

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):	Carduus pycnocephalus L.
Synonyms:	enter text here
Common names:	Italian thistle
Evaluation date (mm/dd/yy):	05/22/04
Evaluator #1 Name/Title:	John J. Knapp/ Invasive Plant Program Manager
Affiliation:	Catalina Island Conservancy
Phone numbers:	(310) 510-1299
Email address:	jknapp@catalinaconservancy.org
Address:	P.O. Box 2739 Avalon, CA 90704
Evaluator #2 Name/Title:	Joseph DiTomaso
Affiliation:	University of California-Davis
Phone numbers:	530-754-8715
Email address:	jmditomaso@ucdavis.edu
Address:	Dept. Plant Sci., Mail Stop 4, Davis, CA 95616

Section below for list committee use—please leave blank

List committee members:	Carla Bossard, John Randall, Carri Piroso, Dan Gluesenkamp, Gina Skurka, Brianna Richardson
Committee review date:	7/8/05
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

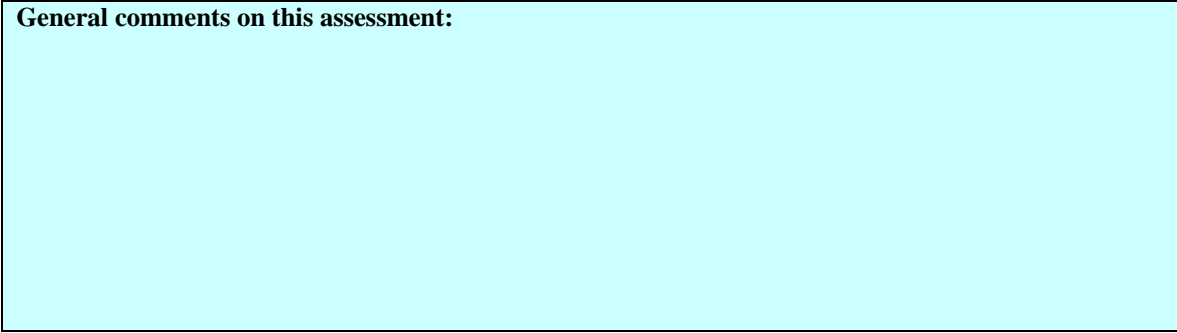


Table 2. Criteria, Section, and Overall Scores

<u>1.1</u>	Impact on abiotic ecosystem processes	C	Other Pub. Mat'l
<u>1.2</u>	Impact on plant community	A	Other Pub. Mat'l
<u>1.3</u>	Impact on higher trophic levels	B	Other Pub. Mat'l
<u>1.4</u>	Impact on genetic integrity	D	Other Pub. Mat'l

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

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

“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:
12
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
No Alert

<u>3.1</u>	Ecological amplitude/Range	A	Other Pub. Mat'l
<u>3.2</u>	Distribution/Peak frequency <u>Wksht C</u>	B	Observational

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

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes</p>	<p>C Other Pub. Mat'l back</p>
<p>Identify ecosystem processes impacted: <i>C. pycnocephalus</i> increases fire frequency and movement into overstory of island scrub oak chaparral, and dense populations of rosettes inhibit light penetration to the soil surface.</p>	
<p>Rationale: Fire is carried into the oak overstory by <i>C. pycnocephalus</i> midstory. This may or may not increase the threat compared to native vegetation or annual grasses in the same area, but the Italian thistle plants tend to grow taller and be a better fire ladder than other species.</p>	
<p>Sources of information: Wilken, D. and Hannah, L. 1998. <i>Carduus pycnocephalus</i>. Channel Islands National Park Service Species Literature Review. Unpublished.</p> <p>Anonymous. 2003. Written findings of the State Noxious Weed Control Board-Class A Weed. http://www.nwcb.wa.gov/weed_info/Written_findings/Carduus_pycnocephalus.html</p>	
<p>Question 1.2 Impact on plant community composition, structure, and interactions</p>	<p>A Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Both rosettes and mature adults populations can reach nearly 100% cover over large areas inhibiting seedling recruitment and survivorship. Within island scrub oak chaparral habitat, <i>C. pycnocephalus</i> can form a midstory layer. 85% of seeds produce germination inhibitors, but they are readily leached. Both the depth and density of grasslands are altered. Harbors insect pests.</p> <p>Host plant for introduced weevil <i>Rhynocilus conicus</i>, which attacks native thistles, thereby reducing populations of the native plants (Gluesenkamp and Randall).</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: Wilken, D. and Hannah, L. 1998. <i>Carduus pycnocephalus</i>. Channel Islands National Park Service Species Literature Review. Unpublished.</p> <p>Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.</p> <p>Pitcher, D. and Russo, M.J. 1997. The Nature Conservancy Element Stewardship Abstract: <i>Carduus pycnocephalus</i>. California Field Office, San Francisco</p> <p>Dan Gluesenkamp, Audubon Canyon Ranch, and John Randall, The Nature Conservancy, pers. obs.</p>	
<p>Question 1.3 Impact on higher trophic levels</p>	<p>B Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Stem and leaves have spiny wings and phyllaries that are spine tipped, and may be injurious components to wildlife. Dense populations can alter habitat structure. A diversity of insects pollinate <i>C. pycnocephalus</i>.</p>	
<p>Rationale: Competes with native vegetation for multiple pollinator visitation due to numerous seed heads.</p>	
<p>Sources of information: Wilken, D. and Hannah, L. 1998. <i>Carduus pycnocephalus</i>. Channel Islands National Park Service Species Literature Review. Unpublished.</p> <p>Anonomous. 2003. Written findings of the State Noxious Weed Control Board-Class A Weed.</p>	

http://www.nweb.wa.gov/weed_info/Written_findings/Carduus_pycnocephalus.html	
Question 1.4 Impact on genetic integrity	D Other Pub. Mat'l back
Identify impacts: No hybridization is known to occur with California native taxa.	
Rationale: No taxa native to California are within the genus Carduus.	
Sources of information: Hickman, J.C. (ed.). 1993. The Jepson manual of higher plants of California. P. 220. University of California Press, Berkeley.	
Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Other Pub. Mat'l back
Describe role of disturbance: Disturbed sites such as: fallow fields, margins of cultivated fields, irrigation canals, roadsides, fire breaks, landsides, feral pig rooting, grazed heavily, and canyon bottoms are areas of establishment.	
Rationale: enter text here	
Sources of information: Wilken, D. and Hannah, L. 1998. Carduus pycnocephalus. Channel Islands National Park Service Species Literature Review. Unpublished.	
Anonomous. 2003. Written findings of the State Noxious Weed Control Board-Class A Weed.	
Cowan, B. 2000. Italian thistles: an ominous threat. California Exotic Pest Plant Council News, 8(1):15.	
Elkhorn Slough National Estuarine Research Reserve. 2000. Weed control by species. Elkhorn Slough National Estuarine Research Reserve. Pp. 1-57.	
Question 2.2 Local rate of spread with no management	B Other Pub. Mat'l back
Describe rate of spread: Populations are maintained annually by a majority of seed that fall within a few meters of the population each year. Long distance wind dispersal allows for new satellite populations to form. C. pycnocephalus is described as an aggressive species. Ants are suspected of microdistribution of seed. New populations are being detected each year, and are increasing in size along the Big Sur Coast and Catalina Island. Neither the 1923 or 1967 floras for Catalina Island recorded populations of C. pycnocephalus, but in 2003, 200 population were rcorde throughout the Island. Germinates rapidly in large numbers.	
Rationale: enter text here	
Sources of information: Anonomous. 2004. Tamar Valley Weed Strategy- www.weeds.asn.au. http://www.weeds.asn.au/weeds/txts/slen_thstle.html .	
Anonomous. 2003. Written findings of the State Noxious Weed Control Board-Class A Weed.	
Moore, P.E. and Gerlach, J.D. 2001. Exotic species threat assessment in Ssequoia, Kings Canyon, and Yosemite national parks. Crossing boundaries in park management: proceedings of the 11th conference on research and resource management in parks and on public lands. The George Wright Society.	
Cowan, B. 2000. Italian thistles: an ominous threat. California Exotic Pest Plant Council News, 8(1):15.	

<p>Massera, J. 2001. More about Italian thistle. California Exotic Pest Plant Council New, spring.</p> <p>Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.</p> <p>Elkhorn Slough National Estuarine Research Reserve. 2000. Weed control by species. Elkhorn Slough National Estuarine Research Reserve. Pp. 1-57.</p>	
<p>Question 2.3 Recent trend in total area infested within state</p>	<p>B Other Pub. Mat'l back</p>
<p>Describe trend: San Miguel, Santa Rosa and Catalina islands are invaded, along with the California coast from Mendocino to San Diego counties, lower Sacramento River Valley, Sierra Nevada foothills. It is listed as a noxious weed by California State Department of Food and Agriculture. <i>C. pycnocephalus</i> control has occurred at Ring Mountain and Jepson Prairie preserves, Sequoia, Yosemite, Kings Canyon, and Channel Islands National Parks, Inland Empire- California State Parks, Elkhorn Slough National Estuarine Research Reserve, and the Catalina Island Conservancy. Currently 8,324,425 square feet are invaded on Catalina Island.</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: Wilken, D. and Hannah, L. 1998. <i>Carduus pycnocephalus</i>. Channel Islands National Park Service Species Literature Review. Unpublished.</p> <p>Pitcher, D. and Russo, M.J. 1997. The Nature Conservancy Element Stewardship Abstract: <i>Carduus pycnocephalus</i>. California Field Office, San Francisco.</p> <p>Moore, P.E. and Gerlach, J.D. 2001. Exotic species threat assessment in Sequoia, Kings Canyon, and Yosemite national parks. Crossing boundaries in park management: proceedings of the 11th conference on research and resource management in parks and on public lands. The George Wright Society.</p> <p>Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.</p> <p>California State Parks. 2000. Urban edge effects and their relationship with the natural environment. Pp. 1-30. California State Parks Inland Empire District.</p>	
<p>Question 2.4 Innate reproductive potential</p>	<p>B Other Pub. Mat'l back</p>
<p>Describe key reproductive characteristics: <i>C. pycnocephalus</i> is an annual or biennial that is bisexual and self-compatible. It is pollinated by a diversity of insects. Spreads by seeds only, and is mainly wind dispersed, but seeds become mucilaginous when wetted. Seeds can germinate under water-limiting conditions such as drought. <i>C. pycnocephalus</i> has 83-96% germination rate, with greater germination on clay soils. Seeds remain dormant under shaded conditions, and are thought to remain viable for over 7-10 years in the soil. Individual plants produce hundreds of seeds. Seed can set without vernalisation or stem elongation. Seeds can germinate at lower temperatures (zero to five degrees Celsius) than other thistle species. Presence of musk thistle biocontrol agent (<i>Rhinocyllus conicus</i>) has been reported to reduce seed production by about 50%.</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: Wilken, D. and Hannah, L. 1998. <i>Carduus pycnocephalus</i>. Channel Islands National Park Service Species Literature Review. Unpublished.</p> <p>Anonymous. 2004. Tamar Valley Weed Strategy- www.weeds.asn.au. http://www.weeds.asn.au/weeds/txts/slen_thistle.html.</p>	

<p>Pitcher, D. and Russo, M.J. 1997. The Nature Conservancy Element Stewardship Abstract: <i>Carduus pycnocephalus</i>.</p> <p>Moore, P.E. and Gerlach, J.D. 2001. Exotic species threat assessment in Ssequoia, Kings Canyon, and Yosemite national parks. Crossing boundaries in park management: proceedings of the 11th conference on research and resource management in parks and on public lands. The George Wright Society.</p> <p>Groves, R.H. and Kaye, P.E. 1989. Germination and phenology of seven introduced thistle species in Southern Australia. <i>Australian Journal of Botany</i>, 37:351-359.</p> <p>Elkhorn Slough National Estuarine Research Reserve. 2000. Weed control by species. Elkhorn Slough National Estuarine Research Reserve. Pp. 1-57.</p>	
Question 2.5 Potential for human-caused dispersal	B Other Pub. Mat'l back
<p>Identify dispersal mechanisms: Seeds are dispersed by humans, vehicles, machinery, soil, and hay, but long distance transport is probably uncommon.</p>	
<p>Rationale: Mucilagious seeds can be dispersed by humans.</p>	
<p>Sources of information: Anonymous. 2003. Written findings of the State Noxious Weed Control Board</p> <p>Moore, P.E. and Gerlach, J.D. 2001. Exotic species threat assessment in Ssequoia, Kings Canyon, and Yosemite national parks. Crossing boundaries in park management: proceedings of the 11th conference on research and resource management in parks and on public lands. The George Wright Society.</p>	
Question 2.6 Potential for natural long-distance dispersal	C Other Pub. Mat'l back
<p>Identify dispersal mechanisms: Seed is dispersed mainly by wind; however, mucilagious seeds are dispersed by livestock and short distances by ants. Some movement long distance by animals and by water.</p>	
<p>Rationale: Mucilagious seeds can be dispersed by mammals, birds and insects.</p>	
<p>Sources of information: Anonymous. 2004. Tamar Valley Weed Strategy http://www.weeds.asn.au/weeds/txts/slen_thstle.html.</p> <p>Moore, P.E. and Gerlach, J.D. 2001. Exotic species threat assessment in Sequoia, Kings Canyon, and Yosemite national parks. Crossing boundaries in park management: proceedings of the 11th conference on research and resource management in parks and on public lands. The George Wright Society.</p> <p>Brown, K. and Brooks, K. 2002. Bushland Weeds: a practical guide to their management with case studies from the Swan Coastal Plain and beyond. The Environmental Weeds Action Network.</p>	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
<p>Identify other regions: <i>C. pycnocephalus</i> is invasive in Australia, New Zealand, South Africa, North America, weterm Asia, Iran, and Pakistan. Naturalized in temperate regions around the world.</p>	
<p>Rationale: enter text here</p>	

Sources of information: Wilken, D. and Hannah, L. 1998. <i>Carduus pycnocephalus</i> . Channel Islands National Park Service Species Literature Review. Unpublished.	
Anonomous. 2003. Written findings of the State Noxious Weed Control Board-Class A Weed.	
Question 3.1 Ecological amplitude/Range	A Other Pub. Mat'l back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: <i>C. pycnocephalus</i> was introduced to California during the 1930's. It is not listed in either the 1923 or 1967 Santa Catalina Island Floras. In 2003, 200 populations were detected, and the following is the percentage of habitats invaded: bare-<0.00%, beach-<0.00%, coastal bluff scrub-8%, coastal scrub-0.02%, coastal scrub/grassland-0.01%, grassland-1.5%, mixed chaparral-<0.00%, scrub oak chaparral-<0.00%, riparian-0.12%, oak woodland-<0.00%; and the following is the number of populations by non-native communities: 15- roadside, 1-non-native woodland, and 9-non-native herbaceous.	
Rationale: enter text here	
Sources of information: Anonymous. 2003. Written findings of the State Noxious Weed Control Board-Class A Weed.	
Knapp, J.J. 2004. Catalina Invasive Plant Ranking Plan for the Catalina Island Conservancy. Unpublished.	
Question 3.2 Distribution/Peak frequency	B Observational back
Describe distribution: Very common in Oak woodlands throughout the state.	
Rationale: enter text here	
Sources of information: Joe DiTomaso, UC Davis, observational	

Worksheet A[back](#)

Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	No: 0 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
	5 pts Total Unknowns
	B (4-5 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	D. presen
	desert	score
	interior	score
Scrub and Chaparral	coastal bluff scrub	D. presen
	coastal scrub	C. 5-20%
	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	D. presen
Grasslands, Vernal Pools, Meadows, and other Herb Communities	coastal prairie	D. presen
	valley and foothill grassland	D. presen
	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	D. presen
	riparian scrub (incl. desert washes)	D. presen
Woodland	cismontane woodland	B. 21-50%
	piñon and juniper woodland	score
	Sonoran thorn woodland	score
Forest	broadleaved upland forest	D. presen
	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).