

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):	<i>Echium candicans</i> L.f.
Synonyms:	<i>Echium branchyanthum</i> Hornem., <i>Echium cynoglossoides</i> Desf., <i>Echium densiflorum</i> DC., <i>Echium fastuosum</i> auct. Non Dryander ex Aiton, <i>Echium macrophyllum</i> Lehm., <i>Echium pallidum</i> Salisb., a few others
Common names:	Pride of Madeira
Evaluation date (mm/dd/yy):	08/01/04 & 01/03/06
Evaluator #1 Name/Title:	David Chang, Agricultural Program Specialist Coordinator, Weed Management Area
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Evaluator #2 Name/Title:	
Affiliation:	
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Section below for list committee use—please leave blank

List committee members:	Joe DiTomaso, Peter Warner, Alison Stanton, Cynthia Roye, John Randall, Jake Sigg
Committee review date:	8/27/2004 (Revised 9/13/05, J.DiTomaso, J.Sigg, Carla Bossard) Re-evaluated 1/10/06, J. DiTomaso, J. Sigg, J. Randall, P. Warner
List date:	enter text here
Re-evaluation date(s):	

General comments on this assessment:

This assessment is based on Joe DiTomaso's pre-published document, my observation of one serious patch at the Coast Gallery, on the observation of an infestation in San Diego County by Carolyn Martus, a few anecdotal web site comments and a comment from Dieter Wilken.

From the appearance of the infestation at the Coast Gallery it appears to me that *E.candicans* could be invasive. The infestation occurs on a steep hillside and appears unlikely to have been intentionally planted. Carolyn Martus, active CNPS/Cal-IPC member and WMA participant, reports that *E.candicans* is growing wild in San Diego County at the San Elijo Lagoon Ecological Reserve. However, Dieter Wilken believes it unlikely that *E.candicans* is invasive.

Table 2. Criteria, Section, and Overall Scores

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

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

2.1	Role of anthropogenic and natural disturbance	B 2	Observational
2.2	Local rate of spread with no management	B 2	Observational
2.3	Recent trend in total area infested within state	C 1	Observational
2.4	Innate reproductive potential Wksht A	A 3	Other Pub. Mat'l
2.5	Potential for human-caused dispersal	A 3	Observational
2.6	Potential for natural long-distance dispersal	D 0	Observational
2.7	Other regions invaded	B 2	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:
13
 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:
Low
No Alert

3.1	Ecological amplitude/Range	A	Observational
3.2	Distribution/Peak frequency Wksht C	D	Observational

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

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	U No Information back
Identify ecosystem processes impacted:	
Rationale:	
Sources of information:	
Question 1.2 Impact on plant community composition, structure, and interactions	C Observational back
Identify type of impact or alteration: fragmentation of a native community	
Rationale: Carolyn Martus provided photo documentation of a population of <i>E.candicans</i> invading what appears to be coastal bluff scrub. <i>E.candicans</i> appears to be invading a healthy community by seeding itself between the native vegetation. Committee's consensus (1/10/06) is that it is present but there is only minor evidence of specific impacts or displacement of native plants.	
Sources of information: David Chang, observational; Carolyn Martus, photo documentation	
Question 1.3 Impact on higher trophic levels	U No Information back
Identify type of impact or alteration: Toxic, but specific impacts unknown	
Rationale:	
Sources of information: Observational Joe DiTomaso, Jake Sigg. 2004.	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: The description of <i>E.candicans</i> in the Jepson manual makes this statement: "Several spp. cult on CA coast, > 1 probably naturalized, some may be hybrids. Pls with pink to pale blue corollas and nutlets sharply tubercled are called <i>E. strictum</i> L.f. Pls 2-3 m with basal lf rosette and +- cylindric infl 1+ m are called <i>E. pininana</i> Webb & Berth."	
Rationale:	
Sources of information: Hickman, James C. The Jepson Manual. 1996	

Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Observational back
Describe role of disturbance: tolerant of poor soils and able to tolerate drought, once established	
<p>Looking at pictures that I took, of a wildland infestation at the Coast Gallery on Highway 1 south of Big Sur, there are hundreds of <i>Echium</i> plants growing down a steep hill - an area that seems unlikely to have been intentionally planted or could have only have been intentionally planted by throwing seeds or propagative parts down the cliff bank. There are small plants seen in the pictures. I've also noticed individual plants growing on the roadsides of Highway 154 in Santa Barbara County away from garden areas, but I cannot be certain whether these plants are garden escapes or garden remnants.</p> <p>However, Dieter Wilken stated on 7/28/04, in an email to me, " Its been over 10 years since I did the treatment of those taxa for the Jepson Manual, and I had a lot of assistance from Elizabeth McClintock at the time. The two species, as I recall, are found primarily in the bay area. I find it hard to believe that <i>Echium candicans</i> would be considered invasive – its largely an urban weed along the coast, and then only in a few localities (at least in the early 1990s). As far as I know, <i>Echium</i> does not have a highly dispersable fruit. Plants persist for many decades. Its possible that someone planted at least one plant there many years ago, and it has slowly expanded at the site. One sees young plants or seedlings only very rarely. Elizabeth McClintock took me to a population on Angel Island in San Francisco Bay that had several hundred plants. I recall her saying that they had persisted there since the late 1940s but that there was hardly any recruitment (i.e. small plants with few branches). Once established, however, the plants seem to survive even the harshest droughts. However, a deep frost usually kills them – one reason why they are found only along the coast in California."</p> <p>I also found mentions of pride of Madeira naturalizing or occurring in natural areas in California on two websites - www.bahiker.com/southbayhikes/quarry.html and forums.gardenweb.com/forums/load/calif/msg0723003323285.html.</p>	
<p>Rationale:</p> <p>Based on appearance of the infestation at the Coast Gallery and at San Elijo Lagoon Ecological Preserve, <i>E.candicans</i> appears able to invade established native plant communities</p>	
<p>Sources of information: David Chang, observational; Carolyn Martus, observational, Dieter Wilken, observational, and DiTomaso, J & Healy, E. Weeds of California and Other Western States. As yet unpublished. Pg 218-220.</p>	
Question 2.2 Local rate of spread with no management	B Observational back
Describe rate of spread: Plants spread outward, but more slowly than doubling in 10 years	
Rationale:	
Sources of information: Observational Peter Warner, Jake Sigg. 2004.	
Question 2.3 Recent trend in total area infested within state	C Observational back
Describe trend: Most infestations are near plantings, the plant's been here a long time and is not spreading quickly.	
Rationale:	

Sources of information: Observational Peter Warner, Joe DiTomaso. 2004.	
Question 2.4 Innate reproductive potential	A Other Pub. Mat'l back
Describe key reproductive characteristics: It is documented that E.candicans reproduces by seed. The document makes no reference to any other reproductive method. Lots of flowers are produced by a single plant. Fruits consist of 4 nutlets on a flat receptacle surrounded by the calyx DiTomaso & Healy Preprinted document states Reproduces by seed. No other reproductive mechanism mentioned, but seedlings seldom encountered and an anecdotal reference, a website, plantsdatabase.com/go/1940/ that states that it can grow from seedling to flowering in just a couple of years.	
Rationale:	
Sources of information: DiTomaso, J & Healy, E. Weeds of California and Other Western States. As yet unpublished. Pg 218-220. and a website plantsdatabase.com/go/1940 Observational Peter Warner, Jake Sigg, Joe DiTomaso. 2004	
Question 2.5 Potential for human-caused dispersal	A Observational back
Identify dispersal mechanisms: E.candicans is available for purchase in nurseries and widely planted in gardens.	
Rationale: direct observation	
Sources of information: David Chang, observational	
Question 2.6 Potential for natural long-distance dispersal	D Observational back
Identify dispersal mechanisms: likely, that seeds drop near the parent plant	
Rationale: apparent escapes are often quite near ornamental plantings.	
Sources of information: David Chang, observational	
Question 2.7 Other regions invaded	B Observational back
Identify other regions: I personally know of two serious wildland infestations. All other observations by me are of individual plants seen sporadically on roadsides close to urban areas.	
Rationale: direct observation and mentions on websites	

Sources of information: David Chang, observational and websites	
Question 3.1 Ecological amplitude/Range	A Observational back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: The most serious patch I have personally observed is at the Coast Gallery on Highway 1 south of Big Sur. That observation was in June of 2004. Dieter Wilken mentions a patch he viewed on Angel Island. And I found two mentions on the internet of naturalization.	
Rationale:	
Sources of information: David Chang, observational Observational Peter Warner, Joe DiTomaso. 2004	
Question 3.2 Distribution/Peak frequency	D Observational back
Describe distribution: A serious patch exists on Highway 1 south of Big Sur and at the San Elijo Lagoon Ecological Reserve and sporadic roadside observations, and other observations as mentioned, previously.	
Rationale: direct observation	
Sources of information: Observational David Chang, Carolyn Martus 2005	

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	Yes: 1 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	Yes: 1 pt
	Total Pts Total Unknowns
	A (6+ pts)
Note any related traits:	

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	D. present
	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)	D. present
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).