

# 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

Electronic version, February 28, 2003

**Table 1. Species and Evaluator Information**

<b>Species name (Latin binomial):</b>	Linaria vulgaris Miller
<b>Synonyms:</b>	
<b>Common names:</b>	Yellow toadflax, butter and eggs, common linaria, common toadflax, wild snapdragon
<b>Evaluation date (mm/dd/yy):</b>	1/3/07
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Section below for list committee use—please leave blank

<b>List committee members:</b>	Joe DiTomaso, Peter Warner, Joanna Clines
<b>Committee review date:</b>	2/15/2007
<b>List date:</b>	enter text here
<b>Re-evaluation date(s):</b>	enter text here

**General comments on this assessment:**

enter text here

**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>A</b>	<b>Other Pub. Mat'l</b>
<a href="#">1.3</a>	Impact on higher trophic levels	<b>B</b>	<b>Other Pub. Mat'l</b>
<a href="#">1.4</a>	Impact on genetic integrity	<b>U</b>	<b>No Information</b>

<p><b>Impact</b></p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p><b>UBBU</b></p> <p><i>Using matrix, determine score and enter below:</i></p> <p><b>B</b></p>
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<a href="#">2.1</a>	Role of anthropogenic and natural disturbance	<b>3 (2 pts)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.2</a>	Local rate of spread with no management	<b>3 (2 pts)</b>	<b>Observational</b>
<a href="#">2.3</a>	Recent trend in total area infested within state	<b>3 (1 pt)</b>	<b>Observational</b>
<a href="#">2.4</a>	Innate reproductive potential <a href="#">Wksht A</a>	<b>3 (3 pts)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.5</a>	Potential for human-caused dispersal	<b>3 (2 pts)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.6</a>	Potential for natural long-distance dispersal	<b>3 (1 pt)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.7</a>	Other regions invaded	<b>3 (1 pt)</b>	<b>Other Pub. Mat'l</b>

<p><b>Invasiveness</b></p> <p><i>Enter the sum total of all points for Q2.1-2.7 below:</i></p> <p><b>12</b></p> <p><i>Use matrix to determine score and enter below:</i></p> <p><b>B</b></p>
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<p><b>Plant Score</b></p> <p><i>Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:</i></p> <p><b>Medium</b></p> <p><b>No Alert</b></p>
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<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>D</b>	<b>Observational</b>

<p><b>Distribution</b></p> <p><i>Using matrix, determine score and enter below:</i></p> <p><b>B</b></p>
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**Table 3. Documentation**

<b>Question 1.1</b> Impact on abiotic ecosystem processes	U No Information <a href="#">back</a>
Identify ecosystem processes impacted: No information known on its impact on abiotic processes.	
Rationale: enter text here	
Sources of information: enter text here	
<b>Question 1.2</b> Impact on plant community composition, structure, and interactions	B Other Pub. Mat'l <a href="#">back</a>
Identify type of impact or alteration: Aggressive perennial with deep root system. Highly competitive for soil moisture with winter annuals and shallow-rooted perennials. Large colonies can displace native vegetation. Can outcompete other plants, including natives. More easily establish in areas where competition is reduced.	
Rationale: enter text here	
Sources of information: DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA. el.erdc.usace.army.mil/pmis/plants/html/linaria1.html www.fs.fed.us/database/feis/plants/forb/linspp/	
<b>Question 1.3</b> Impact on higher trophic levels	B Other Pub. Mat'l <a href="#">back</a>
Identify type of impact or alteration: Reported to be mildly toxic to livestock as it contains a glucoside. Only harmful when eaten in large quantities. Livestock avoid grazing toadflaxes. No information on effects on native wildlife.	
Rationale: enter text here	
Sources of information: DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA. el.erdc.usace.army.mil/pmis/plants/html/linaria1.html Erksine-Ogden, J.A. and M.J. Renz. 2005. Yellow toadflax ( <i>Linaria vulgaris</i> ) New Mexico State University. Fact Sheet. 5 pp.	
<b>Question 1.4</b> Impact on genetic integrity	U No Information <a href="#">back</a>
Identify impacts: One native <i>Linaria</i> in California ( <i>L. canadensis</i> ). No information on potential for hybridization.	
Rationale: enter text here	
Sources of information: Hickman, J. C. (ed.) 1993. The Jepson Manual, Higher Plants of California. University	

of California Press. Berkeley, CA enter text here	
<b>Question 2.1</b> Role of anthropogenic and natural disturbance in establishment	B Other Pub. Mat'l <a href="#">back</a>
Describe role of disturbance: Often invades disturbed areas but can invade relatively undisturbed prairies and riparian habitats. Overgrazing encourages survival. Favored by disturbance, but can also spread into high mountain valleys and parks.	
Rationale: enter text here	
Sources of information: DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA. Beck, K.G. Biology and management of the toadflaxes. 2006. Colorado State University Cooperative Extension. <a href="http://www.ext.colostate.edu/pubs/natres/03114.html">www.ext.colostate.edu/pubs/natres/03114.html</a> <a href="http://www.fs.fed.us/database/feis/plants/forb/linspp/">www.fs.fed.us/database/feis/plants/forb/linspp/</a>	
<b>Question 2.2</b> Local rate of spread with no management	B Observational <a href="#">back</a>
Describe rate of spread: Would likely be expanding in the northern part of the state with no control efforts.	
Rationale: enter text here	
Sources of information: DiTomaso, observational	
<b>Question 2.3</b> Recent trend in total area infested within state	C Observational <a href="#">back</a>
Describe trend: Efforts by CDFA have kept populations from expanding in state.	
Rationale: enter text here	
Sources of information: DiTomaso, observational	
<b>Question 2.4</b> Innate reproductive potential	A Other Pub. Mat'l <a href="#">back</a>
Describe key reproductive characteristics: Perennial. Extensive system of vertical and creeping lateral roots produce new shoots. Flowers May-September. Self incompatible. Average seed production highly variable, from 1500 to 30,000 seeds per plant. Seeds can remain viable for at least 8 years.	
Rationale: enter text here	
Sources of information: DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA.	

<p>extension.oregonstate.edu/catalog/html/pnw/pnw135</p> <p>www.ext.colostate.edu/pubs/natres/03114.html</p> <p>Erksine-Ogden,J.A. and M.J. Renz. 2005. Yellow toadflax (<i>Linaria vulgaris</i>) New Mexico State University. Fact Sheet. 5 pp.</p> <p>www.fs.fed.us/database/feis/plants/forb/linspp/</p> <p>Saner, M.A. et al. 1995. The biology of Canadian weeds. 105. <i>Linaria vulgaris</i> Mill. Can. J. Plant Sci 75:525-537.</p>	
<b>Question 2.5</b> Potential for human-caused dispersal	B Other Pub. Mat'l <a href="#">back</a>
<p>Identify dispersal mechanisms: Introduced as an ornamental. Escapes from cultivation. Still occasionally sold as ornamental, but not as common today. Sold under the common name "butter and eggs" or "wild snapdragon."Root fragments can spread with farm equipment.</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA.</p> <p>www.ext.colostate.edu/pubs/natres/03114.html</p> <p>Erksine-Ogden,J.A. and M.J. Renz. 2005. Yellow toadflax (<i>Linaria vulgaris</i>) New Mexico State University. Fact Sheet. 5 pp.</p>	
<b>Question 2.6</b> Potential for natural long-distance dispersal	C Other Pub. Mat'l <a href="#">back</a>
<p>Identify dispersal mechanisms: Most seed falls by the parent plant but some disperses with water and soil movement. Seeds can float on water for extended periods.Over 80% of the seeds fall within 18 inches of the parent plant and very few seed fall more than 5 feet away.</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA.</p> <p>www.fs.fed.us/database/feis/plants/forb/linspp/</p>	
<b>Question 2.7</b> Other regions invaded	C Other Pub. Mat'l <a href="#">back</a>
<p>Identify other regions: Native to the Mediterranean. Brought to Delaware from Wales in mid-1800s. State-listed noxious weed in Colorado, Idaho, Nevada, New Mexico, Oregon, South Dakota, Washington, and Wyoming. Many areas invaded, but similar habitats as those invaded in California.</p>	
<p>Rationale: enter text here</p>	

Sources of information: DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA.	
Mitich, L.W. 1993. Yellow toadflax. Weed Technology 7:791-793	
<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: Introduced to North America in the 1600s. Found in every state except Hawaii. Invades disturbed sites, forest clearings, roadsides, prairies, riparian habitats. Occurs in much of California except the Great Basin and Desert regions, to 1000m. (1, 5)	
However, listed as a problem plant on the Mojave Weed Management Area website. (2)	
Found in fields, overgrazed pastures, rangeland, waste areas, and along roadsides (3)	
Also found on forest edges (4)	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and Other Western States. University of California Agriculture and Natural Resources Publication 3488. Oakland, CA.	
2. Mojave Weed Management Area website. <a href="http://www.mojavewma.org/weeds.php">http://www.mojavewma.org/weeds.php</a> Accessed 1/3/07.	
3. Butler, M.D., and L. C. Burrill. Yellow toadflax and dalmatian toadflax. 1994. Oregon State University. <a href="http://extension.oregonstate.edu/catalog/html/pnw/pnw135">extension.oregonstate.edu/catalog/html/pnw/pnw135</a>	
4. <a href="http://el.erdc.usace.army.mil/pmis/plants/html/linaria1.html">el.erdc.usace.army.mil/pmis/plants/html/linaria1.html</a>	
5. Erksine-Ogden, J.A. and M.J. Renz. 2005. Yellow toadflax ( <i>Linaria vulgaris</i> ) New Mexico State University. Fact Sheet. 5 pp.	
<b>Question 3.2</b> Distribution/Peak frequency	D Observational <a href="#">back</a>
Describe distribution: Not widely distributed in California. Much more common in other western states.	
Rationale: enter text here	
Sources of information: DiTomaso, observational	

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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>Yes: 2 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>8 pts      Total Unknowns</b>
	<b>A (6+ pts)</b>
<b>Note any related traits:</b> enter text here	

## 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	score
	desert	score
	interior	score
<b>Scrub and Chaparral</b>	coastal bluff scrub	score
	coastal scrub	D. present
	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	score
	valley and foothill grassland	D. present
	Great Basin grassland	D. present
	vernal pool	score
	meadow and seep	score
	alkali playa	score
	pebble plain	score
<b>Bog and Marsh</b>	bog and fen	score
	marsh and swamp	score
<b>Riparian and Bottomland</b>	riparian forest	score
	riparian woodland	D. present
	riparian scrub (incl. desert washes)	score
<b>Woodland</b>	cismontane woodland	score
	piñon and juniper woodland	score
	Sonoran thorn woodland	score
<b>Forest</b>	broadleaved upland forest	score
	North Coast coniferous forest	score
	closed cone coniferous forest	score
	lower montane coniferous forest	D. present
	upper montane coniferous forest	D. present
	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).