

# 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):	<i>Carpobrotun chilensis</i> (Molina) N. E. Br.
<b>Synonyms:</b>	<i>Mesembryanthemum chilensis</i> , <i>Carpobrotus mellei</i> , <i>Carpobrotus aequilaterus</i>
<b>Common names:</b>	Sea fig; iceplant
<b>Evaluation date</b> (mm/dd/yy):	06/03/03
<b>Evaluator #1 Name/Title:</b>	Peter J. Warner, Associate State Parks Resource Ecologist
<b>Affiliation:</b>	California Dept. of Parks and Recreation
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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>	Jake Sigg, Peter Warner, Joe DiTomaso, Doug Johnson, Brianna Richardson
<b>Committee review date:</b>	08/01/03
<b>List date:</b>	enter text here
<b>Re-evaluation date(s):</b>	enter text here

**Table 2. Criteria, Section, and Overall Scores**

1.1	Impact on abiotic ecosystem processes	<b>C</b>	<b>Observational (inferred)</b>
1.2	Impact on plant community	<b>B</b>	<b>Peer-reviewed; observational</b>
1.3	Impact on higher trophic levels	<b>U</b>	<b>Not known</b>
1.4	Impact on genetic integrity	<b>D</b>	<b>Published, peer-reviewed</b>

**“Impact”**

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

**C-B-U-D**

*Use matrix determine the score; enter below:*

**B**

2.1	Role of anthropogenic and natural disturbance	<b>B</b>	<b>Unpublished literature; observational</b>
2.2	Local rate of spread with no management	<b>A</b>	<b>observational</b>
2.3	Recent trend in total area infested within state	<b>B</b>	<b>Observational, inference</b>
2.4	Innate reproductive potential	<b>A</b>	<b>observational</b>
2.5	Potential for human-caused dispersal	<b>C</b>	<b>Observational; inference</b>
2.6	Potential for natural long-distance dispersal	<b>A</b>	<b>Peer-reviewed scientific literature</b>
2.7	Other regions invaded	<b>U</b>	<b>Unknown</b>

**“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:*

**14**

*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:*

**Medium**

**None**

3.1	Ecological amplitude	<b>A</b>	<b>Doc'n level</b>
3.2	Distribution	<b>A</b>	<b>Doc'n level</b>

**“Distribution”**

*Use matrix determine the score; enter below:*

**A**

**Table 3. Documentation**

<b>Question 1.1</b> Impact on abiotic ecosystem processes
Identify ecosystem processes impacted: soil pH reduction in loamy sand; accumulations of litter
Rationale: inferred from results of studies on <i>C. edulis</i>
Sources of information: published review of scientific literature: Albert, M. in Bossard, et al. (2000, based on D'Antonio, C. M. 1990a. Invasion of coastal plant communities in California by the introduced iceplant, <i>Carpobrotus edulis</i> (Aizoaceae). Ph.D dissertation, Univ. of Calif., Santa Barbara, CA
<b>Question 1.2</b> Impact on plant community composition, structure, and interactions
Identify type of impact or alteration: displacement of native species; negative impact on water relations and morphological development of native species (inferred from study on <i>C. edulis</i> )
Rationale: personal observations; inference from published literature on closely related <i>C. edulis</i>
Sources of information: P. Warner, Teresa Sholars; inference based on D'Antonio, C. M., and B. E. Mahall. 1991. Root profiles and competition between the invasive, exotic perennial, <i>Carpobrotus edulis</i> , and 2 native shrub species in California coastal scrub. <i>Am. Journal of Botany</i> 78(7):885-894 ( <a href="http://mycorrhiza.ag.utk.edu/latest/1991/91_dantonio.htm">http://mycorrhiza.ag.utk.edu/latest/1991/91_dantonio.htm</a> )
<b>Question 1.3</b> Impact on higher trophic levels
Identify type of impact or alteration: impacts unknown; deer, raccoons, rodents, et al. may feed on fruits
Rationale: enter text here
Sources of information: none found
<b>Question 1.4</b> Impact on genetic integrity
Identify impacts: none known; would seem to be highly unlikely given that no closely related native species grow in California. Since this species hybridizes readily with <i>C. edulis</i> , differentiating ecological characteristics can be difficult. The pure species look different, and grow differently, yet hybridization can confound separating the two species in terms of impacts and management.
Rationale: no closely related species in California
Sources of information: Hickman, J. C. (editor). 1993. <i>The Jepson Manual: Higher Plants of California</i> . University of California Press, Berkeley.

<b>Question 2.1</b> Role of anthropogenic and natural disturbance in establishment
Describe role of disturbance: coastal bluff erosion appears to provide unoccupied sites for germination and growth of propagules
Rationale: direct observation of habitat and growing sites
Sources of information: personal observations (P. Warner, T. Sholars)
<b>Question 2.2</b> Local rate of spread with no management
Describe rate of spread: individual plants grow very rapidly once established, at rates approaching several feet a year. This species does branch as much as <i>C. edulis</i> , nor root as frequently at nodes or as deeply, so mats are not as dense as those of <i>C. edulis</i> . Nevertheless the increase in biomass is well in excess of doubling/10 years. Pickart (1989) found an approximately 3-fold increase in absolute cover of <i>C. chilensis</i> over a 25-year period at Lanphere-Christensen Dunes (Humboldt Co.).
Rationale: 1. personal observations; 2. published, non-peer reviewed literature; 3. unpublished study
Sources of information: 1. P. Warner, T. Sholars 2. Pickart, A. J., and J. O. Sawyer. 1998. Ecology and Restoration of Northern California Coastal Dunes. California Native Plant Society, Sacramento, CA 3. Pickart, A. J. 1989. 1989 Monitoring results for northern foredune and northern foredune grassland at the Lanphere-Christensen Dunes Preserve. Unpublished document. The Nature Conservancy, Arcata, CA
<b>Question 2.3</b> Recent trend in total area infested within state
Describe trend: Increasing slowly in sites occupied. While this species probably occupies most compatible sites (coastal dunes, bluffs, beaches, scrub) along the Calif. coast, some sites remain vulnerable, though not yet infested. Dispersal by birds and other animals leave offshore/onshore bluffs and stacks open to invasion.
Rationale: observational; inferred from knowledge about dispersal and species' environmental needs
Sources of information: Hickman, J. C. 1993; personal observations (P. Warner, T. Sholars)
<b>Question 2.4</b> Innate reproductive potential
Describe key reproductive characteristics: reproduces both by seed and vegetatively; seeds germinate well after digestion by frugivores; disturbance-prone habitat facilitates vegetative reproduction
Rationale: observations; some characteristics inferred from information available on <i>C. edulis</i> (Albert, M. <i>in</i> Bossard, et al. (2000))
Sources of information: Personal observation (P. Warner); Bossard et al. (2000)

<b>Question 2.5</b> Potential for human-caused dispersal
Identify dispersal mechanisms: this species sold commercially, including on the internet; some plants are removed and pieces distributed to new growing sites, both deliberately and unintentionally, although this is probably not a frequent occurrence. This species hybridizes readily with <i>C. edulis</i> , still planted widely as erosion control.
Rationale: personal observation; published, non-peer-reviewed (internet sites)
Sources of information: P. Warner (personal observations); numerous horticultural internet sites
<b>Question 2.6</b> Potential for natural long-distance dispersal
Identify dispersal mechanisms: animal dispersal of seeds over 1 km (D'Antonio 1993); numerous animals disperse seeds, including birds, mammals, humans; vegetative dispersal common also, due to high rate of habitat disturbance, and gravitational and aquatic mechanisms for dispersal of vegetative fragments.
Rationale: literature, reviews, personal observations
Sources of information: Albert, M. <i>in</i> Bossard et al. (2000); personal observations (P. Warner)
<b>Question 2.7</b> Other regions invaded
Identify other regions: From available literature, this species appears to invade only in Mediterranean climate types, and is already well-established in all suitable ecological regions in California. However, I found no definitive information on this question, only brief accounts of invasions in Chile and France.
Rationale: observational
Sources of information: Peter Warner (personal observations)
<b>Question 3.1</b> Ecological amplitude
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known:  Well established in dune systems along entire California coast; well established on many coastal bluffs in northern California; much less common in coastal scrub and coastal prairie, yet still occasionally found there. Species introduced during pre- or early Spanish settlement of California (1500's).
Rationale: personal observations
Sources of information: P. Warner (personal observations)

<b>Question 3.2</b> Distribution
Describe distribution: common in dunes and coastal bluff scrub; less common in coastal scrub and coastal prairie
Rationale: 1. personal observations; 2. published, non-peer-reviewed literature; 3. published, peer-reviewed literature
Sources of information: <ul style="list-style-type: none"> <li>1. P. Warner</li> <li>2. Pickart and Sawyer (1998)</li> <li>3. Hickman, J. C. (1993)</li> </ul>

### Worksheet A

Complete this worksheet to answer Question 2.4.

Reaches reproductive maturity in 2 years or less	<b>NO</b>
Dense infestations produce >1,000 viable seed per square meter	<b>NO</b>
Populations of this species produce seeds every year.	<b>YES</b>
Seed production sustained over 3 or more months within a population annually	<b>YES</b>
Seeds remain viable in soil for three or more years	<b>UNK</b>
Viable seed produced with <i>both</i> self-pollination and cross-pollination	<b>UNK</b>
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	<b>YES</b>
Fragments easily and fragments can become established elsewhere	<b>YES</b>
Resprouts readily when cut, grazed, or burned	<b>YES</b>
	<b>6    2</b>
	<b>A</b>
<b>Note any related traits:</b> seed germination enhanced by animal digestion, and fruits are attractive to herbivores	

## Worksheet C - California Ecological Types

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	A
	desert	score
	interior	score
<b>Scrub and Chaparral</b>	coastal bluff scrub	B
	coastal scrub	D
	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
<b>Grasslands, Vernal Pools, Meadows, and other Herb Communities</b>	coastal prairie	D
	valley and foothill grassland	score
	Great Basin grassland	score
	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	score
	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	score
	upper montane coniferous forest	score
	subalpine coniferous forest	score
<b>Alpine Habitats</b>	alpine boulder and rock field	score
	alpine dwarf scrub	score