

# 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**

|                                       |   |
|---------------------------------------|---|
| <b>Species name</b> (Latin binomial): | Salsola paulensii Litv.   |
| <b>Synonyms:</b>                      | formerly considered part of Russian thistle species (Salsola iberica or Salsola tragus) |
| <b>Common names:</b>                  | barbwire Russian thistle  |
| <b>Evaluation date</b> (mm/dd/yy):    | 3/22/05   |
| <b>Evaluator #1 Name/Title:</b>       | Elizabeth Brusati, project manager  |
| <b>Affiliation:</b>                   | California Invasive Plant Council   |
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| <b>Address:</b>                       | 1442A Walnut St. #462, Berkeley, CA 94709   |
| <b>Evaluator #2 Name/Title:</b>       | Joseph DiTomaso   |
| <b>Affiliation:</b>                   | University of California-Davis  |
| <b>Phone numbers:</b>                 | 530-754-8715  |
| <b>Email address:</b>                 | jmditomaso@ucdavis.edu  |
| <b>Address:</b>                       | Dept. Plant Sci., Mail Stop 4, Davis, CA 95616  |

Section below for list committee use—please leave blank

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

**General comments on this assessment:**

enter text here

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

|                     |                                       |          |                          |
|---------------------|---------------------------------------|----------|--------------------------|
| <a href="#">1.1</a> | Impact on abiotic ecosystem processes | <b>U</b> | <b>No Information</b>    |
| <a href="#">1.2</a> | Impact on plant community             | <b>C</b> | <b>Other Pub. Mat'l</b>  |
| <a href="#">1.3</a> | Impact on higher trophic levels       | <b>C</b> | <b>Rev'd, Sci. Pub'n</b> |
| <a href="#">1.4</a> | Impact on genetic integrity           | <b>D</b> | <b>Other Pub. Mat'l</b>  |

**Impact**

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

**UCCD**

*Using matrix, determine score and enter below:*

**C**

|                     |   |                  |                          |
|---------------------|---|------------------|--------------------------|
| <a href="#">2.1</a> | Role of anthropogenic and natural disturbance         | <b>B (2 pts)</b> | <b>Other Pub. Mat'l</b>  |
| <a href="#">2.2</a> | Local rate of spread with no management               | <b>C (1 pt)</b>  | <b>Observational</b>     |
| <a href="#">2.3</a> | Recent trend in total area infested within state      | <b>C (1 pt)</b>  | <b>Observational</b>     |
| <a href="#">2.4</a> | Innate reproductive potential <a href="#">Wksht A</a> | <b>C (1 pt)</b>  | <b>Rev'd, Sci. Pub'n</b> |
| <a href="#">2.5</a> | Potential for human-caused dispersal                  | <b>D (0 pts)</b> | <b>Rev'd, Sci. Pub'n</b> |
| <a href="#">2.6</a> | Potential for natural long-distance dispersal         | <b>D (0 pts)</b> | <b>Rev'd, Sci. Pub'n</b> |
| <a href="#">2.7</a> | Other regions invaded                                 | <b>C (1 pt)</b>  | <b>Rev'd, Sci. Pub'n</b> |

**Invasiveness**

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

**6**

*Use matrix to determine score and enter below:*

**C**

**Plant Score**

*Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:*

**Low**

**No Alert**

|                     |   |          |                         |
|---------------------|---|----------|-------------------------|
| <a href="#">3.1</a> | Ecological amplitude/Range                          | <b>C</b> | <b>Other Pub. Mat'l</b> |
| <a href="#">3.2</a> | Distribution/Peak frequency <a href="#">Wksht C</a> | <b>D</b> | <b>Observational</b>    |

**Distribution**

*Using matrix, determine score and enter below:*

**C**

**Table 3. Documentation**

|   |  |
|---|--|
| <b>Question 1.1</b> Impact on abiotic ecosystem processes   | U No Information <a href="#">back</a>    |
| Identify ecosystem processes impacted: Unknown  |  |
| Rationale: enter text here  |  |
| Sources of information: enter text here   |  |
| <b>Question 1.2</b> Impact on plant community composition, structure, and interactions  | C Other Pub. Mat'l <a href="#">back</a>  |
| Identify type of impact or alteration: Forms dense stands (1). The similar <i>Salsola tragus</i> is thought to facilitate colonization of other plants by forming pools of phosphorous in the soil (2). Generally found in disturbed sites or along roadsides.  |  |
| Rationale: Because seeds tend to fall close to the parent plants, barbwire Russian thistle plants are often clumped together (1).   |  |
| Sources of information: 1. Evans, R. A. and J. A. Young 1982. Russian thistle and barbwire Russian thistle seed and seedbed ecology, US Dept. of Agriculture, Agricultural Research Service, ARR-W-25. 39pp<br>2. Cannon, J.P., E.B. Allen, M.F. Allen, L.M. Dudley, and J.J. Jurinak. 1995. The effects of oxalates produced by <i>Salsola tragus</i> on the phosphorus nutrition of <i>Stipa pulchra</i> . <i>Oecologia</i> 102: 265-272. |  |
| <b>Question 1.3</b> Impact on higher trophic levels   | C Rev'd, Sci. Pub'n <a href="#">back</a> |
| Identify type of impact or alteration: Can accumulate oxalates that are toxic to livestock, especially sheep. Diarrhea and toxicity problems can occur when sheep forage on <i>Salsola</i> species for several weeks (1). However, considered good fodder for sheep (and camels) (2).   |  |
| Rationale: enter text here  |  |
| Sources of information: 1. DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States.<br>2. Kostivkovsky, V., and J. A. Young. 2000. Invasive exotic rangeland weeds: a glimpse at some of their native habitats. <i>Rangelands</i> . 22(6): 3-6.   |  |
| <b>Question 1.4</b> Impact on genetic integrity   | D Other Pub. Mat'l <a href="#">back</a>  |
| Identify impacts: No native <i>Salsola</i> in California.   |  |
| Rationale: enter text here  |  |
| Sources of information: Hickman, J. C. (ed.) 1993. <i>The Jepson Manual, Higher Plants of California</i> . University of California Press. Berkeley, CA enter text here   |  |

|   |  |
|---|--|
| <b>Question 2.1</b> Role of anthropogenic and natural disturbance in establishment  | B Other Pub. Mat'l <a href="#">back</a>  |
| Describe role of disturbance: Inhabits disturbed areas, including disturbed natural and semi-natural plant communities, but is usually found in disturbed sites (1).  |  |
| Rationale:  |  |
| Sources of information: DiTomaso and Healy. 2006. Weeds of California. UC DANR Publ. #3488.   |  |
| <b>Question 2.2</b> Local rate of spread with no management   | C Observational <a href="#">back</a>     |
| Describe rate of spread: Does not form dense stands in wildland areas. Primarily a problem along roadsides or disturbed sites.  |  |
| Rationale: enter text here  |  |
| Sources of information: DiTomaso, observational.  |  |
| <b>Question 2.3</b> Recent trend in total area infested within state  | C Observational <a href="#">back</a>     |
| Describe trend: Does not appear to be any more common today than several years ago.   |  |
| Rationale: enter text here  |  |
| Sources of information: DiTomaso, observational.  |  |
| <b>Question 2.4</b> Innate reproductive potential   | C Rev'd, Sci. Pub'n <a href="#">back</a> |
| Describe key reproductive characteristics: Summer annuals. Seed production at a site in Nevada rarely exceeded 1000 seeds/plant and averages 600 seeds/plant (1). Has adaptations to arid areas, including early maturation and seeds dispersal, seed dispersal underneath parent plants, and less specific temperature after-ripening requirements than Russian thistle (1). Wind-pollinated. Outcrossing and self-fertile. Flowers June to September. Most seeds survive about 1 year and a few seeds can survive 3 years (2). Barbwire Russian thistle plants tend to be clumped together, especially under old plant canopies that provide a favorable environment for germination (3). |  |
| Rationale: enter text here  |  |
| Sources of information: 1. Evans, R. A. and J. A. Young. 1980. Establishment of Barbwire Russian Thistle <i>Salsola-Paulsenii</i> in Desert Environments. <i>Journal of Range Management</i> 33(3): 169-173<br>2. DiTomaso and Healy. 2006. Weeds of California. UC DANR Publ. #3488.<br>3. Evans, R. A. and J. A. Young 1982. Russian thistle and barbwire Russian thistle seed and seedbed ecology, USDA-ARS: 1-39.   |  |

|  |  |
|--|--|
| <b>Question 2.5</b> Potential for human-caused dispersal   | D Rev'd, Sci. Pub'n <a href="#">back</a> |
| Identify dispersal mechanisms: Has been spread in contaminated cotton and wool (1). Could be spread by livestock, but long distance human transport is probably rare.  |  |
| Rationale: enter text here   |  |
| Sources of information: 1. Kostivkovsky and Young 2000   |  |
| <b>Question 2.6</b> Potential for natural long-distance dispersal  | D Rev'd, Sci. Pub'n <a href="#">back</a> |
| Identify dispersal mechanisms: Most seeds fall underneath the parent plant. Unlike Russian thistle, barbwire Russian thistle does not need to "tumble" to release seeds (1). At least 60% of seeds fall within 1.5m of the parent plant. However, hybrids with <i>S. iberica</i> can form tumbleweeds (2).   |  |
| Rationale: enter text here   |  |
| Sources of information: 1. Young, J. A. and R. A. Evans 1979. Barbwire Russian Thistle <i>Salsola-Paulsenii</i> Seed Germination. <i>Journal of Range Management</i> 32(5): 390-394<br>2. Lee, M. A. B. and T. Brothers 1981. Seed Dispersal in Hybrid <i>Salsola</i> . <i>Great Basin Naturalist</i> 41(3): 370-376.  |  |
| <b>Question 2.7</b> Other regions invaded  | C Rev'd, Sci. Pub'n <a href="#">back</a> |
| Identify other regions: Native to Eurasia. Probably introduced to the southwestern U.S. at the turn of the century (1) from contaminated wool or cotton (2), but was not recognized as a species until 1967 (1) when it was found at the Nevada atomic bomb test site (2). Also present in Arizona, New Mexico, Colorado, Nevada, Utah, and Oregon (1). One of the most widely-occurring alien annuals in western North America (3).   |  |
| Rationale: Scoring as C because already common in California.  |  |
| Sources of information: 1. DiTomaso and Healy. 2006. Weeds of California. UC DANR Publ. #3488.<br>2. Kostivkovsky, V., and J. A. Young. 2000. Invasive exotic rangeland weeds: a glimpse at some of their native habitats. <i>Rangelands</i> . 22(6): 3-6<br>3. Young, J. A. and R. A. Evans 1979. Barbwire Russian Thistle <i>Salsola-Paulsenii</i> Seed Germination. <i>Journal of Range Management</i> 32(5): 390-394.  |  |
| <b>Question 3.1</b> Ecological amplitude/Range   | C Other Pub. Mat'l <a href="#">back</a>  |
| Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Common in Mojave Desert, east of the Sierra Nevada, northern Western Transverse Ranges, mostly 700-1800m (1). USDA lists it in Santa Barbara, Kern, Inyo, and San Bernardino counties (2). Can establish at low levels in arid desert conditions (3). Prefers to grow under the canopies of desert trees and shrubs such as <i>Haloxylon</i> , <i>Tamarix</i> , <i>Salsola</i> , and <i>Ephedra</i> , among others (4). |  |

|  |                                      |
|--|--------------------------------------|
| Rationale: enter text here   |                                      |
| Sources of information: 1. DiTomaso and Healy. 2006. Weeds of California. UC DANR Publ. #3488.<br>2. USDA, NRCS. 2004. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.<br>3. Evans, R. A. and J. A. Young. 1980. Establishment of Barbwire Russian Thistle <i>Salsola-Paulsenii</i> in Desert Environments. <i>Journal of Range Management</i> 33(3): 169-173.<br>4. Kostivkovsky and Young 2000 |                                      |
| <b>Question 3.2</b> Distribution/Peak frequency  | B Observational <a href="#">back</a> |
| Describe distribution: Frequently found in the desert areas.   |                                      |
| Rationale: enter text here   |                                      |
| Sources of information: DiTomaso, observational.   |                                      |

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|  |                                  |
|--|----------------------------------|
| Reaches reproductive maturity in 2 years or less   | <b>Yes: 1 pt</b>                 |
| Dense infestations produce >1,000 viable seed per square meter                             | <b>No: 0 pts</b>                 |
| Populations of this species produce seeds every year.                                      | <b>Yes: 1 pt</b>                 |
| Seed production sustained over 3 or more months within a population annually               | <b>No: 0 pt</b>                  |
| Seeds remain viable in soil for three or more years  | <b>No: 0 pts</b>                 |
| Viable seed produced with <i>both</i> self-pollination and cross-pollination               | <b>Yes: 1 pt</b>                 |
| Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes | <b>No: 0 pt</b>                  |
| Fragments easily and fragments can become established elsewhere                            | <b>No: 0 pts</b>                 |
| Resprouts readily when cut, grazed, or burned  | <b>No: 0 pt</b>                  |
|  | <b>3 pts      Total Unknowns</b> |
|  | <b>C (1-3)</b>                   |
| <b>Note any related traits:</b> enter text here  |                                  |

## Worksheet C - California Ecological Types

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(*sensu* Holland 1986)

| 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  | score      |
|  | desert   | score      |
|  | interior   | score      |
| <b>Scrub and Chaparral</b>   | coastal bluff scrub                                | score      |
|  | coastal scrub                                      | score      |
|  | Sonoran desert scrub                               | D. present |
|  | Mojavean desert scrub (incl. Joshua tree woodland) | C. 5-20%   |
|  | Great Basin scrub                                  | D. present |
|  | chenopod scrub                                     | D. present |
|  | montane dwarf scrub                                | score      |
|  | Upper Sonoran subshrub scrub                       | score      |
| chaparral  | score  |            |
| <b>Grasslands, Vernal Pools, Meadows, and other Herb Communities</b> | coastal prairie                                    | score      |
|  | 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      |

\* 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).