

# 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**

<b>Species name</b> (Latin binomial):	Festuca arundinacea
<b>Synonyms:</b>	Bromus arundinaceus, Festuca elatior ssp. arundinacea, F. elatior var. arundinacea, Lolium arundinaceum
<b>Common names:</b>	alta fescue, coarse fescue, rescue, reed fescue, tall fescue, Kentucky fescue, numerous cultivars exist.
<b>Evaluation date</b> (mm/dd/yy):	8/5/2004
<b>Evaluator #1 Name/Title:</b>	Brianna Richardson, Project Manager
<b>Affiliation:</b>	California Invasive Plant Council
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<b>Evaluator #2 Name/Title:</b>	enter text here
<b>Affiliation:</b>	enter text here
<b>Phone numbers:</b>	enter text here
<b>Email address:</b>	enter text here
<b>Address:</b>	enter text here

Section below for list committee use—please leave blank

<b>List committee members:</b>	Joe DiTomaso, John Randall, Alison Stanton, Peter Warner, Cynthia Roye, Jake Sigg
<b>Committee review date:</b>	8/27/2004
<b>List date:</b>	enter text here
<b>Re-evaluation date(s):</b>	enter text here

<p><b>General comments on this assessment:</b> enter text here</p>
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**Table 2. Criteria, Section, and Overall Scores**

<a href="#">1.1</a>	Impact on abiotic ecosystem processes	<b>U</b>	<b>No Information</b>
<a href="#">1.2</a>	Impact on plant community	<b>B</b>	<b>Rev'd, Sci. Pub'n</b>
<a href="#">1.3</a>	Impact on higher trophic levels	<b>B</b>	<b>Rev'd, Sci. Pub'n</b>
<a href="#">1.4</a>	Impact on genetic integrity	<b>C</b>	<b>Other Pub. Mat'l</b>

**Impact**

*Enter four characters from Q1.1-1.4 below:*

**UBBC**

*Using matrix, determine score and enter below:*

**B**

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

**Invasiveness**

*Enter the sum total of all points for Q2.1-2.7 below:*

**13**

*Use matrix to determine score and enter below:*

**B**

**Plant Score**

*Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:*

**Medium**

**No Alert**

<a href="#">3.1</a>	Ecological amplitude/Range	<b>A</b>	<b>Other Pub. Mat'l</b>
<a href="#">3.2</a>	Distribution/Peak frequency <a href="#">Wksht C</a>	<b>A</b>	<b>Observational</b>

**Distribution**

*Using matrix, determine score and enter below:*

**A**

**Table 3. Documentation**

<p><b>Question 1.1</b> Impact on abiotic ecosystem processes</p>	<p>U No Information <a href="#">back</a></p>
<p>Identify ecosystem processes impacted: None.</p>	
<p>Rationale: No literature described ecosystem processes impacts.</p>	
<p>Sources of information: enter text here</p>	
<p><b>Question 1.2</b> Impact on plant community composition, structure, and interactions</p>	<p>B Rev'd, Sci. Pub'n <a href="#">back</a></p>
<p>Identify type of impact or alteration: Tall fescue grows in dense stands in the mid-South. Tall fescue leaves droop and fall upon senescence, creating a deep layer of thatch. This prevents germination of other seeds. Invasion by Festuca threatens remaining native CA grasslands. The level of plant diversity in successional fields with tall fescue tends to decrease over time (as fescue is highly competitive and increases in number and size). Can displace native species. In PN, F. arundinacea inhibits woody plant growth and survival. Allelopathic compounds increase its persistence and competitiveness. Can form dense, solid stands. Can change the vegetation structure (from open, forb and grasslands to dense cover) and can reduce forb populations in grasslands.</p>	
<p>Rationale: Can form dense stands and significant thatch layer. Unknown whether dense stands &gt;75% cover are common in CA. When dense, Festuca does extirpate native species. Could be an A, conservatively a B.</p>	
<p>Sources of information: Fettinger, J.L., C.A. Harper, C.E. Dixon. 2002. Invertebrate availability for upland game birds in tall fescue and native warm-season grass fields. Journal of the Tennessee Academy of Science 77(4): 83-87.</p> <p>Reynolds, SA, JD Corbin, CM D'Antonio. 2001. The effects of litter and temperature on the germination of native and exotic grasses in a coastal California grassland. Madrono 48(4): 230-235.</p> <p>Batcher, MS. Element Stewardship Abstract: Festuca arundinacea. The Nature Conservancy.</p>	
<p><b>Question 1.3</b> Impact on higher trophic levels</p>	<p>B Rev'd, Sci. Pub'n <a href="#">back</a></p>
<p>Identify type of impact or alteration: Can be infected with an endophytic fungus that causes illness in livestock and some wild mammals that graze on it. In the mid-South, conversion of idle cropland to tall fescue pasture has degraded wildlife habitat and has been identified as a primary factor for the decline in northern bobwhite populations. Tall fescue stands make travel for many small wildlife species extremely difficult. Difficulty in travel may decrease game bird feeding rates, cause increases in energy expenditure, and possibly in mortality via stress or predation. The thatch it creates reduces food availability for wildlife. The endophytic fungal toxicosis syndromes make tall fescue poor forage for wildlife. Bobwhites on a tall fescue diet exhibit cloacal swelling and increased mortality. In the British Isles, F. arundinacea is never favored by livestock over other pasture grasses. Many animals in North America feed on F. arundinacea. Tall fescue palatability is poor for elk.</p>	
<p>Rationale: Reduces habitat, travel corridors, and forage for wildlife. May be a poisoning problem.</p>	
<p>Sources of information: DiTomaso, J., E. Healy. Weeds of California and Other Western States. Not yet published.</p>	

<p>Fettinger, J.L., C.A. Harper, C.E. Dixon. 2002. Invertebrate availability for upland game birds in tall fescue and native warm-season grass fields. <i>Journal of the Tennessee Academy of Science</i> 77(4): 83-87.</p> <p>Gibson, DJ, JA Newman. 2001. Biological flora of the British Isles: <i>Festuca arundinacea</i> Schreber. <i>Journal of Ecology</i> 89: 304-324.</p> <p>Batcher, MS. Element Stewardship Abstract: <i>Festuca arundinacea</i>. The Nature Conservancy.</p>	
<b>Question 1.4</b> Impact on genetic integrity	C Other Pub. Mat'l <a href="#">back</a>
<p>Identify impacts: Many native <i>Festucas</i> exist, no documentation discussed hybridization between natives and <i>F. arundinacea</i>.</p>	
<p>Rationale: Hybridization may be a problem, unknown.</p>	
<p>Sources of information: CalFlora database. Accessed 8/6/2004: <a href="http://www.calflora.org">www.calflora.org</a>.</p>	
<b>Question 2.1</b> Role of anthropogenic and natural disturbance in establishment	B Other Pub. Mat'l <a href="#">back</a>
<p>Describe role of disturbance: More frequently invades when an area has been disturbed, or its natural fire cycle has been disrupted. Able to invade undisturbed tall grass prairie in Texas.</p> <p>Persists long after introduction for forage or cover, absent significant disturbance, and spreads from existing stands without significant disturbance. Persists after natural disturbances, such as fire and flooding.</p>	
<p>Rationale: Unclear whether disturbance is necessary or only facultative in California ecosystems.</p>	
<p>Sources of information: Batcher, MS. Element Stewardship Abstract: <i>Festuca arundinacea</i>. The Nature Conservancy.</p> <p>Warner, PJ. 2004. Observations of populations in Marin, Sonoma, Mendocino Counties, 1999-2004.</p>	
<b>Question 2.2</b> Local rate of spread with no management	B Observational <a href="#">back</a>
<p>Describe rate of spread: Will spread more rapidly absent existing cover and competition, but will exploit small pockets within established vegetation, and spread from these pioneering sites.</p>	
<p>Rationale: Does not appear to dominate areas already covered by competing vegetation, so spread is likely to be slow in wildland areas.</p>	
<p>Sources of information: Warner, PJ. 2004. Observations in Marin, Sonoma, Mendocino Counties. 1999-2004.</p>	
<b>Question 2.3</b> Recent trend in total area infested within state	C Other Pub. Mat'l <a href="#">back</a>
<p>Describe trend: Volume of reports on distribution in CA suggests this species is widespread throughout, in a diversity of climates and ecological types.</p>	
<p>Rationale: Considering that this species continues to be introduced for forage, turfgrass, erosion control, yet is</p>	

already widely distributed, best estimate is that it's spreading slowly, if at all.	
Sources of information: CalFlora Database. 2004. www.calflora.org Observational, Peter Warner, Joe DiTomaso, 2004.	
<b>Question 2.4</b> Innate reproductive potential	A Rev'd, Sci. Pub'n <a href="#">back</a>
Describe key reproductive characteristics: Tufts enlarge around the perimeter by short rhizomes and tillers. Flowers May-June. Reproduces by seed. Can reproduce by vegetative rhizome fragments that result from human activities. Single plants do not produce seed the first year. <i>F. arundinacea</i> germinates under thick and thin levels of litter. In Britain, seeds do not last a long time in the soil. Predominantly self-sterile, but cultivars may be self-fertile. Can resprout from rhizomes after burning. Most seed germinates in the first year, but seeds can remain viable under ideal conditions for at least 19 years.	
Rationale: 6 points.	
Sources of information: DiTomaso, J., E. Healy. Weeds of California and Other Western States. Not yet published. Reynolds, SA, JD Corbin, CM D'Antonio. 2001. The effects of litter and temperature on the germination of native and exotic grasses in a coastal California grassland. <i>Madrono</i> 48(4): 230-235. Gibson, DJ, JA Newman. 2001. Biological flora of the British Isles: <i>Festuca arundinacea</i> Schreber. <i>Journal of Ecology</i> 89: 304-324. Batcher, MS. Element Stewardship Abstract: <i>Festuca arundinacea</i> . The Nature Conservancy. Fire Effects Information System. Accessed 8/2004. www.fs.fed.us/database/feis/plants Observational, Peter Warner, Joe DiTomaso, 2004.	
<b>Question 2.5</b> Potential for human-caused dispersal	A Other Pub. Mat'l <a href="#">back</a>
Identify dispersal mechanisms: Widely planted for pasture, turf, hay, and erosion control. Can reproduce by vegetative fragments created by human activity. Viable seed can be transported by horse dung.	
Rationale: Intentionally planted for a variety of reasons.	
Sources of information: DiTomaso, J., E. Healy. Weeds of California and Other Western States. Not yet published. Gibson, DJ, JA Newman. 2001. Biological flora of the British Isles: <i>Festuca arundinacea</i> Schreber. <i>Journal of Ecology</i> 89: 304-324.	
<b>Question 2.6</b> Potential for natural long-distance dispersal	C Rev'd, Sci. Pub'n <a href="#">back</a>
Identify dispersal mechanisms: The awn facilitates dispersal by animals. Viable seed can be transported by horse dung.	

Rationale: Potential low.	
Sources of information: Gibson, DJ, JA Newman. 2001. Biological flora of the British Isles: <i>Festuca arundinacea</i> Schreber. <i>Journal of Ecology</i> 89: 304-324.	
Observational, Peter Warner, Joe DiTomaso, 2004.	
<b>Question 2.7</b> Other regions invaded	C Other Pub. Mat'l <a href="#">back</a>
Identify other regions: In the British Isles it grows along riversides and in woods (it is native there). Has naturalized on New Zealand's South Island and replaces native grass on coastal dunes and talus slopes. Invades grazed scrub communities in the Netherlands. Invades grasslands in Illinois. Tall fescue is found in tallgrass prairie, salt desert shrub, and sagebrush ( <i>Artemisia</i> spp.). It is also found in pine ( <i>Pinus</i> spp.)-Douglas-fir ( <i>Pseudotsuga mesziesii</i> ) forest, ponderosa pine ( <i>Pinus ponderosa</i> ) forest, juniper ( <i>Juniperus</i> spp.)-pinyon ( <i>Pinus</i> spp.) woodland, mountain mahogany ( <i>Cercocarpus</i> spp.)-oak ( <i>Quercus</i> spp.) scrub, and saltbush ( <i>Atriplex</i> spp.)-greasewood ( <i>Sarcobatus</i> spp.) communities.	
Rationale: Invades a number of ecological types, in a number of states and countries, but no information available on whether it is found in these in CA. DiTomaso (unpublished) lists it as only occurring in coastal scrub and grassland, which would mean that it could potentially invade 4 additional habitats listed above, as well as coastal dunes.	
CalFlora Database lists over 100 occurrences in California, from a diversity of vegetation types, including coastal and interior grasslands, riparian and marshes, dunes, woodlands.	
Sources of information: Gibson, DJ, JA Newman. 2001. Biological flora of the British Isles: <i>Festuca arundinacea</i> Schreber. <i>Journal of Ecology</i> 89: 304-324.	
Ellis, JL, G Spyreas, CJ Carroll. Non-native plant dominance in Illinois. Illinois Natural History Survey.	
Fire Effects Information System. Accessed 8/2004. <a href="http://www.fs.fed.us/database/feis/plants">www.fs.fed.us/database/feis/plants</a>	
CalFlora Database. 2004. <a href="http://www.calflora.org">www.calflora.org</a>	
Observational, Peter Warner, Joe DiTomaso, 2004.	
<b>Question 3.1</b> Ecological amplitude/Range	A Other Pub. Mat'l <a href="#">back</a>
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Invasive in coastal scrub, grassland, cismontane woodlands, marshes, dunes throughout California. Inhabits pastures, roadsides, ditches, and other disturbed dry or wet sites. Exists throughout California, except Great Basin and deserts, to 2700 m. Can invade savanna and woodland habitats, and the edges of open marsh and fens. Invades grassland and foothill woodland in Bidwell Park, near Chico.	
Rationale: Invades three or more major ecotypes in California.	
Sources of information: DiTomaso, J., E. Healy. Weeds of California and Other Western States. Not yet published.	
Batcher, MS. Element Stewardship Abstract: <i>Festuca arundinacea</i> . The Nature Conservancy.	
Friends of Bidwell Park website. Accessed 8/2004. <a href="http://www.friendsofbidwellpark.org">www.friendsofbidwellpark.org</a>	

CalFlora Database. <a href="http://www.calflora.org">www.calflora.org</a>	
<b>Question 3.2</b> Distribution/Peak frequency	A Observational <a href="#">back</a>
Describe distribution: Widespread and common species throughout north coast grasslands, especially in moist areas. Reported from many other ecological types, but no direct observations of extent of sites where this species is present.	
Rationale: Present in > 50% of coastal prairie grassland.	
Sources of information: Warner, PJ. 2004. Observations in San Mateo, Marin, Sonoma, Mendocino Counties, 1999-2004. Observational, Peter Warner, Joe DiTomaso, 2004.	

### Worksheet A

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Reaches reproductive maturity in 2 years or less	<b>Yes: 1 pt</b>
Dense infestations produce >1,000 viable seed per square meter	<b>Yes: 2 pts</b>
Populations of this species produce seeds every year.	<b>Yes: 1 pt</b>
Seed production sustained over 3 or more months within a population annually	<b>No: 0 pt</b>
Seeds remain viable in soil for three or more years	<b>Unknown: 0 pts</b>
Viable seed produced with <i>both</i> self-pollination and cross-pollination	<b>No: 0 pt</b>
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	<b>Yes: 1 pt</b>
Fragments easily and fragments can become established elsewhere	<b>No: 0 pts</b>
Resprouts readily when cut, grazed, or burned	<b>Yes: 1 pt</b>
	<b>6 pts      1 unknown</b>
	<b>A (6+ pts)</b>
<b>Note any related traits:</b> The number of tillers increases when grazed. Gibson, DJ, JA Newman. 2001. Biological flora of the British Isles: <i>Festuca aurndiancea</i> Schreber. Journal of Ecology 89: 304-324. Some cultivars are self-fertile, generally plant is self-sterile.	

## Worksheet C - California Ecological Types

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(*sensu* Holland 1986)

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