WEED RISK ASSESSMENT FORM

Botanical name: **Dactylis glomerata** L.
Common name: orchardgrass

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**Assessors:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
</tbody>
</table>

**Reviewers:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
</tbody>
</table>

Outcome score:

**A. Climatic Comparison**

<table>
<thead>
<tr>
<th>Eco-geographic Region</th>
<th>Present/Established</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Coastal</td>
<td>Yes</td>
</tr>
<tr>
<td>Interior-Boreal</td>
<td>Yes</td>
</tr>
<tr>
<td>Arctic-Alpine</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**B. Invasiveness Ranking**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Total (Total Answered*)</th>
<th>Total Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological impact</td>
<td>40 (40)</td>
<td>16</td>
</tr>
<tr>
<td>Biological characteristic dispersal ability</td>
<td>25 (25)</td>
<td>10</td>
</tr>
<tr>
<td>Ecological amplitude and distribution</td>
<td>25 (25)</td>
<td>23</td>
</tr>
<tr>
<td>Feasibility of control</td>
<td>10 (10)</td>
<td>5</td>
</tr>
<tr>
<td>Outcome score</td>
<td>100 (100)†</td>
<td>54 a</td>
</tr>
</tbody>
</table>

* For questions answered “unknown” do not include point value for the question in parentheses for “Total Answered Points Possible.”
† Calculated as $\frac{a}{b}$.

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**A. CLIMATIC COMPARISON:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Has this species ever been collected or documented in Alaska?</td>
<td>Yes</td>
<td>continue to 1.2</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>continue to 2.1</td>
</tr>
<tr>
<td>1.2. Which eco-geographic region has it been collected or documented (see inset map)? Proceed to Section B. Invasiveness Ranking.</td>
<td>Yes</td>
<td>South Coastal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interior-Boreal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arctic-Alpine</td>
</tr>
</tbody>
</table>

**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:**

2.1. Is there a 40% or higher similarity (based on CLIMEX climate matching) between climates anywhere 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: 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.


B. INVASIVENESS RANKING

1. ECOLOGICAL IMPACT

1.1. Impact on Natural Ecosystem Processes

A. No perceivable impact on ecosystem processes
   Score 0

B. Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability)
   Score 3

C. Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl)
   Score 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)
   Score 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:
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:

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:

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
**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).

**Sources of information:**

**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/m²)) | 1 |
| C. | Moderately aggressive (reproduces vegetatively and/or by a moderate amount of seed, <1,000/m²) | 2 |
| D. | Highly aggressive reproduction (extensive vegetative spread and/or many seeded, >1,000/m²) | 3 |
| U. | Unknown | Score 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:**

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#### 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:**
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:

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:


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

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td>0</td>
</tr>
<tr>
<td>B. Forms dense thickets</td>
<td>1</td>
</tr>
<tr>
<td>C. Has climbing or smothering growth habit, or otherwise taller than the surrounding vegetation</td>
<td>2</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**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:**

### 2.7. Germination requirements

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Requires open soil and disturbance to germinate</td>
<td>0</td>
</tr>
<tr>
<td>B. Can germinate in vegetated areas but in a narrow range or in special conditions</td>
<td>2</td>
</tr>
<tr>
<td>C. Can germinate in existing vegetation in a wide range of conditions</td>
<td>3</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**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:**

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td>0</td>
</tr>
<tr>
<td>B. Yes</td>
<td>3</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**
Species:
None (USDA, NRCS 2006).

**Sources of information:**
2.9. Aquatic, wetland, or riparian species

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Not invasive in wetland communities</td>
<td>0</td>
</tr>
<tr>
<td>B. Invasive in riparian communities</td>
<td>1</td>
</tr>
<tr>
<td>C. Invasive in wetland communities</td>
<td>3</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**

Describe type of habitat:

Rational:

Sources of information:

3. DISTRIBUTION

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td>0</td>
</tr>
<tr>
<td>B. Is occasionally an agricultural pest</td>
<td>2</td>
</tr>
<tr>
<td>C. Has been grown deliberately, bred, or is known as a significant agricultural pest</td>
<td>4</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**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:

3.2. Known level of ecological impact in natural areas

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Not known to cause impact in any other natural area</td>
<td>0</td>
</tr>
<tr>
<td>B. Known to cause impacts in natural areas, but in dissimilar habitats and climate zones than exist in regions of Alaska</td>
<td>1</td>
</tr>
<tr>
<td>C. Known to cause low impact in natural areas in similar habitats and climate zones to those present in Alaska</td>
<td>3</td>
</tr>
<tr>
<td>D. Known to cause moderate impact in natural areas in similar habitat and climate zones</td>
<td>4</td>
</tr>
<tr>
<td>E. Known to cause high impact in natural areas in similar habitat and climate zones</td>
<td>6</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**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
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:

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

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

4. FEASIBILITY OF CONTROL

4.1. Seed banks
A. Seeds remain viable in the soil for less than 3 years
B. Seeds remain viable in the soil for between 3 and 5 years
C. Seeds remain viable in the soil for 5 years and more
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:

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

Score 3
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:

4.3. Level of effort required

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

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:

References:
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.


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


