

perennial pepperweed

Lepidium latifolium L.

Synonyms: *Cardaria latifolia* (L.) Spach, *Lepidium affine* Ledebour, *L. latifolium* ssp. *affine* (Ledebour) Kitagawa, *L. latifolium* var. *affine* (Ledebour) C. A. Meyer, *L. latifolium* ssp. *sibiricum* Thellung, *L. sibiricum* Schweigger (1812), not Pallas (1776).

Other common names: broadleaved pepperweed, broadleaved peppergrass, peppergrass mustard, perennial peppergrass, tall whitetop, Virginia pepperweed

Family: Brassicaceae

Invasiveness Rank: 71 The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description

Perennial pepperweed grows from a widely spreading root system. Stems are numerous, erect, and 30 ½ to 91 cm tall. Basal leaves are entire to evenly toothed, up to 30 ½ cm long, and 5 to 7 ½ cm wide. Petioles are nearly equal to the blades in length. Stem leaves are reduced in size and lack petioles. Plants form dense clusters of flowers in pyramidal panicles. Flowers are white, very small, and approximately 1.5 mm long. Each fruit (silicle) contains 2 seeds (Douglas et al. 1998, Renz 2000, Whitson et al. 2000).



Basal rosettes of *Lepidium latifolium* L. Photo by L. Mehrhoff.



Lepidium latifolium L. panicle. Photo by M. Harte.

Similar species: Perennial pepperweed is unlikely to be confused with any other small, white-flowered mustards in Alaska.

Ecological Impact

Impact on community composition, structure, and interactions: Perennial pepperweed creates large, monospecific stands that displace native plants and animals (Corliss 1993, Renz 2000). Stands of perennial pepperweed increase the salt content of surrounding soil, favoring halophytes and eliminating other species. Infestations change plant species composition and diversity. Perennial pepperweed causes the accumulation of significant amounts of litter, reducing light availability for other plant species and preventing the emergence of annual plants (Renz 2000). Perennial pepperweed also interferes with the regeneration of important riparian plant species such as willows and cottonwoods (Young et al. 1995). It degrades animal nesting and foraging sites (Howald 2000).

Impact on ecosystem processes: Perennial pepperweed may retard natural successional processes in previously disturbed areas. The roots fragment easily, allowing soil erosion to occur more readily in infested areas (Renz 2000). Perennial pepperweed transports salt ions from deep in the soil profile to the soil surface, drastically increasing soil salinity (Blank and Young 2002, Blank and Young 2004).

Biology and Invasive Potential

Reproductive potential: Perennial pepperweed

reproduces sexually by seeds and vegetatively from intact root systems or pieces of underground stems. Each plant is capable of producing thousands of seeds per year (Howald 2000, Renz 2000). Seeds lack a hard coat and do not seem to be capable of surviving for long periods of time in the soil. Seed viability is likely to be short (Renz 2000).

Role of disturbance in establishment: Perennial pepperweed can establish in disturbed areas and may disperse into minimally damaged or undisturbed habitats (Howald 2000).

Potential for long-distance dispersal: Seeds have no specific adaptations for long-distance dispersal but can be transported by wind, water, and possibly waterfowl (Howald 2000). Root fragments can be transported in streams to locations where they will establish new populations (Renz 2000).

Potential to be spread by human activity: Perennial pepperweed was introduced to North America as a contaminant in sugar beet seed. Seeds are often transported in hay or straw that is used as forage or mulch (Howald 2000). Seeds can be dispersed by vehicles.

Germination requirements: Seeds rapidly germinate under laboratory conditions, but, for unknown reasons, few seedlings are observed in the field (Renz 2000). Germination rates are high with alternating temperatures (Miller et al. 1986).

Growth requirements: Perennial pepperweed normally grows in full sunlight in heavy, moist, saline or alkaline soils. However, it can also be found in drier sites and different soil types (Howald 2000).

Congeneric weeds: Field pepperweed (*Lepidium campestre*), common pepperweed (*L. densiflorum*), clasping pepperweed (*L. perfoliatum*), and roadside pepperweed (*L. ruderale*) are known to occur as non-native weeds in North America (Royer and Dickinson 1999, USDA 2010).

Legal Listings

- Has not been declared noxious
- Listed noxious in Alaska

- Listed noxious by other states (CA, CO, HI, ID, IN, MT, NV, NM, OR, SD, UT, WA, WY)
- Federal noxious weed
- Listed noxious in Canada or other countries (BC)

Distribution and abundance

Perennial pepperweed can invade a wide range of habitats, including riparian areas, wetlands, marshes, estuaries, irrigation channels, and floodplains. It thrives in roadsides, hay meadows, crop fields, and rangelands (Renz 2000).

Native and current distribution: Perennial pepperweed is native to southeastern Europe and southwestern Asia. It has naturalized throughout Europe and North America. Infestations have also been found in Australia (eFloras 2008). Perennial pepperweed has not been recorded in Alaska.

Management

Once established, perennial pepperweed can be very difficult to remove. Mechanical methods are unlikely to control perennial pepperweed because new plants quickly regenerate from pieces of rootstock. Chemical methods have been used successfully. Most of the effective herbicides cannot be applied near or over water. No biological control agents have been introduced to control perennial pepperweed because there are several important cultivated crops in the same family (canola, mustard, cabbage, and kale) as well as several threatened and endangered, native *Lepidium* species in the United States. Old stems and litter take several years to degrade. It may be necessary to remove the litter, which prevents the germination and establishment of desirable native plant species. If soil salinities are dramatically increased, an intensive soil remediation program may be necessary before native species can reestablish. Controlled areas must be monitored because this species can regenerate from dormant root fragments (Howald 2000, Renz 2000).

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