

# shepherd's purse

## *Capsella bursa-pastoris* (L.) Medik.

Synonyms: *Bursa bursa-pastoris* (L.) Britt., *B. bursa-pastoris* (L.) Britt. var. *bifida* Crépin, *B. gracilis* Gren., *Capsella rubella* Reut., *Thlaspi bursa-pastoris* L.

Other common names: None

Family: Brassicaceae

**Invasiveness Rank:** 40 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

Shepherd's purse is an annual or winter annual plant that grows from a taproot. Plants can be smooth or with simple and star-like hairs. Stems are erect, simple or branched, and 8 to 45 cm tall. Basal leaves grow in rosettes. They are 2 ½ to 15 cm long, up to 4 cm wide, oblanceolate, and entire to pinnately lobed. Stem leaves have lobed margins and lack petioles. They decrease in size up the stem. Small white flowers appear in terminal clusters. Flowers measure up to 9½ mm across and are composed of four green sepals, four white petals, six stamens, and one pistil. Flowering stalks elongate during fruit development. Pods are triangular and 9½ mm long with approximately 20 seeds each. Seeds are round to oblong and dull orange (Douglas and Meidinger 1998, Royer and Dickinson 1999, Whitson et al. 2000).



*Capsella bursa-pastoris* (L.) Medik. L.

**Similar species:** Shepherd's purse can be distinguished from the native lyrate rockcress (*Arabis lyrata*) by its triangular seed pods and its long, terminal, racemose inflorescences.

### Ecological Impact

**Impact on community composition, structure, and interactions:** Shepherd's purse is grazed by cattle, horses, yaks, sheep, and rabbits (Crawley 1990). Its leaves are also eaten by insects and slugs (Dirzo and

Harper 1980, Cook et al. 1996, Aksoy et al. 1998). Flowers are usually self-pollinated; however, small insects, particularly flies and small bees, visit the flowers (Aksoy et al. 1998). Shepherd's purse is a host for various nematode species and viruses (Townshend and Davidson 1962, Royer and Dickinson 1999).

**Impact on ecosystem processes:** Shepherd's purse colonizes open ground and may inhibit the establishment of native species (Rutledge and McLendon 1996).

### Biology and Invasive Potential

**Reproductive potential:** Shepherd's purse reproduces entirely by seeds. The number of seeds produced per plant varies, depending mainly on habitat. Stevens (1932) recorded 38,500 seeds per plant. Hurka and Haase (1982) recorded a minimum of 500 seeds per plant and a maximum of 90,000 seeds per plant. Shepherd's purse can produce two or three generations in a single year (Rutledge and McLendon 1996, Aksoy et al. 1998).

**Role of disturbance in establishment:** Shepherd's purse requires open soil and disturbance to germinate. Plants may appear on sites that have been redisturbed several decades after the last human disturbance (Densmore et al. 2001). In studies, intense grazing led to greater densities of Shepherd's purse in perennial pastures (Harker et al. 2000).

**Potential for long-distance dispersal:** Seeds are small and light. They can be carried by wind or rain wash. They become sticky when moistened and can be dispersed on the feet of birds and mammals (Hurka and Haase 1982, Aksoy et al. 1998). Seeds remain viable after passing through digestive tracts of birds, cattle, and horses (Rutledge and McLendon 1996).

**Potential to be spread by human activity:** Seeds can be transported in mud stuck to shoes or car tires (Hurka and Haase 1982, Aksoy et al. 1998, Densmore et al. 2001). Horticultural stock may carry Shepherd's purse seeds as a contaminant (Hodkinson and Thompson 1997).

**Germination requirements:** Ripe seeds of shepherd's purse are dormant and require a period of stratification before they can germinate. Seeds

germinate throughout the year, usually with a large peak in early spring and a small peak in fall, at temperatures between 5°C and 29°C. Seeds of shepherd's purse require light for germination (Popay and Roberts 1970, Baskin and Baskin 1986, Baskin and Baskin 1989, Aksoy et al. 1998).

**Growth requirements:** Shepherd's purse is a plant of dry, open areas that shows some adaptability to moderate droughts. It is found mainly on clay to sandy loam soils with pH between 5.0 and 8.0. Seedlings grow best at daytime temperatures of 20°C and nighttime temperatures of 15°C (Aksoy et al. 1998). This plant has been observed surviving winter temperatures as low as -12°C in Germany (Göppert 1881 cited in Aksoy et al. 1998).

**Congeneric weeds:** No other *Capsella* species are known to occur as weeds (Flora of North America 2010, Invaders 2010, ITIS 2010)

### Legal Listings

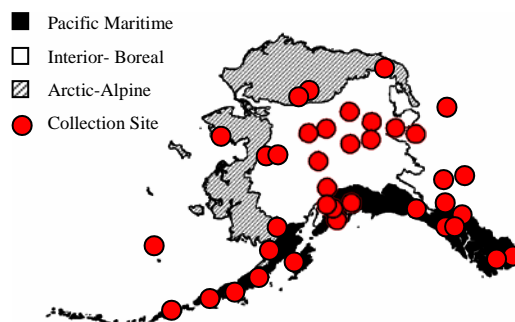
- Has not been declared noxious
- Listed noxious in Alaska
- Listed noxious by other states
- Federal noxious weed
- Listed noxious in Canada or other countries (AB and MB)

### Distribution and abundance

Shepherd's purse is common in cultivated crops, gardens, lawns, pastures, waste areas, and roadsides (Welsh 1974, Alex and Switzer 1976, Rutledge and

McLendon 1996, Aksoy et al. 1998, Royer and Dickinson 1999, Whitson et al. 2000).

**Native and current distribution:** Shepherd's purse is native to Europe and West Asia. It is now widely distributed throughout Europe, Asia, North America, Australia, and Africa. It has also been introduced into South America, New Zealand, and Tasmania (Hultén 1968). This species is well established in disturbed habitats of arctic of Greenland, Spitsbergen, Iceland, and Northland (Polunin 1957, Tolmatchev 1975). It has been documented from all three ecogeographic regions of Alaska (Hultén 1968, AKEPIC 2010).



Distribution of shepherd's purse in Alaska

### Management

Shepherd's purse is a pioneer colonizer of disturbed areas and will not persist for more than two to five years unless the site is repeatedly disturbed. Plants can be easily pulled up by hand (Densmore et al. 2001).

### References:

- AKEPIC database. Alaska Exotic Plant Information Clearinghouse Database. 2010. Available: <http://akweeds.uaa.alaska.edu/>
- Alex, J.F. and C.M. Switzer. 1976. Ontario weeds. Guelph, Ontario: Ontario Agricultural College, University of Guelph. 200 p.
- Aksoy, A., J.M. Dixon and W.H. Hale. 1998. Biological flora of the British Isles. *Capsella bursa-pastoris* (L.) Medikus (*Thlaspi bursa-pastoris* L., *Bursa bursa-pastoris* (L.) Shull, *Bursa pastoris* (L.) Weber). Journal of Ecology 86: 171-186.
- Baskin, J.M. and C.C. Baskin. 1986. Temperature requirements for after-ripening in seeds of nine winter annuals. Weed Research 26: 375-380.
- Baskin, J.M. and C.C. Baskin. 1989. Germination responses of buried seeds of *Capsella bursa-pastoris* exposed to seasonal temperature changes. Weed Research 29: 205-212.
- Cook, R.T., S.E.R. Bailey, and C.R. McCrohan. 1996. Slug preferences for winter wheat cultivars and common agricultural weeds. Journal of Applied Ecology 33: 866-872.
- Crawley, M.J. 1990. Rabbit grazing, plant competition and seedling recruitment in acid grassland. The Journal of Applied Ecology 27(3): 803-820.
- Densmore, R. V., P. C. McKee, C. Roland. 2001. Exotic plants in Alaskan National Park Units. Report on file with the National Park Service – Alaska Region, Anchorage, Alaska. 143 pp.
- Dirzo, R. and J.L. Harper. 1980. Experimental studies on slug-plant interactions: II. The effect of grazing by slugs on high density monocultures of *Capsella bursa-pastoris* and *Poa annua*. The Journal of Ecology 68(3): 999-1011.
- Douglas, G. W. and D. Meidinger. Brassicaceae. In: Douglas, G. W., G. B. Straley, D. Meidinger, J. Pojar. 1998. Illustrated flora of British Columbia. V. 2. Ministry of Environment, Lands and Parks Ministry of Forests. British Columbia. 401 pp.
- Flora of North America. Editorial Committee, eds. 1910. Flora of North America North of Mexico. 7 vols. New York and Oxford.
- Harker, K.N., V.S. Baron, D.S. Chanasyk and F.C. Stevenson. 2000. Grazing intensity effects on

- weed populations in annual and perennial pasture systems. *Weed Science* 48: 231-238.
- Hodkinson, D., K. Thompson. 1997. Plant dispersal: the role of man. *Journal of Applied Ecology*, 34: 1484-1496.
- Hultén, E. 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA. 1008 p.
- Hurka, H. and R. Haase. 1982. Seed ecology of *Capsella bursa-pastoris* (Cruciferae): dispersal mechanism and the soil seed bank. *Flora* 172: 35-46.
- Invaders Database System. 2010. University of Montana. Missoula, MT.  
<http://invader.dbs.umt.edu/>
- ITIS. 2010. Integrated Taxonomic Information System.  
<http://www.itis.gov/>
- Polunin, N. 1959. *Circumpolar arctic flora*. Oxford: At the Clarendon Press. 514 p.
- Popay, A.J. and E.H. Roberts. 1970. Ecology of *Capsella bursa-pastoris* (L.) Medik, and *Senecio vulgaris* L. in relation to germination behaviour. *The Journal of Ecology* 58(1): 123-139.
- Royer, F., and R. Dickinson. 1999. *Weeds of the Northern U.S. and Canada*. The University of Alberta press. 434 pp.
- Rutledge, C.R., and T. McLendon. 1996. *An Assessment of Exotic Plant Species of Rocky Mountain National Park*. Department of Rangeland Ecosystem Science, Colorado State University. 97 pp. Northern Prairie Wildlife Research Center Home Page.  
<http://www.npwrc.usgs.gov/resource/plants/explant/index.htm> (Version 15DEC98).
- Stevens, O.A. 1932. The number and weight of seeds produced by weeds. *American Journal of Botany* 19(9): 784-794.
- Tolmatchev, A.I., editor. 1975. *Flora Arctica URSS*. Vol. VII. Papaveraceae – Cruciferae. Leninopoli: Editio Nauka. 180 pp.
- Townshend, J.L. and T.R. Davidson. 1962. Some weed hosts of the northern root-knot nematode, *Meloidogyne hapla* Chitwood, 1949, in Ontario. *Canadian Journal of Botany* 40: 543-548.
- University of Alaska Museum. University of Alaska Fairbanks. 2003.  
<http://hispidamuseum.uaf.edu:8080/home.cfm>
- USDA, NRCS. 2006. The PLANTS Database, Version 3.5 (<http://plants.usda.gov>). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- Welsh, S. L. 1974. *Anderson's flora of Alaska and adjacent parts of Canada*. Brigham University Press. 724 pp.
- Whitson, T. D., L. C. Burrill, S. A. Dewey, D. W. Cudney, B. E. Nelson, R. D. Lee, R. Parker. 2000. *Weeds of the West*. The Western Society of Weed Science in cooperation with the Western United States Land Grant Universities, Cooperative Extension Services. University of Wyoming. Laramie, Wyoming. 630 pp.