WEED RISK ASSESSMENT FORM

Botanical name: *Bromus inermis* ssp. *inermis* Leyss.

Common name: smooth brome

Assessors:

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Outcome score:

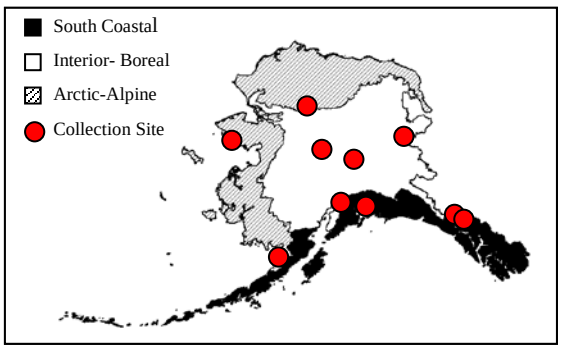
A.	**Climatic Comparison**		
	This species is present or may potentially establish in the following eco-geographic regions:		
1	South Coastal	Yes	
2	Interior-Boreal	Yes	
3	Arctic-Alpine	Yes	
	This species is unlikely to establish in any region in Alaska		

B.	**Invasiveness Ranking**	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	20
2	Biological characteristic and dispersal ability	25 (25)	16
3	Ecological amplitude and distribution	25 (25)	18
4	Feasibility of control	10 (10)	8
	Outcome score	100 (100)[b]	62
	Relative maximum score†		0.62

* 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
Yes	Interior-Boreal
Yes	Arctic-Alpine



Documentation: *Bromus inermis* ssp. *inermis* has been reported from all ecoregions of Alaska (Densmore et al. 2001, Hultén 1968).
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.
Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.

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 5

Documentation:
Identify ecosystem processes impacted:
Smoothe brome may inhibit natural succession processes (Densmore et al. 2001, Rutledge and McLendon 1996).
Rational:

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. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page.

http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm (Version 15DEC98).

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:
Establishes in an existing layer, increasing the density of the layer and reducing the density of shorter herbaceous layers (I. Lapina and M. L. Carlson – pers obs.).
Rational:

Sources of information:
Carlson, M. L., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.
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 5

Documentation:
Identify type of impact or alteration:
It forms a dense sod that may eliminate other species, thus contributing to the loss of species diversity in natural areas (Butterfield et al. 1996, Rutledge and McLendon 1996). In recent years *Bromus inermis* has largely replaced *B. pumpellianus* and certain other native species (Elliott 1949).
Rational:

Sources of information:
Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).
Elliott, F.C. 1949. *Bromus inermis* and *B. pumpellianus* in North America. Evolution 3(2):142-149.
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. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm (Version 15DEC98).

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:

Smooth brome has high palatability for grazing animals (USDA 2002). It is an alternate host for the viral diseases of crops (Sather 1987, Royer and Dickinson 1999). In southern Alaska hybrid swarms with *B. inermis* ssp. *pumpelliana* occur (Elliott 1949, Hultén 1968).

Rational:

Sources of information:

Elliott, F.C. 1949. *Bromus inermis* and *B. pumpellianus* in North America. Evolution 3(2):142-149.

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

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

Sather, N. 1987. Element Stewardship Abstract for *Bromus inermis* Awnless Brome, Smooth Brome. The Nature Conservancy. Arlington, VA.

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.

Total Possible 40

Total 20

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 3

Documentation:

Describe key reproductive characteristics (including seeds per plant):

Bromus inermis reproduces by rhizomes and seeds. The number of seeds produced has a very wide range. Each plant is capable of producing 156 to 10,080 viable seeds (Butterfield et al. 1996, Sather 1987). In studies of McKone (1985) *Bromus inermis* had significantly lower average seed set (17.2 per plant). Reproductive potential in Alaska is unknown.

Rational:

Sources of information:

Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).

McKone, M. J. 1985. Reproductive biology of several bromegrasses (*Bromus*): breeding system, pattern of fruit maturation, and seed set. American Journal of Botany 72(9): 1334-1339.
Sather, N. 1987. Element Stewardship Abstract for *Bromus inermis* Awnless Brome, Smooth Brome. The Nature Conservancy. Arlington, VA.

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 1

Documentation:
Identify dispersal mechanisms:
Seeds may be transported short distances by wind and ants (Rutledge and McLendon 1996, Sather 1987).
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. 97pp. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm (Version 15DEC98).
Sather, N. 1987. Element Stewardship Abstract for *Bromus inermis* Awnless Brome, Smooth Brome. The Nature Conservancy. Arlington, VA.

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:
Smooth brome, often planted as a forage crop, persists after cultivation and infests surrounding vegetation. It is spread when soil containing rhizomes is moved (Densmore et al. 2001).
Rational:

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.

2.4. Allelopathic

A.	No	0
B.	Yes	2
U.	Unknown	

Score 0

Documentation:
Describe effect on adjacent plants:

There is no known allelopathy potential. (USDA 2002).
Rational:

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.

2.5. 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 2

Documentation:
Evidence of competitive ability:
Smooth brome is a highly competitive weed in agricultural fields (Butterfield et al. 1996). In Alaska its competitiveness is largely restricted to sunny sites with nutrient rich mesic soils (J. Conn – pers. com.).
Rational:

Sources of information:
Conn, J. Weed Scientist, USDA Agricultural Research Service PO Box 757200 Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184. – Pers. com.
Butterfield, C., J. Stubbendieck, J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).

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:
It forms a dense sod that often excludes other species (Butterfield et al. 1996, Rutledge and McLendon 1996). Stands are very dense and often greater than 1 m tall (M. L. Carlson – pers. obs.)
Rational:

Sources of information:
Butterfield, C., J. Stubbendieck, J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).
Carlson, M.L., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.
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. 97pp. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm (Version

15DEC98).

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 2

Documentation:
Describe germination requirements:
Butterfield et al. (1996) suggests this species establishes in undisturbed or lightly disturbed areas, while Densmore et al. (2001) indicate it requires open soil and disturbance for germination.
Rational:

Sources of information:
Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).
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.

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

A. No 0
B. Yes 3
U. Unknown

Score 3

Documentation:
Species:
Bromus arenarius Labill., *B. briziformis* Fischer and C. Meyer, *B. diandrus* Roth, *B. japonicus* Thunb. ex Murr., *B. hordeaceus* L., *B. madritensis* L. *B. secalinus* L., *B. stamineus* Desv., *B. sterilis* L., *B. tectorum* L., *B. trinii* Desv. (Wilken and Painter 1993, Royer and Dickinson 1999, USDA 2002).
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 (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.
Wilken, D.H, and E.L. Painter. 1993. *Bromus* Brome. *In* J. C. Hickman (ed.) The Jepson Manual of Higher Plants of California. University of California Press, Berkley. Pp. 1400.

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:
Smooth brome is a weed of roadsides, forests, prairies, fields, lawns, and lightly disturbed sites (Butterfield et al. 1996, Rutledge and McLendon 1996).
Rational:

Sources of information:
Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).
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. 97pp. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm (Version 15DEC98).

Total Possible	25
Total	16

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3. DISTRIBUTION

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

A.	No	0
B.	Is occasionally an agricultural pest	2
B.	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:
It is widely planted as a forage species In Alaska, exotic *Bromus inermis* has been widely planted as a pasture and forage crop and for revegetation along roadsides and along pipeline corridors (Densmore et al. 2001).
Rational:

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.

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 3

Documentation:
Identify type of habitat and states or provinces where it occurs:
Bromus inermis appears to be invading native prairie from roadsides in Wisconsin and other states (Sather 1987, WDNR 2003). It is found in mid-successional sites in Iowa and Nebraska. In Minnesota smooth brome is found in late successional sites that were disturbed over 50 years ago, but it may spread vegetatively into undisturbed areas (Butterfield et al 1996).
Sources of information:
Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).
Sather, N. 1987. Element Stewardship Abstract for *Bromus inermis* Awnless Brome,

Smooth Brome. The Nature Conservancy. Arlington, VA.
Wisconsin Department of Natural Resources: abstract. Non-native plants. 2003. http://www.dnr.state.wi.us

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:
Smooth brome can establish in undisturbed or lightly disturbed areas (Butterfield et al. 1996). In Alaska its distribution is largely restricted to areas of substrate disturbance (I. Lapina pers. obs., M.L. Carson – pers. obs.).
Rational:

Sources of information:
Carlson, M.L., Assistant Research Professor – Botany, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2790 – Pers. obs.
Lapina, I., Botanist, Alaska Natural Heritage Program, University of Alaska Anchorage, 707 A Street, Anchorage, Alaska. Tel: (907) 257-2710. Pers. obs.
Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).

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 3

Documentation:
Describe distribution:
Distribution range of smooth brome includes Europe, temperate Asia, and North America (USDA, ARS 2004).
Rational:

Sources of information:
USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN)* [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/var/apache/cgi-bin/npgs/html/taxon.pl?300618 (May 7, 2004).

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:
Found throughout United States and Canada, except in the southeastern states (Royer and Dickinson 1999, USDA 2002). Listed as a weed in Tennessee (Royer and Dickinson 1999). However, the species is not considered noxious in North America (Invaders Database System 2003, USDA 2002).
Rational:

Sources of information:
Invaders Database System. The University of Montana. 2003. Montana Noxious Weed Trust Fund. Department of Agriculture. http://invader.dbs.umt.edu/
Royer, F. and R. Dickinson. 1999. Weeds of the Northern U.S. and Canada. The University of Alberta press. 434 pp.
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.

Total Possible	25
Total	18

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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

Documentation:
Identify longevity of seed bank:
Studies report a range of seeds longevity 2 to 10 years (Butterfield et al. 1996, Rutledge and McLendon 1996).
Rational:

Sources of information:
Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).
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. 97pp. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm (Version 15DEC98).

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:
Plants may regrow after cutting (Densmore et al. 2001, Rutledge and McLendon 1996).

Rational:

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. 97pp. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/explant/explant.htm (Version 15DEC98).

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:
Cultural, chemical, and mechanical control methods have all been used in agriculture (Butterfield et al. 1996, Rutledge and McLendon 1996). Unfortunately, most current control techniques are not effective in natural communities (J. Conn – pers. comm.).
Rational:

Sources of information:
Butterfield, C., J. Stubbendieck, and J. Stumpf. 1996. Species abstract of highly disruptive exotic plants. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/othrdata/exoticab/exoticab.htm (Version 16JUL97).
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Total Possible	10
Total	8

Total for 4 sections Possible	100
Total for 4 sections	62

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