

# 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):	Atriplex semibaccata
<b>Synonyms:</b>	Atriplex denticulata, Atriplex flagellaris
<b>Common names:</b>	Australian saltbush, berry saltbush, creeping saltbush, scrambling berry saltbush
<b>Evaluation date</b> (mm/dd/yy):	8/6/2004
<b>Evaluator #1 Name/Title:</b>	John J. Knapp, Invasive Plant Program Manager
<b>Affiliation:</b>	Santa Catalina Island Conservancy
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<b>Evaluator #2 Name/Title:</b>	Brianna Richardson, Project Manager
<b>Affiliation:</b>	California Invasive Plant Council
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Section below for list committee use—please leave blank

<b>List committee members:</b>	Joe DiTomaso, John Randall, Cynthia Roye, Alison Stanton, Jake Sigg, Peter Warner.
<b>Committee review date:</b>	8/27/2004
<b>List date:</b>	enter text here
<b>Re-evaluation date(s):</b>	enter text here

**General comments on this assessment:**

Native origin--Australia.

On Santa Catalina Island, *A. semibaccata* populations are underestimated because the extent of large populations could not be recorded accurately due to the lack of visibility, which is restricted by other vegetation, flat topography, the species' prostrate habit, and distance in the case of aerial and coastal surveys.

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

<a href="#">1.1</a>	Impact on abiotic ecosystem processes	<b>C</b>	<b>Other Pub. Mat'l</b>
<a href="#">1.2</a>	Impact on plant community	<b>A</b>	<b>Other Pub. Mat'l</b>
<a href="#">1.3</a>	Impact on higher trophic levels	<b>D</b>	<b>Other Pub. Mat'l</b>
<a href="#">1.4</a>	Impact on genetic integrity	<b>C</b>	<b>Other Pub. Mat'l</b>

**Impact**

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

**CADC**

*Using matrix, determine score and enter below:*

**B**

<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>Other Pub. Mat'l</b>
<a href="#">2.3</a>	Recent trend in total area infested within state	<b>C (1 pt)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.4</a>	Innate reproductive potential <a href="#">Wksht A</a>	<b>A (3 pts)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.5</a>	Potential for human-caused dispersal	<b>B (2 pts)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.6</a>	Potential for natural long-distance dispersal	<b>B (2 pts)</b>	<b>Other Pub. Mat'l</b>
<a href="#">2.7</a>	Other regions invaded	<b>C (1 pt)</b>	<b>Other Pub. Mat'l</b>

**Invasiveness**

*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 Overall Score and Alert Status from the three section scores and enter below:*

**Medium**

**No Alert**

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

**Distribution**

*Using matrix, determine score and enter below:*

**B**

**Table 3. Documentation**

<p><b>Question 1.1</b> Impact on abiotic ecosystem processes</p>	<p>C Other Pub. Mat'l <a href="#">back</a></p>
<p>Identify ecosystem processes impacted: Alters fire intensity. Increases local soil moisture and nutrient content by bringing minerals, water, and chemicals to the soil surface. Can be used to revegetate mining sites. May reduce SE levels in soil.</p>	
<p>Rationale: Minor alteration of fire, water, and nutrient regimes.</p>	
<p>Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i>. In, <i>Invasive Plants of California's Wildlands</i>. C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles.</p> <p>Banuelos, GS, DW Meek. 1990. Accumulation of selenium in plants grown on selenium-treated soil. <i>Journal of Environmental Quality</i>. V.19: 772-777.</p> <p>(2) Stone, C.P., C.W. Smith, and J.T. Tunison, eds. 1992. <i>Alien plant invasions in native ecosystems of Hawai'i: Management and research</i>. University of Hawai'i Cooperative National Park Resources Unit, Honolulu, Hawai'i.</p>	
<p><b>Question 1.2</b> Impact on plant community composition, structure, and interactions</p>	<p>A Other Pub. Mat'l <a href="#">back</a></p>
<p>Identify type of impact or alteration: A ground spreading plant, displaces native plants. One plant can form a mat up to 4 ft in diameter. Has a dramatic effect on island grassland populations.</p>	
<p>Rationale: Forms dense stands, reduces native vegetation, creates thick ground cover.</p>	
<p>Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i>. In, <i>Invasive Plants of California's Wildlands</i>. C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles.</p> <p>(2) Stone, C.P., C.W. Smith, and J.T. Tunison, eds. 1992. <i>Alien plant invasions in native ecosystems of Hawai'i: Management and research</i>. University of Hawai'i Cooperative National Park Resources Unit, Honolulu, Hawai'i.</p> <p>Personal observation: John Knapp, Santa Catalina Island Conservancy.</p>	
<p><b>Question 1.3</b> Impact on higher trophic levels</p>	<p>D Other Pub. Mat'l <a href="#">back</a></p>
<p>Identify type of impact or alteration: Seeds eaten by birds. Flowers used by the pygmy blue butterfly.</p>	
<p>Rationale: No negative impacts to higher trophic levels documented in the literature. May cause damage through extirpation of native vegetation used as cover and for food. Could rate a "C."</p>	
<p>Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i>. In, <i>Invasive Plants of California's Wildlands</i>. C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles.</p> <p>Las Pilitas Nursery website: <a href="http://www.laspilitas.com/butterflies">www.laspilitas.com/butterflies</a></p>	
<p><b>Question 1.4</b> Impact on genetic integrity</p>	<p>C Other Pub. Mat'l <a href="#">back</a></p>
<p>Identify impacts: 31 closely related California natives, some of which are rare or endangered. <i>A. semibaccata</i></p>	

<p>can possibly hybridize with two Santa Catalina Island native slabush species (<i>A. coulterii</i> [listed as G2 by NatureServe] and <i>A. pacifica</i> [listed as G3 by NatureServe]). 46 native taxa are in the genus <i>Atriplex</i> in California. <i>A. semibaccata</i> hybridizes readily with <i>A. spinibractea</i> in Australia.</p>	
<p>Rationale: No information currently exists on whether <i>A. semibaccata</i> is hybridizing with CA natives. Trials are being conducted on Catalina Island to try to produce a hybrid between <i>A. semibaccata</i> and two native spp</p>	
<p>Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i>. In, <i>Invasive Plants of California's Wildlands</i>. C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles.</p> <p>DiTomaso, J., E. Healy. <i>Weeds of California and Other Western States</i>. Not yet published.</p> <p>Personal communication: B. Richardson w/ John Knapp. Email 8/10/2004.</p> <p>Harden, G.J. 1990. <i>Flora of New South Wales volume 1</i>. New South Wales University Press.</p> <p>Hickman, J.C. (ed.). 1993. <i>The Jepson manual of higher plants of California</i>. Pp. 501-505. University of California Press, Berkeley.</p>	
<p><b>Question 2.1</b> Role of anthropogenic and natural disturbance in establishment</p>	<p>B Other Pub. Mat'l <a href="#">back</a></p>
<p>Describe role of disturbance: Prefers areas that have been heavily grazed or disturbed. Readily establishes in areas newly developed, roadsides, margins of cultivated fields, coastal marshes.</p>	
<p>Rationale: Most establishment attributed to disturbance.</p>	
<p>Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i>. In, <i>Invasive Plants of California's Wildlands</i>. C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles.</p> <p>Harden, G.J. 1990. <i>Flora of New South Wales volume 1</i>. New South Wales University Press.</p> <p>Wilken, D. and Hannah, L. 1998. <i>Channel Islands National Park Species Literature Review</i>. Unpublished.</p>	
<p><b>Question 2.2</b> Local rate of spread with no management</p>	<p>B Other Pub. Mat'l <a href="#">back</a></p>
<p>Describe rate of spread: Naturalized in localized areas on Santa Catalina Island prior to 1921. Naturalized widely by 1966 and 2003. Spread by seed and vegetatively is slow.</p>	
<p>Rationale: A large amount of uninfested habitat exists on Catalina Island.</p>	
<p>Sources of information: Millspaugh, C.F. and Nuttall, L.W. 1923. <i>Flora of Santa Catalina Island</i>. Pp. 91-92. Field Museum of Natural History, Botany v.5. Chicago.</p> <p>Thorne, R.F. 1967. <i>A flora of Santa Catalina Island, California</i>. <i>Aliso</i>, 6(3):1-77.</p> <p>Knapp, J.J. 2003. <i>Prioritized invasive plant management for the Santa Catalina Island Conservancy</i>. Unpublished.</p> <p>USDA. No Date. <i>Conservation plant characteristics for: Australian saltbush</i>. USDA Natural Resources Conservation Service.</p> <p>Observational, Peter Warner, Joe DiTomaso, 2004</p>	

<b>Question 2.3</b> Recent trend in total area infested within state	C Other Pub. Mat'l <a href="#">back</a>
Describe trend: Species not targeted for removal on Catalina as of 2003 (1). Occupies 53,559,275 square ft. on Santa Catalina Island (2). Common on Anacapa Island and in a wide range of habitats on other Northern Channel Islands such as grasslands and disturbed habitats (3). Elkhorn Slough National Estuarine Research Reserve (4). Inland Empire California State Parks (5).	
Rationale: A. semibaccata is too widespread for control measures.	
Sources of information: (1) Knapp, D.A. 2001. Personal communication. Santa Catalina Island Plant Ecologist. (2) Knapp, J.J. 2004. Prioritized invasive plant management plan for the Santa Catalina Island Conservancy. Unpublished. (3) Stone, C.P., C.W. Smith, and J.T. Tunison, eds. 1992. Alien plant invasions in native ecosystems of Hawai'i: Management and research. University of Hawai'i Cooperative National Park Resources Unit, Honolulu, Hawai'i. (4) Elkhorn Slough National Estuarine Research Reserve. 2000. Weed control by species. Elkhorn Slough National Estuarine Research Reserve. Pp. 1-57. (5) California State Parks. 2000. Urban edge effects and their relationship with the natural environment. Pp. 1-30. California State Parks Inland Empire District.	
<b>Question 2.4</b> Innate reproductive potential	A Other Pub. Mat'l <a href="#">back</a>
Describe key reproductive characteristics: Reproduces by seed only. Flowers April-December. Seeds produced summer-December. Likely self-pollinating (other Atriplex are). Seeds produced in "large numbers," though others state low seed abundance. Seed persistence in soil is unknown. Resprouts when cut. Produces seed annually on Catalina Island.	
Rationale: 6 points.	
Sources of information: Randall, JM and MC Hoshovsky. 2000. Atriplex semibaccata. In, Invasive Plants of California's Wildlands. C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles. Elkhorn Slough National Estuarine Research Reserve. 2000. Weed control by species. Elkhorn Slough National Estuarine Research Reserve. Pp. 1-57. Wilken, D. and Hannah, L. 1998. Channel Islands National Park Species Literature Review. Randall, J.M. and Hoshovsky, M.C. 2000. Atriplex semibaccata. In, Invasive Plants of California's Wildlands. (eds.) C. Bossard, J. Randall, and M. Hoshovsky. Pp. 59-61. University Press, Los Angeles. Knapp, J.J. 2004. Prioritized invasive plant management plan for the Santa Catalina Conservancy. Unpublished. USDA. No Date. Conservation plant characteristics for: Australian saltbush. USDA Natural Resources Conservation Service.	
<b>Question 2.5</b> Potential for human-caused dispersal	B Other Pub. Mat'l <a href="#">back</a>
Identify dispersal mechanisms: Was promoted as livestock forage, as a ground cover, for erosion control, and to attract birds. Recently promoted as a fire-resistant ground cover and for reclamation of mined sites in the southwest. Seeds dispersed by human activities. Disposal of soil from urban areas to the Interior may transport	

seed to new locales. Sold horticulturally.	
Rationale: Currently sold horticulturally and for revegetation. Readily moved by soil transport.	
Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i> . In, <i>Invasive Plants of California's Wildlands</i> . C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles. DiTomaso, J., E. Healy. <i>Weeds of California and Other Western States</i> . Not yet published. de Villiers, AJ, MW van Rooyen, GK Theron, AS Claassens. 1996. Tolerance of six Namaqualand pioneer species of saline soil conditions. <i>South African Journal of Plant and Soil</i> 14(1): 38-42. Las Pilitas Nursery website: <a href="http://www.laspilitas.com/butterflies">www.laspilitas.com/butterflies</a> Wilken, D. and L. Hannah. 1998. Channel Islands National Park Species Literature Review. Knapp, JJ. Personal observations from 2001-2004 on Santa Catalina Island, CA. 310.510.1299. Observational, Peter Warner, Joe DiTomaso, 2004.	
<b>Question 2.6</b> Potential for natural long-distance dispersal	B Other Pub. Mat'l <a href="#">back</a>
Identify dispersal mechanisms: Fruits are dispersed by frugivores: mammals, birds, reptiles, and ants. Seeds dispersed by water, in mud or soil movement, and animals.	
Rationale: Fleshy bright red fruits make them attractive to vectors, and have been found as a dietary constituent of several fauna, which can disperse the seeds over long distances.	
Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i> . In, <i>Invasive Plants of California's Wildlands</i> . C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles. DiTomaso, J., E. Healy. <i>Weeds of California and Other Western States</i> . Not yet published. Wilken, D. and L. Hannah. 1998. Channel Islands National Park Species Literature Review. Observational, Peter Warner, Joe DiTomaso, 2004.	
<b>Question 2.7</b> Other regions invaded	C Other Pub. Mat'l <a href="#">back</a>
Identify other regions: Found in NV, AZ, NM, UT, TX. Introduced to South Africa, Chile, Tasmania, Hawaii, Canary Island, South America, central Asia.	
Rationale: Similar habitats to those invaded in CA.	
Sources of information: DiTomaso, J., E. Healy. <i>Weeds of California and Other Western States</i> . Not yet published. Wilken, D, L. Hannah. 1998. <i>Atriplex semibaccata</i> R. Br. (Chenopodiaceae) Australian saltbush, creeping saltbush. Santa Barbara Botanic Garden. de Villiers, AJ, MW van Rooyen, GK Theron, AS Claassens. 1996. Tolerance of six Namaqualand pioneer species of saline soil conditions. <i>South African Journal of Plant and Soil</i> 14(1): 38-42.	

Wilken, D. and L. Hannah. 1998. Channel Islands National Park Species Literature Review.	
<b>Question 3.1</b> Ecological amplitude/Range	A 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: Introduced to CA as livestock forage, Tulare Co in 1910. Found in margins of grassland, scrub, shrubland, and salt marshes, waste places, and woodland below 3,280 ft. Found in the Mojave and Sonoran deserts, and arid parts of the South Coast, Central Coast, SF Bay area, and Central Valley to Glenn Co. Coastal areas and salt marshes from San Diego to Mendocino Co, as well as all Channel Islands. Common in grasslands on Santa Cruz Island. On Santa Catalina Island, 3308 populations were recorded and the following is the percentage of habitat type invaded: bare soil-2.8%, beach-3.1%, coastal scrub-0.1%, coastal scrub/grassland-6.3%, grassland-0.56%, non-native scrub-0.00%, and riparian-0.17% (2). In 1966, coastal bluff scrub was also invaded on Santa Catalina Island (3). Also found in coastal marsh (4). Considered a regional noxious weed by CDFA.	
Rationale: Found in at least 6 major and 11 minor ecotypes in CA.	
Sources of information: Randall, JM and MC Hoshovsky. 2000. <i>Atriplex semibaccata</i> . In, <i>Invasive Plants of California's Wildlands</i> . C. Bossard, J. Randall, M. Hoshovsky (eds.) 59-61. University Press, Los Angeles. DiTomaso, J., E. Healy. <i>Weeds of California and Other Western States</i> . Not yet published. Millsbaugh, C.F. and Nuttall, L.W. 1923. <i>Flora of Santa Catalina Island</i> . Pp. 91-92. Field Museum of Natural History, Botany v.5. Chicago. Knapp, J.J. 2004. <i>Prioritized invasive plant management plan for the Santa Catalina Island Conservancy</i> . Unpublished. Thorne, R.F. 1967. <i>A flora of Santa Catalina Island, California</i> . <i>Aliso</i> , 6(3):1-77. Elkhorn Slough National Estuarine Research Reserve. 2000. <i>Weed control by species</i> . Elkhorn Slough National Estuarine Research Reserve. Pp. 1-57. Wilken, D. and Hannah, L. 1998. <i>Channel Islands National Park Species Literature Review</i> . Stone, C.P., C.W. Smith, and J.T. Tunison, eds. 1992. <i>Alien plant invasions in native ecosystems of Hawai'i: Management and research</i> . University of Hawai'i Cooperative National Park Resources Unit, Honolulu, Hawai'i.	
<b>Question 3.2</b> Distribution/Peak frequency	C Other Pub. Mat'l <a href="#">back</a>
Describe distribution: On Catalina Island, ranks a "C." Statewide distribution unknown.	
Rationale: enter text here	
Sources of information: DiTomaso, J., E. Healy. <i>Weeds of California and Other Western States</i> . Not yet published. Knapp, JJ. 2004. <i>Prioritized invasive plant management plan for the Santa Catalina Island Conservancy</i> . Unpublished. Thorne, RF. 1967. <i>A flora of Santa Catalina Island, California</i> . <i>Aliso</i> 6(3): 1-77. Observational, Peter Warner, Joe DiTomaso, 2004.	



**Worksheet A**

[back](#)

Reaches reproductive maturity in 2 years or less	<b>Yes: 1 pt</b>
Dense infestations produce >1,000 viable seed per square meter	<b>Unknown: 0 pts</b>
Populations of this species produce seeds every year.	<b>Unknown: 0 pts</b>
Seed production sustained over 3 or more months within a population annually	<b>Yes: 1 pt</b>
Seeds remain viable in soil for three or more years	<b>Yes: 2 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>Yes: 1 pt</b>
	<b>6 pts      2 unknowns</b>
	<b>A (6+ pts)</b>

**Note any related traits:** Seeds produced in "large" numbers.

## Worksheet C - California Ecological Types

[back](#)

(*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	Unknown
	desert	score
	interior	score
<b>Scrub and Chaparral</b>	coastal bluff scrub	Unknown
	coastal scrub	C. 5-20%
	Sonoran desert scrub	Unknown
	Mojavean desert scrub (incl. Joshua tree woodland)	Unknown
	Great Basin scrub	score
	chenopod scrub	score
	montane dwarf scrub	score
	Upper Sonoran subshrub scrub	Unknown
	chaparral	score
<b>Grasslands, Vernal Pools, Meadows, and other Herb Communities</b>	coastal prairie	Unknown
	valley and foothill grassland	Unknown
	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	Unknown
<b>Riparian and Bottomland</b>	riparian forest	score
	riparian woodland	score
	riparian scrub (incl. desert washes)	Unknown
<b>Woodland</b>	cismontane woodland	Unknown
	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).