

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):	Arctotheca calendula (L.) Levyns (fertile varieties)
Synonyms:	Arctotheca calendulacea (R. Br.) Lewin, Arctotis calendula L.; Cryptostemma calendulaceum (L.) R.Br
Common names:	fertile capeweed
Evaluation date (mm/dd/yy):	12/09/04
Evaluator #1 Name/Title:	Ed Finley
Affiliation:	California Dept. of Food and Agriculture
Phone numbers:	530-224-2425, fax 530-224-2427
Email address:	efinley@cdfa.ca.gov
Address:	20235 Charlanne Dr., Redding, CA. 96002
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, John Randall, Cynthia Roye, Jake Sigg, Peter Warner
Committee review date:	2/11/05
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

Two forms of capeweed occur in California, a fertile seed producing form with limited distribution in the state and a sterile form available from nurseries. The fertile form is currently A-rated by CDFA, but the sterile form is not rated. The fertile form was first intercepted as a contaminant of Australian subterranean clover seed in 1974 and the first established infestation was reported in 1988 on a dairy in Humboldt County (Barbe, Doug. 1988. CDFA Pest Detection Advisory, PD33-88). This assessment will address the fertile form.

Table 2. Criteria, Section, and Overall Scores

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

Impact

Enter four characters from Q1.1-1.4 below:

CBDD

Using matrix, determine score and enter below:

B

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

Invasiveness

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

11

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
Red Alert

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

Distribution

Using matrix, determine score and enter below:

C

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes</p>	<p>C Rev'd, Sci. Pub'n back</p>
<p>Identify ecosystem processes impacted: Capeweed probably impacts soil moisture and nutrient availability.</p>	
<p>Rationale: Capeweed infestations in agriculture may attain percent plant cover ratios approaching 100%. Such a dominance would likely affect soil moisture and nutrient availability to the detriment of other species, but capeweed does not seem to compete well in wildland situations, thus it would normally pose only a minor alteration of these ecosystem processes.</p>	
<p>Sources of information: McIvor, J.G.; Smith D.F. 1973. Competitive growth of capeweed, <i>Arctotheca calendula</i>, and some annual pasture species. <i>Australian Journal of Experimental Agriculture & Animal Husbandry</i>. 13(61): 185-189.</p> <p>Anonymous. Capeweed <i>Arctotheca calendula</i>. Http://weeds.tassie.net.au/txts/capeweed.html. Accessed on 8/16/1999</p> <p>Finley, Ed. 2004. Personal observations of fertile capeweed on a Humboldt County dairy, 2001 to present. 530-224-2425 efinley@cdfa.ca.gov</p>	
<p>Question 1.2 Impact on plant community composition, structure, and interactions</p>	<p>B Rev'd, Sci. Pub'n back</p>
<p>Identify type of impact or alteration: Capeweed seems to be a relatively poor competitor with native species, but if established may pose a moderate impact on native plant communities.</p>	
<p>Rationale: Capeweed has the potential to invade disturbed areas (bare ground) and establish nearly pure stands, thereby excluding native plants from re-colonizing such areas and possibly expanding into surrounding plant communities. Again, capeweed seems to be a relatively poor competitor, thus posing a moderate threat.</p>	
<p>Sources of information: McIvor, J.G.; Smith D.F. 1973. Competitive growth of capeweed, <i>Arctotheca calendula</i>, and some annual pasture species. <i>Australian Journal of Experimental Agriculture & Animal Husbandry</i>. 13(61): 185-189</p> <p>Eaton, Ronnie. Alameda County Dept. of Agriculture. 2004. Observation on fertile capeweed at a private ranchette in San Mateo County, 2003 to 2004. Personal communication, 02/28/03. (510)670-5232.</p> <p>Finley, Ed; Griffin, Denis; Oliver, Brad. Personal observations on a fertile capeweed infestation at a vineyard in Monterey County, April, 2001. 530-224-2425, efinley@cdfa.ca.gov</p>	
<p>Question 1.3 Impact on higher trophic levels</p>	<p>D Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Fertile capeweed probably would have little effect on higher trophic levels.</p>	
<p>Rationale: Since fertile capeweed is distributed mainly in agricultural situations, its impact on higher trophic levels would be negligible. Though not preferred, stock may feed on fertile capeweed.</p>	
<p>Sources of information: Anonymous. Capeweed <i>Arctotheca calendula</i>. Http://weeds.tassie.net.au/txts/capeweed.html. accessed on 8/16/1999</p>	

Question 1.4 Impact on genetic integrity	D Rev'd, Sci. Pub'n back
Identify impacts: There are no reports of fertile capeweed hybridization in California.	
Rationale: There are no native species of <i>Arctotheca</i> in California.	
Sources of information: Hickman, James C., ed. 1993. <i>The Jepson Manual Higher Plants of California</i> . University of California Press, Berkeley and Los Angeles, California	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	C Rev'd, Sci. Pub'n back
Describe role of disturbance: It appears that fertile capeweed needs anthropogenic disturbance to establish.	
Rationale: Distributions of fertile capeweed are generally in agricultural situations, particularly swards, pastures, and vineyards. There is very little spread into wildland situations without some disturbance, typically caused by agricultural practices (cultivation and transportation of stock fodder) or actual planting of specimens.	
Sources of information: Wood, Helen. 1994. The Introduction and spread of Capeweed, <i>Arctotheca calendula</i> , (L.) Levyns (Asteraceae) in Australia. <i>Plant Protection Quarterly</i> . 9(3): 94-100.	
Eaton, Ronnie. Alameda County Dept. of Agriculture. 2004. Observations on fertile capeweed at a private ranchette in San Mateo County, 2003 to 2004. Personal communication, 02/28/03. (510)670-5232.	
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Question 2.2 Local rate of spread with no management	B Rev'd, Sci. Pub'n back
Describe rate of spread: Fertile capeweed is still only locally distributed in California and has increased its population very slowly, if at all. In Australia, capeweed seems to have the potential for further spread, but apparently in agriculture.	
Rationale: In limited disjunct California populations of fertile capeweed, there is little indication of spread into wildland situation. In Australia, capeweed is still spreading in agriculture.	
Sources of information: Wood, Helen. 1994. The Introduction and spread of Capeweed, <i>Arctotheca calendula</i> , (L.) Levyns (Asteraceae) in Australia. <i>Plant Protection Quarterly</i> . 9(3): 94-100.	
Barbe, Doug. 1988. CDFa, Division of Plant Industry, Pest Detection Advisory, PD33-88.	
Barbe, Doug. 1990. CDFa, Division of Plant Industry, Pest Detection Advisory, PD30-90.	
Barbe, Doug. 1992. CDFa, Division of Plant Industry, Pest Detection Advisory, PD16-92.	
Hrusa, Fred. 1999. CDFa, Division of Plant Industry, Pest and Damage Record, 1237670.	
Hrusa, Fred, 2001. CDFa, Division of Plant Industry, Pest and Damage Record, P114622.	
Finley, Ed; Griffin, Denis; Oliver, Brad. Personal observations on a fertile capeweed infestation at a vineyard in Monterey County, April, 2001. 530-224-2425, efinley@cdfa.ca.gov	

Question 2.3 Recent trend in total area infested within state	C Other Pub. Mat'l back
Describe trend: Disjunct California populations do not seem to be spreading and are declining only with repeated treatments (hand removal or herbicidal).	
Rationale: Very small populations in the GGNRA and Point Reyes National Seashore have been eradicated by hand removal. Herbicidal treatments on the larger populations at a dairy in Humboldt County and a vineyard in Monterey County have had only limited success.	
Sources of information: Barbe, Doug. 1990. CDFA, Division of Plant Industry, Pest Detection Advisory, PD30-90. Barbe, Doug. 1992. CDFA, Division of Plant Industry, Pest Detection Advisory, PD16-92. Finley, Ed. 2004. Personal observations of fertile capeweed on a Humboldt County dairy, 2001 to present. 530-224-2425 efinley@cdfa.ca.gov Finley, Ed; Griffin, Denis; Oliver, Brad. Personal observations on a fertile capeweed infestation at a vineyard in Monterey County, April, 2001. 530-224-2425, efinley@cdfa.ca.gov	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics: Fertile capeweed may produce viable seeds, as well as reproduce vegetatively by stolens rooting at the nodes and rooting of fragments.	
Rationale: Fertile capeweed's inherent characteristics bestow it with high reproductive potential.	
Sources of information: Hickman, James C., ed. 1993. The Jepson Manual Higher Plants of California. University of California Press, Berkeley and Los Angeles, California DiTomasso, J. Healy E. Weeds of California and other Western States. (as yet unpublished)	
Question 2.5 Potential for human-caused dispersal	A Rev'd, Sci. Pub'n back
Identify dispersal mechanisms: Fertile capeweed may disperse via contaminated seed, hay, fodder, sheep wool, horses, and through direct movement by humans.	
Rationale: Fertile capeweed was originally introduced into California via contaminated alfalfa seed, and in Australia by practically all of the above mentioned routes.	
Sources of information: Wood, Helen. 1994. The Introduction and spread of Capeweed, <i>Arctotheca calendula</i> , (L.) Levyns (Asteraceae) in Australia. Plant Protection Quarterly. 9(3): 94-100. Barbe, Doug. 1988. CDFA, Division of Plant Industry, Pest Detection Advisory, PD33-88.	
Question 2.6 Potential for natural long-distance dispersal	D Observational back
Identify dispersal mechanisms: It appears that California infestations of fertile capeweed have not spread more than 1 km.	

<p>Rationale: The California fertile capeweed populations have been relatively stable. Human-caused dispersal seems to be the primary means of spread. There may be some movement of seed, which is covered by dense wooly hairs, by animals, wind, or water, but so far this is limited.</p>	
<p>Sources of information: Finley, Ed. 2004. Personal observations of fertile capeweed on a Humboldt County dairy, 2001 to present. 530-224-2425 efinley@cdfa.ca.gov</p> <p>Finley, Ed; Griffin, Denis; Oliver, Brad. Personal observations on a fertile capeweed infestation at a vineyard in Monterey County, April, 2001. 530-224-2425, efinley@cdfa.ca.gov</p>	
<p>Question 2.7 Other regions invaded</p>	<p>C Rev'd, Sci. Pub'n back</p>
<p>Identify other regions: Fertile capeweed is an invasive species in agricultural regions in Australia.</p>	
<p>Rationale: Fertile capeweed is a pest in swards of Australia, presumably equivalent to coastal prairie and scrub ecological types converted to agriculture in California.</p>	
<p>Sources of information: Wood, Helen. 1994. The Introduction and spread of Capeweed, <i>Arctotheca calendula</i>, (L.) Levyns (Asteraceae) in Australia. <i>Plant Protection Quarterly</i>. 9(3): 94-100.</p> <p>Barbe, Doug. 1988. CDFA, Division of Plant Industry, Pest Detection Advisory, PD33-88.</p>	
<p>Question 3.1 Ecological amplitude/Range</p>	<p>B Rev'd, Sci. Pub'n back</p>
<p>Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: It appears that fertile capeweed is capable of moderate tendency to invade different ecological types.</p>	
<p>Rationale: In California, fertile capeweed has a distribution so far limited to coastal prairie (Humboldt County) and coastal scrub (Monterey County). In Australia, it has invaded agricultural areas and is most successful in regions with climates similar to its range in South Africa.</p>	
<p>Sources of information: Wood, Helen. 1994. The Introduction and spread of Capeweed, <i>Arctotheca calendula</i>, (L.) Levyns (Asteraceae) in Australia. <i>Plant Protection Quarterly</i>. 9(3): 94-100.</p> <p>Barbe, Doug. 1988. CDFA, Division of Plant Industry, Pest Detection Advisory, PD33-88.</p>	
<p>Question 3.2 Distribution/Peak frequency</p>	<p>D Other Pub. Mat'l back</p>
<p>Describe distribution: Fertile capeweed has not dominated any of the ecological types in which it occurs.</p>	
<p>Rationale: So far, fertile capeweed is limited to two ecological types in California and it has not achieved dominance in either.</p>	
<p>Sources of information: Barbe, Doug. 1988. CDFA, Division of Plant Industry, Pest Detection Advisory, PD33-88.</p>	

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Barbe, Doug. 1992. CDFA, Division of Plant Industry, Pest Detection Advisory, PD16-92.
Hrusa, Fred. 1999. CDFA, Division of Plant Industry, Pest and Damage Record, 1237670.
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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	Unknown: 0 pts
Seeds remain viable in soil for three or more years	Unknown: 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	Yes: 1 pt
Fragments easily and fragments can become established elsewhere	Yes: 2 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
	8 pts 3 unknowns
	A (6+ pts)
Note any related traits: enter text here	

Worksheet C - California Ecological Types

[back](#)

(*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	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
Grasslands, Vernal Pools, Meadows, and other Herb Communities	coastal prairie	D. present
	valley and foothill grassland	score
	Great Basin grassland	score
	vernal pool	score
	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)	score
Woodland	cismontane woodland	score
	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).