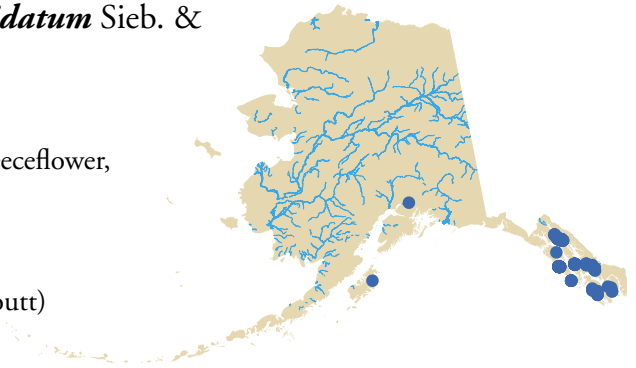
Family Polygonaceae

Japanese Knotweed

Polygonum cuspidatum Sieb. & Zucc.



Alternate Names

Japanese bamboo, fleeceflower, Mexican bamboo

Synonyms

Fallopia japonica (Houtt) Dcne; *Plueropterus cuspidatum* (Sieb. & Zucc.) Moldenke; *Plueropterus zuccarinii* (Small) Small; *Polygonum zuccarinii* Small; *Reynourtia japonica* Houtt

Related Species

Polygonum sachalinense F. Schmidt ex Maxim Bohemian Knotweed
Polygonum x bohemicum (J. Chrtek & A. Chrtkova) P.F. Zika & A.L. Jacobson

XID Services photo by Richard Old

Japanese knotweed flowers.

Description

Japanese knotweed stems grow up to 10 feet tall and are hollow and bamboo-like, with thickened nodes where the leaf stalks meet the stem. Nodes are surrounded by thin papery sheaths, and stems are angled slightly at each node. Leaves are broadly oval, satiny-textured, and up to 6 inches long with short stalks. Inflorescences are branched sprays of small white to greenish-white flowers in late summer. Giant knotweed has very large leaves, up to 18 inches long. To differentiate the species, look at leaves from the middle of a shoot, not the shoot tip leaves, which are highly variable. Leaves of Japanese knotweed are flat-based, with an acutely tapering tip, whereas leaves of giant knotweed have a deeply notched base with a more gradually tapering tip, and leaves of bohemian knotweed are intermediate between the other 2 species. Hairs on the

midvein on the underside of the leaf are also diagnostic. To observe, use a 10X lens to view a backlit leaf bent over a finger. Hairs of giant knotweed are multicellular, kinky, and long, whereas hairs of bohemian knotweed are shorter and unicellular with a broad base, and hairs of Japanese knotweed are reduced to bumps.

USDA Forest Service photo by Tom Heutte

Similar Species

Black bindweed (*Polygonum convolvulus* L., included in this book), is a viny species occasionally found in Alaska with smaller leaves and stature than Japanese knotweed. Bukhara fleeceflower (*P. baldschuanicum* Regel) is found in the Pacific Northwest and has pink-tinted flowers. Cultivated knotweed (*P. polystachyum* Wallich ex Meisn.) has a habit of forming dense colonies but has narrow willow-shaped leaves and is found in California and Oregon. All native species of *Polygonum* in Alaska are considerably smaller than Japanese knotweed and do not have broad leaves.

Ecological Impact

Japanese knotweed forms single-species stands that reduce biodiversity by outshading native vegetation. This species clogs waterways and lowers the quality of habitat for wild-

life and fish. It also reduces the food supply for juvenile salmon in the spring. There is an increased risk of soil erosion due to the presence of Japanese knotweed. Dead stems and leaf litter decompose very slowly and form deep organic layers that prevent native seeds from germinating, thereby altering the succession of native plant species. During dormant periods, dried stems and leaves can create a fire hazard.

Biology and Invasive Potential

Japanese knotweed reproduces primarily by vegetative regeneration of rhizomes and fresh stems. Very small fragments of rhizome, as little as 1/40 of an ounce, can produce a new plant. Seed production in Britain varies from none when fertile male plants are rare to several hundred seeds nearer to sources of giant knotweed and Bukhara fleeceflower (Beerling et al. 1994). No systematic study of seed longevity has been undertaken, but seeds stored at room temperature retained viability for 4 years. This species is capable of establishment in native habitats with little or no observable disturbance. Plant fragments washed downstream are capable of producing new colonies. Dispersal across marine waters has also been reported (Beerling et al. 1994). Fruits disperse primarily with wind.

XID Services photo by Richard Old

Japanese knotweed, ***Polygonum Cuspidatum****.*

Japanese knotweed has been planted as an ornamental in southeast Alaska and in the Anchorage area and commonly escapes from gardens. Transportation of soil containing rhizome fragments on construction equipment is also possible. Germination rates are high either after 5 months of storage at room temperature or 3 months at 35° to 40°F. Japanese knotweed has been observed growing in a variety of soil types including silt, loam, and sand, with

pH levels ranging from 4.5 to 7.4. It requires high light environments and can tolerate high temperatures, salinity, and drought (Seiger 1991). Japanese knotweed is listed as noxious in California, Oregon, and Washington.

Distribution and Abundance

Japanese knotweed was introduced to North America in the late 1800s. It is now widely found in at least 42 of the United States and most Canadian provinces. Infestations are common around most communities in southeast Alaska (AKEPIC Database 2004). This species is often found near water sources, such as along streams and rivers, in disturbed areas, in utility rights-of-way, in neglected gardens, and around old homesites. It has also been observed growing in the understory of alder thickets in Alaska. In Europe, the northern limit of Japanese knotweed distribution corresponds with the boundary of 120 frost-free days (Beerling et al. 1994). It is native to Japan, North China, Taiwan, and Korea and is now a serious invasive in mainland Europe, the United Kingdom, North America, and New Zealand.

USDA Forest Service photo by Brad Kriekhaus

Japanese knotweed, ***Polygonum cuspidatum****.*

Management

For Japanese knotweed, hand-pulling is extremely labor intensive and effective only for small initial populations. Application of herbicide is very effective but is hampered by the height of plants. To get around this problem, one can cut or bend plants over in mid-summer and then spray herbicide on the foliage of regrowing plants before they get too tall to spray. Herbicide application on cut stems is ineffective. Application to foliage with a wick applicator or paintbrush has more limited effectiveness but can mini-

mize damage to desirable vegetation where the knotweed is interspersed with native species. Stem injection devices are commercially available. The advantage of these devices is that plants that are too tall to spray may be treated without having to cut plants and allow them to regrow. These may be preferable as an alternative to spray application, but the stem injection method is much more time consuming and uses greater quantities of herbicide, as each stem must be treated separately. When performing stem injection, it is necessary to mark which stems have been injected to track progress. Expect to see sparse growth of small, stunted plants one year afer treatment. Several years of monitoring and follow-up treatments are recommended for any control method used on Japanese knotweed.

Notes

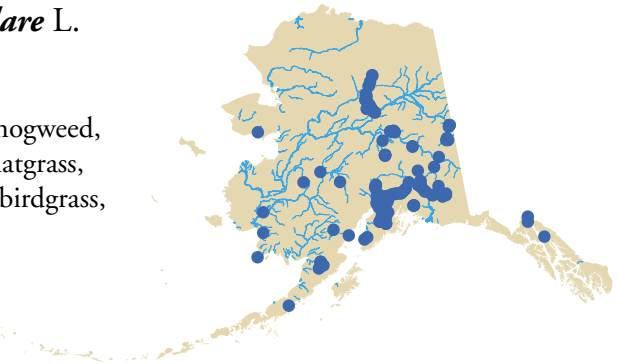
Knotweed is a rapid colonizer of bare soil and has been used to stabilize soil on steep slopes. It has been spread around many of our communities by dumping soil and possibly cut brush along roadsides. Single plants may cover several acres. One clump along the beachfront south of Juneau is over 400 feet long. Japanese knotweed grows, in its native range, high on the slopes of Mt. Fuji. A native of Asia, this species was introduced to England in 1825 for use as an ornamental and was subsequently introduced to the United States for use in ornamental hedges and for erosion control. In Japan, the plant is commonly called "itadori," which means strong plant.

USDA Forest Service photo by Tom Heutte

Bohemain knotweed, ***Polygonum bohemicum****.*

Prostrate Knotweed

Polygonum aviculare L.



Alternate Names

knotweed, wireweed, hogweed, common knotgrass, matgrass, doorweed, pinkweed, birdgrass, stonegrass

Description

KULAK photo by Paul Busselen

Prostrate knotweed is an annual plant that grows prostrate and mat-like, with long, spreading branches, small leaves, and tiny flowers in the axils of the leaves. Prostrate stems grow up to 3 feet long. Leaves are alternate, oval, apex-pointed, and hairless. Stipules are pointed and toothed. Stems are tough, wiry, and hairless, with longitudinal grooves and a sheath surrounding the stems at the nodes. Stems generally sprawl over the ground surface but may have an erect habit among other plants. Flowers are small and pink, with 1 to 5 in axillary clusters.

Management

Plants are easily pulled up by hand, although several weedings may be necessary to eliminate plants germinating from buried seeds (Densmore et al. 2001).

Notes

The origin of prostrate knotweed is unknown, but it may have come from Eurasia. Other common names include waygrass and doorweed, reflecting its propensity to grow in firmly packed soils. This plant has been shown to be an important food for partridge chicks and is also a favored food of seed-eating birds.

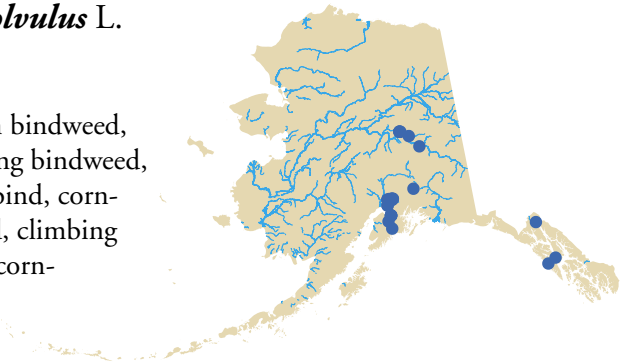
Family: Polygonaceae

Prostrate Knotweed

KULAK photo by Paul Busselen

Black Bindweed

Polygonum convolvulus L.



Alternate Names

wild buckwheat, corn bindweed, ivy bindweed, climbing bindweed, knot bindweed, bearbind, corn-bind, black knotweed, climbing buckwheat, dullseed corn-bind.

Synonyms

Fallopia convolvulus (L.) A. Love, *Fagopyrum convolvulus* (L.) H. Gross, *Tiniaria convolvulus* (L.) Webb. & Moq., *Bilderdykia convolvulus* (L.) Dumort

XID Services photo by Richard Old

Description

Black bindweed is an herbaceous annual climbing plant with a thin, spindle-formed, deep root and is often profusely branched. The stem is slender and 2 to 100 inches long with long internodes. Leaves are alternate, 3/4 to 2 1/2 inches long, long-petioled, elongate-ovate, pointed, and heart or arrow-shaped. Flowers are small, up to 3/16 of an inch in diameter, and grouped in short axillary clusters of 2 to 6 flowers or in terminal interrupted or spike-like racemes. The fruit is a triangular achene, 1/8 to 3/16 of an inch long, minutely pitted, brownish-black, and dull, with an obtuse base and pointed top.

XID Services photo by Richard Old

Similar Species

Superficially resembling field bindweed (*Convolvulus arvensis* L., included in this book), black bindweed can be distinguished by its annual habit, pointed leaves, papery leaf sheaths, and small green flowers. Field bindweed has white to lavender, large, showy, and trumpet-shaped flowers.

Management

Tillage has limited success for controlling black bindweed because of the large seed bank created by this species (Holm et al. 1991). Hand-pulling provides effective control if supplemented by follow-up montoring and retreatment. A number of selective herbicides sprayed alone or in mixtures have been used to control black bindweed (Anderson et al. 1986, Fain 1986). One biological control method involves the use of allelopathic chemicals from another weed species to depress germination and seedling growth. In Argentina, a fungus was found to cause sufficient damage to black bindweed to warrant investigation as a biological control agent (Dal-Bello and Carranza 1995).

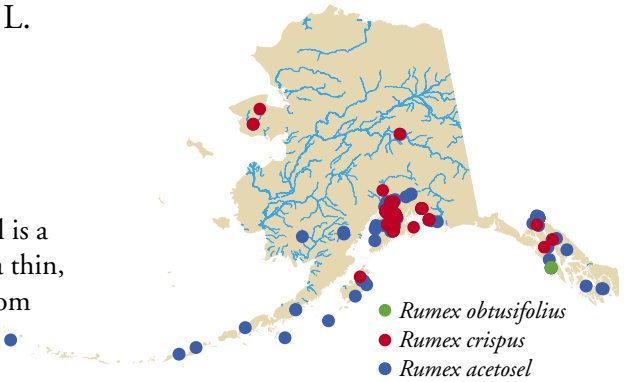
Notes

Black bindweed is listed as a restricted noxious weed in Alaska (Alaska Administrative Code 1987). Its genus name, *Polygonum*, is derived from the Greek words polys, "many," and gonu, "knee or joint," hence "many joints" describes the thickened joints on the stem. The species name, *convolvulus*, comes from the Latin word convolvere, which means "to twine around."

KULAK photo by Paul Busselen

Common Sheep Sorrel

Rumex acetosella L.



Alternate Names

field sorrel, red sorrel

Description

Common sheep sorrel is a perennial plant with a thin, erect stem growing from a slender rootstock. Leaves are long, narrow, and arrowhead-shaped with divergent basal lobes. The inflorescence is loose and reddish or yellowish. Stalks are jointed, and male and female flowers occur on separate plants. The ripe fruit is about 1/16 of an inch long.

Similar or Related Species

There are at least 15 species of Rumex in Alaska. Of these, 7 are exotic to Alaska (Hultén 1968). Curly dock (*R. crispus* L.) and bitter dock (*R. obtusifolius* L.) are two of the more common exotic species found in Alaska. Common sheep sorrel can be differentiated from all of these species by its arrowhead-shaped basal leaves.

XID Services photo by Richard Old

Common sheep sorrel, ***Rumex acetosella****.*

Management

If hand-pulling of common sheep sorrel is attempted, the entire root mass and all rhizomes should be removed for effective control. Herbicide treatments can also be effective.

Notes

These plants came from Eurasia. Most of the leaves of this genus are edible and have been cultivated as salad greens.

Family: Polygonaceae

Common Sheep Sorrel

Common sheep sorrel leaves are famous for their sour taste and have been used to treat inflammations, scurvy, and fevers. Curly dock is used for skin irritations, and its reddish-brown mature fruits can be used in baking. Bitter dock has been used as an astringent, blood purifier, contraceptive, and salve.

KULAK photo by Paul Busselen

Curly dock, ***Rumex crispus****.*

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Curly dock, ***Rumex crispus****.*

XID Services photo by Richard Old

Bitter dock, ***Rumex dotusifolius****.*