**WEED RISK ASSESSMENT FORM**

**Botanical and common name:**  
*Poa pratensis* ssp. *pratensis* L., Kentucky bluegrass  
*Poa pratensis* ssp. *irrigata* (Lindm.) Lindb. f., spreading bluegrass  
*Poa trivialis* L., rough bluegrass

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**Outcome score:**

### A. Climatic Comparison

This species is present or may potentially establish in the following eco-geographic regions:

<table>
<thead>
<tr>
<th>Region</th>
<th>Establish in Alaska</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 South Coastal</td>
<td>Yes</td>
</tr>
<tr>
<td>2 Interior-Boreal</td>
<td>Yes</td>
</tr>
<tr>
<td>3 Arctic-Alpine</td>
<td>Yes</td>
</tr>
</tbody>
</table>

This species is unlikely to establish in any region in Alaska

### B. Invasiveness Ranking

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total (Total Answered*)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ecological impact</td>
<td>40 (40)</td>
<td>12</td>
</tr>
<tr>
<td>2 Biological characteristic and dispersal ability</td>
<td>25 (25)</td>
<td>14</td>
</tr>
<tr>
<td>3 Ecological amplitude and distribution</td>
<td>25 (25)</td>
<td>19</td>
</tr>
<tr>
<td>4 Feasibility of control</td>
<td>10 (10)</td>
<td>7</td>
</tr>
</tbody>
</table>

**Outcome score**  
100 (100)  

**Relative maximum score**  
0.52

* 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 for *Poa pratensis*, Kentucky bluegrass:

<table>
<thead>
<tr>
<th>1.1 Has this species ever been collected or documented in Alaska?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

**1.2. Which eco-geographic region has it been collected or documented (see inset map)? Proceed to Section B. Invasiveness Ranking.**

<table>
<thead>
<tr>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Coastal</td>
</tr>
<tr>
<td>Interior-Boreal</td>
</tr>
<tr>
<td>Arctic-Alpine</td>
</tr>
</tbody>
</table>

### CLIMATE COMPARISON for *Poa pratensis* ssp. *irrigata*, spreading bluegrass:

<table>
<thead>
<tr>
<th>1.1 Has this species ever been collected or documented in Alaska?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

**1.2. Which eco-geographic region has it been collected or documented (see inset map)? Proceed to Section B. Invasiveness Ranking.**

<table>
<thead>
<tr>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Coastal</td>
</tr>
<tr>
<td>Interior-Boreal</td>
</tr>
<tr>
<td>Arctic-Alpine</td>
</tr>
</tbody>
</table>

### A. CLIMATIC COMPARISON for *Poa trivialis*, rough bluegrass:

<table>
<thead>
<tr>
<th>1.1 Has this species ever been collected or documented in Alaska?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

**1.2. Which eco-geographic region has it been collected or documented (see inset map)? Proceed to Section B. Invasiveness Ranking.**

<table>
<thead>
<tr>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Coastal</td>
</tr>
<tr>
<td>Interior-Boreal</td>
</tr>
<tr>
<td>Arctic-Alpine</td>
</tr>
</tbody>
</table>

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**Documentation:** *Poa pratensis* ssp. *pratensis* and *P. pratensis* ssp. *irrigata* have been collected from all eco-geographic regions of Alaska. *Poa trivialis* is documented in South Coastal ecogeographic region (Weeds of Alaska Database 2005, UAM 2005, Hultén 1968).

**Sources of information:**

**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
The CLIMEX matching program indicates the climatic similarity between Fairbanks and areas where this species is documented is high. Rough bluegrass is well established in Omsk, Tobolsk, and Tomsk, Russia (Malyschev and Peschkova 1990), which has 77%, 70% and 68% climatic matches with Fairbanks, Alaska. *Poa trivialis* is documented in arctic areas as Ust-Tsilma and Arkhangelsk, Russia (Tolmachev et al. 1995), with have 78% and 76% of climate similarity with Nome, Alaska. The establishment of rough bluegrass in Interior Boreal and Arctic Alpine ecogeographic regions of Alaska may be possible.

Sources of information:

## B. INVASIVENESS RANKING

### 1. ECOLOGICAL IMPACT

#### 1.1. Impact on Natural Ecosystem Processes

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No perceivable impact on ecosystem processes</td>
<td>0</td>
</tr>
<tr>
<td>B. Influences ecosystem processes to a minor degree (e.g., has a perceivable but mild influence on soil nutrient availability)</td>
<td>3</td>
</tr>
<tr>
<td>C. Significant alteration of ecosystem processes (e.g., increases sedimentation rates along streams or coastlines, reduces open water that are important to waterfowl)</td>
<td>7</td>
</tr>
<tr>
<td>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)</td>
<td>10</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**

Identify ecosystem processes impacted:

Kentucky, spreading, and rough bluegrasses have the potential for long-term modification or retardation of succession (Butterfield et al. 1996). In Alaska these grasses are restricted to non-native communities (J. Conn – pers. com.). Rough bluegrass likely increases soil water content in sod (Glenn and Welker 1996).

**Rational:**

Sources of information:


#### 1.2. Impact on Natural Community Structure

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No perceived impact; establishes in an existing layer without influencing its structure</td>
<td>0</td>
</tr>
<tr>
<td>B. Influences structure in one layer (e.g., changes the density of one layer)</td>
<td>3</td>
</tr>
<tr>
<td>C. Significant impact in at least one layer (e.g., creation of a new layer or elimination of an existing layer)</td>
<td>7</td>
</tr>
<tr>
<td>D. Major alteration of structure (e.g., covers canopy, eradicating most or all layers below)</td>
<td>10</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>
### Documentation:

**Identify type of impact or alteration:**

*Poa pratensis* is capable of creating uniform, dense mats, greatly increasing the density of lower herbaceous layers (Weaver and Darland 1948). *Poa trivialis* rarely occurs in pure stands, but is capable of changing the density of the layer (Uchytil 1993).

**Rational:**

**Sources of information:**


#### 1.3. Impact on Natural Community Composition

<table>
<thead>
<tr>
<th></th>
<th>Impact Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No perceived impact; causes no apparent change in native populations</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>Influences community composition (e.g., reduces the number of individuals in one or more native species in the community)</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Significantly alters community composition (e.g., produces a significant reduction in the population size of one or more native species in the community)</td>
<td>7</td>
</tr>
<tr>
<td>D</td>
<td>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)</td>
<td>10</td>
</tr>
<tr>
<td>U</td>
<td>Unknown</td>
<td></td>
</tr>
</tbody>
</table>

### Documentation:

**Identify type of impact or alteration:**

Kentucky and rough bluegrass have the ability to dominate community, replace prairie plant species, reducing species diversity and altering the natural floristic composition (Marriott et al. 2003, Wisconsin DNR 2003, Rutledge and McLendon 1996, Sather 1996). However, these species are not observed in undisturbed areas in Alaska, and negative effects are likely minimal (J. Conn – pers. com.).

**Rational:**

**Sources of information:**

Conn, J.S., Weed Scientist, USDA Agricultural Research Service PO Box 757200 Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184. – Pers. comm.


#### 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)

<table>
<thead>
<tr>
<th></th>
<th>Impact Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Negligible perceived impact</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>Minor alteration</td>
<td>3</td>
</tr>
</tbody>
</table>
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

**Documentation:**
Identify type of impact or alteration:
Bluegrasses can be an important part of the diets of elk, deer, and sheep (Rutledge and McLendon 1996). The leaves and seeds are eaten by numerous species of small mammals and birds. Kentucky-bluegrass-dominated grassland provide habitat for species of small mammals and birds. It naturally hybridizes with several other native and exotic bluegrasses (Uchytil 1993, Dale et al. 1975). It is a host for number of pest insects and diseases (Butterfield et al. 1996, Uchytil 1993).

**Rational:**

**Sources of information:**

**Total Possible** 40
**Total** 12

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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** 3

**Documentation:**
Describe key reproductive characteristics (including seeds per plant):
Kentucky and spreading bluegrass reproduce from both seed and rhizomes. Kentucky bluegrass can produce 100-200 seeds per panicle in the first year, and as many as 800,000 seeds per square meter. Production of 1000 seeds per plant of rough bluegrass has been documented (Froud-Williams and Ferris 1985). Rhizomes expand horizontal growth as much as 2 square meters in 2 years (Rutledge and McLendon 1996, Sather 1996).
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)
  - Score: 0

- B. Infrequent or inefficient long-distance dispersal (occurs occasionally despite lack of adaptations)
  - Score: 2

- C. Numerous opportunities for long-distance dispersal (species has adaptations such as pappus, hooked fruit-coats, etc.)
  - Score: 3

- U. Unknown
  - Score: 1

**Documentation:**
Identify dispersal mechanisms:
Seeds can spread short distances in clumps (Froud-Williams and Ferris 1986), but they lack specific adaptations for long-distance dispersal.

**Rational:**
Sources of information:

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
  - Score: 0

- B. Low (human dispersal is infrequent or inefficient)
  - Score: 1

- C. Moderate (human dispersal occurs)
  - Score: 2

- D. High (there are numerous opportunities for dispersal to new areas)
  - Score: 3

- U. Unknown
  - Score: 3

**Documentation:**
Identify dispersal mechanisms:
Kentucky, spreading and rough bluegrasses are commonly planted as a lawn and pastures grasses (Butterfield et al. 1996, Liskey 1999). They are used in Alaska, Colorado, and Wisconsin for soil stabilization along highway roadbanks (Uchytil 1993). They also contaminate commercial seeds (Liskey 1999). Hodkinson and Thompson (1997) found seeds of rough bluegrass spreading on vehicles, with topsoil, and contaminating horticultural stock.

**Rational:**
Sources of information:

### 2.4. Allelopathic

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>B. Yes</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**

**Describe effect on adjacent plants:**

These species are not listed as allelopathic (USDA 2002).

**Rational:**

**Sources of information:**


### 2.5. Competitive ability

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Poor competitor for limiting factors</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>B. Moderately competitive for limiting factors</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>C. Highly competitive for limiting factors and/or nitrogen fixing ability</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Documentation:**

**Evidence of competitive ability:**

Bluegrass can out-compete native grasses and forbs and dominate on high nitrogen soils (Wisconsin DNR 2003). These grasses do not appear to be competing with native species in Alaska (J. Conn – pers. com.).

**Rational:**

Bluegrass is adapted to wide range of environmental conditions, and is marginally flood tolerant (Lenssen et al. 2004, Rutledge and McLendon 1996). It grows early in the season, when most other species are still dormant. However, because it has a shallow root system it is susceptible to high soil temperatures and low soil moisture (Wisconsin DNR 2003). In experimental conditions rough bluegrass appeared to compete strongly with ryegrass (*Lolium perenne*) during first weeks of establishment (Haggar 1979).

**Sources of information:**

Conn, J.S. Weed Scientist, USDA Agricultural Research Service PO Box 757200 Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184. – Pers. comm.


Wisconsin Department of Natural Resources. 2003. Non-native plants. Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*Poa compressa*).
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:
Bluegrass is capable of forming dense sod in highly fertile soils (Sather 1996, Uchytil 1993). In Alaska, naturalized populations of bluegrass do not form dense stands (J. Conn – pers. com.).

Rational:
Sources of information:
Conn, J.S., Weed Scientist, USDA Agricultural Research Service PO Box 757200 Fairbanks, Alaska 99775 tel: (907) 474-7652; fax (907) 474-6184. – Pers. comm.

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:
Generally, Kentucky and rough bluegrass requires light and open soil for germination establishment (Butterfield et al. 1996, Sather 1996). However, some rough bluegrass cultivars do not require open surface and are recommended for overseeding in established lawns (Liskey 1999).

Rational:
Sources of information:

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

A. No 0
B. Yes 3
U. Unknown

Score 3
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 1

Documentation:
Describe type of habitat:
These grasses often invade wetland and riparian habitats in addition to gardens, pastures, roadways, meadows, open woodlands, and prairies (Rutledge and McLendon 1996). In its native range Kentucky and rough bluegrass inhabits swamps and marshes, wet meadows and streambanks (Gubanov et al. 2003, Tolmachev et al. 1995, Malyschev and Peschkova 1990).

Rational:

Sources of information:

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:
Kentucky bluegrass and spreading bluegrass were introduced as a cultivar and has since undergone selective breeding. Over 100 cultivars of Kentucky bluegrass have been developed. It is commonly planted as a lawn and pastures grass (Butterfield et. al. 1996, Wisconsin DNR 2003).

Rational:

Sources of information:
Wisconsin Department of Natural Resources. 2003. Kentucky Bluegrass (Poa pratensis) Canada Bluegrass (Poa compressa) www.dnr.state.wi.us [2004, July 9].

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 – or high impacts in weakly similar habitats 3
D. Known to cause moderate impact in natural areas in similar habitat and climate zones – or high impacts in moderately similar habitats 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:
Bluegrass has successfully invaded prairies and savannas in Wisconsin and Nebraska (Weaver and Darland 1948, Wisconsin DNR 2003). It is naturalized in dry to moist meadows in Oregon and Washington, and it is a major problem species in aspen communities in central Colorado and South Dakota (Uchytil 1993).

Sources of information:
Wisconsin Department of Natural Resources. 2003. Non-native plants. Kentucky bluegrass (Poa pratensis), Canada bluegrass (Poa compressa). http://www.dnr.state.wi.us [July 9, 2004].

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 2

Documentation:
Identify type of disturbance:
Bluegrasses readily establish by seeds on disturbed sites. Kentucky bluegrass increases with grazing and burning (Sather 1996, Weaver and Darland 1948).

Rational:

Sources of information:
Sather, N. 1996. Element Stewardship Abstract for Poa pratensis, Poa compressa
Kentucky Bluegrass, Canada Bluegrass. The Nature Conservancy. Arlington,
3.4. Current global distribution

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Occurs in one or two continents or regions (e.g., Mediterranean region)</td>
<td>0</td>
</tr>
<tr>
<td>B. Extends over three or more continents</td>
<td>3</td>
</tr>
<tr>
<td>C. Extends over three or more continents, including successful introductions in arctic or subarctic regions</td>
<td>5</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

Documentation:
Describe distribution:
Both species are native to Europe. They have been introduced into North and South America, New Zealand, and Australia (Gubanov et al. 2003, Hultén 1968).

Rational:
Sources of information:

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 0-5% of the states</td>
<td>0</td>
</tr>
<tr>
<td>B. 6-20% of the states</td>
<td>2</td>
</tr>
<tr>
<td>C. 21-50%, and/or state listed as a problem weed (e.g., “Noxious,” or “Invasive”) in 1 state or Canadian province</td>
<td>4</td>
</tr>
<tr>
<td>D. Greater than 50%, and/or identified as “Noxious” in 2 or more states or Canadian provinces</td>
<td>5</td>
</tr>
<tr>
<td>U. Unknown</td>
<td></td>
</tr>
</tbody>
</table>

Documentation:
Identify states invaded:
Kentucky, spreading, and rough bluegrasses are found naturalized in nearly all American states and in Canada from Labrador to the west coast. Poa pratensis listed as an invasive weed in Nebraska and Wisconsin. Poa trivialis is restricted weed seed in New Jersey and Virginia (Invaders Database System 2003, USDA 2002).

Rational:
Sources of information:

<table>
<thead>
<tr>
<th>Total Possible</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>19</td>
</tr>
</tbody>
</table>

4. FEASIBILITY OF CONTROL
4.1. Seed banks

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Seeds remain viable in the soil for less than 3 years</td>
<td>0</td>
</tr>
<tr>
<td>B. Seeds remain viable in the soil for between 3 and 5 years</td>
<td>2</td>
</tr>
<tr>
<td>C. Seeds remain viable in the soil for 5 years and more</td>
<td>3</td>
</tr>
</tbody>
</table>
U. **Unknown**

**Documentation:**
Identify longevity of seed bank:
A maximum of 560 Poa pratensis seed/m² in soil samples from a Netherlands pastures was reported. Seeds germinate within the first four years after burial (Sather 1996); however, other studies indicate that the seed is no longer dormant 6 months after harvest (Butterfield et al. 1996). Chippindale and Milton (1934) stated in their study that seeds of Poa trivialis may remain dormant in the soil for 24, 40 and even 68 years.

**Rational:**

**Sources of information:**

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 | 3 |

**Documentation:**
Describe vegetative response:
These grasses can resprout rapidly (Rutledge and McLendon 1996).

**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) | 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 | 3 |

**Documentation:**
Identify types of control methods and time-term required:
Chemical methods and burning might be useful. Practices that will damage bluegrass may often harm the native species more (Butterfield et al. 1996, Sather 1996).

**Rational:**
Sources of information:

Total Possible 10
Total 7

Total for 4 sections Possible 100
Total for 4 sections 52

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