WEED RISK ASSESSMENT FORM

Botanical name:	*Dactylis glomerata* L.	
Common name:	orchardgrass	
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Reviewers:	Michael Shephard Vegetation Ecologist Forest Health Protection State & Private Forestry 3301 C Street, Suite 202, Anchorage, AK 99503 (907) 743-9454; fax 907 743-9479	Jeff Conn, Ph.D. Weed Scientist, USDA Agricultural Research Service PO Box 757200 Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184
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Outcome score:

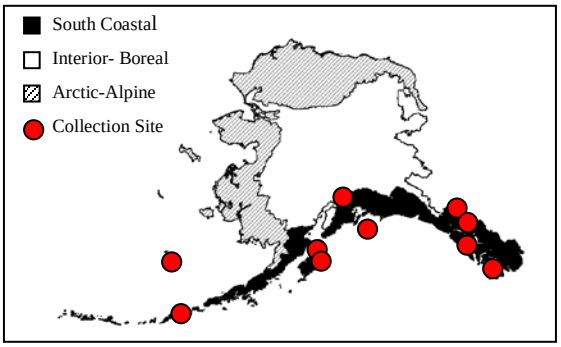
A.	**Climatic Comparison**		
	This species is present or may potentially establish in the following eco-geographic regions:		
1	South Coastal	Yes	
2	Interior-Boreal	Yes	
3	Arctic-Alpine	Yes	

B.	**Invasiveness Ranking**	Total (Total Answered*) Possible	Total
1	Ecological impact	40 (40)	16
2	Biological characteristic and dispersal ability	25 (25)	10
3	Ecological amplitude and distribution	25 (25)	23
4	Feasibility of control	10 (10)	5
	Outcome score	100 (100)[b]	54 [a]
	Relative maximum score†		0.54

* 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: *Dactylis glomerata* has been collected in South Coastal eco-geographic region of Alaska (Weeds of Alaska Database 2005, Hultén 1968, UAM 2004, Welsh 1974).
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://hispida.museum.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/
Welsh, S.L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.

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: *Dactylis glomerata* is known to occur throughout Europe and has been documented as far north as the northern province in Norway (Finnmark) at 70ºN (Lid and Lid 1994). The range of this species also includes Røros and Dombås, Norway, which have 76% and 63% climatic matches with Nome, and 55% and 52% climatic matches with Fairbanks, respectively. Thus, it may be possible for *Dactylis glomerata* to become established in the Interior-Boreal and Arctic-Alpine ecogeographic regions.
Sources of information: CLIMEX for Windows, Version 1.1a. 1999. CISRO Publishing, Australia.
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 5

Documentation:
Identify ecosystem processes impacted:
Dense stands of orchardgrass may suppress growth of native shrubs (Anderson and Brooks 1975) and trees (Powell et al. 1994).
Rational:
Lodgepole pine seedlings survival and growth rate decreased as the density of orchardgrass increased in a field study conducted in British Columbia (Powell et al. 1994).
Sources of information:
Anderson, E.W. and L.E. Brooks. 1975. Reducing erosion hazard on a burned forest in Oregon by seeding. Journal of Range Management 28(5): 394-398.
Powell, G.W., M.D. Pitt and B.M. Wikeem. 1994. Effect of forage seeding on early growth and survival of lodgepole pine. Journal of Range Management 47: 379-384.

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:

Orchardgrass alone usually does not form a dense layer, but when it grows with another perennial European grass such as *Festuca arundinacea*, *Holcus lanatus* or *Phalaris aquatica*, it is capable of developing a dense stand that excludes native perennial grasses (Cobrin et al. 2004, Cal-IPC 2005).

Rational:

Sources of information:

Cal-IPC - California Invasive Plant Council. 2005. *Dactylis glomerata*. Plant Assessment Form. Available: http://www.cal-ipc.org/ [February 2, 2005].

Corbin, J.D., M. Thomsen, J. Alexander and C.M. D'Antonio. 2004. Out of the frying pan: invasion of exotic perennial grasses in coastal prairies. In, C. Pirosko, (ed). Proceedings of the California Invasive Plant Council Symposium. Vol. 8: 2004. pp. 27-28.

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 3

Documentation:

Identify type of impact or alteration:

As a co-dominant with other exotic perennial grasses, orchardgrass is capable of causing reduction and extirpation of native perennial grasses (Cobrin et al. 2004, Cal-IPC 2005).

Rational:

Sources of information:

Cal-IPC - California Invasive Plant Council. 2005. *Dactylis glomerata*. Plant Assessment Form. Available: http://www.cal-ipc.org/ [February 2, 2005].

Corbin, J.D., M. Thomsen, J. Alexander and C.M. D'Antonio. 2004. Out of the frying pan: invasion of exotic perennial grasses in coastal prairies. In, C. Pirosko, (ed). Proceedings of the California Invasive Plant Council Symposium. Vol. 8: 2004. pp. 27-28.

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:
Orchardgrass is moderately nutritious and highly palatable to wildlife browsing animals. Orchardgrass also provides food and cover for a number of small mammals, birds, and insects (Sullivan 1992). However, suppressed development of native shrubs might be detrimental to native wildlife habitat (Anderson and Brooks 1975).
Rational:

Sources of information:
Anderson, E.W. and L.E. Brooks. 1975. Reducing erosion hazard on a burned forest in Oregon by seeding. Journal of Range Management 28(5): 394-398.
Sullivan, J. 1992. Dactylis glomerata. 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/ [2006, April 5].

Total Possible 40
Total 16

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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^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 1

Documentation:
Describe key reproductive characteristics (including seeds per plant):
Orchardgrass reproduces by seeds (Beddows 1957).
Rational:
Because orchardgrass breeders have traditionally focused on forage traits, most cultivars are not necessarily good seed producers (Casler et al. 2003).
Sources of information:
Beddows, A.R. 1959. *Dactylis glomerata* L. The Journal of Ecology 47(1): 223-239.
Casler, M.D., R.E. Barker, E.C. Brummer, Y.A. Papadopolous and L.D. Hoffman. 2003. Selection for orchardgrass seed yield in target vs. nontarget environments. Crop Science 43: 532-538.

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:
Most seeds fall directly to the soil below the parent plant. Some seeds attach to animals and travel long distances (Beddows 1957).
Rational:

Sources of information:
Beddows, A.R. 1959. *Dactylis glomerata* L. The Journal of Ecology 47(1): 223-239.

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:
Orchardgrass is widely used as a forage crop and is recommended as part of a mix for erosion control and pasture rehabilitation (Anderson and Brooks 1975, McLean and Clark 1980). It is a common commercial seed contaminant (Bush et al. 2005).
Rational:

Sources of information:
Anderson, E.W. and L.E. Brooks. 1975. Reducing erosion hazard on a burned forest in Oregon by seeding. Journal of Range Management 28(5): 394-398.
Bush, T., D. Ogle, L.St. John, M. Stannard and K.B. Jensen. 2005. Plant guide. Orchardgrass *Dactylis glomerata* L. USDA NRCS Pullman Plant Materials Center. Pullman, Washington.
McLean, A. and M.B. Clark. 1980. Grass, trees, and cattle on clearcut-logged areas. Journal of Range Management 33(3): 213-217.

2.4. Allelopathic

A.	No	0
B.	Yes	2
U.	Unknown	

Score 0

Documentation:
Describe effect on adjacent plants:
Orchardgrass is not listed as an allelopathic (USDA, NRCS 2006).
Rational:
In experimental studies orchardgrass did not show significant inhibition of germination, root and shoot growth (Grant and Sallens 1964, Larson et al. 1995).
Sources of information:
Grant, E.A. and W.G. Sallens. 1964. Influence of plant extracts on germination and growth of eight forage species. J. Br. 18 Grass Soc. 19: 191-197.
Larson, M.M., S.H. Patel and J.P. Vimmerstedt. 1995. Allelopathic interactions between herbaceous species and trees grown in topsoil and spoil media. Journal of Sustainable Forestry 3(1): 39-52.
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.

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:
Orchardgrass is able to compete with native perennials and annual species (Corbin et al. 2004).

Rational:

Sources of information:
Corbin, J.D., M. Thomsen, J. Alexander and C.M. D'Antonio. 2004. Out of the frying pan: invasion of exotic perennial grasses in coastal prairies. In, C. Pirosko, (ed). Proceedings of the California Invasive Plant Council Symposium. Vol. 8: 2004. pp. 27-28.

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:
Orchardgrass rarely forms dense layers, but it is capable of creating a dense stand when grown with other perennial European grasses (Corbin et al. 2004, Cal-IPC 2005).
Rational:

Sources of information:
Cal-IPC - California Invasive Plant Council. 2005. *Dactylis glomerata*. Plant Assessment Form. Available: http://www.cal-ipc.org/ [February 2, 2005].
Corbin, J.D., M. Thomsen, J. Alexander and C.M. D'Antonio. 2004. Out of the frying pan: invasion of exotic perennial grasses in coastal prairies. In, C. Pirosko, (ed). Proceedings of the California Invasive Plant Council Symposium. Vol. 8: 2004. pp. 27-28.

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 3

Documentation:
Describe germination requirements:
Orchardgrass is widely used for pasture improvements and is commonly broadcast seeded (Sullivan 1992). Thus, orchardgrass presumably can germinate on vegetated sites.
Rational:

Sources of information:
Sullivan, J. 1992. *Dactylis glomerata*. 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/ [2006, April 5].

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

A.	No	0
B.	Yes	3
U.	Unknown	

Score 0

Documentation:
Species:
None (USDA, NRCS 2006).
Sources of information:
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.

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:
Orchardgrass prefers dry soils in waste places, fields, yards, and roadsides (Hultén 1968, Welsh 1974).
Rational:

Sources of information:
Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.
Welsh, S.L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham University Press. 724 pp.

Total Possible 25
Total 10

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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
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:
Orchardgrass is widely used as a forage crop. A number of cultivars have been developed (Anderson and Brooks 1975, McLean and Clark 1980).
Rational:

Sources of information:
Anderson, E.W. and L.E. Brooks. 1975. Reducing erosion hazard on a burned forest in Oregon by seeding. Journal of Range Management 28(5): 394-398.
McLean, A. and M.B. Clark. 1980. Grass, trees, and cattle on clearcut-logged areas. Journal of Range Management 33(3): 213-217.

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 3

Documentation:
Identify type of habitat and states or provinces where it occurs:
Orchardgrass has invaded oak woodlands and perennial grasslands in California (Williamson and Harrison 2002, Corbin et al. 2004). However its impact on natural communities is considered to be low (Cal-IPC 2005). Orchardgrass appears to have potential for invading and modifying existing plant communities in Rocky Mountain

National Park (Rutledge and McLendon 1996). Orchardgrass invades open woodlands and prairies in western Oregon (M. Carlson – pers. obs.)

Sources of information:

Cal-IPC - California Invasive Plant Council. 2005. *Dactylis glomerata L.* Plant Assessment Form. Available: http://www.cal-ipc.org/ [February 2, 2005].

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

Corbin, J.D., M. Thomsen, J. Alexander and C.M. D'Antonio. 2004. Out of the frying pan: invasion of exotic perennial grasses in coastal prairies. *In*, C. Pirosko, (ed.). Proceedings of the California Invasive Plant Council Symposium. Vol. 8: 2004. pp. 27-28.

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).

Williamson, J and S. Harrison. 2002. Biotic and abiotic limits to the spread of exotic revegetation species. Ecological Applications 12(1): 40-51.

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 5

Documentation:

Identify type of disturbance:

Orchardgrass is usually associated with human disturbances (Hultén 1968, Welsh 1974, Williamson and Harrison 2002), but it is known invading undisturbed coastal prairie grasslands (Corbin et al. 2004).

Rational:

Sources of information:

Corbin, J.D., M. Thomsen, J. Alexander and C.M. D'Antonio. 2004. Out of the frying pan: invasion of exotic perennial grasses in coastal prairies. In, C. Pirosko, (ed). Proceedings of the California Invasive Plant Council Symposium. Vol. 8: 2004. pp. 27-28.

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

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

Williamson, J and S. Harrison. 2002. Biotic and abiotic limits to the spread of exotic revegetation species. Ecological Applications 12(1): 40-51.

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:

Orchardgrass was introduced from Europe and it is now present throughout temperate Asia and North America. It was also introduced into South America, Australia, and New Zealand, and can be found in the arctic (Hultén 1968, Tolmachev et al. 1995).

Rational:

Sources of information:
Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 p.
Tolmachev, A.I., J.G. Packer and G.C.D. Griffiths. 1995. Flora of the Russian arctic. Vol. I. Polypodiaceae – Gramineae. 330 p.

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:
Orchardgrass is present throughout the United States and Canada (USDA, NRCS 2006). It is declared noxious in New Jersey and Virginia (Rice 2006).
Rational:

Sources of information:
Rice, P.M. 2006. INVADERS Database System (http://invader.dbs.umt.edu). Division of Biological Sciences, University of Montana, Missoula, MT 59812-4824.
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.

Total Possible 25
Total 23

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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 0

Documentation:
Identify longevity of seed bank:
Orchardgrass does not have long-lived seeds. Most seeds germinate in the fall or following spring (Dorph-Petersen 1925, Beddows 1959).
Rational:

Sources of information:
Beddows, A.R. 1959. *Dactylis glomerata* L. The Journal of Ecology 47(1): 223-239.
Dorph-Petersen, K. 1925. Examination of the occurrence and vitality of various weed seed species under different conditions, made at the Danish State Seed Testing Station during the years 1896-1923. 4th International Seed Testing Congress, 1924, Cambridge, England. pp. 128-138.

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:
Vegetative regeneration of orchardgrass occurs through tillering. When plants are cut or plowed, rooting stems may develop new plants (Beddows 1957).
Rational:

Sources of information:
Beddows, A.R. 1959. *Dactylis glomerata* L. The Journal of Ecology 47(1): 223-239.

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:
Generally, mechanical methods are not effective in control of orchardgrass. Numerous herbicides are available for orchardgrass (Rutledge and McLendon 1996).
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).

Total Possible	10
Total	5

Total for 4 sections Possible	100
Total for 4 sections	54

References:

Anderson, E.W. and L.E. Brooks. 1975. Reducing erosion hazard on a burned forest in Oregon by seeding. Journal of Range Management 28(5): 394-398.

Baker, B.S. and G.A. Jung. 1968. Effect of environmental conditions on the growth of four perennial grasses. I. Response to controlled temperature. Agronomy Journal 60: 155-158.

Beddows, A.R. 1959. *Dactylis glomerata* L. The Journal of Ecology 47(1): 223-239.

Bush, T., D. Ogle, L. St. John, M. Stannard and K.B. Jensen. 2005. Plant guide. Orchardgrass *Dactylis glomerata* L. USDA NRCS Pullman Plant Materials Center. Pullman, Washington.

Cal-IPC - California Invasive Plant Council. 2005. *Dactylis glomerata*. Plant Assessment Form. Available: http://www.cal-ipc.org/ [February 2, 2005].

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

Casler, M.D., R.E. Barker, E.C. Brummer, Y.A. Papadopolous and L.D. Hoffman. 2003. Selection for orchardgrass seed yield in target vs. nontarget environments. Crop Science 43: 532-538.

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

Corbin, J.D., M. Thomsen, J. Alexander and C.M. D'Antonio. 2004. Out of the frying pan: invasion of exotic perennial grasses in coastal prairies. *In*, C. Pirosko, (ed). Proceedings of the California Invasive Plant Council Symposium. Vol. 8: 2004. pp. 27-28.

Dorph-Petersen, K. 1925. Examination of the occurrence and vitality of various weed seed species under different conditions, made at the Danish State Seed Testing Station during the years 1896-1923. 4th International Seed Testing Congress, 1924, Cambridge, England. pp. 128-138.

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

Lid, J. and D. T. Lid. 1994. Flora of Norway. The Norske Samlaget, Oslo. Pp. 1014.

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