WEED RISK ASSESSMENT FORM

Botanical name: *Convolvulus arvensis* L.

Common name: field bindweed, morning glory

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Outcome score:

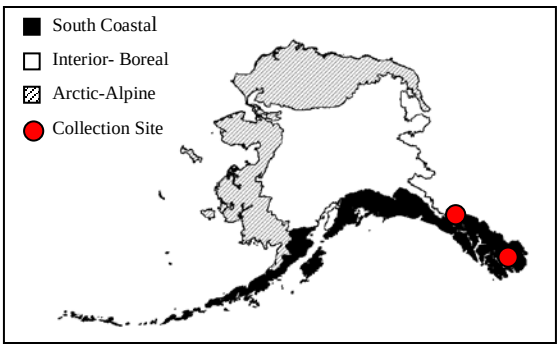
A.	**Climatic Comparison**		
	This species is present or may potentially establish in the following eco-geographic regions:		
1	South Coastal	Yes	
2	Interior-Boreal	Yes	
3	Arctic-Alpine	Yes	

B.	**Invasiveness Ranking**	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	18
2	Biological characteristic and dispersal ability	25 (25)	14
3	Ecological amplitude and distribution	25 (25)	16
4	Feasibility of control	10 (10)	8
	Outcome score	100 (100)[b]	56 [a]
	Relative maximum score†		0.56

* 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)? *Proceed to Section B. Invasiveness Ranking.*
Yes	South Coastal
	Interior-Boreal
	Arctic-Alpine



Documentation: *Convolvulus arvensis* has been reported from Haines and Ketchikan (AK Weeds Database. 2004).
Sources of information:
AK Weeds Database. 2004. 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
Yes – *record locations and similarity; proceed to Section B. Invasiveness Ranking*
No

c. Nome (Arctic-Alpine)?
Yes
Yes – *record locations and similarity; proceed to Section B. Invasiveness Ranking*
No
– *If "No" is answered for all regions, reject species from consideration*

Documentation: The CLIMEX matching program indicates that climatic similarity between Nome and areas where the species is documented is high. The native range of the species includes Røros, Norway (Lid and Lid 1994) and Zlatoust and Bogolovsk, Russia (Gubanov et al. 2004), which have 76%, 71%, and 67% climatic similarity with Nome, respectively. There is also climatic similarity between Fairbanks and areas within the native range of field bindweed. Chita, Irkutsk, and Kirensk, Russia have 79%, 78%, and 77% climatic similarity with Fairbanks, respectively. We conclude *Convovlulus arvensis* could potentially establish in the Interior-Boreal and Arctic-Alpine ecoregions of Alaska.
Sources of information: CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.
Gubanov IA, Kiseleva KV, Novikov VS, Tihomirov VN. An Illustrated identification book of the plants of Middle Russia, Vol. 3: Angiosperms (dicots: archichlamydeans). Moscow: Institute of Technological Researches; 2004. 520 p.
Lid, J. and D.T. Lid. 1994. Flora of Norway. The Norske Samlaget, Oslo. Pp. 1014.

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 3

Documentation:
Identify ecosystem processes impacted:
Field bindweed tends to occupy bare ground under open conditions. It is unclear how long this species may persist in native plant communities, but it can affect successional processes (Rutledge and McLendon 1996). The extensive root system of field bindweed reduces the soil moisture and nutrients available to other plants (Zouhar 2004).
Rational:

Sources of information:
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).
Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

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 5

Documentation:
Identify type of impact or alteration:
Field bindweed can twine and may climb over forbs and shrubs, or form dense tangled mats on the ground, but it does not create new layer (Gubanov et al. 2004, Zouhar 2004).
Rational:

Sources of information:
Gubanov I.A., Kiseleva K.V., Novikov V.S., Tihomirov V.N. An Illustrated identification book of the plants of Middle Russia, Vol. 3: Angiosperms (dicots: archichlamydeans). Moscow: Institute of Technological Researches; 2004. 520 p.
Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

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 5

Documentation:
Identify type of impact or alteration:
Field bindweed reportedly reduces cover of native grasses and forbs thereby decreasing biodiversity (Lyons 1982).
Rational:

Sources of information:
Lyons, K.E. 1998. Element stewardship abstract for *Convolvulus arvensis* L. Field bindweed. The Nature Conservancy: Arlington, Virginia.

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 5

Documentation:

Identify type of impact or alteration:

This plant attracts various pollinators including bees, honeybees, bumblebees, butterflies and moths (Zouhar 2004). Field bindweed may be mildly toxic to some grazing animals (Lyons 1998, Todd et al. 1995) although livestock has been observed consuming field bindweed (Gubanov et al. 2004). This plant hosts several viruses (Weaver and Riley 1982).

Rational:

Sources of information:

Gubanov IA, Kiseleva KV, Novikov VS, Tihomirov VN. An Illustrated identification book of the plants of Middle Russia, Vol. 3: Angiosperms (dicots: archichlamydeans). Moscow: Institute of Technological Researches; 2004. 520 p.

Lyons, K.E. 1998. Element stewardship abstract for Convolvulus arvensis L. Field bindweed. The Nature Conservancy: Arlington, Virginia.

Todd, F.G., F.R. Stermitz, P. Schultheis, A.P. Knight, and J. Traub-Dargatz. 1995. Tropane alkaloids and toxicity of *Convolvulus arvensis*. Phytochemistry 39(2): 301-303.

Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.

Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

Total Possible	40
Total	18

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/m^2)	1
C.	Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed, <1,000/m^2)	2
D.	Highly aggressive reproduction (extensive vegetative spread and/or many seeded, >1,000/m^2)	3
U.	Unknown	

Score 2

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Field bindweed reproduces by seed and rhizome. The number of seeds per plant varies between 12 and 500 (Royer and Dickinson 1999, Weaver and Riley 1982).

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.

Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.

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 2

Documentation:
Identify dispersal mechanisms:
Seeds fall near the parent plant, but can be dispersed farther by water, or passage through animals or birds (Harmon and Keim 1934, Proctor 1968, Weaver and Riley 1982, Zouhar 2004).
Rational:

Sources of information:
Harmon, G.W. and F.D. Keim. 1934. The percentage and viability of weed seeds recovered in the feces of farm animals and their longevity when buried in manure. Journal of the American Society of Agronomy 26: 762-767.
Proctor, V.W. 1968. Long-distance dispersal of seeds by retention in digestive tract of birds. Science 160: 321-322.
Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.
Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

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 can be dispersed by vehicles, machinery and in contaminated farm and garden seed, and root balls. Field bindweed is planted as an ornamental ground cover and in hanging baskets (Zouhar 2004).
Rational:

Sources of information:
Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

2.4. Allelopathic

A.	No	0
B.	Yes	2
U.	Unknown	

Score 2

Documentation:
Describe effect on adjacent plants:

Field bindweed is highly allelopathic to other species (Reynders and Ducke 1979 cited in Weaver and Riley 1982).
Rational:

Sources of information:
Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.

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 3

Documentation:
Evidence of competitive ability:
Due to its extensive root system field bindweed is extremely competitive (Elmore and Cudney 2003, Rutledge and McLendon 1996) and is able to outcompete native grasses for moisture and nutrients (Lyons 1982).
Rational:
Field bindweed is tolerant of a variety of environmental conditions allowing it to effectively compete for resources (Rutledge and McLendon 1996, Whitson et al. 2000).
Sources of information:
Elmore, C.L. and D.W. Cudney. 2003. Field bindweed. Integrated pest management for home gardeners and landscape professionals. Pest notes. Davis (CA): University of California, Agriculture and Natural Resources. Publication nr 7462. 4 p.
Lyons, K.E. 1998. Element stewardship abstract for Convolvulus arvensis L. Field bindweed. The Nature Conservancy: Arlington, Virginia.
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).

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 2

Documentation:
Describe grow form:
Field bindweed can twine, climb and form dense, tangled mats over other forbs and shrubs (Gubanov et al. 2004, Zouhar 2004, Weaver and Riley 1982).
Rational:

Sources of information:
Gubanov IA, Kiseleva KV, Novikov VS, Tihomirov VN. An Illustrated identification book of the plants of Middle Russia, Vol. 3: Angiosperms (dicots: archichlamydeans). Moscow: Institute of Technological Researches; 2004. 520 p.
Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.
Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research

Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

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 0

Documentation:
Describe germination requirements:
Field bindweed establishes and germinates better on bare ground than on sites with vegetation or litter (Zouhar 2004).
Rational:

Sources of information:
Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

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

A.	No	0
B.	Yes	3
U.	Unknown	

Score 0

Documentation:
Species:
No other weedy *Convolvulus* species are known (USDA 2002).
Sources of information:
USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

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 0

Documentation:
Describe type of habitat:
Field bindweed is especially common in cereal crops, orchards, and vineyards. It can be also found on ditchbanks, and along roadsides, streambanks and lakeshores (Lyons 1998, SAFRR 2005). It is found on dry or moderately moist soils and it is not normally a weed of wetlands (Weaver and Riley 1982).
Rational:

Sources of information:
Lyons, K.E. 1998. Element stewardship abstract for Convolvulus arvensis L. Field bindweed. The Nature Conservancy: Arlington, Virginia.
SAFRR - Saskatchewan Agriculture, Food and Rural Revitalization. 1984. Hemp-nettle (*Galeopsis tetrahit*). Available: http://www.agr.gov.sk.ca/default.asp [March 15, 2005].
Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.

Total Possible 25
Total 14

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:

Field bindweed has had a reputation as a weed in European gardens since the 17th century. In the late 19th century this pest became a problem in North America (Austin 2000) and is now it is considered to be the worst agricultural weed in many areas (Hitchcock et al. 1959). It is particularly troublesome in white bean, cereal and corn crops and is abundant in vineyards and orchards and in sugar beet and vegetable crops. Field bindweed can reduce crop yields by 50% (Royer and Dickinson 1999). This species has not been recorded in agricultural field of Alaska however (J. Conn – pers. com).

Rational:

Sources of information:

Austin, D.F. 2000. Bindweed (*Convolvulus arvensis*, Convolvulaceae) in North America, from medicine to menace. Journal of the Torrey Botanical Society 127(2): 172-177.

Hitchcock, C.L., A. Cronquist, and M. Ownbey. 1959. Vascular plants of the Pacific Northwest. Part 4: Ericaceae through Campanulaceae. Seattle, WA: University of Washington Press. 510 p.

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

3.2. Known level of 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 2

Documentation:

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

Field bindweed occurs in open annual grassland and oak savannah sites in California where it threatens endangered native grasses and forbs. In Idaho field bindweed outcompetes native grasses and threatens bunchgrass and forb-dominated habitats. Field bindweed dominates the understory in tree and shrub communities in Wyoming and has invaded remote, undisturbed aspen stands, riparian areas and mountain shrublands and grasslands in Colorado (Lyons 1982, Zouhar 2004). It occurs in the understory in cottonwood stands along the Missouri river in Southeastern South Dakota (Wilson 1970). Field bindweed is a dominant species in some disturbed riverbank areas in Quebec (Morin et al. 1989).

Sources of information:

Lyons, K.E. 1998. Element stewardship abstract for Convolvulus arvensis L. Field bindweed. The Nature Conservancy: Arlington, Virginia.

Morin, E., A. Bouchard, P. Jutras. 1989. Ecological analysis of disturbed riverbanks in the Montreal area of Quebec. Environmental Management 13(2): 215-225.

Wilson, R.E. 1970. Succession in stands of *Populus deltoides* along the Missouri River in Southeastern South Dakota. American Midland Naturalist 83(2): 330-342.

Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

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 0

Documentation:
Identify type of disturbance:
Field bindweed is an early successional species that establishes well on bare ground or in disturbed natural communities. Germination is better on bare ground than on sites with litter or vegetation (Zouhar 2004).
Rational:

Sources of information:
Zouhar, K. 2004. *Convolvulus arvensis*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, January 12].

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:
Field bindweed is native to Europe and Asia, but is now cosmopolitan between 60°N and 45°S latitudes, growing in temperate, tropical, and Mediterranean climates (Gubanov et al. 2004, Weaver and Riley 1982).
Rational:

Sources of information:
Gubanov IA, Kiseleva KV, Novikov VS, Tihomirov VN. An Illustrated identification book of the plants of Middle Russia, Vol. 3: Angiosperms (dicots: archichlamydeans). Moscow: Institute of Technological Researches; 2004. 520 p.
Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.

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:
Field bindweed is common in the United States, except in the extreme Southeast, New

Mexico, and Arizona. It is found in agricultural regions of all Canadian provinces, except Newfoundland and Prince Edward Island (Weaver and Riley 1982). Field bindweed is a Noxious Weed in 35 American states and 5 Canadian provinces (Invaders Database System 2003, USDA 2002) and is a prohibited noxious weed in Alaska (Alaska Administrative Code 1987).
Rational:

Sources of information:
Alaska Administrative Code. Title 11, Chapter 34. 1987. Alaska Department of Natural Resources. Division of Agriculture.
Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agriculture. http://invader.dbs.umt.edu/
USDA (United States Department of Agriculture), NRCS (Natural Resource Conservation Service). 2002. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
Weaver, S.E. and W.R. Riley. 1982. The biology of Canadian weeds. 53. *Convolvulus arvensis* L. Canadian Journal of Plant Science 62: 461-472.

Total Possible	25
Total	16

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:
Seed bank of field bindweed is extremely persistent. Seeds may lie dormant in the soil up more than 50 years (Elmore and Cudney 2003, Lyons 1998, Timmons 1949, Whitson et al. 2000).
Rational:

Sources of information:
Elmore, C.L. and D.W. Cudney. 2003. Field bindweed. Integrated pest management for home gardeners and landscape professionals. Pest notes. Davis (CA): University of California, Agriculture and Natural Resources. Publication nr 7462. 4 p.
Lyons, K.E. 1998. Element stewardship abstract for Convolvulus arvensis L. Field bindweed. The Nature Conservancy: Arlington, Virginia.
Timmons, F.L. 1949. Duration o viability of bindweed seed under field conditions and experimental results in the control of bindweed seedlings. Agronomy Journal 41: 130-133.
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.

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 2

Documentation:

Describe vegetative response:

Field bindweed resprouts repeatedly following removal of above-ground growth. Root fragments 2½ inches or more in length are able to produce new shoots under conditions of sufficient moisture (Lyons 1998, Sherwood 1945, Swan and Chancellor 1976).

Rational:

Roots and rhizomes of field bindweed store carbohydrates and proteins that provide the resources necessary for resprouting (Lyons 1998).

Sources of information:

Lyons, K.E. 1998. Element stewardship abstract for *Convolvulus arvensis* L. Field bindweed. The Nature Conservancy: Arlington, Virginia.

Sherwood, L.V. 1945. Field bindweed, *Convolvulus arvensis* L., root fragments may grow. Journal of the American Society of Agronomy 37(4): 307-313.

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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 3

Documentation:

Identify types of control methods and time-term required:

Herbicides are generally the most effective control of field bindweed. Mechanical control is not a likely option because plants are able to reproduce from roots. Currently, no biological control agents are available (Elmore and Cudney 2003, Whitson et al. 2000, Rutledge and McLendon 1996).

Rational:

Sources of information:

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Total Possible	10
Total	8

Total for 4 sections Possible	100
Total for 4 sections	56

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