# splitlip hempnettle
*Galeopsis bifida* Boenn.

# brittlestem hempnettle
*Galeopsis tetrahit* L.

Synonyms for *Galeopsis bifida*: *Galeopsis bifida* var. *emarginata* Nakai, *G. tetrahit* var. *bifida* (Boenn.) Lej. & Court., *G. tetrahit* var. *parviflora* Bentham
Other common name: none

Synonyms for *Galeopsis tetrahit*: none
Other common name: common hempnettle

Family: Lamiaceae

**Invasiveness Rank:** **50** 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**
Splitlip hempnettle and brittlestem hempnettle are annual plants that grow 20 to 80 cm tall from taproots. Stems are erect, quadrangular, simple or branched, hairy, and usually swollen below nodes. Leaves are opposite, petiolated, lanceolate to ovate, sparsely hairy on both sides, 3 to 10 cm long, and 1 to 5 cm wide with long-pointed tips and coarsely toothed margins. Petioles are hairy and 1 to 2.5 cm long. Flowers are arranged in dense clusters in leaf axils near the ends of stems. Floral bracts are linear to lanceolate and 3 to 6 mm long with bristly margins. Calyxes are hairy and approximately 1 cm long with narrowly triangular teeth that end in rigid spines. Corollas consist of five fused petals. Corollas are purple to white, bilaterally symmetrical, and tubular. Upper corolla lips are arched and entire. Lower corolla lips are three-lobed and spreading. Nutlets are arranged in clusters of four. They are ovoid and 3 to 4 mm long (Hultén 1968, O'Donovan and Sharma 1987, eFloras 2008, Klinkenberg 2010, NatureGate 2011).

Leaf of *Galeopsis tetrahit* s. l.

These *Galeopsis* species can be distinguished from each other based on the following features. Brittlestem hempnettle has stems that are hairy mainly on the nodes, rounded leaf bases, and central lobes on the corollas that are entire. Corollas of brittlestem hempnettle are 15 to 23 mm long. Splitlip hempnettle has internodes that are usually densely hairy, triangular leaf bases, and central lobes on the corollas that are notched. Corollas of splitlip hempnettle are usually less than 15 mm long (Hultén 1968, Klinkenberg 2010, NatureGate 2011). Brittlestem hempnettle and splitlip hempnettle can form hybrids, further complicating efforts to distinguish the two species (O'Donovan and Sharma 1987). They are often treated together as *Galeopsis tetrahit* s. l.

Flowers and foliage of *Galeopsis tetrahit* s. l.

*Similar species:* Hempnettle can be confused with several other members of the Lamiaceae family in Alaska. Stinging nettle (*Urtica dioica*) can be distinguished from hempnettle by the presence of stinging glandular hairs and small, greenish flowers (NatureGate 2011). Field mint (*Mentha arvensis*) can be distinguished from hempnettle by the presence of regular, four-lobed corollas (Hultén 1968). Unlike white deadnettle (*Lamium album*), which has net-veined leaves, hempnettle has pinnately veined leaves (NatureGate 2011). Splitlip hempnettle and brittlestem hempnettle can be distinguished from other members of the Lamiaceae family in Alaska by the presence of calyxes with five nearly equal lobes, well developed bracteal leaves in the flower axes, and rounded lobes on the lower corolla lips (Hultén 1968).

**Ecological Impact**

*Impact on community composition, structure, and interactions*: In Alaska, brittlestem hempnettle establishes in disturbed areas, where it creates a dense mid-forb layer and reduces the cover of graminoids and low forbs (Lapina pers obs.). Even under low light intensities, plants can develop large leaves and outshade underlying vegetation. Infestations in agricultural fields can occur at densities over 400 plants per square meter (O'Donovan and Sharma 1987). Dense populations of brittlestem hempnettle likely inhibit numerous species of native grasses and forbs from establishing in disturbed areas (Carlson pers. obs.). In Juneau, this species is highly competitive in open woodlands (Shephard pers. comm.). The bristly hairs along the stems and the spiny calyxes are strong enough to penetrate animal skin (Pojar and MacKinnon 1999) and may discourage herbivory (O'Donovan and Sharma 1987). Brittlestem hempnettle is associated with several harmful plant pests and diseases (O'Donovan and Sharma 1987).

*Impact on ecosystem processes:* Brittlestem hempnettle reduces the availability of soil moisture and nutrients (Royer and Dickinson 1999). It likely delays the establishment of native species in disturbed sites (Lapina pers. obs.).

**Biology and Invasive Potential**

*Reproductive potential:* Brittlestem hempnettle reproduces by seeds only. Plants produce an average of 387 seeds each (O'Donovan and Sharma 1987) but are capable of producing up to 2,800 seeds (NAPPO 2003). Splitlip hempnettle can produce up to 10,000 seeds per plant (Sokolova 2009a). No seeds of brittlestem hempnettle germinated after being buried in soil for 2.7, 3.7, or 4.7 years, but some did germinate after 6.7 years of burial (Conn and Werdin-Pfisterer 2010). Seeds have remained viable for up to 15 years in Russia (Sokolova 2009b). In Norway, seeds of splitlip hempnettle remained viable in the seed bank for more than five years (Rosef 2008), and they have remained viable for up to 14 years in Russia (Sokolova 2009a).

*Role of disturbance in establishment:* Splitlip hempnettle grows abundantly in sparsely vegetated areas. and has been documented in undisturbed forests in Southcentral Alaska (Conn pers. obs.). It does not grow well in established vegetation (Sokolova 2009a). Brittlestem hempnettle and splitlip hempnettle are often associated with anthropogenic disturbances (Lapina pers. obs., AKEPIC 2011, UAM 2011); however, they also can establish in areas disturbed naturally by river action, coastal processes, or animal activities (AKEPIC 2011, UAM 2011).

*Potential for long-distance dispersal:* Seeds are ovoid and 3 to 4 mm long (Klinkenberg 2010) and weigh 5 mg each (Sokolova 2009b). They do not have any apparent adaptations for long-distance dispersal (Lapina pers. obs.). However, seeds can be dispersed by wind and water (O'Donovan and Sharma 1987). Seeds can be transported on animal fur and are spread in excrement after being ingested (NatureGate 2011).

*Potential to be spread by human activity:* Seeds are known to contaminate crop seed and can be spread by farm machinery (O'Donovan and Sharma 1987).

*Germination requirements:* The optimal temperature for germination is 13°C, and seeds do not germinate at temperatures higher than 25°C (O'Donovan and Sharma 1987). Seedlings emerge from depths of 1 to 4 cm (NAPPO 2003).

*Growth requirements:* Brittlestem hempnettle requires moist soils (O'Donovan and Sharma 1987) and grows best on nitrogen-rich soils (Sokolova 2009b). The optimal pH range for growth is from 5 to 6. Brittlestem hempnettle is primarily self-fertilizing (O'Donovan and Sharma 1987).

**Legal Listings**

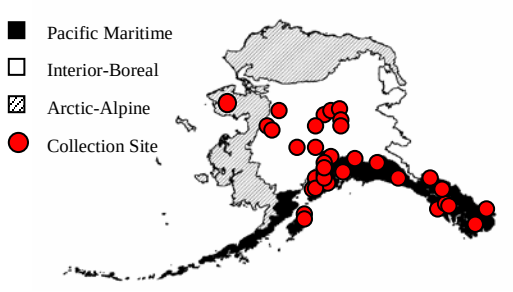
- ☐ Has not been declared noxious
- ☒ Listed noxious in Alaska
- ☐ Listed noxious by other states
- ☐ Federal noxious weed
- ☒ Listed noxious in Canada or other countries (AB, MB, QC)

**Distribution and abundance**

Splitlip hempnettle and brittlestem hempnettle are serious agricultural weeds in Canada and Russia (O'Donovan and Sharma 1987, Sokolova 2009a, Sokolova 2009b). They grow in disturbed sites, roadsides, gardens, agricultural fields, forest margins, in North America (O'Donovan and Sharma 1987, Klinkenberg 2010). They have been documented growing in riparian areas, lakeshores, sloughs (AKEPIC 2011), and the upper portions of a coastal marsh in Alaska (UAM 2011).

*Native and current distribution:* Splitlip hempnettle and

brittlestem hempnettle are native to Europe and Asia (eFloras 2008, Klinkenberg 2010). They have been introduced to North America and New Zealand (O'Donovan and Sharma 1987, Landcare Research 2011). Splitlip hempnettle grows in 21 states in the northern half of the U.S. and much of Canada. Brittlestem hempnettle grows in 28 states of the U.S., mostly in the northern half, and most of Canada (USDA 2011). Brittlestem hempnettle is known to grow as far north as 78.9°N in Svalbard (Vascular Plant Herbarium Oslo 2011). Splitlip hempnettle occurs in arctic regions in western and central Russia (Sokolova and Budrevskaya 2004). *Galeopsis tetrahit* s. l. has been documented from the Pacific Maritime and Interior-Boreal ecogeographic regions of Alaska (Hultén 1968, AKEPIC 2011, UAM 2011).




Distribution of *Galeopsis tetrahit* s. l. in Alaska.

**Management**

Control methods outside of agricultural areas are largely undocumented. Hand-pulling is likely effective as splitlip hempnettle and brittlestem hempnettle are annual plants, and roots pull out easily. However, hand pulling in Portage Valley has been ineffective in reducing population size with 5 years of treatment (Charnon pers. obs.). Brittlestem hempnettle can be controlled by chlorsulfuron at 10 grams per hectare when applied to plants in the two-leaf stage of growth (O'Donovan and Sharma 1987). Controlled areas should be monitored for several years following treatment.

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