

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

Species name (Latin binomial):	Trifolium hirtum All.
Synonyms:	
Common names:	rose clover
Evaluation date (mm/dd/yy):	2/22/05
Evaluator #1 Name/Title:	Elizabeth Brusati, project manager
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Section below for list committee use—please leave blank

List committee members:	Joe DiTomaso, Joanna Clines, Cynthia Roye, Doug Johnson
Committee review date:	7/8/05
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Common species of Great Basin and valley and foothill grasslands.

Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	C	Other Pub. Mat'l
1.2	Impact on plant community	C	Rev'd, Sci. Pub'n
1.3	Impact on higher trophic levels	D	Other Pub. Mat'l
1.4	Impact on genetic integrity	U	No Information

<p>Impact</p> <p><i>Enter four characters from Q1.1-1.4 below:</i></p> <p>CCDU</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>C</p>

2.1	Role of anthropogenic and natural disturbance	B (2 pts)	Rev'd, Sci. Pub'n
2.2	Local rate of spread with no management	C (1 pt)	Other Pub. Mat'l
2.3	Recent trend in total area infested within state	C (1 pt)	Other Pub. Mat'l
2.4	Innate reproductive potential Wksht A	A (3 pts)	Rev'd, Sci. Pub'n
2.5	Potential for human-caused dispersal	A (3 pts)	Other Pub. Mat'l
2.6	Potential for natural long-distance dispersal	D (0 pts)	Other Pub. Mat'l
2.7	Other regions invaded	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>11</p> <p><i>Use matrix to determine score and enter below:</i></p> <p>B</p>
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<p>Plant Score</p> <p><i>Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:</i></p> <p>Medium</p> <p>No Alert</p>

3.1	Ecological amplitude/Range	B	Rev'd, Sci. Pub'n
3.2	Distribution/Peak frequency Wksht C	B	Observational

<p>Distribution</p> <p><i>Using matrix, determine score and enter below:</i></p> <p>B</p>

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	C Other Pub. Mat'l back
Identify ecosystem processes impacted: Nitrogen fixing (1). Stabilizes soil and exhausts all available soil moisture (2). Co-exists with other native legumes for nitrogen fixation is an important component of the community.	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States 2. Love, R. M. (1985). Rose Clover Trifolium-Hirtum. Taylor, N. L. (Ed.). Agronomy: A Series of Monographs, No. 25. Clover Science and Technology. Xx+616p. American Society of Agronomy, Inc., Crop Science Society of America, Inc., Soil Science Society of America, Inc., Publishers: Madison, Wis., USA. Illus. 1985. 535-546.	
Question 1.2 Impact on plant community composition, structure, and interactions	C Rev'd, Sci. Pub'n back
Identify type of impact or alteration: Prevents establishment of other plants because it uses soil moisture (1). Generally in areas with abundant rose clover there is still relatively high diversity.	
Rationale:	
Sources of information: 1. Love 1985.	
Question 1.3 Impact on higher trophic levels	D Other Pub. Mat'l back
Identify type of impact or alteration: Eaten by cattle, sheep, deer. Quail and robins eat seeds. Does not cause estrogenic effects (sterility) in sheep (1).	
Rationale: enter text here	
Sources of information: 1. Love 1985.	
Question 1.4 Impact on genetic integrity	U No Information back
Identify impacts: There are at least 30 native species of Trifolium in California. No information on 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	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Rev'd, Sci. Pub'n back
Describe role of disturbance: Inhabits disturbed places (1). Invaded up to 95 m into oak woodland, 35m into serpentine meadows, and 5m into serpentine seeps from revegetated mine areas (2), but does not form dense	

infestations in these areas.	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States 2. Williamson, J. and S. Harrison (2002). "Biotic and abiotic limits to the spread of exotic revegetation species." Ecological Applications 12(1): 40-51.	
Question 2.2 Local rate of spread with no management	C Observational back
Describe rate of spread: Does not tend to become a very concentrated dense patch. Generally becomes part of the community.	
Rationale: enter text here	
Sources of information: DiTomaso, observational	
Question 2.3 Recent trend in total area infested within state	C Observational back
Describe trend: Has been present for so long it is probably already in all the places that it could be introduced.	
Rationale: enter text here	
Sources of information: DiTomaso, observational	
Question 2.4 Innate reproductive potential	A Rev'd, Sci. Pub'n back
Describe key reproductive characteristics: Annual. Flowers April to May. Reproduces by seed. Fruits fall near the parent plant but disperse longer distances. Some seeds are hard-coated and require scarification or decomposition of the seed coat to germinate (1). Seeds remain viable for many years (2). Colonizes well due to rapid morphological changes and by retention of some outbreeding and genetic variation in some populations (3).	
Rationale: enter text here	
Sources of information: 1. DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States 2. Love 1985 3. Jain, S. K. and P. S. Martins (1979). Ecological Genetics of the Colonizing Ability of Rose Clover Trifolium-Hirtum. American Journal of Botany 66(4): 361-366.	
Question 2.5 Potential for human-caused dispersal	A Other Pub. Mat'l back
Identify dispersal mechanisms: Used as rangeland forage. Can be dispersed by turf maintenance, agricultural	

activities, as seed contaminants, and by clinging to shoes, clothing, or tires. Grazing favors survival (1).	
Rationale: Counts of seeds in droppings of cattle grazing on rose clover during the summer showed an average of 6500 undigested seeds/dropping, 85% of which were still viable (2).	
Sources of information: 1. DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States. 2. Love 1985	
Question 2.6 Potential for natural long-distance dispersal	D Other Pub. Mat'l back
Identify dispersal mechanisms: Can cling to fur and feet of animals, but this is an uncommon method of moving seed >1 km..	
Rationale: enter text here	
Sources of information: DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States.	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: Native to Mediterranean and Asia (1). Also invades Oregon and the southeastern U.S. (2)	
Rationale: Scoring as C because already widespread in California.	
Sources of information: 1. Love 1985. 2. USDA, NRCS. 2004. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	
Question 3.1 Ecological amplitude/Range	A Rev'd, Sci. Pub'n back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Planted in California starting in the 1940's (1). Present throughout California, except deserts and the Great Basin, to 2060m. Inhabits roadsides, fields, grassland, and open slopes (2). Hard seeds allow it to survive on drier range sites (3). Found in oak woodland and serpentine meadows (4).	
Rationale: enter text here	
Sources of information: 1. Love 1985. 2. DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States 3. Graves, W. L., B. L. Kay, et al. "Hardseeded Spanish subclover finds a place in southern California." Calif Agric Calif Agric Exp Stn 41(11/12): 8-10. 4. Williamson, J. and S. Harrison (2002). "Biotic and abiotic limits to the spread of exotic revegetation species." Ecological Applications 12(1): 40-51.	

Question 3.2 Distribution/Peak frequency	B Observational back
Describe distribution: Common species of Great Basin and valley and foothill grasslands.	
Rationale: enter text here	
Sources of information: DiTomaso, observational Joanna Clines, US Forest Service, pers. obs.	

Worksheet A[back](#)

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	Yes: 2 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	No: 0 pt
Fragments easily and fragments can become established elsewhere	No: 0 pts
Resprouts readily when cut, grazed, or burned	No: 0 pt
	7 pts Total Unknowns
	A (6+ pts)
Note any related traits: enter text here	

Worksheet C - California Ecological Types

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(*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	score
	coastal scrub	score
	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
Grasslands, Vernal Pools, Meadows, and other Herb Communities	coastal prairie	score
	valley and foothill grassland	B. 21-50%
	Great Basin grassland	B. 21-50%
	vernal pool	score
	meadow and seep	D. present
	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)	score
Woodland	cismontane woodland	B. 21-50%
	piñon and juniper woodland	score
	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).