

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):	Asphodelus fistulosus L.
Synonyms:	None
Common names:	Onionweed, Pink Asphodel
Evaluation date (mm/dd/yy):	3/22/10
Evaluator #1 Name/Title:	Ryan Edwards/ Masters research assistant
Affiliation:	Colorado State University
Phone numbers:	720-308-1569
Email address:	Redwards155@hotmail.com
Address:	300 W Pitkin St., Ft. Collins, CO 80523
Evaluator #2 Name/Title:	enter text here
Affiliation:	enter text here
Phone numbers:	enter text here
Email address:	enter text here
Address:	enter text here

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:

Onionweed is an invasive, herbaceous plant which has infested drier habitats in Australia, California, New Mexico and Texas. Infestations of Onionweed have been shown to reduce rangeland productivity by 75%, and can impact cultivation of cereal crops. Onionweed is drought tolerant, and can disperse by wind or by clinging to clothing or machinery.

Onionweed (*Asphodelus fistulosus* L.) is an erect biennial or perennial herb that reproduces from seed. Onionweed resembles an onion in shape and leaf structure, however does not smell or taste like an onion. The stems are rigid and hollow, and produce a small shrub-like appearance. Leaves are produced along the stem. Onionweed produces small white or pink flowers at the ends of each stem; each flower has 6 petals with a brown/red stripe down the center of each petal. Produces small brown seeds from each flower. Root structure is fibrous.

Onionweed is a reasonable candidate for the A-list, based on its impacts in Australia. At a minimum it should be placed on a watch list.

Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	B	Other Pub. Mat'l	<p>Impact</p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p>BBBD</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>B</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>Moderate Red Alert</p>
1.2	Impact on plant community	B	Other Pub. Mat'l		
1.3	Impact on higher trophic levels	B	Other Pub. Mat'l		
1.4	Impact on genetic integrity	D	Rev'd, Sci. Pub'n		
2.1	Role of anthropogenic and natural disturbance	A (3 pts)	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>14</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	B (2 pts)	Other Pub. Mat'l		
2.3	Recent trend in total area infested within state	U (0 pts)	No Information		
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	A (3 pts)	Other Pub. Mat'l		
2.7	Other regions invaded	D (0 pts)	Anecdotal		
3.1	Ecological amplitude/Range	U	No Information	<p>Distribution</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>U</p>	
3.2	Distribution/Peak frequency Wrksht B	U	No Information		

4.1	Poisonous to livestock	D (0 pts)	Other Pub. Mat'l
4.2	Detrimental to economic crops	A (3 pts)	Other Pub. Mat'l
4.3	Detrimental to management of agricultural system, rangeland and pasture	A (3 pts)	Other Pub. Mat'l
4.4	Human impacts Wrksht C	C (1 pt)	Other Pub. Mat'l

Agricultural / Human Impact

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

7

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

Red Alert

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	B Other Pub. Mat'l back
Identify ecosystem processes impacted: Onionweed can decrease available soil moisture and soil nitrogen (1).	
Rationale: Onionweed forms dense patches when it establishes and can quickly outcompete other surrounding plants for available water and micronutrient resources.	
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.	
Question 1.2 Impact on plant community composition, structure, and interactions	B Other Pub. Mat'l back
Identify type of impact or alteration: Onionweed has been known to reduce grass populations once it becomes established (1).	
Rationale: Onionweed is drought tolerant, and fast growing. Dense populations of Onionweed can push out native grasses and forbs. Onionweed is also unpalatable to livestock and wildlife, further decreasing the ability of surrounding grasses and forbs to compete with it.	
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.	
Question 1.3 Impact on higher trophic levels	B Other Pub. Mat'l back
Identify type of impact or alteration: Onionweed is unpalatable to livestock and wildlife (1).	
Rationale: Once Onionweed becomes established, it can force out other grasses and forbs around it, thus decreasing the foraging capacity of an area and indirectly influencing higher trophic levels.	
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.	
Question 1.4 Impact on genetic integrity	D Rev'd, Sci. Pub'n back
Identify impacts: Onionweed does not cross with Narrow-leaved Asphodel (<i>Asphodelus tenuifolius</i>) (2).	
Rationale: Reports in the literature indicate that the occurrence of crossing between Onionweed and Narrow-leaved Asphodel does not occur due to incompatibility between the two species. Occurrences of Onionweed crossing with other species of <i>Asphodelus</i> are thought to follow the same pattern.	
Sources of information: (2) Ruiz-Rejoin, C., Blanca, G., Cueto, M., Lozano, R., and Ruiz-Rejoin, M. 1990. <i>Asphodelus tenuifolius</i> and	

<p>A. fistulosus (Liliaceae) are morphologically, genetically, and biologically different species. Plant Systemics and Evolution: 169: 1-12.</p>	
<p>Question 2.1 Role of anthropogenic and natural disturbance in establishment</p>	<p>A Other Pub. Mat'l back</p>
<p>Describe role of disturbance: Onionweed can establish rapidly on sites with high disturbance (1). Onionweed has also been known to establish along roadsides in Australia (3).</p>	
<p>Rationale: High disturbance situations seem to be the optimum environment for Onionweed to establish. Reports in the literature indicate that Onionweed does not readily establish on sites where active competition for resources is common.</p>	
<p>Sources of information:</p> <p>(1) Parsons, W.T., and Cuthbertson, E.G. 2001. "Onionweed". Noxious Weeds of Australia. 2: 90-92.</p> <p>(3) Pitt, J.L., Virtue, J.G., and Feuerherdt, L.J. Fifteenth Australian Weeds Conference. Onionweed: pest or perception. Available at: http://www.caws.org.au/awc/2006/awc200614541.pdf</p>	
<p>Question 2.2 Local rate of spread with no management</p>	<p>B Other Pub. Mat'l back</p>
<p>Describe rate of spread: Onionweed grows quickly and can spread over large areas primarily through wind dispersal (1).</p>	
<p>Rationale: Wind born seed dispersal appears to be the primary dispersal mechanism, and in combination with high disturbance events, can lead to dense infestations of Onionweed.</p>	
<p>Sources of information:</p> <p>(1) Parsons, W.T., and Cuthbertson, E.G. 2001. "Onionweed". Noxious Weeds of Australia. 2: 90-92.</p>	
<p>Question 2.3 Recent trend in total area infested within state</p>	<p>U No Information back</p>
<p>Describe trend: There are no reports of Onionweed in the state of Colorado at this time.</p>	
<p>Rationale: The USDA PLANTS database indicates that Onionweed populations have been found in California, Texas and New Mexico (4).</p>	
<p>Sources of information:</p> <p>(4) USDA PLANTS database. "Onionweed". Available at: http://plants.usda.gov/java/nameSearch?keywordquery=onionweed+&mode=comname&submit.x=12&submit.y=10</p>	
<p>Question 2.4 Innate reproductive potential</p>	<p>A Other Pub. Mat'l back</p>
<p>Describe key reproductive characteristics: Onionweed reproduces from seeds, and typically takes 18 months to reach reproductive potential (1). The literature indicates that in arid areas, many Onionweed seedlings do not survive the first summer after their germination (1). After establishment, Onionweed exhibits drought tolerance</p>	

(1).
Rationale: From the literature, Onionweed appears to take a long time to establish and set seed, and it appears that the seeds depend upon moisture, especially within the first year after germination. Due to Colorado's relatively dry climate, this could be a factor which prevents Onionweed from establishing in the state. However, once established, Onionweed is relatively drought tolerant, possibly allowing it to survive in Colorado (1).
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.
Question 2.5 Potential for human-caused dispersal A Other Pub. Mat'l back
Identify dispersal mechanisms: Onionweed seeds can be dispersed by catching on clothing, or by transport from vehicles or heavy machinery (1).
Rationale: Onionweed appears to have relative ease at being transported to new sites, and could potentially become an invasive species here in Colorado through accidental introduction to the state.
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.
Question 2.6 Potential for natural long-distance dispersal A Other Pub. Mat'l back
Identify dispersal mechanisms: Onionweed has been shown to be dispersed by wind blowing dead plants across the landscape (1). Onionweed has also been show to be transported by water, and by sticking to animal's fur (1).
Rationale: The literature indicates that Onionweed can spread relatively easily through multiple avenues, thus increasing the treat of an infestation in the state through natural means.
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.
Question 2.7 Other regions invaded D Anecdotal back
Identify other regions: In California, Onionweed has been found in the San Joaquin valley (4). Infestations in Australia are widespread, and typically occurred in areas where there was abundant moisture during the growing seasons, or areas where grazing and cereal farming permitted (1). However, once established, Onionweed is relatively drought tolerant (1).
Rationale: Onionweed appears to be a serious problem in climates like California and Australia, where there is abundant moisture for growth, especially during its establishment. However, once established Onionweed's drought hardiness would allow it to become a major invasive species in the state.

Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92. (4) USDA PLANTS database. "Onionweed". Available at: http://plants.usda.gov/java/nameSearch?keywordquery=onionweed+&mode=comname&submit.x=12&submit.y=10	
Question 3.1 Ecological amplitude/Range	U No Information back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: There is no information in the literature describing Onionweeds presence in the state of Colorado.	
Rationale: The USDA PLANTS database does not list Onionweed becoming established in Colorado, and there are no other reports of this species establishing in the state.	
Sources of information: (4) USDA PLANTS database. "Onionweed". Available at: http://plants.usda.gov/java/nameSearch?keywordquery=onionweed+&mode=comname&submit.x=12&submit.y=10	
Question 3.2 Distribution/Peak frequency	U No Information back
Describe distribution: There is no information in the literature describing Onionweeds presence in the state of Colorado.	
Rationale: The USDA PLANTS database does not list Onionweed becoming established in Colorado, and there are no other reports of this species establishing in the state.	
Sources of information: (4) USDA PLANTS database. "Onionweed". Available at: http://plants.usda.gov/java/nameSearch?keywordquery=onionweed+&mode=comname&submit.x=12&submit.y=10	
Question 4.1 Poisonous to Livestock	D Other Pub. Mat'l back
Describe impacts in terms of high probability of death, long-term health impacts, or short-term health impacts: There are no reports in the literature of livestock being poisoned by Onionweed, however the literature does indicate that due to the taste of the plant, livestock often do not feed upon it (1).	
Rationale: Reports in the literature indicate that Onionweed is not grazed upon by livestock, possibly opening an avenue for overgrazing the surrounding vegetation, and furthering the infestations of Onionweed.	
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.	

Question 4.2 Detrimental to Economic Crops	A Other Pub. Mat'l back
Describe impacts to all aspects of cropping systems (see guidelines): Infestations of Onionweed have been found in many cereal crops in Australia. Infestations of Onionweed increase when minimum or no-till practices were implemented (1). Large Onionweed plants can disrupt cultivation by impeding the tines/discs of the cultivator (1).	
Rationale: Onionweed appears to have a large impact on Economic crops; partially due to impeding the tillage and cultivation machinery. The literature does also indicate that Onionweed is beneficial to the honey industry, due to its large production of pollen during the flowering season. Bee keepers in Australia search for dense infestations of Onionweed to set up their hives.	
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.	
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: Onionweed is reported to have lowered the carrying capacity of grazing lands by 75% (1).	
Rationale: Reductions in pastures productivity could greatly affect the open range cattle industry, and could influence many of the pastures in Colorado. Onionweed is also not eaten by livestock, thus furthering infestations of Onionweed and creating a positive feedback system.	
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.	
Question 4.4 Human Health Impacts	C Other Pub. Mat'l back
Describe key human impacts such as; irritants, property values, recreational values, and industry impacts: Onionweed is suspected of causing dermatitis in humans (1).	
Rationale: There is a small section in the literature identifying Onionweed as a possible agent of dermatitis in humans, however there are no other reports of such a behavior.	
Sources of information: (1) Parsons, W.T., and Cuthbertson, E.G. 2001."Onionweed". Noxious Weeds of Australia. 2: 90-92.	

Worksheet A

[back](#)

Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	Unknown: 0 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	Yes: 1 pt
Seeds remain viable in soil for three or more years	Yes: 2 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Unknown: 0 pts
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	No: 0 pt
Fragments easily and fragments can become established elsewhere	No: 0 pts
Resprouts readily when cut, grazed, or burned	No: 0 pt
	5 pts 2 unknowns
	A (6+ pts)
Note any related traits: Onionweed typically takes 18 months to reach reproductive maturity, and reproduces only from seed. Seed are dispersed through natural means, and attaching to clothing or machinery. Viability in the soil seed bank has not been tested, however the literature states it is long.	

Worksheet B - Colorado Ecological Types and Land Use

[back](#)

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	Unknown
	Tallgrass prairie	Unknown
	Sandsage prairie	Unknown
	Montane meadows	Unknown
Irrigated Agriculture	Hay meadows	Unknown
	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	Unknown
Arid Shrublands	Sagebrush shrublands	Unknown
	Foothills shrublands	Unknown
	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	Yes: 1 pt
Property values are decreased due to increased risk of fire	No: 0 pts
Decreased property value due to moderate to heavy infestations	Yes: 2 pts
Decreased land value for recreational use; boating, fishing, camping, etc.	Unknown: 0 pts
Impact of listing detrimental to industry; agriculture, horticulture, nursery, and/or seed	Yes: 2 pt
	5 pts 1 unknown
	A (4+ pts)
Note any related traits: Onionweed has been shown to form dense infestations which can decrease productivity of rangelands, thus decreasing property values. Onionweed is also a pest in many agronomic cereal crops, and can impact tillage and cultivation.	