

WEED RISK ASSESSMENT FORM

Botanical name:	<i>Capsella bursa-pastoris</i> (L.) Medik. L.		
Common name:	Shepherd's purse		
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Outcome score:

A. Climatic Comparison		
This species is present or may potentially establish in the following eco-geographic regions:		
1 South Coastal	Yes	
2 Interior-Boreal	Yes	
3 Arctic-Alpine	Yes	

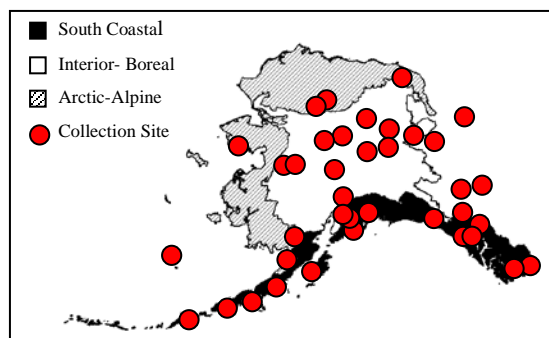
B.	Invasiveness Ranking	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	7
2	Biological characteristic and dispersal ability	25 (25)	11
3	Ecological amplitude and distribution	25 (25)	18
4	Feasibility of control	10 (10)	4
	Outcome score	100 (100) ^b	40 ^a
	Relative maximum score†		0.40

* For questions answered "unknown" do not include point value for the question in parentheses for "Total Answered Points Possible."

† Calculated as ^a/_b.

A. CLIMATIC COMPARISON:

	1.1. Has this species ever been collected or documented in Alaska?
Yes	Yes – continue to 1.2
	No – continue to 2.1
	1.2. Which eco-geographic region has it been collected or documented (see inset map)? <i>Proceed to Section B. Invasiveness Ranking.</i>
Yes	South Coastal
Yes	Interior-Boreal
Yes	Arctic-Alpine



Documentation: *Capsella bursa-pastoris* has been documented in all ecogeographic regions of Alaska (Weeds of Alaska Database 2005, Hultén 1968, UAM 2004).
 Sources of information:
 Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.
 University of Alaska Museum. University of Alaska Fairbanks. 2004.
<http://hispidamuseum.uaf.edu:8080/home.cfm>
 Weeds of Alaska Database. 2005. Database of exotic vegetation collected in Alaska. University of Alaska, Alaska Natural Heritage Program – US Forest Service – National Park Service Database. Available: <http://akweeds.uaa.alaska.edu/>

2.1. Is there a 40% or higher similarity (based on CLIMEX climate matching) between climates any where the species currently occurs and

- a. Juneau (South Coastal Region)?
 Yes – record locations and similarity; proceed to Section B. Invasiveness Ranking
 No
- b. Fairbanks (Interior-Boreal)?
 Yes – record locations and similarity; proceed to Section B. Invasiveness Ranking
 No
- c. Nome (Arctic-Alpine)?
 Yes – record locations and similarity; proceed to Section B. Invasiveness Ranking
 No
 – If “No” is answered for all regions, reject species from consideration

Documentation:
 Sources of information:

B. INVASIVENESS RANKING

1. ECOLOGICAL IMPACT

1.1. Impact on Natural Ecosystem Processes

- A. No perceivable impact on ecosystem processes 0
- B. Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability) 3
- C. Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl) 7
- D. Major, possibly irreversible, alteration or disruption of ecosystem processes (e.g., the species alters geomorphology; hydrology; or affects fire frequency, altering community composition; species fixes substantial levels of nitrogen in the soil making soil unlikely to support certain native plants or more likely to favor non-native species) 10
- U. Unknown

Score

1

Documentation:

Identify ecosystem processes impacted:

Shepherd’s purse colonizes open ground and may inhibit the establishment of native species (Rutledge and McLendon 1996). Though this plant is only found in highly disturbed environments (Densmore et al. 2001, Welsh 1974) it has potential for retardation succession after sites have been disturbed.

Rational:

Sources of information:

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.

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/othrdata/Explant/explant.htm> (Version 15DEC98).

Welsh, S. L. 1974. *Anderson's flora of Alaska and adjacent parts of Canada*. Brigham University Press. 724 pp.

1.2. Impact on Natural Community Structure

- A. No perceived impact; establishes in an existing layer without influencing its structure 0
- B. Influences structure in one layer (e.g., changes the density of one layer) 3
- C. Significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer) 7
- D. Major alteration of structure (e.g., covers canopy, eradicating most or all layers below) 10
- U. Unknown

Score 3

Documentation:

Identify type of impact or alteration:

Shepherd's purse is a pioneer of disturbed ground. It tends to have a high percentage of cover initially. However, after perennial grasses enter the area, it declines in abundance and soon disappears (Aksoy et al. 1998, I. Lapina – pers. obs.).

Rational:

Sources of information:

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.

Lapina, I. Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710 – Pers. obs.

1.3. Impact on Natural Community Composition

- A. No perceived impact; causes no apparent change in native populations 0
- B. Influences community composition (e.g., reduces the number of individuals in one or more native species in the community) 3
- C. Significantly alters community composition (e.g., produces a significant reduction in the population size of one or more native species in the community) 7
- D. Causes major alteration in community composition (e.g., results in the extirpation of one or several native species, reducing biodiversity or change the community composition towards species exotic to the natural community) 10
- U. Unknown

Score 0

Documentation:

Identify type of impact or alteration:

Shepherd's purse has not been observed in undisturbed areas in Alaska and no perceived impacts on native populations have been documented (Densmore et al. 2001).

Rational:

Sources of information:

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.

1.4. Impact on higher trophic levels (cumulative impact of this species on the animals, fungi, microbes, and other organisms in the community it invades)

- A. Negligible perceived impact 0
- B. Minor alteration 3
- C. Moderate alteration (minor reduction in nesting/foraging sites, reduction in habitat connectivity, interference with native pollinators, injurious components such as spines, toxins) 7
- D. Severe alteration of higher trophic populations (extirpation or endangerment of an existing native species/population, or significant reduction in nesting or foraging sites) 10

U. Unknown

Score

3

Documentation:

Identify type of impact or alteration:

Shepherd's purse is grazed by cattle, horses, sheep and rabbits (Crawley 1990). Its leaves are also eaten by insects and slugs (Aksoy et al. 1998, Dirzo and Harper 1980, Cook et al. 1996). 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 nematodes and viruses (Royer and Dickinson 1999).

Rational:

Sources of information:

- 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.
- 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.
- 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.
- Royer, F., and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 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.

Total Possible

40

Total

7

2. BIOLOGICAL CHARACTERISTICS AND DISPERSAL ABILITY

2.1. Mode of reproduction

- A. Not aggressive reproduction (few [0-10] seeds per plant and no vegetative reproduction) 0
- B. Somewhat aggressive (reproduces only by seeds (11-1,000/m²)) 1
- C. Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed, <1,000/m²) 2
- D. Highly aggressive reproduction (extensive vegetative spread and/or many seeded, >1,000/m²) 3
- U. Unknown

Score

3

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Shepherd's purse reproduces entirely by seeds. Stevens (1932) recorded 38,500 seeds per plant. Hurka and Haase (1982) conducted experiment in which they recorded a minimum of 500 seeds and a maximum of 90000 seeds per plant. The number of seeds per plant varies mainly depending on habitat

Rational:

Sources of information:

- Hurka, H. and R. Haase. 1982. Seed ecology of *Capsella bursa-pastoris* (Cruciferae): dispersal mechanism and the soil seed bank. *Flora* 172: 35-46.
- Stevens, O.A. 1932. The number and weight of seeds produced by weeds. *American Journal of Botany* 19(9): 784-794.

2.2. Innate potential for long-distance dispersal (bird dispersal, sticks to animal hair, buoyant fruits, wind-dispersal)

- A. Does not occur (no long-distance dispersal mechanisms) 0
- B. Infrequent or inefficient long-distance dispersal (occurs occasionally despite lack of adaptations) 2
- C. Numerous opportunities for long-distance dispersal (species has adaptations such as pappus, hooked fruit-coats, etc.) 3
- U. Unknown

Score 3

Documentation:

Identify dispersal mechanisms:

Seeds are small and light, and carried by wind or rain wash. Seeds become sticky when moistened and can be dispersed on the feet of birds and mammals (Aksoy et al. 1998, Hurka and Haase 1982).

Rational:

Sources of information:

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.

Hurka, H. and R. Haase. 1982. Seed ecology of *Capsella bursa-pastoris* (Cruciferae): dispersal mechanism and the soil seed bank. Flora 172: 35-46.

2.3. Potential to be spread by human activities (both directly and indirectly – possible mechanisms include: commercial sales, use as forage/revegetation, spread along highways, transport on boats, contamination, etc.)

- A. Does not occur 0
- B. Low (human dispersal is infrequent or inefficient) 1
- C. Moderate (human dispersal occurs) 2
- D. High (there are numerous opportunities for dispersal to new areas) 3
- U. Unknown

Score 3

Documentation:

Identify dispersal mechanisms:

Seeds may be transported in mud sticking to the human feet and to car tires (Aksoy et al. 1998, Densmore et al. 2001, Hurka and Haase 1982). Hodkinson and Thompson (1997) note that horticultural stock carried Shepherd's purse seeds as a contaminant.

Rational:

Sources of information:

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.

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.

Hodkinson, D., K. Thompson. 1997. Plant dispersal: the role of man. Journal of Applied Ecology, 34: 1484-1496.

Hurka, H. and R. Haase. 1982. Seed ecology of *Capsella bursa-pastoris* (Cruciferae): dispersal mechanism and the soil seed bank. Flora 172: 35-46.

2.4. Allelopathic

- A. No 0
- B. Yes 2
- U. Unknown

Score 0

Documentation:

Describe effect on adjacent plants:

Shepherd's purse is not known to be allelopathic.

Rational:

Sources of information:

2.5. Competitive ability

- | | |
|---|---|
| A. Poor competitor for limiting factors | 0 |
| B. Moderately competitive for limiting factors | 1 |
| C. Highly competitive for limiting factors and/or nitrogen fixing ability | 3 |
| U. Unknown | |

Score **1**

Documentation:

Evidence of competitive ability:

Shepherd's purse is a serious competitor with annual crops; however, it cannot compete with perennial grasses (Aksoy et al. 1998).

Rational:

Sources of information:

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.

2.6. Forms dense thickets, climbing or smothering growth habit, or otherwise taller than the surrounding vegetation

- | | |
|---|---|
| A. No | 0 |
| B. Forms dense thickets | 1 |
| C. Has climbing or smothering growth habit, or otherwise taller than the surrounding vegetation | 2 |
| U. Unknown | |

Score **0**

Documentation:

Describe grow form:

Shepherd's purse is capable of creating a dense stand of up to 300 plants per m² (Harker et al. 2000), however plants are small, up to 18 inches tall, and do not possess a climbing or smothering growth habit (Douglas and Meidinger 1998, Royer and Dickinson 1999, Whitson et al. 2000).

Rational:

Sources of information:

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.

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.

Royer, F., and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 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.

2.7. Germination requirements

- | | |
|--|---|
| A. Requires open soil and disturbance to germinate | 0 |
| B. Can germinate in vegetated areas but in a narrow range or in special conditions | 2 |
| C. Can germinate in existing vegetation in a wide range of conditions | 3 |
| U. Unknown | |

Score

Documentation:

Describe germination requirements:

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).

Rational:

Sources of information:

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.

2.8. Other species in the genus invasive in Alaska or elsewhere

- A. No 0
- B. Yes 3
- U. Unknown

Score

Documentation:

Species:

The genus *Capsella* is monotypic (USDA, NRCS 2006).

Sources of information:

2.9. Aquatic, wetland, or riparian species

- A. Not invasive in wetland communities 0
- B. Invasive in riparian communities 1
- C. Invasive in wetland communities 3
- U. Unknown

Score

Documentation:

Describe type of habitat:

In its native and introduced range, Shepherd's purse is a weed of cultivated crops, gardens, and waste areas (Alex and Switzer 1976, Aksoy et al. 1998, Royer and Dickinson 1999, Rutledge and McLendon 1996, Welsh 1974, Whitson et al. 2000). However this weed has been observed invading gravel bars at Brooks Camp, Katmai National Park and Preserve (J. Heys – pers. obs.).

Rational:

Sources of information:

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.

Heys, J., Exotic Plant Management Program Coordinator, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907)644-3451, fax: 644-3809 – pers. obs.

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/othrdata/Explant/explant.htm> (Version 15DEC98).

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.

Total Possible	25
Total	11

3. DISTRIBUTION

3.1. Is the species highly domesticated or a weed of agriculture

- A. No 0
- B. Is occasionally an agricultural pest 2
- C. Has been grown deliberately, bred, or is known as a significant agricultural pest 4
- U. Unknown

Score

4

Documentation:

Identify reason for selection, or evidence of weedy history:

Shepherd's purse is considered one of the dominating species in the weed flora (Aksoy et al. 1998).

Rational:

Sources of information:

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.

3.2. Known level of ecological impact in natural areas

- A. Not known to cause impact in any other natural area 0
- B. Known to cause impacts in natural areas, but in dissimilar habitats and climate zones than exist in regions of Alaska 1
- C. Known to cause low impact in natural areas in similar habitats and climate zones to those present in Alaska 3
- D. Known to cause moderate impact in natural areas in similar habitat and climate zones 4
- E. Known to cause high impact in natural areas in similar habitat and climate zones 6
- U. Unknown

Score

1

Documentation:

Identify type of habitat and states or provinces where it occurs:

Shepherd's purse has been observed established in Rocky Mountain National Park, Colorado, where it may inhibit the establishment of native species (Rutledge and McLendon 1996). Shepherd's purse is not known to impact natural areas in Alaskan National Park Units (Densmore et al. 2001).

Sources of information:

Densmore, R.V., P.C. McKee and C. Roland. 2001. Exotic plants in Alaskan National Park Units. Report on file with the National Park Service – Alaska Region, Anchorage, Alaska. 143 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/othrdata/Explant/explant.htm> (Version 15DEC98).

3.3. Role of anthropogenic and natural disturbance in establishment

- A. Requires anthropogenic disturbances to establish 0
- B. May occasionally establish in undisturbed areas but can readily establish in areas with natural disturbances 3
- C. Can establish independent of any known natural or anthropogenic disturbances 5

U. Unknown

Score **3**

Documentation:

Identify type of disturbance:

Shepherd's purse usually requires open soil and disturbance for establishment (Densmore et al. 2001). However Jeff Heys observed infestation of Shepherd's purse on river erosion sites at Brooks Camp, Katmai National Park and Preserve

Rational:

Sources of information:

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.

3.4. Current global distribution

- A. Occurs in one or two continents or regions (e.g., Mediterranean region) 0
- B. Extends over three or more continents 3
- C. Extends over three or more continents, including successful introductions in arctic or subarctic regions 5
- U. Unknown

Score **5**

Documentation:

Describe distribution:

Shepherd's purse is native to Europe and West Asia. It has become cosmopolitan and is widely distributed throughout Europe, Asia, North America, Australia, and Africa. It is introduced into South America, New Zealand, and Tasmania (Hultén 1968). It has also been recorded in arctic and subarctic regions in Greenland, Spitsbergen, Iceland, Northland and Alaska (Hultén 1968, Polunin 1957, Tolmatchev 1975, UAM 2004, Weeds of Alaska Database 2005).

Rational:

Sources of information:

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

Polunin, N. 1959. Circumpolar arctic flora. Oxford: At the Clarendon Press. 514 p.

Tolmatchev, A.I., editor. 1975. Flora Arctica URSS. Vol. VII. Papaveraceae – Cruciferae. Leninopoli: Editio Nauka. 180 pp.

University of Alaska Museum. University of Alaska Fairbanks. 2003.

<http://hispidamuseum.uaf.edu:8080/home.cfm>

Weeds of Alaska Database. 2005. Database of exotic vegetation collected in Alaska.

University of Alaska, Alaska Natural Heritage Program – US Forest Service – National Park Service Database. Available: <http://akweeds.uaa.alaska.edu/>

3.5. Extent of the species U.S. range and/or occurrence of formal state or provincial listing

- A. 0-5% of the states 0
- B. 6-20% of the states 2
- C. 21-50%, and/or state listed as a problem weed (e.g., “Noxious,” or “Invasive”) in 1 state or Canadian province 4
- D. Greater than 50%, and/or identified as “Noxious” in 2 or more states or Canadian provinces 5
- U. Unknown

Score **5**

Documentation:

Identify states invaded:

Shepherd's purse has been recorded in nearly all American States and Canadian provinces (USDA, NRCS 2006, Whitson et al. 2000). *Capsella bursa-pastoris* is listed as a noxious weed in Colorado, Alberta, and Manitoba (Royer and Dickinson 1999, USDA, NRCS. 2006).

Rational:

Sources of information:

Royer, F., and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
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.
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.

Total Possible	25
Total	18

4. FEASIBILITY OF CONTROL

4.1. Seed banks

- A. Seeds remain viable in the soil for less than 3 years 0
- B. Seeds remain viable in the soil for between 3 and 5 years 2
- C. Seeds remain viable in the soil for 5 years and more 3
- U. Unknown

Score

3

Documentation:

Identify longevity of seed bank:

Viable seeds were recorded after a dormancy of 35 years (Kivilaan and Bandurski 1981, Darlington and Steinbauer 1961), although a decline in number of viable seeds was recorded after 3.5, 5, and 6 years in other studies (Chepil 1946, Duvel 1904, Roberts and Feast 1973). A seed viability experiment in Alaska showed a dramatic decrease in viability between 6.7 and 9.7 years after burial (Conn and Deck 1995).

Rational:

Sources of information:

Chepil, W.S. 1946. Germination of weed seeds. I. Longevity, periodicity of germination, and vitality of seeds in cultivated soil. *Scientific Agriculture* 26: 307-346.
Conn, J.S. and R.E. Deck. 1995. Seed viability and dormancy of 17 weed species after 9.7 years of burial in Alaska. *Weed Science* 43: 583-585.
Darlington, H.T. and G.P. Steinbauer. 1961. The eighty-year period for Dr. Beal's seed viability experiment. *American Journal of Botany* 48(4): 321-325.
Duvel, J.W.T. 1904. Preservation of seed buried in the soil. *Botanical Gazette* 37(2): 146-147.
Kivilaan, A. and R.S. Bandurski. 1981. The one hundred-year period for Dr. Beal's seed viability experiment. *American Journal of Botany* 68(9): 1290-1292.
Roberts, H.A. and P.M. Feast. 1973. Emergence and longevity of seeds of annual weeds in cultivated and undisturbed soil. *The Journal of Applied Ecology* 10(1): 133-143.

4.2. Vegetative regeneration

- A. No resprouting following removal of aboveground growth 0
- B. Resprouting from ground-level meristems 1
- C. Resprouting from extensive underground system 2
- D. Any plant part is a viable propagule 3
- U. Unknown

Score

0

Documentation:

Describe vegetative response:

Shepherd's purse plants do not regenerate vegetatively (Aksoy et al. 1998, Densmore

et al. 2001).

Rational:

Sources of information:

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.

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.

4.3. Level of effort required

- A. Management is not required (e.g., species does not persist without repeated anthropogenic disturbance) 0
- B. Management is relatively easy and inexpensive; requires a minor investment in human and financial resources 2
- C. Management requires a major short-term investment of human and financial resources, or a moderate long-term investment 3
- D. Management requires a major, long-term investment of human and financial resources 4
- U. Unknown

Score

1

Documentation:

Identify types of control methods and time-term required:

Shepherd’s purse is a pioneer colonizer of disturbed areas and is usually does not persist more than 2-5 years unless the site is repeatedly disturbed. The plants can be easily pulled up by hand (Densmore et al. 2001). It seems to persist in unshaded natural sites with disturbances in Alaska (J. Heys – pers. obs.).

Rational:

Sources of information:

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.

Heys, J., Exotic Plant Management Program Coordinator, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907)644-3451, fax: 644-3809 – pers. obs.

Total Possible

10

Total

4

Total for 4 sections Possible

100

Total for 4 sections

40

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- Heys, J., Exotic Plant Management Program Coordinator, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907)644-3451, fax: 644-3809 – pers. obs.
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