

Part IV. Plant Assessment Form

For use with “Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands”
by the California Exotic Pest Plant Council and the Southwest Vegetation Management Association

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Bromus madritensis spp. rubens
Synonyms:	Bromus rubens
Common names:	red brome, foxtail chess
Evaluation date (mm/dd/yy):	2/10/03
Evaluator #1 Name/Title:	Matt Brooks/Reearch Botanist
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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:	Carla Bossard, Joe DiTomaso, John Randall, Peter Warner, Doug Johnson, John Hall, Cindy Roye, Dana Backer
Committee review date:	2/10/03
List date:	enter text here
Re-evaluation date(s):	enter text here

Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	A	Rev'd, Sci. Pub'n
1.2	Impact on plant community	B	Rev'd, Sci. Pub'n
1.3	Impact on higher trophic levels	B	Rev'd, Sci. Pub'n
1.4	Impact on genetic integrity	U	Observational

“Impact”
Enter four characters from Q1.1-1.4 below:
ABBU
Use matrix determine the score; enter below:
A

2.1	Role of anthropogenic and natural disturbance	B 2	Rev'd, Sci. Pub'n
2.2	Local rate of spread with no management	B 2	Rev'd, Sci. Pub'n
2.3	Recent trend in total area infested within state	C 1	Observational
2.4	Innate reproductive potential	B 2	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A 3	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	A 3	Other Pub. Mat'l
2.7	Other regions invaded	C 1	Observational

“Invasiveness”
For questions at left, recall that an A gets 3 points, a B gets 2, a C gets 1, and a D or U gets=0. Enter the sum total of all points for Q2.1-2.7 below:
14
Use matrix to determine score and enter below:
B

“Plant Score”
Using matrix, determine the Overall Score and Alert Status from the three section scores and enter them below:
High Alert Status

3.1	Ecological amplitude	A	Observational
3.2	Distribution	A	Observational

“Distribution”
Use matrix determine the score; enter below:
A

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes</p>
<p>Identify ecosystem processes impacted: A: fire, soil nutrient status (via fire-induced changes)</p>
<p>Rationale: Increases fuel continuity and flammability. Removal of shrub cover alters microhabitat characteristics and soil nutrient cycling and distribution.</p>
<p>Sources of information: Brooks, M.L. 1999a. Alien annual grasses and fire in the Mojave Desert. <i>Madroño</i> 46:13-19, Brooks, M.L., and T.C. Esque. 2002. Alien annual plants and wildfire in desert tortoise habitat: status, ecological effects, and management. <i>Chelonian Conservation and Biology</i> 4:330-340. Brooks, M.L. 2000. <i>Bromus madritensis</i> subsp. <i>rubens</i> (L.) Husnot [<i>B. rubens</i> L.], Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). <i>Noxious Wildland Weeds of California</i>. Berkeley: University of California Press, pp. 72-76. Brooks, M.L. and D. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pp. 1-14 In K. Galley and T. Wilson (eds.), <i>Proceedings of the Invasive Species Workshop: The Role of Fire In the Control and Spread of Invasive Species</i>. Fire Conference 2000: The First National Congress on Fire, Ecology, Prevention and Management. Miscellaneous Publications No. 11, Tall Timbers Research Station, Tallahassee, Florida, USA.</p>
<p>Question 1.2 Impact on plant community composition, structure, and interactions</p>
<p>Identify type of impact or alteration: B: May reduce vigor, fecundity, and species diversity of native annual plant communities.</p>
<p>Rationale: Can compete with native annual plants, reducing the biomass and species richness of seedling cohorts. Can have high % cover, but usually only after disturbances such as fire, creation of new thatch layer in semi-arid systems may extirpate native plants (but not actually documented)</p>
<p>Sources of information: Brooks, M.L. 2000. Competition between alien annual grasses and native annual plants in the Mojave Desert. <i>American Midland Naturalist</i> 144:92-108. Brooks, M.L. 2000a. <i>Bromus madritensis</i> subsp. <i>rubens</i> (L.) Husnot [<i>B. rubens</i> L.], Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). <i>Noxious Wildland Weeds of California</i>. Berkeley: University of California Press, pp. 72-76. Brooks, M.L. and D. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pp. 1-14 In K. Galley and T. Wilson (eds.), <i>Proceedings of the Invasive Species Workshop: The Role of Fire In the Control and Spread of Invasive Species</i>. Fire Conference 2000: The First National Congress on Fire, Ecology, Prevention and Management. Miscellaneous Publications No. 11, Tall Timbers Research Station, Tallahassee, Florida, USA.</p>
<p>Question 1.3 Impact on higher trophic levels</p>
<p>Identify type of impact or alteration: B: may alter wildlife habitat for T&E species such as the desert tortoise and the sage grouse.</p>
<p>Rationale: By promoting fire, red brome may promote the conversion of native shrubland to alien annual grassland. Competes with native annual plants that are preferred forage for the desert tortoise. Seeds cached by desert granivorous rodents.</p>
<p>Sources of information: Brooks, M.L., and T.C. Esque. 2002. Alien annual plants and wildfire in desert tortoise habitat: status, ecological effects, and management. <i>Chelonian Conservation and Biology</i> 4:330-340. Brooks, M.L. and D. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pp. 1-14 In K. Galley and T.</p>

Wilson (eds.), Proceedings of the Invasive Species Workshop: The Role of Fire In the Control and Spread of Invasive Species. Fire Conference 2000: The First National Congress on Fire, Ecology, Prevention and Management. Miscellaneous Publications No. 11, Tall Timbers Research Station, Tallahassee, Florida, USA Brooks, M.L. 2000. Competition between alien annual grasses and native annual plants in the Mojave Desert. American Midland Naturalist 144:92-108.
Question 1.4 Impact on genetic integrity
Identify impacts: U: May hybridize with alien Bromus and become more invasive, may hybridize with native Bromus
Rationale: May hybridize with Bromus tectorum, and evolve to expand its environmental potential range. No known hybridization with native Bromus spp., although numerous species exist.
Sources of information: James Young, Rangeland Scientist, USDA-ARS personal communication.
Question 2.1 Role of anthropogenic and natural disturbance in establishment
Describe role of disturbance: B: Can establish in relatively undisturbed areas, but will not likely rise to extreme dominance without disturbance.
Rationale: Much higher cover in previously burned areas, and slightly higher cover in areas exposed to OHV and livestock grazing, compared to relatively undisturbed areas. However, can occur in relatively undisturbed regions. Dominance often more limited by soil nutrient status than disturbance in desert regions.
Sources of information: Brooks, M.L., and T.C. Esque. 2002. Alien annual plants and wildfire in desert tortoise habitat: status, ecological effects, and management. Chelonian Conservation and Biology 4:330-340. Brooks, M.L. 2000. Bromus madritensis subsp. rubens (L.) Husnot [B. rubens L.], Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). Noxious Wildland Weeds of California. Berkeley: University of California Press, pp. 72-76. Brooks, M.L. and D. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pp. 1-14 In K. Galley and T. Wilson (eds.), Proceedings of the Invasive Species Workshop: The Role of Fire In the Control and Spread of Invasive Species. Fire Conference 2000: The First National Congress on Fire, Ecology, Prevention and Management. Miscellaneous Publications No. 11, Tall Timbers Research Station, Tallahassee, Florida, USA. Brooks, M.L. 1999. Habitat invasibility.. Biological Invasions.
Question 2.2 Local rate of spread with no management
Describe rate of spread: B: May spread rapidly, recolonizing areas where it was previously extirpated due to drought.
Rationale: Years of high rainfall result in population explosions and spread.
Sources of information: Brooks, M.L., and T.C. Esque. 2002. Alien annual plants and wildfire in desert tortoise habitat: status, ecological effects, and management. Chelonian Conservation and Biology 4:330-340. Brooks, M.L. 2000. Bromus madritensis subsp. rubens (L.) Husnot [B. rubens L.], Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). Noxious Wildland Weeds of California. Berkeley: University of California Press, pp. 72-76. Brooks, M.L. and D. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pp. 1-14 In K. Galley and T. Wilson (eds.), Proceedings of the Invasive Species Workshop: The Role

of Fire In the Control and Spread of Invasive Species. Fire Conference 2000: The First National Congress on Fire, Ecology, Prevention and Management. Miscellaneous Publications No. 11, Tall Timbers Research Station, Tallahassee, Florida, USA.
Question 2.3 Recent trend in total area infested within state
Describe trend: C: Has likely reach maximum distribution under current rainfall and land use regimes.
Rationale: has been present in the state since the 1800s, and was noted to be a dominant disturbance follower from the early 1900s.
Sources of information: Brooks, personal observation Brooks, M.L., and T.C. Esque. 2002. Alien annual plants and wildfire in desert tortoise habitat: status, ecological effects, and management. Chelonian Conservation and Biology 4:330-340. Brooks, M.L. 2000. Bromus madritensis subsp. rubens (L.) Husnot [B. rubens L.], Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). Invasive Wildland Weeds of California. Berkeley: University of California Press, pp. 72-76.
Question 2.4 Innate reproductive potential
Describe key reproductive characteristics: B: reproductive maturity in <2 years, high seed production
Rationale: enter text here
Sources of information: Brooks, M.L. 2000. Bromus madritensis subsp. rubens (L.) Husnot [B. rubens L.], Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). Invasive Wildland Weeds of California. Berkeley: University of California Press, pp. 72-76.
Question 2.5 Potential for human-caused dispersal
Identify dispersal mechanisms: A: spread by adhering to clothing and livestock, also in some seed mixes used for landscaping,
Rationale: enter text here
Sources of information: Brooks, M.L. 2000. Bromus madritensis subsp. rubens (L.) Husnot [B. rubens L.], Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). Invasive Wildland Weeds of California. Berkeley: University of California Press, pp. 72-76.
Question 2.6 Potential for natural long-distance dispersal
Identify dispersal mechanisms: A: moderately high
Rationale: Barbed awns allow long-distance dispersal via hitchhiking on animals. Native granivorous rodents also collect and cache seeds on the soil surface.
Sources of information: Brooks, M.L. 2000. Bromus madritensis subsp. rubens (L.) Husnot [B. rubens L.],

Foxtail Chess (Red Brome). In: Bossard, C., Hoshovsky, M. and Randall, J. (Eds.). Invasive Wildland Weeds of California. Berkeley: University of California Press, pp. 72-76.
Question 2.7 Other regions invaded
Identify other regions: C: Has invaded Europe, Africa, Asia
Rationale: appears to have reached current extent of distribution in California, and has invaded similar habitats there as elsewhere
Sources of information: Bor, N.L. 1968. Bromus. in Townsend, Guest, and Al-Rawi. Flora of Iraq. Volume 9. Ministry of Agriculture of Republic of Iraq, Baghdad, Iraq.
Question 3.1 Ecological amplitude
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: A: scrub chaparral, grassland, woodland
Rationale: scrub chaparral, grassland, woodland
Sources of information: Matt Brooks pers obs
Question 3.2 Distribution
Describe distribution: A: widespread in arid, semi-arid, and mesic systems.
Rationale: enter text here
Sources of information: Matt Brooks pers obs

Worksheet A

Complete this worksheet to answer Question 2.4.

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	No: 0 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
	4 pts 1 unknown
	B (4-5 pts)
Note any related traits: enter text here	

Worksheet C - California Ecological Types

(*sensu* Holland 1986)

Major Ecological Types	Minor Ecological Types	Code*
Marine Systems	marine systems	score
Freshwater and Estuarine Aquatic Systems	lakes, ponds, reservoirs	score
	rivers, streams, canals	score
	estuaries	score
Dunes	coastal	score
	desert	score
	interior	score
Scrub and Chaparral	coastal bluff scrub	A. >50%
	coastal scrub	A. >50%
	Sonoran desert scrub	C. 5-20%
	Mojavean desert scrub (incl. Joshua tree woodland)	B. 21-50%
	Great Basin scrub	D. presen
	chenopod scrub	C. 5-20%
	montane dwarf scrub	score
	Upper Sonoran subshrub scrub	B. 21-50%
Grasslands, Vernal Pools, Meadows, and other Herb Communities	coastal prairie	B. 21-50%
	valley and foothill grassland	B. 21-50%
	Great Basin grassland	D. presen
	vernal pool	D. presen
	meadow and seep	score
	alkali playa	score
	pebble plain	score
Bog and Marsh	bog and fen	score
	marsh and swamp	score
Riparian and Bottomland	riparian forest	score
	riparian woodland	score
	riparian scrub (incl. desert washes)	C. 5-20%
Woodland	cismontane woodland	C. 5-20%
	piñon and juniper woodland	C. 5-20%
	Sonoran thorn woodland	score
Forest	broadleaved upland forest	score
	North Coast coniferous forest	score
	closed cone coniferous forest	score
	lower montane coniferous forest	score
	upper montane coniferous forest	score
	subalpine coniferous forest	score
Alpine Habitats	alpine boulder and rock field	score
	alpine dwarf scrub	score

* 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).