamental in states where regulations do not prohibit its sale and distribution.

Habitat Description
Lythrum salicaria is capable of invading a variety of wetland habitats, including marshes, river and stream banks, pond edges, lakes, road site ditches, and reservoirs. The plant prefers moist soil with neutral to slightly acidic pH. Once established, however, *L. salicaria* can exist in a wide range of soil types. Disturbed areas are more prone to invasion because exposed soil is ideal for germination.

Reproduction
Lythrum salicaria reproduces by seed and vegetatively. Flowers require pollination by insects and seeds require open, wet soils and a high temperature to germinate. Flowers are tristylous and pollination restricted to crosses between the style of one length with stamens of the corresponding length. *L. salicaria* can also spread vegetatively by leftover pieces of trampled, clipped, mowed and pulled plants. A mature plant over 2m tall can have as many as thirty flowering stems and produce large numbers of seeds (up to 3 million seeds per plant has been reported (Thompson *et al*. 1987)). Seed production is dependent upon age, size and habitat conditions. Seeds are very small and are transported by wind, water, wildlife, vehicles, construction equipment, and humans. Seed survival can be as high as 70%, creating an extensive seed bank. Seedling establishment occurs in late spring and early summer or after soil disturbances including chemical applications. Shoots from vegetative reproduction grow at a rate of approximately 0.3mt per year.

General Impacts
Lythrum salicaria is often reported to outcompete and replace native grasses, sedges, and other flowering plants that provide a higher quality food source and habitat for wildlife. A literature review by Lavoie (2010) of the studies published on purple loosestrife impacts on plants found that 10 out of 11 manipulative studies detected a negative impact on plants. Interestingly all seven observational (field) studies detected no negative impacts. Of the two studies that use both manipulative and observational methods, Yakimowski *et al*. (2005 in Lavoie, 2010) showed a reduction of the abundance and richness of vascular plant seedlings in purple loosestrife invaded wetlands, while Denoth and Myers (2007 in Lavoie, 2010) concluded that the competitive effect of purple loosestrife on a rare species was not greater than the impact of native plants.\r\n\r\n
Lythrum stands can deleteriously impact wildlife habitat used by birds and furbearers. *L. salicaria* forms dense homogeneous stands that restrict native wetland plant species, including some endangered plants. *L. salicaria* can overrun wetlands and almost entirely eliminate open water habitat if left untreated. The recreational and aesthetic value of wetlands and waterways is diminished as dense stands of *L. salicaria* choke waterways and decrease biodiversity. A review of literature by Lavoie (2010) found that out of fourteen animal species or groups studied only six were negatively affected, while others were either not affected or positively affected by purple loosestrife. The strongest negative effects were on tadpoles and the marsh wren (*Cistothorus palustris*). The American toad (*Bufo americanus* is also negatively affected by compounds leached from *L. salicaria*. There have been no studies published on the impacts on fish, mammals or waterfowl (Lavoie, 2010). \r\n
In North American freshwater wetlands, *L. salicaria* alters decomposition rates and nutrient cycling, water chemistry, leads to reductions in wetland plant diversity, reduces pollination and seed output of the native *Lythrum alatum*, and reduces habitat suitability for specialized wetland bird species such as black terns, least bitterns, pied-billed grebes, and marsh wrens (Blossey *et al*., 2001; Fickbohm & Zhu, 2006). *L. salicaria* effects on wetlands, incurring from lost forage and control costs have been estimated to cost US $28 million per year (Barbier & Knowler, 2006). However, according to Lavoie (2010) “their analysis was apparently based on a previous estimation of the damages calculated by Thompson et al. (1987), damages that were only conjecture.”

Management Info
Preventative measures: The best control measure, however, as with many invasive plants, is to preserve a healthy native ecosystem to prevent or slow invasion.\r\n
Physical: Small infestations (< 100 plants) of *L. salicaria* can be controlled but cutting and pulling. Cutting should be done just before the plants begin flowering to avoid spreading seed. Pulling should be done by carefully removing all root fragments and disposing of all uprooted plants. Plant materials should be dried and burnt where possible. These fragments and uprooted plants could grow into new plants, possibly making the problem worse. Mowing and burning is ineffective and sometimes makes the problem worse.
Chemical: Herbicides are most commonly used for quick, effective control of *L. salicaria*. Spot treating with a glyphosate type herbicide (e.g., Rodeo for wetlands, Roundup for uplands) is effective on older plants. These herbicides may be most effective when applied, as plants are preparing for dormancy, however, mid-summer and late season treatments may be needed to reduce the amount of seed produced. In Canada, only Roundup is registered for the control of Lythrum in terrestrial areas only. Multiple chemical treatments are usually required as new seedlings annually emerge from the seed bank. Chemical treatments may not be desired in sensitive wetland habitats.
Biological control: Conventional methods such as physical, mechanical or chemical, have continuously failed to curb the spread of *Lythrum salicaria* or to provide satisfactory control. State and federal agencies as well as private citizens and schools now participate in rearing, release and monitoring of *Galerucella* beetle species which have been released in 33 states and >1500 wetlands nationwide. Large populations of *G. calmariensis* have developed in many of the monitored release sites and have caused up to 100% defoliation of *L. salicaria*. Stem height was reduced 73–85%, percent plant cover was reduced 61–95%, and richness of nontarget plant species increased significantly at four out of five sites. By 2001, *L. salicaria* stem height and percent cover were reduced 38–81% and 32–74%, respectively, and nontarget plant species richness increased significantly at all five sites. Of the 19 additional sites monitored for 3–5 years post release, 50% (4/8) of the 1997 releases have developed into large *G. calmariensis* populations and produced severe damage to *L. salicari* (Blossey *et al*, 2001; Landis *et al*, 2003).
A long-term assessment of biological control impacts after 10 years in central New York State concluded that *Galerucella* species had significant impacts on plants at the individual level, i.e. shorter plants and reduced flowering rates. However there was no change at the population level: there was no change in overall plant density or in size of stands. Surveys of beetle movement from release site showed only limited spread of beetles to new areas (Grevstad, 2006).
Integrated management: Results from a study conducted in Manitoba, Canada indicated that an integrated strategy using herbicides (glyphosate and triclopyr amine), combined with biological control *G calmariensis* outperformed herbicide alone treatments and *Galerucella calmariensis* alone (Henne *et al*, 2005).

Pathway

Principal source:

Compiler: IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Claude Lavoie, École supérieure d'aménagement du territoire et de développement régional (ESAD)

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ALIEN RANGE

[2] AUSTRALIA
[1] ETHIOPIA
[2] NEW ZEALAND
[1] SOUTH AFRICA
[12] CANADA
[1] GEORGIA
[1] SAINT PIERRE AND MIQUELON
[48] UNITED STATES

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Summary: English:
The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (http://www.conabio.gob.mx/invasoras/index.php/Portada), under the section Novedades for information on updates.
Invasive species - Plants is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]
Spanish:
La lista de especies del Sistema de informaci&#65533;n sobre especies invasoras de m&#65533;xico cuenta actualmente con informaci&#65533;n aceca de nombre cient&#65533;fico, familia, grupo y nombre com&#65533;n, as&#65533; como h&#65533;bitat, estado de la invasi&#65533;n en M&#65533;xico, rutas de introducci&#65533;n y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la p&#65533;gina de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualizaci&#65533;n, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php/Portada), en la secci&#65533;n novedades, para conocer los cambios.
Especies invasoras - Plantas is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]
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ITIS (Integrated Taxonomic Information System), 2005. Online Database *Lythrum salicaria*
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
Available from:
http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Lythrum+salicaria&p_format=&p_ifx=plglt&p_lang= [Accessed March 2005]
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Summary: Detailed reports on identification, distribution, biology, life history, growth requirements, habitat, arrival and establishment in North America, biology, uses, possible invasion pathways, ecological impacts, agricultural impacts, control measures, and containment.
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