# 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)**:** | Cirsium vulgare (Savi) Ten. |
| **Synonyms:** | Carduus lanceolatus, Cirsium lanceolatum |
| **Common names:** | bull thistle |
| **Evaluation date** (mm/dd/yy)**:** | 6/7/05 |
| **Evaluator #1 Name/Title:** | Elizabeth Brusati, project manager |
| **Affiliation:** | California Invasive Plant Council |
| **Phone numbers:** | 510-843-3902 |
| **Email address:** | edbrusati@cal-ipc.org |
| **Address:** | 1442A Walnut St. #462, Berkeley, CA 94709 |
| **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:** | Joe DiTomaso, Alison Stanton, 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:**
enter text here

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

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

**Impact**

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

**UBBU**

*Using matrix, determine score and enter below:*

**B**

| | | | |
|---|---|---|---|
| 2.1 | Role of anthropogenic and natural disturbance | A (3 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 | B (2 pts) | Rev'd, Sci. Pub'n |
| 2.6 | Potential for natural long-distance dispersal | C (1 pt) | Rev'd, Sci. Pub'n |
| 2.7 | Other regions invaded | C (1 pt) | Rev'd, Sci. Pub'n |

**Invasiveness**

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

**12**

*Use matrix to determine score and enter below:*

**B**

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

**Distribution**

*Using matrix, 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**

**No Alert**

## Table 3. Documentation

| |
|---|
| **Question 1.1** Impact on abiotic ecosystem processes U No Information back |
| Identify ecosystem processes impacted: no information |
| Rationale: enter text here |
| Sources of information: enter text here |
| **Question 1.2** Impact on plant community composition, structure, and interactions B Rev'd, Sci. Pub'n back |
| Identify type of impact or alteration: Dominates recently clearcut forests in the Sierra Nevadas. Growth of ponderosa pine was limited by bull thistle rosettes. Can form dense stands (1). Bull thistle also colonizes and maintains high population densities for up to six years in clearcuts in redwood and mixed evergreen forests in northwestern California (2). |
| Rationale: enter text here |
| Sources of information: 1. Forcella F., Randall J.M. 1994. Biology of Bull Thistle, Cirsium vulgare (Savi) Tenore. Rev. Weed Sci. 6:29-50.<br>2. Randall, J. M. 2000. in Bossard, C. C. , J. M. Randall, and M. C. Hoshovsky. Invasive Plants of California's Wildlands. University of California Press, Berkeley, CA. Also on-line: http://groups.ucanr.org/ceppc/Invasive_Plants_of_California's_Wildlands/ |
| **Question 1.3** Impact on higher trophic levels B Other Pub. Mat'l back |
| Identify type of impact or alteration: Displaces forage species used by native ungulates such as deer and elk (1). |
| Rationale: enter text here |
| Sources of information: Randall, J. M. 2000. in Bossard, C. C. , J. M. Randall, and M. C. Hoshovsky. Invasive Plants of California's Wildlands. University of California Press, Berkeley, CA. Also on-line: http://groups.ucanr.org/ceppc/Invasive_Plants_of_California's_Wildlands/ |
| **Question 1.4** Impact on genetic integrity U Rev'd, Sci. Pub'n back |
| Identify impacts: Hybridization with bull thistle has been suggested for endangered Cirsium hydrophyllum var. hydrophyllum in California. However, there is no evidence of this (1), chromosome numbers make it highly unlikely (Hickman, 1993), and the claim almost certainly a case of mis-identification (Dean Kelch, pers com to Daniel Gluesenkamp 2001). There are numerous native thistles in California, but no information on hybridization (2). |
| Rationale: enter text here |
| Sources of information: 1. Forcella F., Randall J.M. 1994. Biology of Bull Thistle, Cirsium vulgare (Savi) |

Tenore. Rev. Weed Sci. 6:29-50.

2. 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 A Other Pub. Mat'l back

Describe role of disturbance: It is most troublesome in recently or repeatedly disturbed areas such as pastures, overgrazed rangelands, recently burned forests and forest clearcuts, and along roads, ditches, and fences. Even small-scale disturbances such as gopher mounds promote bull thistle establishment and survival. It can also colonize areas in relatively undisturbed grasslands, meadows, and forest openings.

Rationale: enter text here

Sources of information: Randall, J. M. 2000. in Bossard, C. C. , J. M. Randall, and M. C. Hoshovsky. Invasive Plants of California's Wildlands. University of California Press, Berkeley, CA. Also on-line: http://groups.ucanr.org/ceppc/Invasive_Plants_of_California's_Wildlands/

**Question 2.2** Local rate of spread with no management C Other Pub. Mat'l back

Describe rate of spread: Already present in most of California, so probably not spreading much.

Rationale: enter text here

Sources of information: USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

**Question 2.3** Recent trend in total area infested within state C Other Pub. Mat'l back

Describe trend: Already present in most of California, so probably not spreading much. Transient populations enter after disturbance, then disappear.

Rationale: enter text here

Sources of information: USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Joe DiTomaso, UC Davis, pers. obs.

**Question 2.4** Innate reproductive potential A Rev'd, Sci. Pub'n back

Describe key reproductive characteristics: Biennial. Reproduces only by seed. Flowers are bisexual and can be either self- or cross-pollinated. Plants in California had >60 infloresences, but inflorescences per plant ranged from 1 to 475. Under favorable conditions, bull thistle can produce about 200 seeds/inflorescence (1). Other studies found a mean of 4000 seeds per plant, with germination ranging from 60-90% (2). Less than 5% of plants cut at the soil surface resprouted. However, bull thistle can resprout if cut early in the season (1). Flowering may occur from early June until the first snowfall or hard frost; in California there is a pronounced peak in July and early August. Seeds ripen and are released from early July through October, occasionally later along the coast

(3).

Rationale: enter text here

Sources of information: 1. Forcella F., Randall J.M. 1994. Biology of Bull Thistle, Cirsium vulgare (Savi) Tenore. Rev. Weed Sci. 6:29-50.

2. Klinkhamer P.G.L., de Jong T.J. 1993. Biological Flora of the British Isles: (Carduus lanceolatus L., Cirsium lanceolatum (L.) Scop., non Hill) Journal of Ecology 81: 177-191.

3. Randall, J. M. 2000. in Bossard, C. C. , J. M. Randall, and M. C. Hoshovsky. Invasive Plants of California's Wildlands. University of California Press, Berkeley, CA. Also on-line: http://groups.ucanr.org/ceppc/Invasive_Plants_of_California's_Wildlands/

**Question 2.5** Potential for human-caused dispersal B Rev'd, Sci. Pub'n back

Identify dispersal mechanisms: Transported by vehicles and farm equipment. Most common method of transport is in contaminated hay (1).

Rationale: enter text here

Sources of information: 1. Mitich L.W. 1998. Intriguing World of Weeds, Bull Thistle, Cirsium vulgare. Weed Technology 12: 761-763.

**Question 2.6** Potential for natural long-distance dispersal C Rev'd, Sci. Pub'n back

Identify dispersal mechanisms: Unlikely. Most seeds fall close to the parent plant. Only 10% are transported >32m.

Rationale: enter text here

Sources of information: 1. Forcella F., Randall J.M. 1994. Biology of Bull Thistle, Cirsium vulgare (Savi) Tenore. Rev. Weed Sci. 6:29-50.

John Randall, The Nature Conservancy, pers. obs.

**Question 2.7** Other regions invaded C Rev'd, Sci. Pub'n back

Identify other regions: Native to Europe. Introduced in North America, Australia, Chile, and New Zealand. In other areas, occurs in grasslands, roadsides, coastal dunes, woodland clearings, rock outcroppings, and on banks of rivers and streams (1). The species occurs on every continent except Antarctic (2). Present in all US states (3).

Rationale: Scoring as C because widespread in California.

Sources of information: 1. Klinkhamer P.G.L., de Jong T.J. Biological Flora of the British Isles: (Carduus

lanceolatus L., Cirsium lanceolatum (L.) Scop., non Hill) Journal of Ecology 81: 177-191. 1993.

2. .Forcella F., Randall J.M. 1994. Biology of Bull Thistle, Cirsium vulgare (Savi) Tenore. Rev. Weed Sci. 6:29-50.

3. USDA, NRCS. 2005. 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: Present through most of California (1). Dominates recently clearcut forests in the Sierra Nevadas. Considered a serious pest in Yosemite National Park (2). In California, most common in coastal grasslands, along edges of fresh and brackish marshes, and in meadows and mesic forest openings in the mountains below 7,000 feet (2,120 m). By 1925 it had been reported in California from the San Francisco Bay Area, Central Valley, Klamath region, North Coast, and the northern Sierra Nevada (3).

Rationale: enter text here

Sources of information: 1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

2. Forcella F., Randall J.M. 1994. Biology of Bull Thistle, Cirsium vulgare (Savi) Tenore. Rev. Weed Sci. 6:29-50.

3. Randall, J. M. 2000. in Bossard, C. C. , J. M. Randall, and M. C. Hoshovsky. Invasive Plants of California's Wildlands. University of California Press, Berkeley, CA. Also on-line: http://groups.ucanr.org/ceppc/Invasive_Plants_of_California's_Wildlands/

**Question 3.2** Distribution/Peak frequency C Observational back

Describe distribution: enter text here

Rationale: enter text here

Sources of information: Dan Gluesenkamp, Audubon Canyon Ranch, observational.

Peter Warner, California Dept. of Parks and Recreation, pers. obs.

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 | **Yes: 1 pt** |
| Seeds remain viable in soil for three or more years | **Yes: 2 pts** |
| Viable seed produced with *both* 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** |

| | |
|---|---|
| **6 pts** | **Total 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 | **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 | **D. presen** |
| **Grasslands, Vernal Pools, Meadows, and other Herb Communities** | coastal prairie | **C. 5-20%** |
| | valley and foothill grassland | **D. presen** |
| | Great Basin grassland | **score** |
| | vernal pool | **score** |
| | meadow and seep | **C. 5-20%** |
| | alkali playa | **score** |
| | pebble plain | **score** |
| **Bog and Marsh** | bog and fen | **score** |
| | marsh and swamp | **C. 5-20%** |
| **Riparian and Bottomland** | riparian forest | **D. presen** |
| | riparian woodland | **D. presen** |
| | riparian scrub (incl.desert washes) | **D. presen** |
| **Woodland** | cismontane woodland | **D. presen** |
| | piñon and juniper woodland | **score** |
| | Sonoran thorn woodland | **score** |
| **Forest** | broadleaved upland forest | **score** |
| | North Coast coniferous forest | **C. 5-20%** |
| | closed cone coniferous forest | **D. presen** |
| | lower montane coniferous forest | **C. 5-20%** |
| | 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).