

Dalmatian toadflax

Linaria dalmatica L.

Synonyms: None
Other common names: None
Family: Plantaginaceae

Invasiveness Rank: **58** 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

Dalmatian toadflax is a perennial plant that grows up to 91 cm tall from a stout, woody rootstalk. Stems are glabrous, erect, and often branched. Leaves are 19 to 25 ½ mm wide, lanceolate to ovate, acute or long-tapered, clasping, and alternate (although they often appear to be opposite). Stems and leaves are smooth and bluish-green. Flowers are born in long terminal inflorescences. They are two-lipped and 19 to 38 mm long. Each has a long spur. The throat, which closes the lower lip, is densely hairy and white to orange colored. The fruits are two-celled capsules. Each capsule contains numerous small seeds (Wetherwax 1993, Royer and Dickinson 1999, Whitson et al. 2000).



Linaria dalmatica L. Photo by Utah State University Archive.

Similar species: Yellow toadflax (*Linaria vulgaris*) can be distinguished from Dalmatian toadflax by its much narrower leaves and smaller yellow flowers. The leaves of yellow toadflax are 6 mm wide and 2 ½ to 10 cm long. The flowers have orange throats (Wetherwax

1993, Royer and Dickinson 1999).



Flowers of *Linaria dalmatica* L. Photo by B. Nowierski.

Ecological Impact

Impact on community composition, structure, and interactions: Dalmatian toadflax can outcompete and displace native plant species (Zouhar 2003). Grazing animals find this plant unpalatable. Bumble bees and halictid bees are the most important pollinators for Dalmatian toadflax (Carpenter and Murray 1998). Dalmatian toadflax may form hybrids (Vujnovic and Wein 1977).

Impact on ecosystem processes: Infestations of Dalmatian toadflax can lead to the establishment and

dominance of other invasive species in a community (Zouhar 2003).

Biology and Invasive Potential

Reproductive potential: Dalmatian toadflax reproduces sexually by seeds and vegetatively from buds on the roots. New infestations usually originate from seeds. Each plant can produce up to 500,000 seeds annually (Carpenter and Murray 1998). New plants can be produced when vegetative buds sprout from the lateral roots that are found in the upper 5 to 30 ½ cm of soil (Alex 1962). Plants can regenerate from root fragments as short as ½ inch (Zouhar 2003).

Role of disturbance in establishment: Dalmatian toadflax readily establishes in disturbed sites (Carpenter and Murray 1998). Soil disturbances that remove perennial plants may increase the survival rates of Dalmatian toadflax seedlings and encourage severe infestations (Robocker 1970, Grieshop and Nowierski 2002).

Potential for long-distance dispersal: Most seeds fall to the ground within a short distance of the parent plant. When seeds fall onto crusted snow, they can be blown by wind (Zouhar 2003). Dalmatian toadflax can also be dispersed by cattle, deer, and other browsing animals (Robocker 1970, Vujnovic and Wein 1997).

Potential to be spread by human activity: Dalmatian toadflax was probably introduced to North America as an ornamental plant. It is still planted in gardens in many areas (Alex 1962, Vujnovic and Wein 1997).

Germination requirements: Most seeds germinate in spring, but some can germinate in fall. Seeds are small and germinate if they are not buried deeper than 6 mm in the soil (Robocker 1970).

Growth requirements: Dalmatian toadflax is adapted to grow in a wide variety of soil types and moisture conditions. It can be found in open, sunny places on well-drained, coarse-textured soils with pH between 6.5 and 8.5 (Vujnovic and Wein 1997).

Congeneric weeds: Yellow toadflax (*Linaria vulgaris*) and broomleaf toadflax (*L. genistifolia*) are known to occur as non-native weeds in North America (USDA 2010). Broomleaf toadflax is considered a noxious weed in California, Colorado, Idaho, and New Mexico. Yellow toadflax is considered a noxious weed in four provinces of Canada and nine states of the U.S. (Invaders 2010, USDA 2010).

Legal Listings

Has not been declared noxious

Listed noxious in Alaska

Listed noxious by other states (AZ, CA, CO, ID, MT, ND, NM, NV, OR, SD, WA, WY)

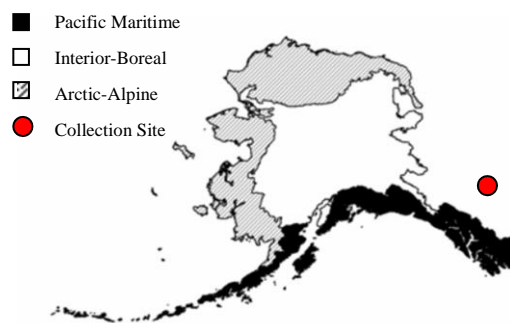
Federal noxious weed

Listed noxious in Canada or other countries (BC, MB)

Distribution and abundance

Dalmatian toadflax commonly grows in roadsides, waste areas, clear-cuts, and overgrazed pastures and rangelands. It establishes in plant communities that are open or have been disturbed (Carpenter and Murray 1998, Beck 2001).

Native and current distribution: Dalmatian toadflax is native to southeastern Europe and southwestern Asia. Its current world distribution includes most of Europe and Asia. Dalmatian toadflax has been introduced to Japan, Australia, New Zealand, South Africa, South America, and North America. It grows throughout the continental U.S. and in almost every province of Canada (Alex 1962, Saner et al. 1995, Royer and Dickinson 1999, USDA 2010). In North America, Dalmatian toadflax grows from 33°N to 56°N. It is most common in western North America (Alex 1962, Carpenter and Murray 1998). This species has not been reported from Alaska. It was found in southeast Yukon (B. Bennett – pers. com.).



Distribution of Dalmatian toadflax in Alaska.

Management

Dalmatian toadflax can be controlled by hand pulling or applying herbicides. Five insect species have been approved by the USDA for release as biological control agents. Because seeds can remain dormant for up to ten years and plants can regenerate from root fragments, control measures must be repeated every year for at least ten years to completely remove a stand (Carpenter and Murray 1998, Beck 2001).

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