Siberian peashrub
Caragana arborescens Lam.

Synonyms: *Caragana arborescens* Lam. var. *pendula* Carriere, *Caragana fruticosa* (Pall.) Besser, *Caragana fruticosa* (Pallas) Besser var. *multiflora* H. Xie & Y. T. Zhao, *Caragana sibirica* Medikus, *Robinia caragana* L.
Other common names: None
Family: Fabaceae

Invasiveness Rank: **74** 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

Siberian peashrub is a deciduous shrub or small tree that grows up to 4.5 meters tall. Plants usually have multiple stems arising from the root crowns. Stems have dark grey bark. Young branches have green to yellow-brown bark. Stipules are narrow, spine-like, and 5 to 10 mm long. Leaves are alternate or whorled and pinnately compound with 8 to 16 leaflets per leaf. Leaf axes, including petioles, are 3 to 10 cm long. Leaflets are obovate to elliptic, 10 to 25 mm long, and 5 to 15 mm wide with entire margins and short points at the tips. Young leaflets are short, silky, and hairy. Older leaflets are nearly hairless. Flowers are borne singly or in small groups. Peduncles are 12 to 35 mm long. Pedicels are 5 to 15 mm long. Calyxes are bell-shaped and 4.5 to 8 mm long. Corollas are yellow and 16 to 23 mm long. Pods are linear-lanceolate, green, strongly flattened, sessile, and 3.5 to 6 cm long. At maturity, pods become more cylindrical and brownish until they open forcefully (Welsh 1974, eFloras 2008, Klinkenberg 2010).

Flowers and young leaflets of *Caragana arborescens* Lam.

Similar species: Siberian peashrub is the only yellow-flowered, pinnately-leaved shrub in the pea family in Alaska. It is therefore unlikely to be confused with other species.

Fruits and foliage of *Caragana arborescens* Lam.

Ecological Impact

Impact on community composition, structure, and interactions: Siberian peashrub appears to significantly reduce populations of native shrubs and grasses in mixed birch-spruce forests in western Russia (Zolotukhin 1980, Baranova pers. comm.). It can replace native shrubs in the understories of deciduous forests in Canada (Henderson and Chapman 2006). In several locations in south central and interior Alaska, Siberian peashrub has formed dense shrub layers in open meadows or forest edges (Carlson pers. obs., Conn pers. obs., Guritz 2008, Lapina pers. obs.). This species reduces the density of underlying graminoid layers (Zolotukhin 1980). Siberian peashrub provides a food source for many animals, including grasshoppers, birds, and deer (Duke 1983, Henderson and Chapman 2006). It also provides cover for wildlife (Graham 1941). Stipules

of leaves often persist as spines (Welsh 1974). Thick stands can hinder the movement of animals.

Impact on ecosystem processes: Once established, Siberian peashrub decreases light availability and inhibits the regeneration of native trees and shrubs by forming dense thickets (Lapina pers. obs., Baranova pers. comm.). Roots are associated with bacteria that fix atmospheric nitrogen; thus, infestations significantly increase the availability of nitrogen in the soil (Henderson and Chapman 2006, Plants for a Future 2011). Recent increases in density in the interior-boreal ecogeographic region suggest greater impact on ecosystem processes, further studies are needed to verify.

Biology and Invasive Potential

Reproductive potential: Siberian peashrub reproduces sexually by seed and vegetatively by producing shoots from the root crowns (Henderson and Chapman 2006). Seeds production is prolific (Henderson and Chapman 2006) but has not been quantified. The amount of time seeds remain viable in the soil is unknown. Vegetative reproduction is relatively unimportant for the expansion of populations compared to sexual reproduction, and populations in Alberta, Canada, included large numbers of seedlings and immature plants (Henderson and Chapman 2006).

Role of disturbance in establishment: In south central and interior Alaska, Siberian peashrub appears to be recruiting in moderately disturbed and partially native habitats (Carlson pers. obs. Conn pers. obs., Guritz 2008). It has been documented on roadsides, parks and along the edges of aspen and birch stands (Viereck and Little 2007). Most recorded infestations of Siberian peashrub in Alaska are associated with anthropogenically disturbed areas. However, this species has also been documented from a naturally disturbed stream gravel bar (UAM 2011), and it has been found establishing in forested areas with no perceivable human or natural disturbances (Lapina pers. obs.). It has spread into the understories of deciduous forests in Alberta, Canada, where it competes with native shrubs (Henderson and Chapman 2006).

Potential for long-distance dispersal: Pods open forcefully, dispersing seeds short distances from the parent plants (Montana Plant Life 2010).

Potential to be spread by human activity: Siberian peashrub is cultivated in Alaska and Yukon (Welsh 1974). It escapes from cultivation (Henderson and Chapman 2006, AKEPIC 2011, UAM 2011). It is currently sold in nurseries (Duke 1983, I. Lapina – pers. obs., WDNR 2003).

Germination requirements: Cold stratification and soaking seeds in water for 24 hours improve germination rates. Germination takes two to three weeks at 20°C (Plants for a future 2002).

Growth requirements: Siberian peashrub grows well in the understories of deciduous forests (Henderson and Chapman 2006). It grows best on well-drained soils. It tolerates nutrient-poor soils (Plants for a Future 2011) and can grow in regions that receive as little as 40 cm of precipitation annually (Duke 1983). Siberian peashrub favors continental climates with long summers and cold, moderately dry winters (Plants for a Future 2011).

Congeneric weeds: No other *Caragana* species are known to occur as non-native weeds (USDA 2011).

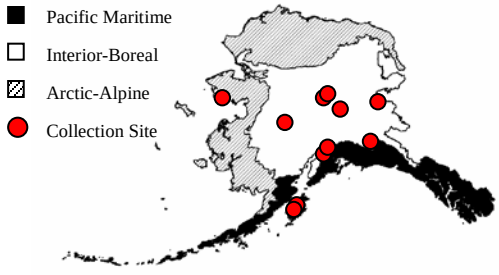
Legal Listings

- ☒ Has not been declared noxious
- ☐ Listed noxious in Alaska
- ☐ Listed noxious by other states
- ☐ Federal noxious weed
- ☐ Listed noxious in Canada or other countries

Distribution and Abundance

Siberian peashrub was introduced to Europe and North America for erosion control and as an ornamental plant for hedges (Henderson and Chapman 2006, Klinkenberg 2010). It is widely planted in the U.S. and Canada, including Alaska, for windbreaks, hedges, and outdoor screening (Welsh 1974, Duke 1983, Henderson and Chapman 2006). In arctic regions, it is a supplementary fodder for reindeer herds (Duke 1983). This species invades grasslands and woodland edges in the Midwestern U.S. (MNDNR 2011). It also invades forests in the Interior-Boreal ecogeographic region of western Russia (Lapina pers. obs.). A population of approximately 50 plants invaded an adjacent forest and increased to approximately 60,000 plants over the course of 75 years in Alberta, Canada (Henderson and Chapman 2006).

Native and current distribution: Siberian peashrub is native to Siberia, Kazakhstan, Mongolia, and China (eFloras 2008, Klinkenberg 2010). It has been introduced to Europe and North America (Henderson and Chapman 2006). This species grows in 21 states of the U.S. and most of Canada (USDA 2011). It grows as far north in Norway as 68.5°N (Vascular Plant Herbarium Trondheim 2011). Siberian peashrub has been documented from all three ecogeographic regions of Alaska (AKEPIC 2011, UAM 2011).



Distribution of Siberian peashrub in Alaska

Management

Siberian peashrub can produce new shoots from the root crowns (Henderson and Chapman 2006). It can be weakened by repeated prescribed burning. Glyphosate or triclopyr applied to cut stumps provide effective control. Spraying basal bark with triclopyr is also effective (MNDNR 2011). In natural areas, control efforts may need to be repeated for up to ten years (Henderson and Chapman 2006).

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