GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Lepidium latifolium***

Lepidium latifolium 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Capparales	Brassicaceae

Common name piperisa (Spanish), peppergrass mustard (English), mastuerzo montesino (Spanish), tall whitetop (English), perennial pepperweed (English), broadleaf pepperweed (English), slender perennial peppercress (English), peppergrass (English), lepidio (Spanish), giant whiteweed (English), erva-pimenteira (Portuguese), grande passerage (French), Virginia pepperweed (English), ironweed (English), perennial peppercress (English), broad-leaf peppergrass (English), Breitblättrige Kresse (German)

Synonym *Cardaria latifolia* , (L.) Spach

Similar species

Summary Lepidium latifolium is an herbaceous perennial that invades wetlands, riparian areas and other water courses. It can tolerate a wide range of soil water potential and survive up to 50 days in submerged soil. Lepidium latifolium is extremely competitive and forms monospecific stands that crowd out desirable native species.

view this species on IUCN Red List

Species Description

L. latifolium is an herbaceous perennial crucifer (member of the mustard family). Because of its ability to survive with inhibited growth in saturated soil, *L. latifolium* is typical of a facultative hydrophyte. Stems can reach 1.5 metres in height. Foliage is glabrous and green to grey-green in colour. Rosette leaves are approximately 30cm long and 8cm wide with serrate margins on long petioles (3-15cm long). Stem leaves are highly reduced, tapered at the base, with margins entire to weakly serrate. These leaves are alternate and lanceolate to elliptic or oblong in shape. This plant forms dense clusters of flowers in panicles. Flowers have 4 green oval sepals less than 1mm long, 4 white, spoon-shaped petals approximately 1.5mm long, 6 stamens (4 long, 2 short), and a single pistil approximately 2mm long. Pods (silicles) produce a fruit that is round to slightly ovate in shape covered with long, simple hairs. The stigma is sessile, and remains on the fruit. Fruit is borne on pedicels that are much longer than the pods themselves. Fruit contain one seed per chamber that is ellipsoid, slightly flattened, approximately 1mm long and 0.5mm wide. These seeds are reddish-brown with a shallow groove on each side. Seeds fall from pods irregularly through winter and some may remain in pods until the following season (Chen and Qualls, 2003; and Renz, 2000).

Lifecycle Stages
Saturated conditions decrease growth of *L. latifolium*, but allow it to survive. In response to a soil flooding regime, adventitious roots on the stem base began to emerge after only 3 days of flooding and the number increased with the duration of inundation. This increase in adventitious roots was accompanied by an increase in the damage and death of original roots. These replacement roots usually emerged from the flooded stem base and reached the water surface above the flooded soil line, where a relatively high content of oxygen is available. These new roots had a positive role in supporting shoot growth during prolonged flooding. It responded to prolonged flooding by increasing root porosity, up to two times that of unflooded plants. *L. latifolium* can survive up to 50 days and had some limited reproductive capacity under soil flooding. (Chen *et al.* 2002).

Habitat Description
L. latifolium often is found in wetlands and riparian areas and can tolerate a wide range of soil water potential. It exhibits morphological adaptability to survive long periods of flooding by developing extensive aerenchyma in roots and adventitious roots on the base of flooded stems. It will also be found thriving along streams, rivers, ditches, irrigation canals, and salty marshes and has little difficulty invading native hay meadows (Allen *et al.* 2001; Chen and Qualls, 2003; Renz, 2000; and Wood, 1998).

Reproduction
L. latifolium reproduces from seed, as well as vegetatively from intact root systems or from pieces of rootstock as small as 2cm. Each mature plant has the capacity to produce thousands of seeds each year. Seeds typically germinate in spring in wet sand or mud. Seedlings grow rapidly and can produce flowering stems the first year. *L. latifolium* rarely produces seedlings where a monoculture exists. There is no known reason for this, as laboratory tests have shown seed viabilities to be high. Seeds lack a hard seed coat and lose viability rapidly, suggesting that resurgence of a treated infestation from the seed bank would be low. In fall and winter aerial stems die back to the ground, creating a thick thatch of dead stems in heavily infested areas. In early spring new shoots begin to form from the rootstocks. A single intact root crown can produce several flowering stems. The plant mainly propagates clonally from its brittle rhizome-like roots. Roots exposed by washouts and land disturbances fragment and move along riparian corridors to start new infestations downstream. Roots fragmented by the mechanical actions of land management practices increase infestation densities and facilitate spread (Boelk, 2005; and Cal-IPC, 2006).

General Impacts
L. latifolium is extremely competitive in many lowland ecosystems and habitats forming monospecific stands that crowd out desirable native species along with displacing threatened and endangered species. *L. latifolium* exhibits a wide range of ecological amplitude of adaptation to different environmental factors. Its adaptive nature and ability to tolerate an extremely wide range of soil moisture conditions has allowed it to spread explosively in recent years in wetlands and riparian areas. It is a highly flood tolerant species and survives both exceptionally long periods of flooding and relatively dry conditions with a deep perennial rhizome. This species is very difficult to manage (Chen *et al.* 2002; Chen and Qualls, 2003; and Renz, 2000).
Additionally, *L. latifolium* also alters the ecosystem that it grows in. Research has shown that these plants can act as \"salt pumps\" which take salt ions from deep in the soil profile, transport them up through their roots and deposit them near the surface. This can favour halophytes and other species are at a disadvantage, thereby shifting plant composition and diversity. If soil salinities are dramatically increased, an intensive soil remediation program may be necessary before desirable native species can reestablish (Renz, 2000).
Furthermore, significant amounts of litter can build up in dense infestations forming a layer impenetrable to light. This layer prevents the emergence of annual plants in these areas and may reduce competition from other species. If *L. latifolium* is controlled, it may be necessary to remove the litter to stimulate germination and growth of desirable plant species (Renz, 2000).

Management Info
Intense monitoring with early detection and removal is the best control measure for *L. latifolium*. Sources of infestations should be located and eliminated to prevent future re-invasions (Renz, 2000). 2,4-D has recently been shown to be a quite effective control measure in combination with mechanical manipulations (Boelk, D., pers.comm., 2006).
Chemical: Research has determined the most effective phenological stage to apply systemic herbicides to *L. latifolium* is the flowerbud to early flowering stage. Chlorsulfuron at 1.5 oz/A (0.052kg /ha) [Telar® at 2 oz/A with 0.1% silicone based or 0.25% nonionic surfactant] delivers the most consistent long-term control of *L. latifolium*. Metsulfuron methyl (Escort®) appears to work as well as chlorsulfuron, but this herbicide has not been studied in as much detail. Both of these herbicides are fairly selective and will not cause significant damage to many grass species. Imazapyr (Arsenal®) can also deliver excellent control, but is a fairly nonselective herbicide, thus lower plant diversity and more bare ground will occur in areas following the use of this herbicide (Renz, 2000).
Mechanical: In studies by Allen *et al.* (2001), *L. latifolium* was reduced from 37 plants/m to 8.3 plants for grazed pastures and 38 plants/m to 17.7 plants for mowed pastures, a reduction of 78% and 46%, respectively, for one season. Sheep grazing reduced the number of *L. latifolium* plants without negatively impacting the growth of other native plant species. Additionally, grazing sheep on heavily infested areas and in topographically challenged regions may be more beneficial, especially if machine access is limited. Cattle and sheep will also graze on young foliage of *L. latifolium* when it grows amid other plants, but will not graze pure, dense stands (Allen *et al.* 2001; and Wood, 1998).
Biological: \r\nWood (1998) believes that *L. latifolium* is an unlikely candidate for biological control by beneficial weed-eating insects because it is a member of the mustard family and is related to several agricultural crops, including broccoli, cabbage, and horseradish. But a bio-control program for Hoary cress (*Lepidium draba*) has recently begun at ARS, Sidney, WY, USA using the collar gall weevil from *Lepidium's* native range.
Physiologically, greenhouse studies have shown that *L. latifolium* depletes soil nutrients, and that introducing certain native plant species with superior root systems and nutrient uptake, may be better suited for searching out nutrients and possibly out competing *L. latifolium* (Wood, 1998).

Pathway
Robbins *et al.* (1951) state that *L. latifolium* may have been introduced to California as a contaminant of sugar beet seed, although no evidence is presented to support this (Cal-IPC, 2006).

Principal source: Chen *et al.* 2002. Adaptive responses of *Lepidium latifolium* to soil flooding: biomass allocation, adventitious rooting, aerenchyma formation and ethylene production.
Renz, 2000. Element Stewardship Abstract for *Lepidium latifolium* L.

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review: Debra A. Boelk, Staff Research Associate University of California - Cooperative Extension Stockton, California

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ALIEN RANGE

[1] AUSTRALIA
[1] MEXICO
[1] CANADA
[26] UNITED STATES

Red List assessed species 2: EN = 1; NT = 1;

Laterallus jamaicensis **NT**
Reithrodontomys raviventris **EN**

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14 references found for **Lepidium latifolium**

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CONABIO. 2008. Sistema de informaci&#65533;n sobre especies invasoras en M&#65533;xico. Especies invasoras - Plantas. Comisi&#65533;n Nacional para el Conocimiento y Uso de la Biodiversidad. Fecha de acceso.

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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Summary: Available from: http://webapps.lib.uconn.edu/ipane/browsing.cfm?descriptionid=8 [Accessed 09 March 2006]

ITIS (Integrated Taxonomic Information System). 2005. Online Database *Lepidium latifolium*

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.

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