

# 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>Arundo donax</i>
<b>Synonyms:</b>	enter text here
<b>Common names:</b>	Giant reed
<b>Evaluation date</b> (mm/dd/yy):	2/8/03
<b>Evaluator #1 Name/Title:</b>	Joe DiTomaso
<b>Affiliation:</b>	UC Davis
<b>Phone numbers:</b>	530-754-8715
<b>Email address:</b>	DiTomaso@vegmail.ucdavis.edu
<b>Address:</b>	Weed Science Program, Robbins Hall, Univ. California, Davis CA 95616
<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 review committee use—please leave blank

<b>Review committee members:</b>	Carla Bossard, John Randall, Peter Warner, Doug Johnson, John Hall, Dana, Cindy Roye, Matt Brooks
<b>Committee review date:</b>	2/10/03
<b>List date:</b>	enter text here
<b>Re-evaluation date(s):</b>	enter text here

**Step 2a:** Complete the first portion of Table 2 by selecting the appropriate response to each of the thirteen criteria questions in Part II. Select the correct letter code from the “score” pull-down menus.

For question 2.4, first complete Worksheet A located below Table 3.

For questions 3.1 and 3.2, first complete the appropriate ecological type worksheet for your state (either Worksheet B, C, or D found below Table 3) by following the instructions in Section 3, then respond to questions 3.1 and 3.2.

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

1.1	Impact on abiotic ecosystem processes	<b>A</b>	<b>Rev'd, Sci. Pub'n</b>
1.2	Impact on plant community	<b>A</b>	<b>Other Pub. Mat'l</b>
1.3	Impact on higher trophic levels	<b>A</b>	<b>Rev'd, Sci. Pub'n</b>
1.4	Impact on genetic integrity	<b>D</b>	<b>No Information</b>

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

2.1	Role of anthropogenic and natural disturbance	<b>B 2</b>	<b>Other Pub. Mat'l</b>
2.2	Local rate of spread with no management	<b>B 2</b>	<b>Other Pub. Mat'l</b>
2.3	Recent trend in total area infested within state	<b>A 3</b>	<b>Observational</b>
2.4	Innate reproductive potential	<b>B 2</b>	<b>Rev'd, Sci. Pub'n</b>
2.5	Potential for human-caused dispersal	<b>B 2</b>	<b>Other Pub. Mat'l</b>
2.6	Potential for natural long-distance dispersal	<b>A 3</b>	<b>Other Pub. Mat'l</b>
2.7	Other regions invaded	<b>C 1</b>	<b>Other Pub. Mat'l</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:  
**15**  
 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:  
**High**

3.1	Ecological amplitude	<b>A</b>	<b>Other Pub. Mat'l</b>
3.2	Distribution	<b>B</b>	<b>Observational</b>

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

**Worksheet A.** Complete this worksheet to answer Question 2.4.

Reaches reproductive maturity in 2 years or less	<b>Yes</b>
Dense infestations produce >1,000 viable seed per square meter	<b>No</b>
Populations of this species produce seeds every year.	<b>No</b>
Seed production sustained over 3 or more months within a population annually	<b>No</b>
Seeds remain viable in soil for three or more years	<b>No</b>
Viable seed produced with <i>both</i> self-pollination and cross-pollination	<b>No</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>5 Total Unknowns 0</b>	
<b>B</b>	

**Table 3. Documentation**

<b>Question 1.1</b> Impact on abiotic ecosystem processes
Identify ecosystem processes impacted: High water use and light suppression of competing species. Water temperature increase due to reduced shading typical of native trees.
Rationale: Can form near monotypic stands.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley; Team Arundo Del Norte, <a href="http://www.teamarundo.org/index.html">www.teamarundo.org/index.html</a> ; DiTomaso, J.M. 1998. Biology and ecology of giant reed. Proc., Arundo and saltcedar workshop. Las Vegas, NV; Iverson, M.E. 1998. Effects of Arundo donax on water resources. CalEPPC News 6:10-11
<b>Question 1.2</b> Impact on plant community composition, structure, and interactions
Identify type of impact or alteration: Displaces native vegetation, shades out lower level plant species.
Rationale: Has been show to comprise 68% of riparian vegetation in Santa Ana River. Other observations indicate nearly pure monotypic stands.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley; Hoshovsky, M. 1986. Arundo donax. The Nature Conservancy Elements of Stewardship Abstract. <a href="http://Tncweeds.ucdavis.edu/esadocs/arundona.html">Tncweeds.ucdavis.edu/esadocs/arundona.html</a> ; DiTomaso, J.M. 1998. Biology and ecology of giant reed. Proc., Arundo and saltcedar workshop. Las Vegas, NV
<b>Question 1.3</b> Impact on higher trophic levels
Identify type of impact or alteration: Reduces habitat for Least Bell's vireo, southwestern willow flycatcher, yellow-billed cockoo. Can also impact fish habitat by increasing water temperature.
Rationale: Negatively impacts wildlife, insects and bird food supply and habitat in riparian habitats.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley (see for reference to peer-reviewed scientific literature).
<b>Question 1.4</b> Impact on genetic integrity
Identify impacts: none
Rationale: Does not reproduce sexually.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley.
<b>Question 2.1</b> Role of anthropogenic and natural disturbance in establishment
Describe role of disturbance: Can establish with or without disturbance.
Rationale: New infestation can develop downstream in undisturbed habitat from fragmentation of upstream populations.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley
<b>Question 2.2</b> Local rate of spread with no management
Describe rate of spread: Locally slow because of lack of seed production, particularly in areas where plants are not subject to flooding and fragmentation of rhizomes or stems.
Rationale: Rapid spread can occur periodically with flooding events that wash away plant fragments.
Sources of information: Hoshovsky, M. 1986. Arundo donax. The Nature Conservancy Elements of Stewardship Abstract. <a href="http://Tncweeds.ucdavis.edu/esadocs/arundona.html">Tncweeds.ucdavis.edu/esadocs/arundona.html</a> ; also much observational data (T. Dudley, C. Bossard, J. DiTomaso, etc.)
<b>Question 2.3</b> Recent trend in total area infested within state
Describe trend: Because of periodic flooding events or mechanical damage, overall trend in Arundo donax is observationally considered to be rapid, greater than doubling every 10 years.
Rationale: El Nino year caused tremendous flooding throughout the state and dramatic increases in Arundo populations in new locations and in already infested areas. Due to fragmentation of stems and rhizomes.
Sources of information: Observational data from many sources (DiTomaso, Rafferty, Team Arundo, etc.)
<b>Question 2.4</b> Innate reproductive potential
Describe key reproductive characteristics: No sexual reproduction, rapid spread with fragmentation of plant parts above and below ground.
Rationale: Rapid spread despite lack of seed production.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley; Hoshovsky, M. 1986. Arundo donax. The Nature Conservancy Elements of Stewardship Abstract. <a href="http://Tncweeds.ucdavis.edu/esadocs/arundona.html">Tncweeds.ucdavis.edu/esadocs/arundona.html</a> ; Boose, A.B. and J.S. Holt. 1999. Environmental effects on asexual reproduction in Arundo donax. Weed Research 39:117-127; DiTomaso, J.M. 1998. Biology and ecology of giant reed. Proc., Arundo and saltcedar workshop. Las Vegas,

NV; Purdue, R.E. 1958. Arundo donax - source of musical reeds and industrial cellulose. Economic Botany 12(4):157-172
<b>Question 2.5</b> Potential for human-caused dispersal
Identify dispersal mechanisms: Plants sold in the nursery industry today, but more often in the past. Mechanical damage caused to humans can lead to long distance transport in water to new sites.
Rationale: Many problematic populations are close to urban area and water sources, where escapes appear to be from cultivated plants.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley; Hoshovsky, M. 1986. Arundo donax. The Nature Conservancy Elements of Stewardship Abstract. <a href="http://tncweeds.ucdavis.edu/esadoes/arundona.html">tncweeds.ucdavis.edu/esadoes/arundona.html</a>
<b>Question 2.6</b> Potential for natural long-distance dispersal
Identify dispersal mechanisms: Water is the main pathway of movement of Arundo donax following fragmentation.
Rationale: Flooding or mechanically damaged plants cause fragments to enter the water where they can be transported long distances.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley.
<b>Question 2.7</b> Other regions invaded
Identify other regions: Giant reed is naturalized and invasive in many regions, including southern Africa, subtropical United States through Mexico, the Caribbean islands and South America, Pacific Islands, Australia, and Southeast Asia (Hafliger and Scholz 1981).
Rationale: Used and transported around the world for years.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley; Wells, M.J., K. Duggan and L. Henderson. 1980. Woody plant invaders of the central Transvaal. Pp. 11-23 in Proc, Third National Weeds Conf., South Africa.
<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: Giant reed was brought to North America quite early, as it was abundant by 1820 in the Los Angeles River, where it was harvested for roofing material and fodder.
Rationale:
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley; Hoshovsky, M. 1986. Arundo donax. The Nature Conservancy Elements of Stewardship Abstract. <a href="http://tncweeds.ucdavis.edu/esadoes/arundona.html">tncweeds.ucdavis.edu/esadoes/arundona.html</a>
<b>Question 3.2</b> Distribution
Describe distribution: Primarily found in Riparian areas and in freshwater aquatic systems. Can also be found in meadows and seeps, as well as marshes and swamps.
Rationale: Most common in scrub and woodland riparian areas and along rivers, streams and canals where primarily observational information indicates that it is present in between 20-50% of these systems.
Sources of information: Dudley, T. 2000. Arundo donax. In, Invasive Plants of California's Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley; also much observational information including DiTomaso, Warner, Brooks, Dudley, etc.

Complete the worksheet that corresponds to your state using the letter codes and instructions in Section 3.

### Worksheet C - California Ecological Types

(*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	C
	rivers, streams, canals	B
	estuaries	D
<b>Dunes</b>	coastal	score
	desert	score
	interior	score
<b>Scrub and Chaparral</b>	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
<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	D
	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	D
	piñon and juniper woodland	D
	Sonoran thorn woodland	B
<b>Forest</b>	broadleaved upland forest	B
	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).