

## PLANT INVASIVENESS ASSESSMENT FORM

Botanical name: *Cirsium arvense* (L.) Scop.

Common name: Canada thistle

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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
This species is unlikely to establish in any region in Alaska		

B.	Invasiveness Ranking	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	26
2	Biological characteristic and dispersal ability	25 (25)	19
3	Ecological amplitude and distribution	25 (25)	21
4	Feasibility of control	10 (10)	10
	Outcome score	100 (100) <sup>b</sup>	76 <sup>a</sup>
	Relative maximum score†		0.76

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

† Calculated as <sup>a</sup>/<sub>b</sub>.

**A. CLIMATIC COMPARISON:**

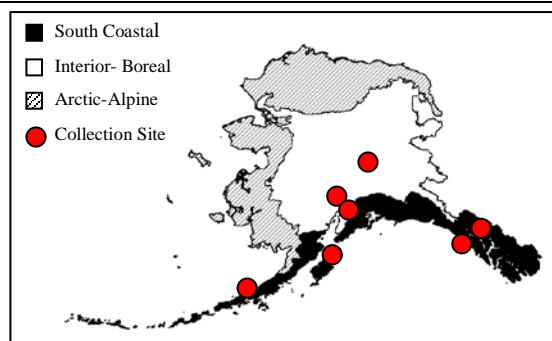
1.1 Has this species ever been collected or documented in Alaska?

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  
 Yes Interior-Boreal  
 Yes Arctic-Alpine



**Documentation:** Has been collected in South Coastal (Afognak, Sitka, and Juneau – UAM 2004, Cold Bay –pers. observ.), Interior-Boreal (Yukon-Tanana Uplands – UAM 2004, Wasilla – Weeds of Alaska 2005), ecoregions in Alaska. It does not appear to have been documented in the Arctic-Alpine ecoregion.

**Sources of information:**

Shephard, M. Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454 - Pers. comm.

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/>

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

Yes c. Nome (Arctic-Alpine)?

Yes – record locations and similarity; proceed to Section B.  
Invasiveness Ranking

Yes. Similarity  
of climate

No

– If “No” is answered for all regions, reject species from consideration

**Documentation:** A few specimens have been collected from the northern Swedish Province of Norrbotten (Natur Historiska Riksmuseet Database, 2004). This region has roughly 135 frost-free days, compared with Nome’s average of 80 frost-free days. This suggests that establishment in arctic and alpine regions of Alaska is unlikely. However, using CLIMEX matching program, climatic similarity between Nome and other areas where the species is documented is high. Range of the species includes Kirov, Russia (Hultén 1968), which has a 66% climatic match with Nome.

**Sources of information:**

CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.

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

Natur Historiska Riksmuseet Database. 2004. <http://www.nrm.se/wise/>

## 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 

5
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**Documentation:**

Identify ecosystem processes impacted:

Canada thistle can increase fire frequency and severity due to its abundant and readily ignited litter (Zouhar 2001).

Rational:

Sources of information:

Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

### 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 

7
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Documentation:

Identify type of impact or alteration:

Spread of Canada thistle can change the structure of natural areas by the reduction or elimination of other plant and animals species (Zouhar 2001).

Rational:

Sources of information:

Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

### 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 

7
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Documentation:

Identify type of impact or alteration:

Canada thistle has the potential to form dense infestations quite quickly by vegetative reproduction, which crowds out and displaces native grasses and forbs through shading, competition, and allelopathy (Bossard et al. 2000, Hitchison 1992, Zouhar 2001).

Rational:

It produces allelopathic chemicals that assist in displacing competing plant species as well as producing a phalanx-like growth habit.

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. Invasive plants of California's wildlands. University of California Press. 360 pp.  
Hutchison, M. 1992. Vegetation management guideline: Canada thistle (*Cirsium arvense* (L.) Scop.). Natural Areas Journal. 12: 160-161.  
Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

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 

7
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**Documentation:**

Identify type of impact or alteration:

*Cirsium arvense* has been reported to accumulate nitrates that cause poisoning in animals. The spiny leaves scratch animal skin, causing infection, at a minimum. It produces allelopathic chemicals and it is a host for bean aphid and stalk borer, and for sod-web worm (Bossard et al. 2000). Last, pollinating insects appear to be drawn away from native plants to visit *C. arvense* (Zouhar 2001).

Rational:

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. Invasive plants of California's wildlands. University of California Press. 360 pp.

Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

Total Possible 

40
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Total 

26
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**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<sup>2</sup>)) 1
- C. Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed, <1,000/m<sup>2</sup>) 2
- D. Highly aggressive reproduction (extensive vegetative spread and/or many seeded, >1,000/m<sup>2</sup>) 3
- U. Unknown

Score 

3
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**Documentation:**

Describe key reproductive characteristics (including seeds per plant):

It reproduces by seeds, but mostly spreads by stem and root fragments (Bostock and Benton 1979, Hayden 1934, Nuzzo 1997). An individual plant may produce up to 5,300 seeds in a year (Evans 1984). A count of 600 to 1,500 seeds per plant for various localities in northern Iowa was made (Hayden 1934).

Rational:

Sources of information:

Bostock, S.J. and R.A. Benton. 1979. The reproductive strategies of five perennial Compositae. The Journal of Ecology 67: 91-107.

Evans, J.E. 1984. Canada thistle (*Cirsium arvense*): A literature review of management practices. Natural Areas Journal 4:11-21.

Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. American Journal of Botany 21: 355-373.

Nuzzo, V. 1997. Element Stewardship Abstract for *Cirsium arvense*. The Nature

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:

The pappus breaks off easily from the seed and most seeds land near the parent plant. However a small proportion of seeds (0.2%) can disperse 1 km or more from the parent plant (Bostock and Benton 1979, Nuzzo 1997). Platt (1975) observed achenes of *C. arvense* windborne on the prairie several hundred meters from the nearest source population. The seeds float and can also be distributed by water. It can also be dispersed in dung (Nuzzo 1997). There is a belief that ducks and other waterfowls are the agents of distribution of Canada thistle seeds (Hayden 1934).

Rational:

Sources of information:

- Bostock, S.J. and R.A. Benton. 1979. The reproductive strategies of five perennial Compositae. *The Journal of Ecology* 67: 91-107.
- Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. *American Journal of Botany* 21: 355-373.
- Nuzzo, V. 1997. Element Stewardship Abstract for *Cirsium arvense*. The Nature Conservancy, Arlington, VA.
- Platt, W.J. 1975. The colonization and formation of equilibrium plant species associations on badger disturbances in a tall-grass prairie. *Ecological Monographs*. 45: 285-305.

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:

It spreads as a contaminant in crop seed, hay, and packing material (Hayden 1934). The seeds float and are easily distributed by water (Bossard et al. 2000). Additionally, it can be spread in mud attached to vehicle and farm equipment (Nuzzo 1997).

Rational:

Sources of information:

- Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. Invasive plants of California's wildlands. University of California Press. 360 pp.
- Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. *American Journal of Botany* 21: 355-373.
- Nuzzo, V. 1997. Element Stewardship Abstract for *Cirsium arvense*. The Nature Conservancy, Arlington, VA.

2.4. Allelopathic

- A. No 0
- B. Yes 2

U. Unknown

Score **2**

**Documentation:**

Describe effect on adjacent plants:

It produces allelopathic chemicals that inhibit adjacent plants (Evans 1984, Hayden 1934).

Rational:

Sources of information:

Evans, J.E. 1984. Canada thistle (*Cirsium arvense*): A literature review of management practices. *Natural Areas Journal* 4:11-21.

Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. *American Journal of Botany* 21: 355-373.

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:

Canada thistle is shade intolerant and grows best when no competing vegetation is present. Its growth may be inhibited in disturbed natural areas if suitable native species are densely enough to provide sufficient competition. Seedlings are significantly less competitive than mature plants (Zouhar 2001). It is quite competitive for water and nutrients in cultivated fields (Bossard et al. 2000, Nuzzo 1997).

Rational:

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. *Invasive plants of California's wildlands*. University of California Press. 360 pp.

Nuzzo, V. 1997. *Element Stewardship Abstract for Cirsium arvense*. The Nature Conservancy, Arlington, VA.

Zouhar, K. 2001. *Cirsium arvense*. In: *Fire Effect 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/>

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:

Canada thistle can form dense colonies one to four feet tall, but on occasion may grow more than six feet tall and branch freely (Bossard et al. 2000, Royer and Dickinson 1999). The vegetative growth can produce very dense stands (I. Lapina – pers. obs.).

Rational:

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. *Invasive plants of California's wildlands*. University of California Press. 360 pp.

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

obs.  
Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 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:  
Seeds germinate best in the top 0.2 to 0.6 inch of soil in bright light (they do not appear to germinate or establish without access to mineral soil) (Nuzzo 1997, Zouhar 2001). Has been observed germinating along the road in vegetated area (M. Shephard - pers. com., P. Spencer - pers.com.).  
Rational:  
  
Sources of information:  
Nuzzo, V. 1997. Element Stewardship Abstract for *Cirsium arvense*. The Nature Conservancy, Arlington, VA.  
Shephard, M. , Vegetation Ecologist, USDA, Forest Service, Forest Health Protection, State and Private Forestry, 3301 C Street, Suite 202, Anchorage, Alaska 99503 Division. Tel: (907) 743-9454 - Pers. com.  
Spencer, P. Ecologist, National Park Service, Alaska Region - Biological Resources Team, 240 W. 5th Ave, #114, Anchorage, AK 99501 tel: (907) 644-3448.  
Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

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

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

Score

**Documentation:**  
Species:  
*Cirsium vulgare* (Savi) Ten. is declared a noxious in number of American states and Canadian provinces (Invaders Database System 2003, USDA, NRCS 2002).  
Sources of information:  
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

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:  
Canada thistle is common on roadsides, railway embankments, lawns, gardens, abandoned fields, agricultural fields, and pastures. It has been observed on exposed substrates following drawdown in wetlands, but is not common in saturated soils (Bossard et al. 2000, Nuzzo 1997, Zouhar 2001).

Rational:

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. Invasive plants of California's wildlands. University of California Press. 360 pp.

Nuzzo, V. 1997. Element Stewardship Abstract for *Cirsium arvense*. The Nature Conservancy, Arlington, VA.

Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

Total Possible	25
Total	17

### 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
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Documentation:

Identify reason for selection, or evidence of weedy history:

Canada thistle is one of the worst weeds in agriculture (Bossard et al. 2000, Royer and Dickinson 1999).

Rational:

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. Invasive plants of California's wildlands. University of California Press. 360 pp.

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 

4
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Documentation:

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

Natural areas invaded include prairies and wet grasslands (Canada, Dakota), sedge meadows (Wisconsin and Illinois). In eastern North America, it occurs in sand dunes, stream banks, lakeshores, swamps, and ditches (Nuzzo 1997). Woodland areas and creek banks are documented habitats in Iowa (Hayden 1934). It is a major pest in grasslands and moist prairies from the Pacific Northwest eastward to the plains (Bossard et al. 2000). Canada thistle has contributed to the elimination of endangered and endemic plant species such as the Colorado butterfly plant in Wyoming (Zouhar 2001).

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. Invasive plants of California's wildlands. University of California Press. 360 pp.

Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. American Journal of Botany 21: 355-373.



Nuzzo, V. 1997. Element Stewardship Abstract for *Cirsium arvense*. The Nature Conservancy, Arlington, VA.  
 Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

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
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**Documentation:**

Identify type of disturbance:

Canada thistle has been observed on natural areas around ponds and wetlands where water levels fluctuate, areas of soil erosion, gopher mounds. It apparently cannot become established or spread in undisturbed or good or excellent condition pastures (Bossard et al. 2000, Evans 1984, Zouhar 2001). Cultivation stimulates the growth of horizontal roots, thereby increasing the number of new upright shoots borne by the horizontal runners (Hayden 1934).

Rational:

Sources of information:

Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. Invasive plants of California's wildlands. University of California Press. 360 pp.  
 Evans, J.E. 1984. Canada thistle (*Cirsium arvense*): A literature review of management practices. *Natural Areas Journal* 4:11-21.  
 Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. *American Journal of Botany* 21: 355-373.  
 Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

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
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**Documentation:**

Describe distribution:

Native to southeastern Europe, western Asia, and northern Africa, it now has a near global distribution, exclusive of Antarctica. Canada thistle occurs throughout Europe, western Asia, and northern and south Africa, western and central Asia, India, Japan, china, North and South America, New Zealand, Tasmania, and Australia (Hayden 1934, Hultén 1968, Nuzzo 1997).

Rational:

Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. *American Journal of Botany* 21: 355-373.  
 Hultén, E. 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, CA. 1008 p.  
 Nuzzo, V. 1997. Element Stewardship Abstract for *Cirsium arvense*. The Nature Conservancy, Arlington, VA.

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
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**Documentation:**

Identify states invaded:

Canada thistle has been declared noxious by 35 states and 6 Canadian provinces Invaders Database System 2003). It 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/>

Total Possible 

25
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Total 

21
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**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
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**Documentation:**

Identify longevity of seed bank:

Approximately 90% of seeds germinate within one year. Some seeds remain dormant in the soil for up to 20 years (Hutchison 1992, Roberts and Chancellor 1979).

Rational:

Sources of information:

Hutchison, M. 1992. Vegetation management guideline: Canada thistle (*Cirsium arvense* (L.) Scop.). Natural Areas Journal. 12: 160-161.  
 Roberts, H.A. and R.J. Chancellor. 1979. Periodicity of seedling emergence and achene survival in some species of *Carduus*, *Cirsium* and *Onopordum*. The Journal of Applied Ecology 16: 641-647.

**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 

3
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**Documentation:**

Describe vegetative response:

It readily propagates from stem and root fragments (Hayden 1934, Nuzzo 1997).

Rational:

Sources of information:

Hayden, A. 1934. Distribution and reproduction of Canada thistle in Iowa. American

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 

4
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**Documentation:**

Identify types of control methods and time-term required:

Management of Canada thistle may be achieved through hand cutting, mowing, controlled burning, chemical poisoning, or some combination of these treatments. It takes at least 2 growing season to determine whether a particular control method is effective. Degree of control is influenced by clonal structure, growth stage, season of treatment, weather conditions, ecotype, soil type, and control methods used (Zouhar 2001).

Rational:

Sources of information:

Zouhar, K. 2001. *Cirsium arvense*. In: Fire Effect 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/>

Total Possible 

10
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Total 

10
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**Total for 4 sections Possible**

100
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**Total for 4 sections**

76
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