

Part IV. Plant Assessment Form

For use with “Criteria for Categorizing Invasive Non-Native Plants that Threaten Colorado’s Wildlands and Agriculture”
By the Colorado Noxious Weed Advisory Committee

Electronic version: December 4, 2008

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Poa bulbosa L.
Synonyms:	Panicum bulbosum L. var viviparum (Koch.) Lunell, Poa bulbosa subsp. bulbosa, Poa bulbosa subsp vivipara
Common names:	Bulbous bluegrass, Winter bluegrass
Evaluation date (mm/dd/yy):	5/4/10
Evaluator #1 Name/Title:	Ryan Edwards / Graduate Student
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Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Bulbous bluegrass has been identified as an invasive grass for several years. It was first recorded in the state in 1943, and is today present in 12 counties. Plants were introduced to the US as a contaminant in alfalfa and clover. The USDA began testing the grass in 1906, as it was reevaluated in 1916, and 1928. Bulbous bluegrass was considered a desirable grass by the USDA/NRCS for many years, and it was recommended for plantings to be prominent during the winter months, and for wildlife foraging, erosion control, and turf. However as early as 1997, it was found that the grass was easily spread along roadsides, and disturbed areas. Since then, Bulbous bluegrass has been targeted as an invasive grass and has since been unavailable for commercial seed mixtures.

Bulbous bluegrass is a short lived perennial, cool season grass. It is easily identified as the only grass in the Poaceae family to have bulbs. These bulbs act as the vegetative system for regrowth. During cool periods, leaves will emerge from the bulbs, and the plant overwinters in this early stage. When the weather begins to warm in the spring, Bulbous bluegrass has a rapid growth pattern (from 3 inches during the winter to 24 inches within a few weeks). Blades are narrow with either a flat or rolled appearance. The plant can produce either seeds or bulbs. Plants will be completely senesced by early May.

It is recommended that this plant be legally designated as noxious and that it be put on the B list.

Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	C	Other Pub. Mat'l	<p>Impact</p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p>CDDD</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>C</p>	<p>Wildlands Plant Score</p> <p><i>Using matrix, determine Overall Score and Alert Status from the first, second, and third section scores and enter below:</i></p> <p>Limited No Alert</p>
1.2	Impact on plant community	D	Other Pub. Mat'l		
1.3	Impact on higher trophic levels	D	Other Pub. Mat'l		
1.4	Impact on genetic integrity	D	No Information		
2.1	Role of anthropogenic and natural disturbance	C (1 pt)	Other Pub. Mat'l	<p>Invasiveness</p> <p><i>Enter the sum total of all points for Q2.1-2.7 below:</i></p> <p>16</p> <p><i>Use matrix to determine score and enter below:</i></p> <p>B</p>	
2.2	Local rate of spread with no management	A (3 pts)	Other Pub. Mat'l		
2.3	Recent trend in total area infested within state	B (2 pts)	Other Pub. Mat'l		
2.4	Innate reproductive potential Wksht A	A (3 pts)	Other Pub. Mat'l		
2.5	Potential for human-caused dispersal	A (3 pts)	Other Pub. Mat'l		
2.6	Potential for natural long-distance dispersal	B (2 pts)	Other Pub. Mat'l		
2.7	Other regions invaded	B (2 pts)	Other Pub. Mat'l		
3.1	Ecological amplitude/Range	A	Other Pub. Mat'l	<p>Distribution</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>B</p>	
3.2	Distribution/Peak frequency Wrksht B	D	Anecdotal		

<u>4.1</u>	Poisonous to livestock	D (0 pts)	Other Pub. Mat'l
<u>4.2</u>	Detrimental to economic crops	B (2 pts)	Doc'n level
<u>4.3</u>	Detrimental to management of agricultural system, rangeland and pasture	A (3 pts)	Doc'n level
<u>4.4</u>	Human impacts <u>Wrksht C</u>	D (0 pts)	Anecdotal

Agricultural / Human Impact

Enter the sum total of all points for Q4.1-4.4 below:

5

Use matrix to determine score and enter below:

B

Agricultural Plant Score

Using matrix, determine Overall Score and Alert Status from the second, third and fourth section scores and enter below:

Moderate

No Alert

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	C Other Pub. Mat'l back
Identify ecosystem processes impacted: On shallow soils, Bulbous bluegrass can stabilize soils due to its root structure (1).	
Rationale: Bulbous bluegrass is relatively drought tolerant, and completes its life cycle very quickly. The limited amount of soil stabilization, in conjunction with the quick life cycle limit the overall effects of the grass.	
Sources of information: (1) Locke, K., and Burrill, L.C. 1994. Bulbous bluegrass: <i>Poa bulbosa</i> L. Pacific Northwest extension publication PNW 467.	
Question 1.2 Impact on plant community composition, structure, and interactions	D Other Pub. Mat'l back
Identify type of impact or alteration: Very limited effects on surrounding plant communities. Bulbous bluegrass is often found with other grasses and plant species; multiple Bromo species, wheatgrass species, Kentucky bluegrass, sagebrush species, mountain mahogany, oak forests, ponderosa pine forests, Douglas-fir forests, and aspen groves (3).	
Rationale: Due to its fast growth cycle, Bulbous bluegrass has very limited competitive ability with other plants, and completes its lifecycle with little to no effects.	
Sources of information: (3) Gucker, C.L. 2007. <i>Poa bulbosa</i> . USDA, USFS FEIS database. Available at http://www.fs.fed.us/database/feis/plants/graminoid/poabul/all.html	
Question 1.3 Impact on higher trophic levels	D Other Pub. Mat'l back
Identify type of impact or alteration: Due to its fast lifecycle, Bulbous bluegrass does not provide much forage to wildlife and livestock (1). However, as plants dry, the bulbils (reproductive structure found along the stem of Bulbous bluegrass) add some palatability to livestock and wildlife (1).	
Rationale: Bulbous bluegrass germinates early in the spring and provides a very brief opening for grazing. However, this window of availability does not last long enough for many livestock or wildlife species to capitalize on its availability (2). The presence of the bulbils, which are high in fat and starch, do attract some birds and rodents to feed upon them, especially when other forage plants are decreased.	
Sources of information: (1) Locke, K., and Burrill, L.C. 1994. Bulbous bluegrass: <i>Poa bulbosa</i> L. Pacific Northwest extension publication PNW 467. (2) Scheinost, P., Stannard M., and Ogle, D. 2008. Bulbous bluegrass: <i>Poa bulbosa</i> L. USDA/NRCS plant guide.	
Question 1.4 Impact on genetic integrity	D No Information back
Identify impacts: There is no information in the literature on any known hybridizations between Bulbous	

bluegrass and other grass species.
Rationale: More research is needed to understand the genetic crossability of Bulbous bluegrass.
Sources of information: enter text here
Question 2.1 Role of anthropogenic and natural disturbance in establishment C Other Pub. Mat'l back
Describe role of disturbance: Bulbous bluegrass is often the first invading species on disturbed shallow soils, that are moist, during the winter or early spring (2)
Rationale: Indicative of its growth pattern, Bulbous bluegrass will colonize sites during the winter or the early spring, allowing the plant to capitalize upon resources before other plants have established in both space and time (early growth form, and early colonization).
Sources of information: (2) Scheinost, P., Stannard M., and Ogle, D. 2008. Bulbous bluegrass: Poa bulbosa L. USDA/NRCS plant guide.
Question 2.2 Local rate of spread with no management A Other Pub. Mat'l back
Describe rate of spread: Populations of Bulbous bluegrass can spread quickly, if the right growing conditions exist (e.g. relatively cool temperatures, on sites that have been disturbed and do not feature active competition) (1,2).
Rationale: Bulbous bluegrass exploits situations where temperatures are cool and there is no active competition from other plants.
Sources of information: (1) Locke, K., and Burrill, L.C. 1994. Bulbous bluegrass: Poa bulbosa L. Pacific Northwest extension publication PNW 467. (2) Scheinost, P., Stannard M., and Ogle, D. 2008. Bulbous bluegrass: Poa bulbosa L. USDA/NRCS plant guide.
Question 2.3 Recent trend in total area infested within state B Other Pub. Mat'l back
Describe trend: Bulbous bluegrass was first identified in the state in 1943, and is found in 12 counties (Moffat, Routt, Garfield, Mesa, Dolores, Montezuma, Larimer, Boulder, Jefferson, Gunnison, Delta, and Montrose) according to the CSU herbarium and the USDA PLANTS database (4,5).
Rationale: The most recent account from the CSU herbarium comes from 1997, in which Bulbous bluegrass was found in Delta county.
Sources of information: (4) CSU herbarium. Poa bulbosa L. Available at:

<p>http://wsprod.colostate.edu/cwis440/herbarium/plantinfo.asp?PlantID=3197 (5) USDA PLANTS database. <i>Poa bulbosa</i> L. Available at: http://plants.usda.gov/java/profile?symbol=POBU</p>	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
<p>Describe key reproductive characteristics: Regeneration is almost exclusively through asexual means in North America (bulbils) (2,3). Seed production is rare (3).</p>	
<p>Rationale: Plants produce two types of spikelets: one produces two-three florets which will eventually develop into seeds, while the other produces a bulbil.</p>	
<p>Sources of information:</p> <p>(2) Scheinost, P., Stannard M., and Ogle, D. 2008. Bulbous bluegrass: <i>Poa bulbosa</i> L. USDA/NRCS plant guide. (3) Gucker, C.L. 2007. <i>Poa bulbosa</i>. USDA, USFS FEIS database. Available at http://www.fs.fed.us/database/feis/plants/graminoid/poabul/all.html</p>	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
<p>Identify dispersal mechanisms: Bulbous bluegrass is actively transported by humans, particularly around roadsides (1).</p>	
<p>Rationale: Bulbous bluegrass spreads rapidly along disturbed roadsides, and is found primarily within 3000 feet of roadsides, and not beyond, indicating that cars were transporting the bulbils (3).</p>	
<p>Sources of information:</p> <p>(1) Locke, K., and Burrill, L.C. 1994. Bulbous bluegrass: <i>Poa bulbosa</i> L. Pacific Northwest extension publication PNW 467. (3) Gucker, C.L. 2007. <i>Poa bulbosa</i>. USDA, USFS FEIS database. Available at http://www.fs.fed.us/database/feis/plants/graminoid/poabul/all.html</p>	
Question 2.6 Potential for natural long-distance dispersal	B Other Pub. Mat'l back
<p>Identify dispersal mechanisms: Bulbous bluegrass can be distributed by wind, animals and gravity (3).</p>	
<p>Rationale: Seeds, when produced, are easily spread by wind. Bulbils are larger, and much heavier than seeds. Bulbils drop to the soil surface and establish large mats of grass. Animals actively graze upon Bulbous bluegrass, and can distribute seed by defecation.</p>	
<p>Sources of information:</p> <p>(3) Gucker, C.L. 2007. <i>Poa bulbosa</i>. USDA, USFS FEIS database. Available at http://www.fs.fed.us/database/feis/plants/graminoid/poabul/all.html</p>	

Question 2.7 Other regions invaded	B Other Pub. Mat'l back
Identify other regions: Bulbous bluegrass can be found in a majority of sites across the western US. Sites include roadsides, rangelands/pastures, grass lands, scrublands, lower elevation montane areas, urban settings, riparian corridors, and above all disturbed areas (3).	
Rationale: Bulbous bluegrass thrives in the above areas in surrounding states. Areas that have not already been invaded by this species are subject to invasions, especially when coupled with disturbance.	
Sources of information: (3) Gucker, C.L. 2007. Poa bulbosa. USDA, USFS FEIS database. Available at http://www.fs.fed.us/database/feis/plants/graminoid/poabul/all.html	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Bulbous bluegrass was first identified in the state in 1943, and is found in 12 counties (Moffat, Routt, Garfield, Mesa, Dolores, Montezuma, Larimer, Boulder, Jefferson, Gunnison, Delta, and Montrose) according to the CSU herbarium and the USDA PLANTS database (4,5).	
Rationale: Areas around the state have been invaded, and in a multitude of environments. This species spreads relatively quickly and with ease, especially in disturbance areas.	
Sources of information: (4) CSU herbarium. Poa bulbosa L. Available at: http://wsprod.colostate.edu/cwis440/herbarium/plantinfo.asp?PlantID=3197 (5) USDA PLANTS database. Poa bulbosa L. Available at: http://plants.usda.gov/java/profile?symbol=POBU	
Question 3.2 Distribution/Peak frequency	D Anecdotal back
Describe distribution: Bulbous bluegrass was first identified in the state in 1943, and is found in 12 counties (Moffat, Routt, Garfield, Mesa, Dolores, Montezuma, Larimer, Boulder, Jefferson, Gunnison, Delta, and Montrose) according to the CSU herbarium and the USDA PLANTS database (4,5).	
Rationale: Environments suspected of invasion by bulbous bluegrass include Short/Tall grass prairie, Hay meadows, Urban areas, and Sagebrush/Foothills scrublands.	
Sources of information: (4) CSU herbarium. Poa bulbosa L. Available at: http://wsprod.colostate.edu/cwis440/herbarium/plantinfo.asp?PlantID=3197 (5) USDA PLANTS database. Poa bulbosa L. Available at: http://plants.usda.gov/java/profile?symbol=POBU	
Question 4.1 Poisonous to Livestock	D No Information back
Describe impacts in terms of high probability of death, long-term health impacts, or short-term health impacts:	

There is no information in the literature which indicates that Bulbous bluegrass is poisonous to animals.	
Rationale: On the contrary, animals feed upon bulbous bluegrass, especially birds and rodents, who feed upon the bulbils once the plants have dried (1).	
Sources of information: (1) Locke, K., and Burrill, L.C. 1994. Bulbous bluegrass: <i>Poa bulbosa</i> L. Pacific Northwest extension publication PNW 467.	
Question 4.2 Detrimental to Economic Crops	B Other Pub. Mat'l back
Describe impacts to all aspects of cropping systems (see guidelines): Bulbous bluegrass has been identified as a pest of agronomic crops, particularly grain and hay fields (1).	
Rationale: Bulbous bluegrass can spread quickly in grain and hay fields where it actively competes with the surrounding plants for available moisture and nutrients, particularly early in their life cycles.	
Sources of information: (1) Locke, K., and Burrill, L.C. 1994. Bulbous bluegrass: <i>Poa bulbosa</i> L. Pacific Northwest extension publication PNW 467.	
Question 4.3 Detrimental to Mgmt of Agricultural System, Rangeland and Pasture	A Other Pub. Mat'l back
Describe impacts to water diversion systems, increased water use, reduced forage for livestock: Bulbous bluegrass has been identified as a pest of range and pasture land (1).	
Rationale: Due to its early lifecycle, Bulbous bluegrass will actively compete with other plants for surrounding nutrients and moisture. In rangeland and pasture settings, Bulbous bluegrass stands can become dense and decrease forage capabilities, and increase competition for resources. Since it competes its life cycle so early, Bulbous bluegrass is not considered good forage for livestock and wildlife.	
Sources of information: (1) Locke, K., and Burrill, L.C. 1994. Bulbous bluegrass: <i>Poa bulbosa</i> L. Pacific Northwest extension publication PNW 467.	
Question 4.4 Human Health Impacts	D Anecdotal back
Describe key human impacts such as; irritants, property values, recreational values, and industry impacts: There is no information in the literature which indicates that Bulbous bluegrass is detrimental to humans, property values or other anthropogenic sources of commerce.	
Rationale: Bulbous bluegrass is rather innocuous to human comings and goings.	

Sources of information: enter text here

Worksheet A

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Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	Yes: 2 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	No: 0 pt
Seeds remain viable in soil for three or more years	Unknown: 0 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Yes: 1 pt
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes: 1 pt
Fragments easily and fragments can become established elsewhere	Yes: 2 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
	9 pts 1 unknown
	A (6+ pts)
Note any related traits: Bulbous bluegrass reproduces by both seeds and vegetative bulbils. Plants produce multiple numbers of seeds/bulbils. Viability in the soil is still being researched. Plants complete their lifecycle quickly, and spread into disturbed areas easily.	

Worksheet B - Colorado Ecological Types and Land Use

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Major Ecological and Land Use Types	Minor Ecological and Land Use Types	Code*
Freshwater and Aquatic Systems	lakes, ponds, reservoirs	Unknown
	rivers, streams, canals	Unknown
Riparian and wetlands	Riparian forest	Unknown
	Riparian shrublands	Unknown
	Wet meadows	Unknown
Grasslands	Shortgrass prairie	D. presen
	Tallgrass prairie	D. presen
	Sandsage prairie	Unknown
	Montane meadows	Unknown
Irrigated Agriculture	Hay meadows	D. presen
	Irrigated crops (alfalfa, corn, sugar beets)	Unknown
Dryland Agriculture	Dryland crops (wheat, corn, millet, dryland grass hay, sunflowers, mustard for biodiesel)	Unknown
Developed Lands	Urban, exurban, industrial	D. presen
Arid Shrublands	Sagebrush shrublands	D. presen
	Foothills shrublands	D. presen
	Gambel oak shrublands	Unknown
Woodlands	Pinyon - juniper	Unknown
	Ponderosa pine	Unknown
	Limber pine	Unknown
Forest	Lodgepole pine	Unknown
	Spruce-fir	Unknown
Alpine	Boulder and rock fields	Unknown
	Dwarf shrublands	Unknown
	Tundra	Unknown
Barrens (lower elevation)	Dunes	Unknown
	Rock outcrops	Unknown
	Canyonlands	Unknown

* A. means >50% of type occurrences are invaded; B means >20% to 50%; C. means >5% to 20%; D. means present but ≤5%; U. means unknown (unable to estimate percentage of occurrences invaded).

Worksheet C – Human Impacts

Human health impacts; irritants (sap), spines, poisonous, and/or smoke impacts	No: 0 pt
Property values are decreased due to increased risk of fire	No: 0 pts
Decreased property value due to moderate to heavy infestations	No: 0 pts
Decreased land value for recreational use; boating, fishing, camping, etc.	No: 0 pts
Impact of listing detrimental to industry; agriculture, horticulture, nursery, and/or seed	No: 0 pt
	Total Pts Total Unknowns
	D (0 pts)
Note any related traits: Bulbous bluegrass is rather innocuous to human comings and goings.	