

# herb Robert

## *Geranium robertianum* L.

Synonyms: *Geranium eriophorum* H. Léveillé.

Other common names: Robert geranium, stinky Bob

Family: Geraniaceae

**Invasiveness Rank:** 67 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

Herb Robert is an annual to short-lived, perennial herb that grows 10 to 60 cm tall from a many-branched taproot. The entire plant has an unpleasant odor. Stems branch from the base, are decumbent, and have long, spreading hairs on the lower portions. Leaves are palmately divided and have three to five pinnately-lobed leaflets. Basal leaves are few and reduced. Stem leaves are opposite, 15 to 90 mm long, petiolated, and sparsely hairy on both sides. Central leaflets and flowers are stalked. Flowers are borne in pairs from the leaf axils. Petals are 8 to 13 mm long and pink or purple with rounded tips, white stripes, and soft hairs on the lower portions. Fruits are five-segmented with a long, erect beak at the top. Seeds are small and oblong (Hultén 1968, Tofts 2004, DiTomaso and Healy 2007, eFloras 2008, Klinkenberg 2010).



Flower of *Geranium robertianum* L. Photo by R. Vidéki.

**Similar species:** Herb Robert is not likely to be confused with other species in Alaska because of its characteristic, unpleasant odor. The white, pink-striped,

or pink flowers of the native Siberian springbeauty (*Claytonia sibirica*) look superficially similar to the flowers of herb Robert. Siberian springbeauty can be distinguished from herb Robert by the presence of linear to lanceolate, simple leaves and a notch at the end of each petal that divides the tip of the petal into two segments. Unlike herb Robert, native geranium species have deeply segmented, simple leaves. Carolina geranium (*Geranium carolinum*) and smallflower geranium (*G. pusillum*) are non-native species known or likely to occur in Alaska. They can be distinguished from herb Robert by their simple leaves and petals shorter than 8 mm. Carolina geranium has not yet been found in Alaska, and smallflower geranium is known only from a few locations (Hultén 1968, DiTomaso and Healy 2007, eFloras 2008).



Compound leaves of *Geranium robertianum* L. Photo by R. Vidéki.

### Ecological Impact

**Impact on community composition, structure, and interactions:** In forests of the Pacific Northwest, herb Robert can grow at densities of up to 250 plants per

square meter. This species forms dense monocultures that displace native herbaceous plant species, and it can spread in undisturbed areas, such as oak and fir woodlands (NWCB 1997, Tofts 2004, King County 2008, ODA 2009, Jones et al. 2010). It is associated with reduced forb and graminoid structural diversity in the forests of Oregon (Carlson pers. obs.). In shaded woodlands and forests in Alaska, herb Robert has the potential to change the understory layers and reduce the populations of native species. Herb Robert is not palatable to wildlife, and grazing is rare. This species is susceptible to rust fungi, but associations with other plant parasites and diseases have not been documented. A wide range of insect herbivores feed on herb Robert. The flowers are visited by flies, butterflies, and bees (Tofts 2004). In Yorkshire, England, the proximity of other flowering species increased the pollination of herb Robert (Goyder 1983). The presence of this species may alter native plant-pollinator relationships. Roots are often associated with mycorrhizal fungi (Boerner 1990). *Impact on ecosystem processes:* Herb Robert is believed to reduce the nutrients and moisture available to native plant species when it grows at high densities. Additionally, populations in the Pacific Northwest are likely to affect forest community dynamics by severe inhibition of native species; however, the full impacts of this species are poorly documented (ODA 2009).

### **Biology and Invasive Potential**

*Reproductive potential:* Herb Robert reproduces by seeds only. In England and Poland, this species has been documented producing from 50 to 1,550 seeds per plant. When growing at a density of 3 to 6 plants per square meter in Europe, *Geranium robertianum* produced 300 to 1,200 seeds per square meter. In Washington, seed density can be as high as 3,100 seeds per square meter (NWCB 1997, Tofts 2004, King County 2007). Seeds can remain viable in soil for up to six years (Roberts and Boddrell 1985).

*Role of disturbance in establishment:* In the Pacific Northwest, herb Robert escapes cultivation and thrives in shaded or partially shaded woodland sites (King County 2008, ODA 2009). Seeds can germinate in undisturbed, vegetated areas in moist, nutrient-rich, moderately basic soils (Tofts 2004, King County 2008). Although all recorded infestations in Alaska are associated with disturbances (AKEPIC 2010), herb Robert has the potential to establish in undisturbed forests and woodlands similar to those of the Pacific Northwest. In northern Spain, herb Robert grew to its highest percent cover in grazed woodlands, indicating that grazing disturbance promotes the growth of this species (Onaindia 2004).

*Potential for long-distance dispersal:* Seeds are forcibly ejected from the capsules and can land up to 21 feet away from the parent plant. Each seed has a sticky, thread-like fiber that can attach to vegetation, leaf litter,

ants, garden snails, and possibly browsing mammals (NWCB 1997, Tofts 2004).

*Potential to be spread by human activity:* In Southeast Alaska, herb Robert spreads along road systems, and 85% of documented infestations are associated with fill importation (AKEPIC 2010). This species has been cultivated as a garden ornamental and a medicinal herb, and it can easily escape cultivation (NWCB 1997, King County 2008, ODA 2009).

*Germination requirements:* Germination is not significantly affected by light or dark. Seeds can germinate immediately if sufficient moisture is present. Scarification or storage at 20°C for a few months increases germination rates. Most seeds germinate in late summer or early fall, but some seeds germinate in spring (Tofts 2004, King County 2008).

*Growth requirements:* Herb Robert can grow in a wide range of climates and habitats, from Mediterranean to boreal regions. It rarely grows in areas with January minimum temperatures below -20°C. It grows best on nutrient-rich, shaded, moist or damp, but not wet, soils. Herb Robert also grows commonly in scree slopes, limestone quarries, wastelands, demolition sites, and arable land (Tofts 2004).

*Congeneric weeds:* No other *Geranium* species are listed as noxious weeds in the U.S. (Invaders 2010, USDA 2010). Several other *Geranium* species are known or suspected to occur as non-native species in Alaska: *G. bicknellii*, *G. carolinianum*, *G. pusillum*, and *G. sanguineum* (AKEPIC 2010). *G. dissectum* and *G. molle* are considered weeds in California (DiTomaso and Healy 2007). *G. lucidum* aggressively invades oak and fir woodlands in Oregon (ODA 2009).

### **Legal Listings**

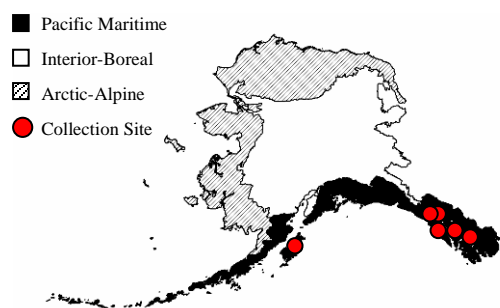
- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states (OR, WA)
- Federal noxious weed
- Listed noxious in Canada or other countries

### **Distribution and Abundance**

Herb Robert has been cultivated as an ornamental plant and occasionally as a medicinal herb. It escapes from cultivation and is a well-known garden pest (NWCB 1997, King County 2008, Plants for a Future 2010).

*Native and current distribution:* Herb Robert is native to Europe, North Africa, Central Asia, and Siberia. Populations have been introduced to Japan, southwest China, temperate South America, North America, Australia, and New Zealand (Tofts 2004). It has been documented from 26 states of the U.S. (USDA 2010). This species has been collected from several sites above the Arctic Circle in Troms County, Norway (Vascular Plant Herbarium Oslo 2010). Herb Robert has been documented from the Pacific Maritime ecogeographic

region of Alaska (Hultén 1968, AKEPIC 2010, UAM 2010).



Distribution of herb Robert in Alaska

## Management

Small or isolated populations of herb Robert can be controlled by hand-pulling. Plants have shallow roots and can be pulled easily. Manual control efforts are most effective before plants produce seeds. Populations can also be controlled by covering with a layer of cardboard underneath 3 or 4 inches of mulch. The spread of herb Robert can be prevented by cutting plants several times per growing season before they produce flowers. Populations can also be controlled by herbicide applications; pre-emergent herbicides and glyphosate herbicides without a surfactant have proven successful. Controlled areas may need to be observed for several years to prevent the reestablishment of populations from the seed banks. The aphid *Acyrtosiphon malvae geranii* is a potential biological control agent, but it may damage native *Geranium* species in addition to herb Robert (NWCB 1997, Tofts 2004, King County 2008).

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